HOMICIDE – A CONCERN ACROSS DEMOGRAPHY?

Source: BBC

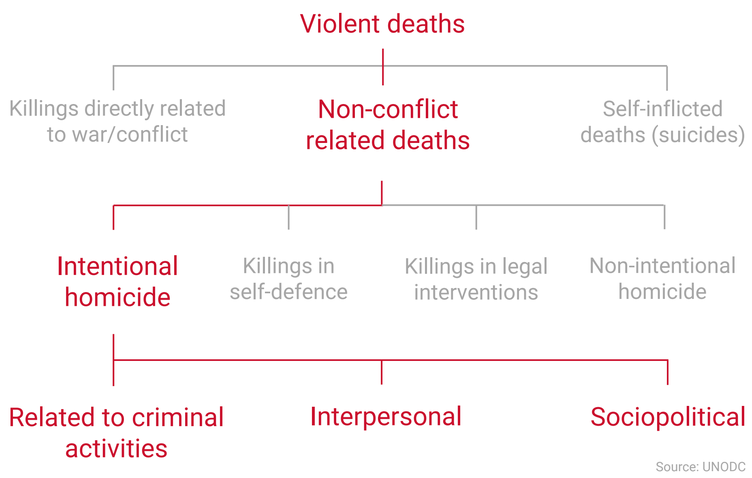
London Business School

When selecting our **Global Experience** (GE) destination, the topic "safety" was also an important factor (especially for our parents). Finding it very intriguing, we set out to conduct our own analysis on Homicides across demography.

Research Questions:

- What **classifies** as homicide?
- Are homicides a major **cause** of death?
- How do homicide counts **vary** (time/place)?
- Can homicide rates be **predicted**?
- Does victim **gender** play a role?

While researching the topic (specifically using news articles from BBC and government reports), it became evident that we did not fully understand what homicide exactly is. A common delimitation has thus been included below:



Source: UNODC

Information sources:

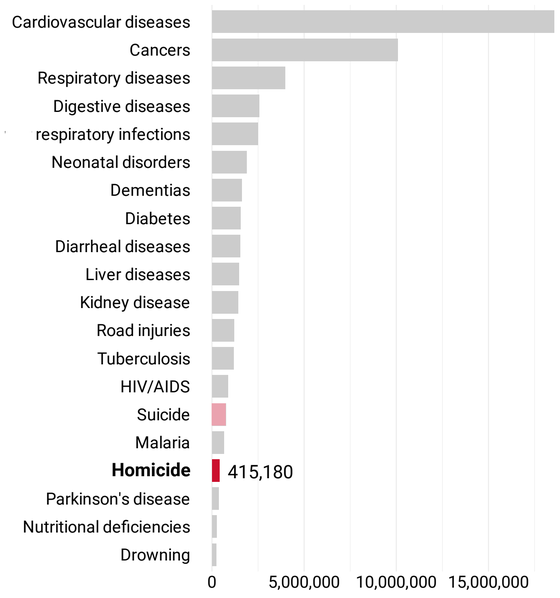
- http://ghdx.healthdata.org/gbd-results-tool
- https://dataunodc.un.org/dp-intentional-homicide-victims
- https://ourworldindata.org/homicides
- https://databank.worldbank.org/source/world-development-indicators

Our methodology:

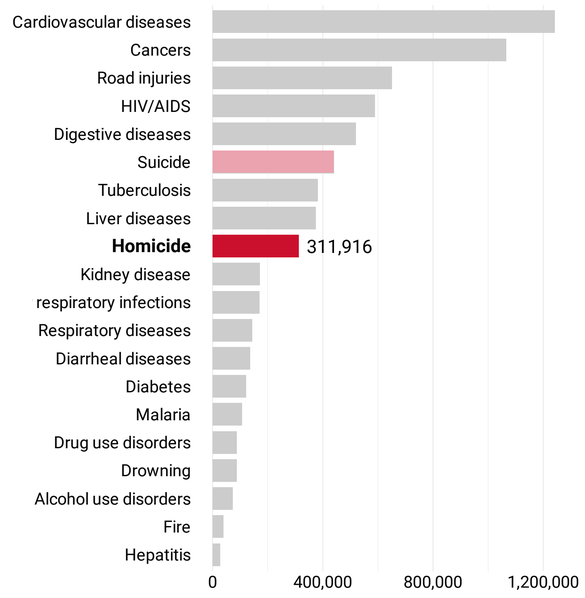
1. Started by reading and learning about the topic and exploring data sets around the former.
2. Inspected the various data sets, cleaned them by filtering, formatting and imputing the NA values.
3. Designed bar graphs, maps, boxplots, scatter plots and flow charts on R, for each research question.
4. Created multiple linear regression model to predict homicides using world development indicators.
5. Exported files and compiled them on poster. Used additional software to add visual features to plots.

