

Annex B – Methodology (United States)

This document accompanies the full report, “The Cost of the Man Box: A Study on the Economic Impacts of Harmful Masculine Stereotypes in the United States,” available for download at www.promundoglobal.org/cost-of-the-man-box.

Stage 1: Risks attributable to the Man Box

We used data from the 2017 Man Box study to ascertain the proportional risk attributable to “being in the Man Box” for all six cost/consequence areas.

The first key variable in our analysis of risks attributable to the Man Box is the variable for being “in the Man Box” or “outside the Man Box.” To create this variable, we calculated a composite score for each respondent’s answers for the 15 Man Box rules (see Annex A). Each response was awarded from one to four points, with the most gender-inequitable answer (usually “strongly agree”) receiving one point and the most gender-equitable answer (usually “strongly disagree”) receiving four points. “Agree” and “disagree” responses received two or three points depending on the nature/direction of the item. We then divided this score by 15 to arrive at each individual’s composite score on the same 1 to 4 scale (with higher scores reflecting more gender-equitable views). In the United States, the average composite score was 2.87 on this scale. For ease of analysis and presentation, we then coded all men with Man Box scores below this country average as “in the Man Box,” and those with scores at or above the country average as “outside the Man Box.” This creates two easily comparable categories that reflect the particular landscape of masculine norms in the United States.

The second set of key variables comprises the specific survey items which cover the six cost categories presented in the report, as follows:

1. Bullying and Violence

A respondent was coded as positive for “perpetrated bullying or violence” if they responded “infrequently,” “often,” or “very often” to any one or more of the following three survey items:

- “In the past month, how often have you done any of the following things: “You made jokes about someone, called someone names they did not like, for any reason?”
- “In the past month, how often have you done any of the following things: “You insulted someone, posted photos meant to embarrass someone, or made threats to someone on SMS, Facebook, Instagram, Snapchat, Twitter, or another app or website?”
- “In the past month, how often have you done any of the following things: “You physically hurt someone on purpose by pushing them down, kicking them or hitting them with a hand, clenched fist, object or weapon?”

2. Sexual Violence

A respondent was coded as positive for “perpetrated sexual harassment” if they responded “infrequently,” “often,” or “very often” to the following survey item:

- “In the past month, how often have you done any of the following things: “You made sexual comments to a woman or girl you didn’t know, in a public place, like the street, your workplace, your school/university, or in an internet or social media space?”

3. Depression

A respondent was coded as positive for depressive symptomatology if they met the threshold for additional screening as measured by the Patient Health Questionnaire.(1) This scale is an internationally validated screening tool for depressive disorder comprising two questions. The two questions have four possible answers, which receive points as follows: Not at All (0 points), Some Days (1 point), More Than Half the Days (2 points), and Nearly Every Day (3 points). Taken together, the possible score ranges from 0 to 6. A respondent scoring 3 points or higher is recommended for additional screening. The two survey items are:

- “Over the past two weeks, how often have you been bothered by any of the following problems: Little interest or pleasure in doing things”
- “Over the past two weeks, how often have you been bothered by any of the following problems: Feeling down, depressed, or hopeless”

4. Suicide

A respondent was coded as positive for suicidal ideation if they responded “Some Days,” “More Than Half the Days,” or “Nearly Every Day” to the survey item:

- “Over the past two weeks, how often have you been bothered by any of the following problems: “Having thoughts of suicide”

5. Binge Drinking

A respondent was coded as positive for binge drinking if they responded “Once per month,” “Once or twice per week,” or “Every day or almost every day” to the survey item, “In the last year, how often did you drink so much that you got drunk?”

