Global Peace Index

**Economic Value of Peace Guide**

**Introduction**

The purpose of this document is to give a detailed overview of how the EVP is constructed and finalized and how it might be improved in a future. For a general overview of the history of the work, please refer to the journal article Estimating the Global Economic Cost of Violence: Methodology Improvement and Estimate Updates.[[1]](#footnote-1)

As it stands, the EVP is constructed in a ‘hybrid’ fashion, wherein a number of data collection and calculation tasks are contained in the GPI EVP R project, as well as calculations in an excel spreadsheet. This was done because historically we did not have the capacity to collect all the data within R, owing to the ‘fiddliness’ of certain data sources (eg. Manual copying from pdfs or actual hardcover publications, or data sources changing format from year to year making previous code redundant), and also because the large number of manual changes simply meant it was easier to clean data sources in excel.

The EVP can only be completed once the GPI data is finalised. However, it can be started before the GPI data is finalised. All of the data for the economic costing section should be available by early March, mid-March at the latest. Thus, this section can be updated from March onwards.

|  |
| --- |
| **Cheat sheet of the costing language:**  The EVP is made up of 3 costing components; direct costs, indirect costs and a multiplier.   **Impact = Direct costs, Indirect costs and a Multiplier**  **Cost = Direct costs and Indirect costs**  **Cost as a percentage of GDP = Cost/GDP**  The entire EVP is in purchasing power parity not USD  The GTI is in USD  The MPI is in peso  The German Peace Index was in euros. |

## The Process – Steps

1. Copy last year’s repository
2. Follow the **master script** for details on the order of the script
3. Update Economic Data
4. Unit Cost
5. Download and clean indicators for the model
6. Combine data and apply unit costs
7. Download data frame and analyse results. Create the chart file.
8. Potentially update dashboard (there is one floating around)
9. Write section

## Step One –Copy last year’s repository

I would recommend just downloading of the S drive as the folder has some large excel files that may not upload correctly to GitHub.

<https://github.com/githubIEP/GPI_2021_ECONOMIC_IMPACT/tree/master/Munge>  
  
S:\Institute for Economics and Peace\Global Peace Index\2022 GPI\Economic costing\GPI\_2021\_ECONOMIC\_IMPACT

## Step Two – Follow the master script for details on the order of the script

I have created two scripts in munge called admin and master script

The admin script has all the functions and the master script has the order of scripts to be completed.

First order of business is to update the economic indicators. These can be updated without the GPI data from the index not yet finalised.

## Step Three – Update Economic indicators

source("~/Github/GPI\_2021\_ECONOMIC\_IMPACT/munge/economic script 2021 v2.R")

**Caveats**

1. Most of the economic data is one year out of date so you may be required to plus one year to each indicator. This is all within the script.
2. Traditionally we downloaded and estimated individual country GDP, GDP per capita, GDP PPP, GDP per capita PPP. This caused a range of issues where they could not be triangulated. In the GPI2021 I changed this to only download GDP PPP. In the 2021 GPI I have changed to using the GDP PPP divided by the population to calculate the GDP PPP per capita. This will speed up the estimation of the model and solves issues with the estimated data and the consequential discrepancies. NOTE: not every country will have GDP and therefore we used to estimate the GDP for up to 15 countries of the 163. We would give estimates for all the above mentioned GDPs. Now we just estimate one — GDP PPP — and the estimates are all derived from this.
3. The IMF can be a little tricky to navigate. You want to download a sheet that has all indicators, years and countries. The R script will clean it for you. I recommend looking at last year’s sheet in the repository.
4. Look at the meta of the World Bank to get the code for the WDI API.

**TABLE: List of Economic Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Name** | **Raw data source** | **Location** |
| 1 | Official exchange rate (LCU per US$, period average) | World Bank | In R Script |
| 2 | Consumer price index (2010 = 100) | World Bank | In R Script |
| 3 | World Economic Outlook data | IMF WEO | IMF website[[2]](#footnote-2) |
| 4 | GDP (current US$) | World Bank | In R Script |
| 5 | Price level ratio of PPP conversion factor (GDP) to market exchange rate[[3]](#footnote-3) | World Bank | In R Script |
| 6 | GDP Deflator | IMF WEO | IMF website[[4]](#footnote-4) |
| 7 | Inflation, average consumer prices | IMF WEO | IMF website[[5]](#footnote-5) |
| 8 | Population IMF | IMF WEO | IMF website[[6]](#footnote-6) |
| 9 | Population World Bank | World Bank | In R Script |