Homicide climbs the ladder as major death cause for specific demography

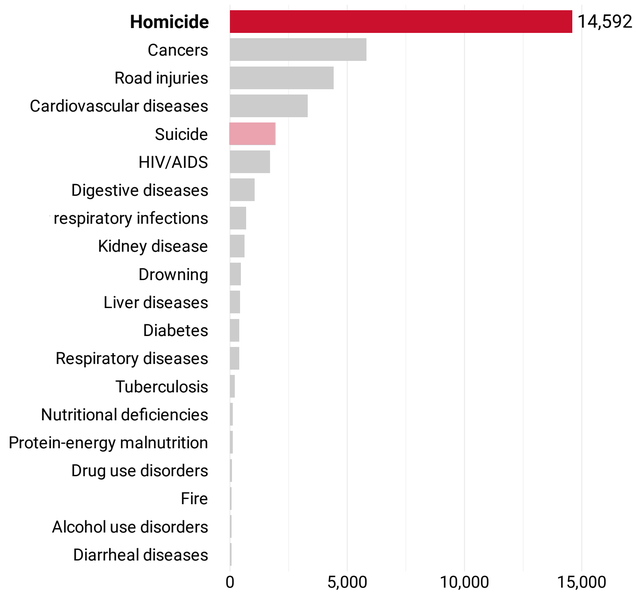
Numbers of death by cause, **World** 2019



Numbers of death by cause, **age 15-49 World** 2019



Numbers of death by cause, **age 15-49 Colombia** 2019



Around 60 million people die every year. As expected, a majority of these are attributable to natural causes of death.

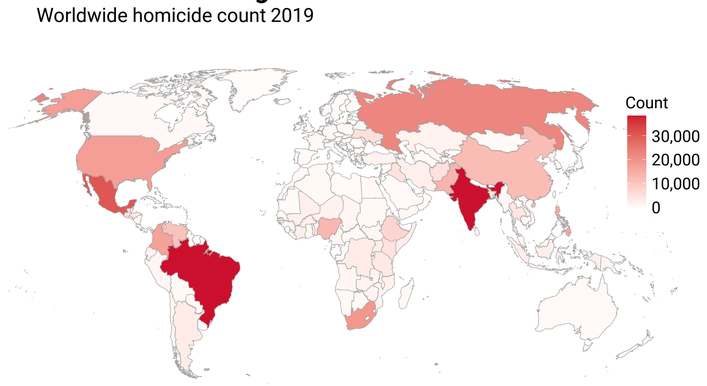
Limiting the scope to the age group between 15-49 years, we can observe that the gap between cardiovascular diseases, cancers and the other causes starts to shrink.

On the rightmost figure homicide becomes the major death cause in 2019. The same is true for other 11 countries, all (!) of which lie in Central/ South America.