6. Traffic Accidents

A respondent was coded as positive for having a recent traffic accident if they responded “Yes, once” or “Yes, more than once” to the survey item, “In the past 12 months, have you, yourself, been in any traffic accidents?” The survey item also included the explanatory note for respondents reading, “*Please think about accidents you might have been involved with automobiles, trucks, buses, minibuses, bicycles, motorbikes, or motorcycles. The accidents might have happened while you were driving a vehicle, riding, or while you were walking.*”

We estimated Population Attributable Fractions for the Man Box variable as a risk factor for each of these six outcome variables, using the *punaf* command(2) in Stata 13. We adjusted these estimates by employment condition (whether an individual was employed full time, part time, unemployed, freelance, was student or other), socioeconomic level, region of the country, and age group (18-24 years and 25-30 years old). We used analytic sample weights in our calculations.

The resulting Population Attributable Fractions (PAF) are as follows:

Outcome	PAF	95% confidence interval lower limit	95% confidence interval upper limit
Bullying and Violence	0.398	0.335	0.456
Sexual Violence	0.692	0.616	0.753
Depression	0.041	0.010	0.072
Suicide	0.392	0.301	0.472
Binge Drinking	0.067	-0.048	0.170
Traffic Accidents	0.412	0.271	0.525

These calculations allow us to conclude that if there were no Man Box as a risk factor, we would expect 39.8% of bullying and violence, 69.2% of sexual violence, 4.1% of depression, 39.2% of suicide, 6.7% of binge drinking, and 41.2% of traffic accidents, using the definitions above, to not occur.

Stage 2: Identifying relevant costs related to men age 18-30

For the second stage, we did not use the 2017 Man Box dataset, but instead sought the most comprehensive available data sources to demonstrate the nationwide prevalence or incidence of the outcomes of interest and the associated costs. We used these figures to ascertain a total cost toll related to each outcome, as restricted to the actions/lives of men age 18-30, to the best of our ability. The data sources and cost calculations for each of the six outcomes are presented below.

1. Bullying and Violence

The data source for this outcome was the 2016 National Crime and Victimization Survey.(3) We included the following survey item in our estimate:

- Other than any incidents already mentioned, has anyone attacked or threatened you in any of these ways:
 - o With a weapon, for instance, a gun or knife,
 - o With anything like a baseball bat, frying pan, scissors, or stick
 - o By something thrown, such as a rock or bottle
 - o Include any grabbing, punching, or choking
 - o Any rape, attempted rape, or other type of sexual attack
 - o Any face to face threats

- Any attack or threat or use of force by anyone at all? Please mention it even if you are not certain it was a crime.
- *Did any incidents of this type happen to you?*

These multiple options are presented as one question to respondents; it is not possible to separate subcategories for the various types of violence mentioned within the question. From the survey dataset, we estimated the total sum of these types of events which respondents reported had been perpetrated by males age 18-29 years old in the year 2016: 242,380.

The main data source for calculating the costs attributable to experiences of violence was the 2018 report, “The Economic and Social Costs of Crime: Second Edition,” using the Quality-Adjusted Life Year (QALY) approach under heading 5.2, “Physical and emotional harms to the victim.”(4) The QALY approach accounts for the negative impact on a person’s quality of life from injuries and emotional impacts of being a victim of violence or crime. This cited report draws upon multiple evidence sources to produce estimates of the **QALY loss**, presented as a percentage. The percentage reflects the proportion of quality of life lost due to that harm. The report also provides the **duration** – meaning the exact number of years (or proportions of years) – for which evidence demonstrates that this quality of life loss will last. Data calculated for this report also show that not every victim experiences each harm, or at the same level, so it also produces a **prevalence** for this harm. As a shorthand example to explain these three concepts: perhaps a broken arm would produce a 10% loss of quality of life (QALY loss) the six months that it takes to fully heal (0.5 year duration) for 40% of people who suffer a broken arm on average (prevalence).

In our judgment, the category of violence available within this data source that most closely matched the bullying and violence variables we were applying from other sources was the category, “violence without injury.” So we have used the QALY loss, duration, and prevalence estimates for this category.