## Step Four – Update Unit Costs

Unit costs are mostly updated in excel.   
Download last years’ **unit costs for gpi2021.xlsx** and update

**!!!This will require the economic script to be completed.!!!!**

**Unit costs come from** the following journals  
McColiester 2010 (crimes)  
Dolan and Peasegood 2005 (fear)  
Shepard et al. (2016) (Suicide)

**EXCEL**

1. Complete economic script
2. Download US and UK CPI and Deflator (or copy from R)
3. US CPI tab: Update the data tables to have the latest year in there for UK and US. I recommend you back date.
4. US CPI tab: You will need to make a decision on whether to use the CPI or deflator. I have made a calculator that will show you the difference between the CPI and deflator. **YOU WANT TO USE WHATEVER ONE IS SMALLER.** 9 times out of ten it is the deflator.
5. US CPI tab: Once you copy and paste the data in. The red cells show you the formula.
6. Calc tab: Once updated check out the calc tab. This should auto update, double check.
7. You will need to apply the exchange rate to UK (column F) (double check this with previous years to see if it is updated)
8. Discuss in person the proportion of directcost (column J)
9. Finalise Unit costs. Unit costs R tab (discuss minwage, police and privtsecurity)

**Now open R**

**source("~/Github/GPI\_2021\_ECONOMIC\_IMPACT/munge/unit cost calc.R")**

This script will take the costs and allocate them for each country for each year. It then will scale them so that countries with high GDP have a higher cost and coutnries with low GDP have a lower cost. This is scaling the unit costs.

## Step Five – Download and clean indicators for the model

There are 15 scripts for the cleaning of each indicator. These don’t necessarily need to be done in the order of the scripts. In saying that, it is done this way based on the release of data.

NOTE: YOU MAY NEED TO PLUS ONE YEAR TO INDICATORS.

**TABLE: List of Costing Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Name** | **Raw data source** | **Location** |
| 1 | Veteran Affairs and interest on military debt — USA[[7]](#footnote-7) | https://www.whitehouse.gov/omb/historical-tables/ | In R Script or excel sheet. Need to update link via the R script |
| 2 | Suicide mortality rate (per 100,000 population) | World Bank, Global Burden of Disease | World Bank in R GBD manually through website |
| 3 | Fear | Gallup | ? |
| 4 | UNHCR refugee funding | UNHCR | Google: UNHCR Global Funding Overview 20XX for the year and download PDF |
| 5 & 6 | Violent assault and Sexual Assault | UNODC | *https://www.unodc.org/unodc/en/data-and-analysis/crime-and-criminal-justice.html* |
| 7 | Small arms | Small Arms Survey | Add latest year. |
| 8 | Security Agency | ? | *Previous Repo* |
| 9 | Peacebuilding | UN + OECD | Country list from UN  Data from OECD |
| 10 | Private Security | Small arms survey | Small arms survey |
| 11 | Internal security - public order and safety | Mix of GPI police rate and IMF public order and safety spending | IMF and GPI2022 |
| 12 & 13 | Terror deaths and injuries | GTI – latest - GTI lead | GTI2022 |
| 14 | Peacekeeping | GPI lead | GPI |

**Veteran Affairs and interest on military debt (Indicator 1)**

**Source: Whitehouse.gov**. https://www.whitehouse.gov/wp-content/uploads/2021/05/hist05z1\_fy22.xlsx

**Already Updated?:** Yes operates 4 to 5 years in advance

**Format:** Spreadsheet. You want “Total, Veterans Benefits and Services” in [Table 5.1—Budget Authority by Function and Subfunction: 1976–2026](https://www.whitehouse.gov/wp-content/uploads/2021/05/hist05z1_fy22.xlsx) and [Table 6.1—Composition of Outlays: 1940–2026](https://www.whitehouse.gov/wp-content/uploads/2021/05/hist06z1_fy22.xlsx) “Net interest (2)”

**Process:** Must be manually downloaded from the website. R cleaning script exists. You can copy the link of the spreadsheet above into R and the script will do the work

OR

You can use last the vet affairs spreadsheet from last years REPO and manually add it. Still requires access to the sheet.