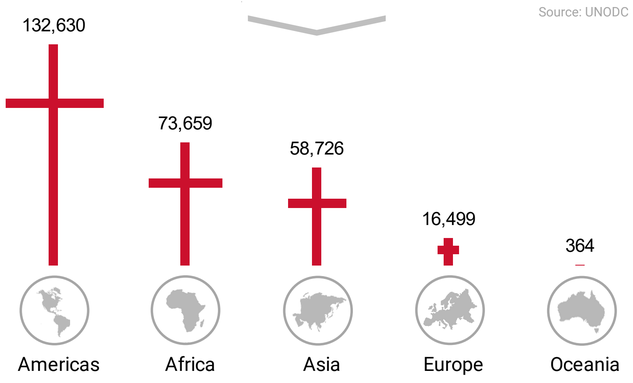
Source: IHME Health

Brazil and India tragic forerunners in homicide count

Worldwide homicide count 2019



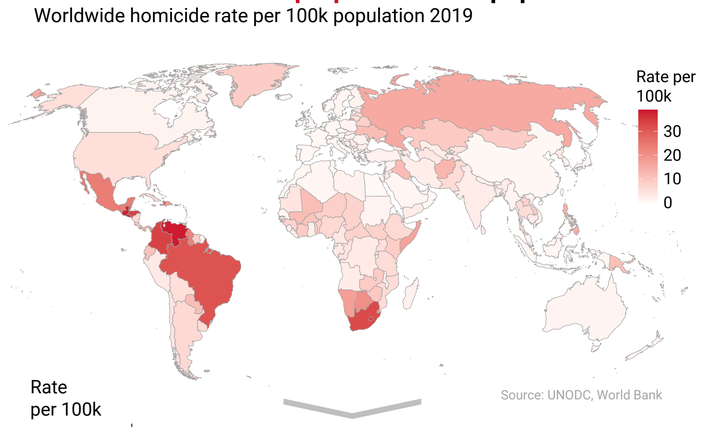
Source: UNODC



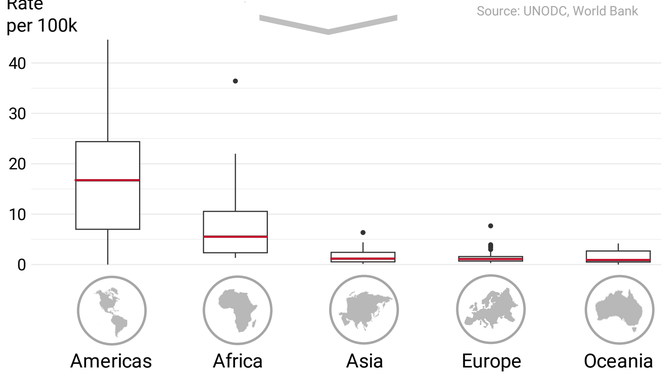
The figure shows that Brazil, India, Mexico, and Russia account for most homicides. The Americas are the continent with most homicides while it is interesting to note that Africa took the second spot, despite not having a dark shade on most countries.

Homicide count is not proportionate to population

Worldwide homicide rate per 100k population 2019



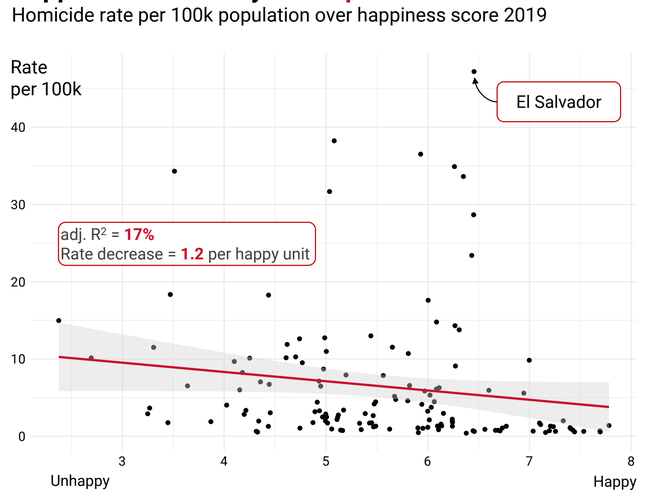
Source: UNODC, World Bank



The high population of Brazil and India reduced the rate compared to other countries (top graph). Central America now accounts for countries taking the top spots. Europe's narrow box-plot shows that rates are particularly uniformly distribute.