These numbers can be translated to a cost estimate when we multiply them by the economic value of a statistical life-year. For the United States, we used a value of a statistical life (VSL) of approximately \$4.7 million dollars. To estimate this figure, we adopted the method proposed by the Organization for Economic Co-operation and Development (OECD).(5) In this method, the OECD has estimated a VSL for all the OECD countries through a systematic review. This estimate can be adjusted for any specific country, according to the following equation:

$$VSL_{US}^t = VSL_{OECD}^t * \frac{Y_{US}^t}{Y_{OECD}^t}^\beta$$

Where VSL_{OECD} is the estimated VSL for the OECD countries of 3.63 million USD in 2016 (inflation adjusted from a 3 USD million estimate in 2005), t is the year of interest, Y is the GDP per capita and β is the income-elasticity of 0.8 used for high-income countries. Indicators of GDP per capita in the OECD and in the United States come from the World

Bank.(6) The VSL can be understood under the Willingness to Pay approach, which is a way to measure society’s valuation of a life of any individual. However, this amount reflects the value of an entire life. To adjust this figure to the remaining life expectancy, we conducted a calculation to determine the average remaining life expectancy. The average remaining life expectancy for all age groups is 41.86 years.(7) Therefore, we conclude that the value of a statistical life-year for use in this calculation in the United States is ~\$4.7 million divided by 41.86 years, for an exact figure of \$112,069.60.

Combining QALY loss, QALY loss duration, and the value of a statistical life year, we reach the following calculations for the known emotional outcomes of being a victim of violence without injury:(4)

Emotional harm of being a victim of violence without injury	Prevalence	QALY loss	Duration	Value of a statistical life year as explained above	Cost of harm per case of violence
Fear	23%	3%	1.25 years	\$112,069.60	\$882.55
Depression	8%	14.5%	1 year	\$112,069.60	\$1,300.01
Panic/anxiety attacks	13%	13.3%	3 years	\$112,069.60	\$5,813.05
Total					\$7,995.61

If the cost of known emotional harms for each case of violence, using the QALY approach above, is \$7,995.61, then one can multiply this cost by above-cited 242,380 acts of violence perpetrated by men age 18-29 in 2016, to produce a total figure of \$1.938 billion. Multiplying this figure by the PAF of 39.8% results in \$772.1 million as our minimum estimated cost of the Man Box with regard to bullying or violence.

Discussion and known limitations: The age range of 18-29 is the closest age range to our target of 18-30 that we were able to ascertain within the definitions of this dataset. The question includes a prompt related to rape and sexual violence, meaning that there could be some overlap with the following category in our study. Even accounting for these limitations, we felt that this was the most comprehensive, accurate, nationally representative survey to ascertain the prevalence of these forms of violence in the United States in 2016. This cost estimate likely significantly underrepresents the true cost toll of these acts, because data sources are not available to measure additional cost areas such as: costs in anticipation of crime, direct costs of medical or psychological treatment, costs of material damages, lost productivity by absenteeism (including due to premature mortality), lost productivity due to presenteeism, or costs in response to crime (such as police or criminal legal system costs).

2. Sexual Violence

The data source for this outcome was also the 2016 National Crime and Victimization Survey.(3) We included the following survey item in our estimate:

- Incidents involving forced or unwanted sexual acts are often difficult to talk about. Other than any incidents already mentioned, have you been forced or coerced to engage in unwanted sexual activity by
 - Someone you didn't know
 - A casual acquaintance
 - Someone you know well
 - *Did any incidents of this type happen to you?*

These multiple options are presented as one question to respondents; it is not possible to separate subcategories for the various types of perpetrators mentioned within the question. The survey dataset presents the sum total of these types of events, which respondents reported had been perpetrated by males age 18-29 years old in the year 2016: 152,737.

In order to calculate the costs caused by this type of events, we also followed the same methods suggested for the bullying and violence items, explained above.(4) The QALY approach accounts for the negative impact on a person's quality of life from injuries and emotional impacts of being a victim of violence or crime.

In our judgment, the category of violence available within this data source that most closely matched the sexual violence variables we were applying from other sources was the category, "semi-violent crime." So we have used the QALY loss, duration, and prevalence estimates for this category, which the report clarifies is meant to include "other sexual offences".