**Notes:** Recommend download the raw data and have a look at it. See if things are in the same place and then just update the link in R and run the second part of the script

**Suicide (Indicator 2)**

**Source: World Bank + Global Burden of Disease.**

**Already Updated?:** One year Lag

**Format: Download** Spreadsheet. You will manually have to enter the details. See previous REPO file.

**Process:** Must be manually downloaded from the website. R cleaning script exists. Choose metric to be rate and casue of death to be self harm from the GBD database

**Perceptions of Fear (Indicator 3)**

**Source:** Gallup World Poll. Data should only be one year lagged (eg. For the 2022 GPI, data should be from 2021 GWP). **You will need to check with current research manager and/or office manager to get the GWP login information.**

**Already Updated?:** Unsure, probably yes

**Format:** % of people who answered “no” to the question “do you feel safe walking home alone at night in your city or neighbourhood”

**Process:** Must be manually downloaded from the Gallup website. R cleaning script exists.

**Notes:** Data for some countries will need to be imputed. I have imputed them using average fear level by peace and region

**UNHCR refugee funding (Indicator 4)**

**Source: UNHCR**. Data should only be one year lagged

**Already Updated?: Y**es

**Format:** PDF. Use a PDF to excel convertor.

**Process:** Must be manually downloaded the PDF called Global Funding Overview dd month yyyy from UNHCR website. R cleaning script exists. But after extensive manual effort. Take the latest global funding overview and select only countries manually when pdf converted. Take values from the totals column. Add these values to existing spreadsheet via the R script (done autonomously once latest year spreadsheet ready)

**Notes: Download 2018 repo and get the  
unhcr<- read\_csv("Data/Refugees and IDP costs unhcr 2018.csv")**

**S:\Institute for Economics and Peace\Global Peace Index\2021 GPI\Economic Impact of Violence\UNHCR funding**

**Has the updates for 2018 2019 and 2020. You will need to update for 2021. It is found here.**[**https://reporting.unhcr.org/sites/default/files/Global%20Funding%20Overview%2015%20February%202021.pdf**](https://reporting.unhcr.org/sites/default/files/Global%20Funding%20Overview%2015%20February%202021.pdf)

1. **Download pdf**
2. **Convert to excel**
3. **# You will be required to delete out many of the entries # I have done this in excel as it was quicker**
4. **Key words deleted “private” “UNHCR” you will need to manually check which ones need to go**
5. **load in data**
6. **run iso3c formula to see what you can quickly eliminate**
7. **Copy formula for 2020 and update for 2021.**
8. **Might be worth running last year script, getting all data up to 2020 then adding 2021.**

**Violent assault and sexual assault (Indicator 5 & 6)**

**Source: UNODC**. Data is significantly lagged, if you can find a better source good!

**Already Updated?: Y**es

**Format:** excel

**Process:** Downloaded latest data and follow script. Use last years REPO as a reference. Make sure the data downloaded is in the same form as the current spreadsheet with just a new year added, to make the script run as it should.

**Small arms survey (Indicator 7)**

**Source: Small Arms Survey**.

S:\Institute for Economics and Peace\Global Peace Index\2021 GPI\Economic Impact of Violence\Small arms survey

**Already Updated?: Unsure**

**Format:** PDF. Use a PDF to excel convertor.

**Process:** Downloaded latest data and follow script. Use the REPO to locate “small arms cleaned for 2020 GPI.csv” this file is all the cleaned small arm survey data. You just need to add 2021. To download the latest data, download the “trade update” pdf from small arms resource library. Add the latest year values to the “clean” sheet and run the R script.

**Security Agency (Indicator 8)**

**Source: Unsure**

**Already Updated?: Unsure**

**Format:** Copy from previous year

**Process:** Copy last years spreadsheet and copy latest year. Script is east to foloow

**Peacebuilding (Indicator 9)**

**Source: UN**

**Already Updated?: YES**

**Format:** Copy from previous year. Update for latest year

**Process: We need to identify what countries are available for peacebuilding. You will need to make a list of this using these countries :** [**https://www.un.org/peacebuilding/content/list-pbf-countries-declared-eligible**](https://www.un.org/peacebuilding/content/list-pbf-countries-declared-eligible)

Once you have checked the list compare to the sheet: Peacebuilding Fund - Projects by Country.xlsx  
  
Then go to the OECD - OECD Development Assistance Committee (DAC) Creditor Reporting System (CRS). <https://stats.oecd.org/Index.aspx?DataSetCode=crs1>.   
  