Happiness Score only minor predictor of homicide rate

Homicide rate per 100k population over happiness score 2019



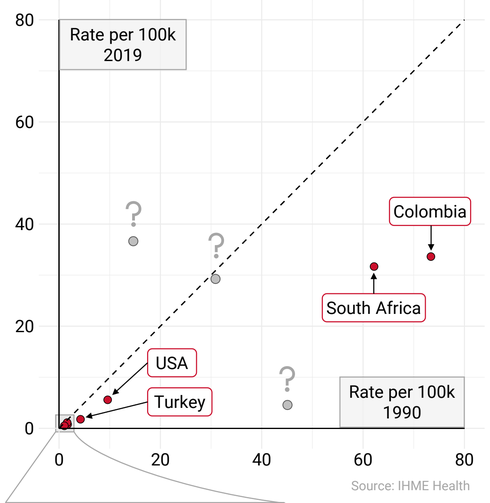
Source: UN, World Bank

As the happiness score is not a sufficient predictor, a better model was built using various World Bank development indicators. The optimizer of the MASS package has been applied to select the relevant features (social support, freedom to make life choices, generosity, and GDP per capita). The resulting adj. R^2 for the log-transformed dependent variable "Homicide Rate" is 40%.

National homicide rates on a global level are very difficult to predict as they are determined by many complex interrelations. In fact, extensive internet research did not reveal any plausible model.

Colombia & South Africa take the top spots

Comparison of homicide rate per 100k population - GE countries



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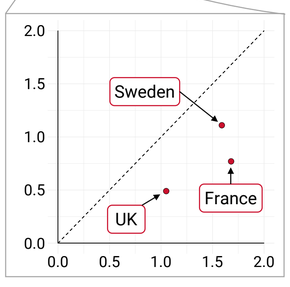
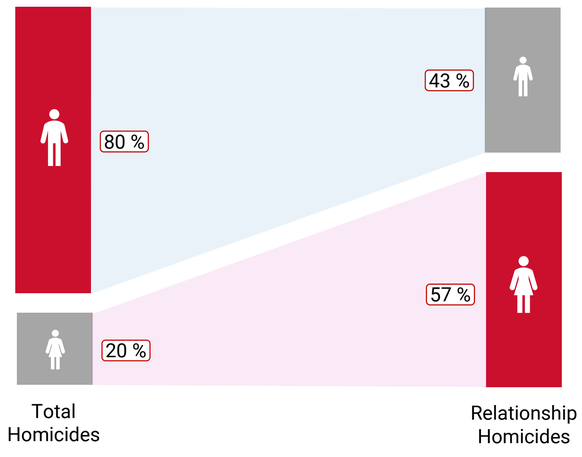


Can you guess which countries (not just GE) the grey spots are?

The figure shows that all GE destinations where able to decrease homicide rate from 1990 to 2019.
However, there are still major gaps between single countries.

Majority of relationship homicide victims are female

Comparison of homicide counts across genders 2019



Source: UNODC

The research into this topic revealed a sad reality. While female victims make up only 20 percent of all committed homicides, this figure jumps to over 50 percent for homicides where a relationship to the perpetrator existed (intimate partner or family related).

How it all comes together …

Enormous difference in exposure to homicide during GE

Name: Vivian
Destination: Stockholm
Age Cat.: 15-49 years
Gender: Female
H. Rate: **0.6**/100k

Name: Gian Marco
Destination: Medellín
Age Cat.: 15-49 years
Gender: Male
H. Rate: **105.5**/100k

x 172

* Accounting for country, age, and gender. Assumptions: gender number parity and country averages for 2019.

Learning

As we moved along the process, we realised the importance of inspecting and cleaning a data set. Real-life data sets are complex and setting them up for data visualisations takes up about 70% of the time. The coding of simple graphs itself takes up the least time.

Critique

We believe we could have had more relevant results had the data been more up to date i.e 2021. There were also some NA values, for which the numbers had to be imputed, thus affecting the accuracy as well. We also observed major discrepancies in the datasets. Lastly, it is believed that the dark figure of homicide is hardly captured.

Advise

Our top advice to our future self and future students is to spend a significant amount of time on exploring the data, as it never fails to surprise with interesting insights. It's important to play with the data-sets and recognise patterns rather than just trying to confirm what one already knows.

Access calculations at: https://github.com/tobias-delago/am10_group11_project