These numbers can be translated to a cost estimate when we multiply them by the economic value of a statistical life-year, estimated in \$112,069.60, as detailed above. Combining QALY loss, QALY loss duration, and the value of a statistical life year, we reach the following calculations for the known emotional outcomes of being a victim of violence without injury:(4)

Emotional harm of being a victim of "semi-violent crimes"	Prevalence	QALY loss	Duration	Value of a statistical life year, men 18-30 in the United States	Cost of harm per case of violence
Fear	23%	3%	1.25 years	\$112,069.60	\$966.60
Depression	8%	14.5%	0.5835 years	\$112,069.60	\$758.55
Panic/anxiety attacks	18%	13.3%	1.5835 years	\$112,069.60	\$4,248.45
Total					\$5,973.60

If the costs of known emotional harms for each case of violence, using the QALY approach above, is \$5,973.60, then one can multiply this cost by above-cited 152,737 acts of violence perpetrated by men age 18-29 in 2016, to produce a total figure of \$912.4 million. Multiplying this figure by the PAF of 69.2% results in \$631.4 million as our minimum estimated cost of the Man Box with regard to sexual violence.

Discussion and known limitations: The age range of 18-29 is the closest age range to our target of 18-30 that we were able to ascertain within the definitions of this dataset. The question refers only to a certain range of acts of sexual violence, and the phrasing of the question may mean that some respondents do not disclose experiences of sexual violence in this question because they had already mentioned it in an earlier survey item. This cost estimate likely significantly underrepresents the true cost toll of these acts, not only because the prevalence figure is likely underreported, but also because data sources are not available to measure additional cost areas such as: costs in anticipation of crime, direct costs of medical or psychological treatment, costs of material damages, lost productivity by absenteeism (including due to premature mortality), lost productivity due to presenteeism, or costs in response to crime (such as police or criminal legal system costs). Had we based our calculation on the 2018 Stop Street Harassment national survey, which estimates that 34.4% of the US population experienced one or more forms of sexual harassment perpetrated by males within the past year, our cost calculation attributable to the Man Box would have approached \$83 billion for this one category alone.

3. Depression

The calculations for depression relied on multiple data sources. By using the National Survey on Drug Use and Health 2016,(8) we estimated that 10,567,398 of men age 18-30 experienced depression (representing 35.4% of the population within this age range).

Starting from this number, we then calculated the dollar value of productivity lost by presenteeism among this population. Presenteeism occurs when the productive capabilities of a person are undermined because of a disease or condition, even as the person is able to go to work. Using Current Population Survey figures,(9) we estimate the cumulative annual productivity of this proportion of males aged 18-30 to be \$1,085,411,000,000. Applying presenteeism factors as reported by Goetzl,(10) we estimate the value of productivity lost due to presenteeism related to depression among males age 18-30 to be \$58,877,000,000. Multiplying this figure by the PAF of 4.1% results in \$2.410 billion as our minimum estimated cost of the Man Box with regard to depression.

Discussion and known limitations: This cost estimate likely significantly underrepresents the true cost toll of depression because data sources are not available to measure additional cost areas such as: direct costs of medical or psychological treatment, lost productivity by absenteeism, or cost estimates for the moral harm associated with this mental health challenge. In addition, it is possible that the PAF that we estimated is also underestimated because of rigid masculinities, *i.e.* that because of the pillars of self-sufficiency and toughness, men in the Man Box likely do not declare to be depressed.

4. Suicide

The calculations for suicides attributable to harmful masculinities relied on two data sources. We estimated the number of suicides among men age 18-30 in 2016 to be 7,493, drawing from mortality microdata from the National Bureau of Economic Research(11)

and taking into account the following International Classification of Diseases 10th version (ICD-10) codes: X60-X84, which are all related to self-inflicted death. To estimate the value of lost productivity from years lost due to premature death, we followed the human capital approach(12) and used the hourly wage from the Current Population Survey as a data source.(9) For every particular age of death from the mortality data, we estimated the productivity loss as the sum of current and future expected productivities obtained from the Current Population Survey by age discounted at a 3% annual rate, in order to calculate present values of future monetary figures, up to the expected age at death. We assumed that there are 240 working days with 8 hours each in order to calculate the annual productivity. We performed this for every single death registered at the mortality microdata and calculated the sum of lost productivities for all self-inflicted deaths, defined above.