You can either filter by the codes in the script or download the big file (will crash GitHub) and clean via the R script.

**Small Arms Survey – Private Security (Indicator 10)**

**Source: Small arms survey**

**Already Updated?: Probably not, updated seldom**

**Format:** Copy from previous year. 2021 = 2020 values

**Process: Go to small arms survey and see if they have updated numbers. See S:\Institute for Economics and Peace\Global Peace Index\2021 GPI\Economic Impact of Violence\Private security for details on the documents.**

**https://www.researchgate.net/publication/335336155\_A\_Booming\_Business\_Private\_Security\_Companies\_and\_Small\_Arms  
  
Manually enter the latest year to last year’s sheet. Contact the author of the above paper for latest figures of private security if he has updated them.**

**Internal security (Indicator 11)**

**Source: GPI police rate + IMF**

**Already Updated?: YEs**

**Format:** Copy from previous year. 2021 = 2020 values

**Process:** [**https://data.imf.org/?sk=ca012d95-6151-4a84-a89b-3914d718b878&hide\_uv=1**](https://data.imf.org/?sk=ca012d95-6151-4a84-a89b-3914d718b878&hide_uv=1) **download latesy data for public order and safety.**

**Update script for latest IMF data.**

**Countries will be missing, supplement with the police rate from GPI.   
  
Follow script   
  
Terror deaths and injuries (Indicator 12 and 13)**

**Source: GTI**

**Already Updated?: YEs**

**Format:** Data in dashboard

**Process: Follow script**

**Peacekeeping (Indicator 14)**

**Source: GPI lead**

**Already Updated?: YEs**

**Format:** Data comes from GPI lead

**Process: Follow script. Copy latest data from Repo in results. Load into R, update for latest year by adding in the latest data.**

## Step Six – Combine data and apply unit costs

Open ‘Cost Calc’ script.   
  
This should run by itself! Follow it line by line. This combines all the economic and cost data and applies unit costs.

#fix errors

India and China must receive 0 for GDP losses.

econcost$value[econcost$indicator=="gdplosses" & econcost$iso3c=="IND"]=0

econcost$value[econcost$indicator=="gdplosses" & econcost$iso3c=="CHN"]=0

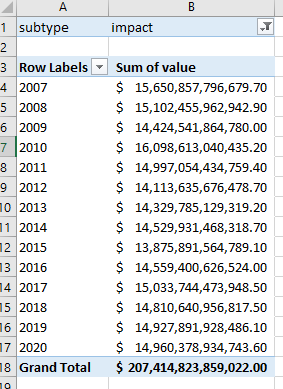
***You now have the final costing!!***

## Step Seven – Download data frame and analyse results. Create the chart file.

1. Write data as CSV.
2. Copy and paste last year’s chart file and commence the update. This is how you will fact check, look for outliers etc.

**Analysing the data**

Create a pivot table like the following and just follow the charts to update



## Step Eight (can skip) – Dashboard

Paste the new updated data into the dashboard, and make sure that all worksheets, charts, tables etc have been updated and refreshed, before signing off on the dashboard. It can **potentially** now be sent to Steve, comms, the rest of the research team, and the regional offices. However, it is mostly done for your own writing.

## Step Nine – Write section

1. https://sci-hub.st/https://doi.org/10.1080/10242694.2019.1689485 [↑](#footnote-ref-1)
2. https://www.imf.org/en/Publications/WEO/weo-database/2021/October/download-entire-database [↑](#footnote-ref-2)
3. Data will be missing for the World Bank data. If so try supplement the missing with https://data.worldbank.org/indicator/PA.NUS.PPP [↑](#footnote-ref-3)
4. https://www.imf.org/en/Publications/WEO/weo-database/2021/October/download-entire-database [↑](#footnote-ref-4)
5. https://www.imf.org/en/Publications/WEO/weo-database/2021/October/download-entire-database [↑](#footnote-ref-5)
6. https://www.imf.org/en/Publications/WEO/weo-database/2021/October/download-entire-database [↑](#footnote-ref-6)
7. Two ways to calculate one is manual one is R. [↑](#footnote-ref-7)