

# Gary's analysis

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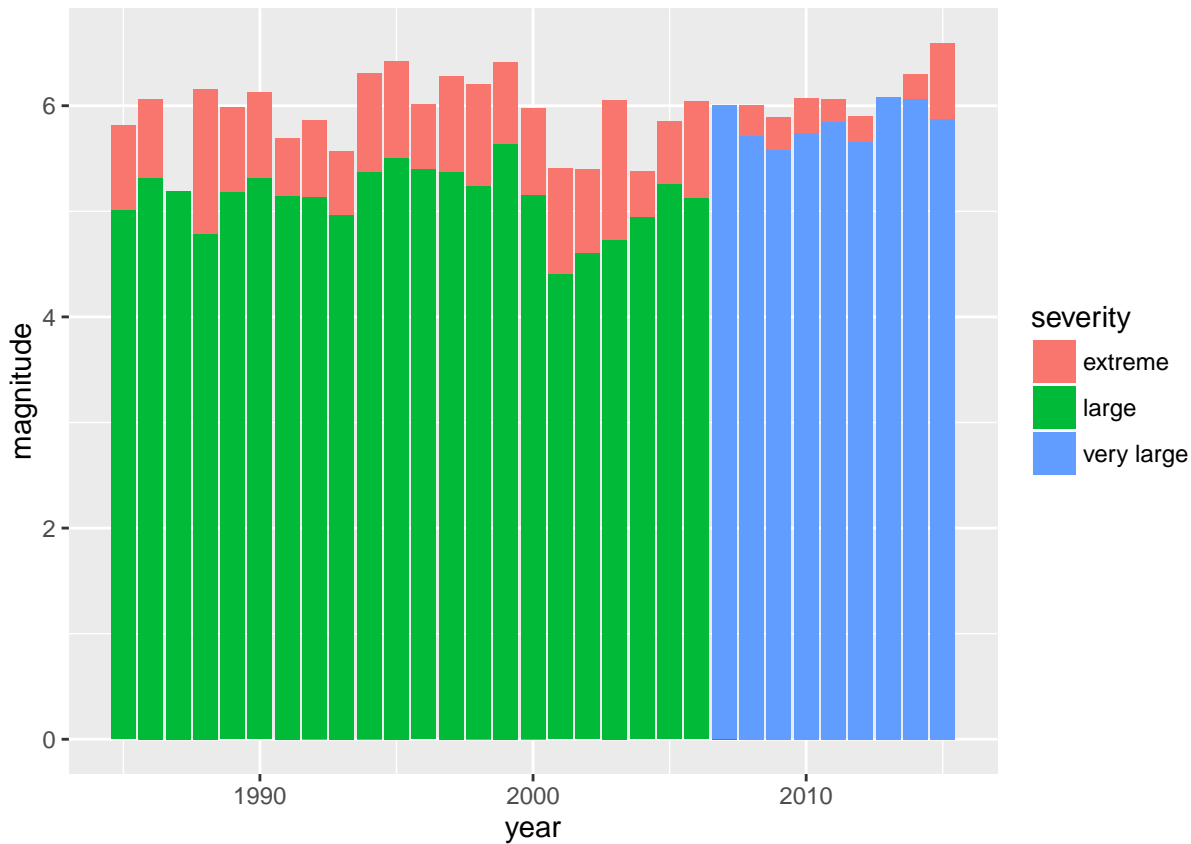
## Part 4 - Understanding the impact of flood

Flood have a huge impact on population and economy. Heavy rain leads to destructionsm, death, displacement, healness, reparations. Some countries may receive more floods based on its location (for example India) but some countries also don't have the capacity to prevent, prepare population, manage flood and repare.

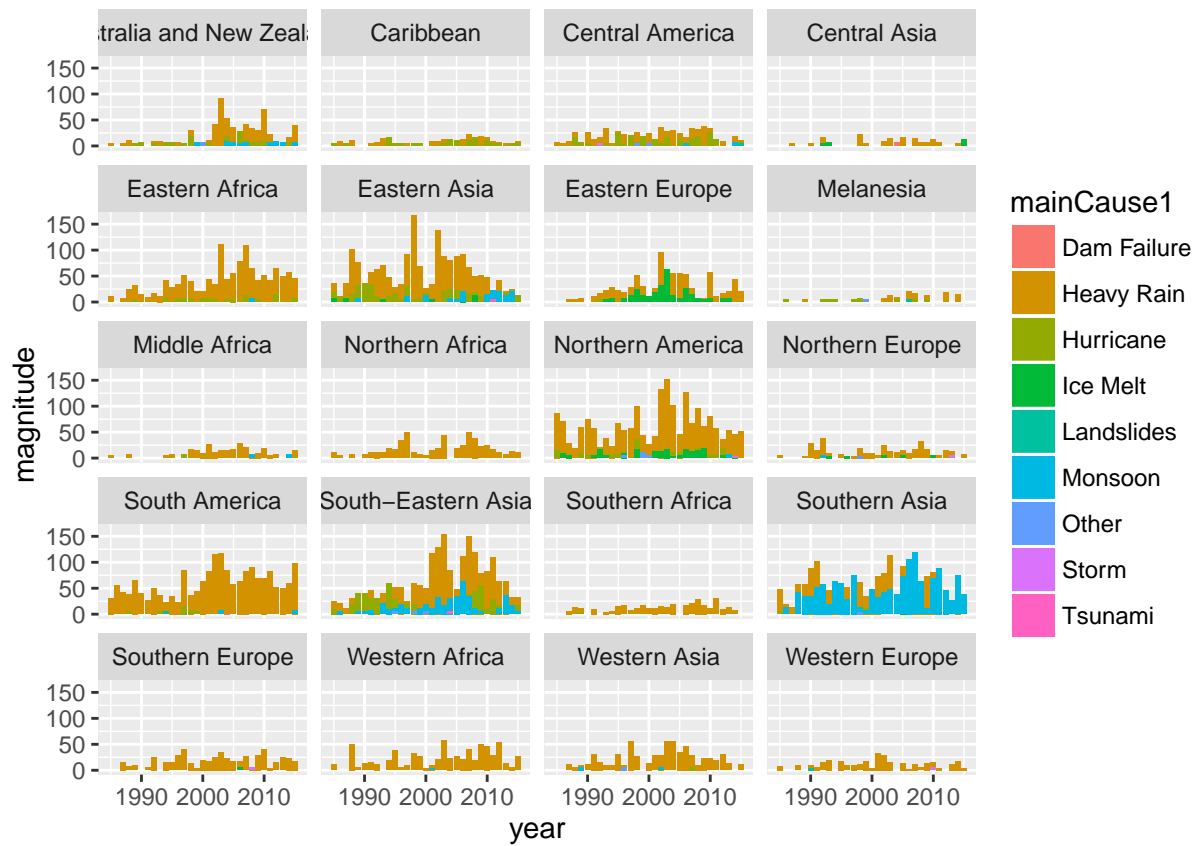
In this analysis we will try to analyse what characteristic influence the impact of a flood.