We estimate the value of productivity lost due to premature death from suicide among males age 18-30 to be \$11.282 billion. Multiplying this figure by the PAF of 39.2% results in \$4.423 billion as our minimum estimated cost of the Man Box with regard to suicide.

Discussion and known limitations: This cost estimate likely significantly underrepresents the true cost toll of suicides because data sources are not available to measure additional cost areas such as: direct costs of medical or psychological treatment, funeral and legal expenses, or moral harm associated with having a close friend, colleague, or family member commit suicide.

5. Binge Drinking

We relied on microdata from the National Survey on Drug Use and Health 2016(8) to estimate the prevalence of binge drinking, defined as having five or more drinks on the same occasion in the past 30 days. We estimated that the prevalence of binge drinking was 40.7%. We assumed that on average, 1.2 working days are lost every year because of being drunks or with hangover.(13) We calculated, as above, that the annual productivity among the 18-30 years old males was \$1,085,411,000,000. Therefore, to calculate the annual productivity lost by binge drinking attributable to the Man Box, we multiplied the prevalence of binge drinking by the percent of working days lost by being drunk or with hangover (0.5%) by the annual productivity and by the Population Attributable Fraction of 6.7%. This multiplication yields to a figure of \$147,990,000 attributable to the Man Box.

We also calculated the lost productivity by premature death by binge drinking. We used mortality microdata(11) to determine the number of deaths by binge drinking with the following ICD-10 codes: T51 (toxic effects of alcohol), F10 (mental and behavioral disorders due to use of alcohol), G62.1 (alcoholic polyneuropathy), I42.6 (alcoholic cardiomyopathy), K29.2 (alcoholic gastritis), and K70 (alcoholic fatty liver). We found that in 2016, 323 men aged 18-30 died by these causes. We then calculated the lost productivity by premature death following the same method as in the case of suicide, detailed above.

By using the Population Attributable Fraction that we calculated for rigid masculinities, we estimated that the lost productivity by premature death by binge drinking ascends to

\$33,100,000. Therefore, \$181 million is the economic sum resulting from lost productivity due to binge drinking.

Discussion and known limitations: This cost estimate likely significantly underrepresents the true cost toll of binge drinking because data sources are not available to measure additional cost areas such as: direct costs of medical treatment, funeral and legal expenses, and costs of accidents specifically caused by being drunk.

6. Traffic Accidents

The data source for the cost consequences of traffic accidents was the National Bureau of Economic Research mortality microdata(11) and the Crash Report Sampling System.(14) We have combined two calculations: costs due to lost productivity from premature death and average costs per event for all traffic accidents in which men age 18-30 were responsible.

To estimate the value of lost productivity from years lost due to these premature deaths, we followed the same steps as for suicide. First, we identified that 4,168 people died in traffic accidents in 2016, with mortality microdata. ICD-10 codes included in this category are: V02-V05, V09, V12-V15, V17-V19, V20-V79, V80.3-V80.6, V01, V10-V11, V80.2, V82.8, V88.9, V87.9, which are all related to traffic accidents.

For every particular age, we estimated the productivity loss as the sum of future expected productivities obtained from the Current Population Survey by age discounted at a 3% annual rate, in order to calculate present values of future monetary figures, up to the expected age at death. We performed this for every single death registered at the mortality microdata and calculated the sum of lost productivities for all deaths caused by traffic accidents and came to a figure of \$6.265 billion. The proportion of this attributable to the Man Box is \$2.581 billion, applying the Population Attributable Fraction of 41.2% that we estimated previously.

In addition, the Crash Report Sampling System(14) shows that in 2016, there were 11,777,213 crash incidents in which men age 18-30 were responsible. We assumed that the average auto liability claim for property damage and for bodily injury was \$9730.20.(15) The total costs for these traffic accidents was \$11,454,500,000, and the costs attributable to the Man Box are \$4,719,300,000, after applying the Population Attributable Fraction of 41.2% that we estimated previously. \$2.581 billion plus \$4.719 billion results in \$7.3 billion.

Discussion and known limitations: This cost estimate likely underrepresents the true cost toll of traffic accidents because data sources are not available to measure additional cost areas such as: direct costs of legal services, direct costs of medical treatment, funeral and legal expenses, and lost productivity by presenteeism and absenteeism.

References

1. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: Validity of a brief depression severity measure. *J Gen Intern Med* [Internet]. 2001 Sep [cited 2019 Mar 31];16(9):606–13. Available from: <http://link.springer.com/10.1046/j.1525-1497.2001.016009606.x>
2. Newson R. Attributable and unattributable risks and fractions and other scenario comparisons. *Stata J*. 13(4):672–98.
3. Bureau of Justice Statistics (BJS). National Crime Victimization Survey (NCVS) [Internet]. 2016 [cited 2019 Mar 1]. Available from: <https://www.bjs.gov/index.cfm?ty=dcdetail&iid=245>
4. Heeks M, Reed S, Tafsiri M, Prince S. Economic and social costs of crime. [Internet]. London, UK: Great Britain Home Office; 2018 [cited 2019 Mar 26]. Available from: https://www.webarchive.org.uk/access/resolve/20180730161657/https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727958/the-economic-and-social-costs-of-crime-horr99.pdf
5. The Economic Consequences of Outdoor Air Pollution [Internet]. OECD Publishing; 2016 [cited 2018 Mar 26]. Available from: http://www.oecd-ilibrary.org/environment/the-economic-consequences-of-outdoor-air-pollution_9789264257474-en
6. World Bank. DataBank [Internet]. 2018. Available from: <http://databank.worldbank.org/data/home.aspx#>
7. World Health Organization. Global Health Observatory (GHO) data. Life tables [Internet]. 2019. Available from: https://www.who.int/gho/mortality_burden_disease/life_tables/life_tables/en/
8. Substance Abuse and Mental Health Services Administration. National Survey on Drug Use and Health 2016 [Internet]. Available from: <https://datafiles.samhsa.gov/study-dataset/national-survey-drug-use-and-health-2016-nsduh-2016-ds0001-nid17185>
9. United States Census Bureau. PINC-01. Selected Characteristics of People 15 Years and Over, by Total Money Income, Work Experience, Race, Hispanic Origin, and Sex. [Internet]. Available from: <https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-01.html>
10. Goetzel R, Long S, Ozminkowski R, Hawkins K, Wang S, Lynch W. Health, Absence, Disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *J Occup Environ Med*. 2004;46(4):398–412.
11. The National Bureau of Economic Research. Mortality Data -- Vital Statistics NCHS' Multiple Cause of Death Data, 1959-2017 [Internet]. 2019. Available from: <https://www.nber.org/data/vital-statistics-mortality-data-multiple-cause-of-death.html>
12. Zweifel P, Breyer F, Kifmann M. Health economics. 2nd ed. Dordrecht ; New York: Springer; 2009. 529
13. Bouchery EE, Harwood HJ, Sacks JJ, Simon CJ, Brewer RD. Economic Costs of Excessive Alcohol Consumption in the U.S., 2006. *Am J Prev Med* [Internet]. 2011 Nov [cited 2019 Mar 30];41(5):516–24. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0749379711005381>
14. National Highway Traffic Safety Administration. Crash Report Sampling System [Internet]. 2019. Available from: <https://www.nhtsa.gov/national-center-statistics-and-analysis-ncsa/crash-report-sampling-system-crss>
15. Rocky Mountain Insurance Information Association. Cost of Auto Crashes & Statistics [Internet]. Cost of Auto Crashes & Statistics. 2019. Available from: http://www.rmiia.org/auto/traffic_saf