### Impact evolution

Let's first take a look at the evolution of flood in time



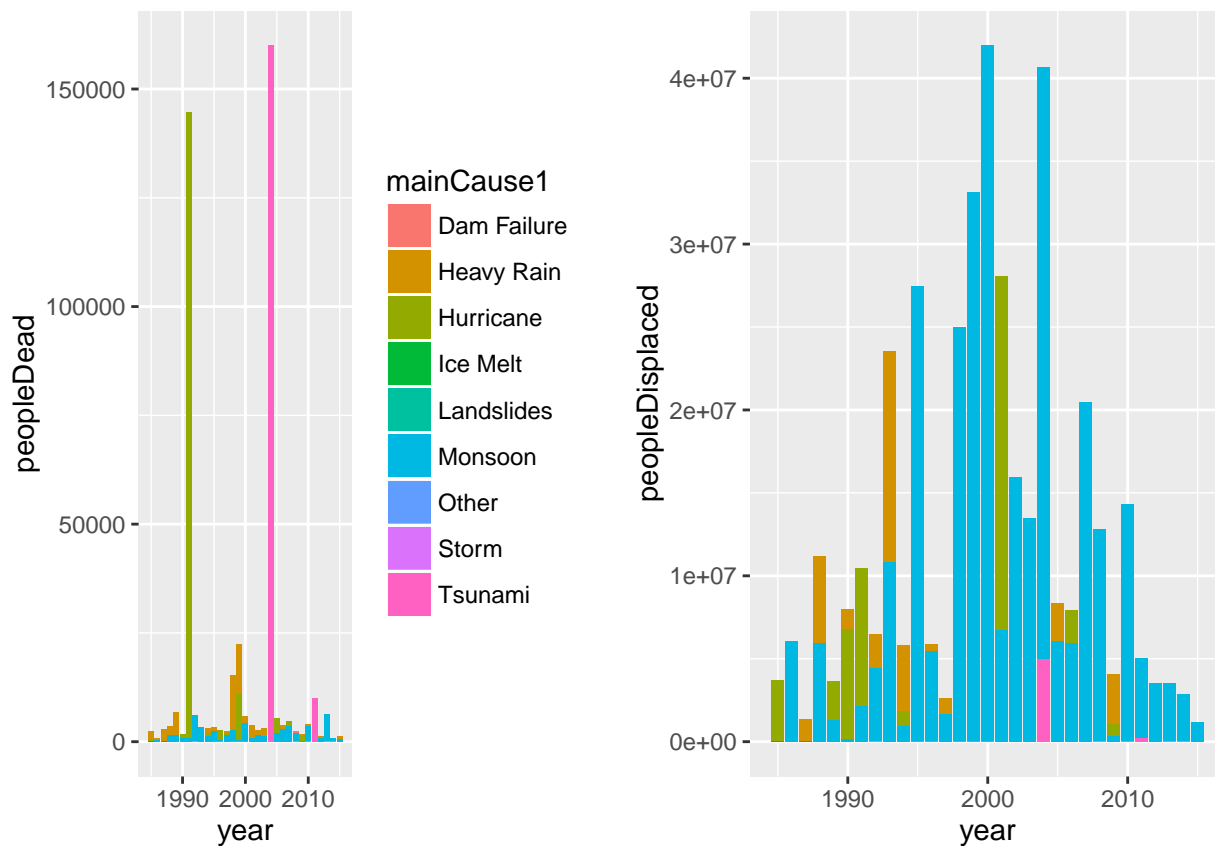
We note that there is an augmentation of the severity of flood in the last decade. But there is no specific cause that can explain it.



When we analyze the repartition of floods by region, we note that there are some region more affected and that some region are more targeted by specific type of disaster. For example:

- Eastern Europe and North American are more touched by Ice Melt
- Southern Asia is highly affected by Monsoon.
- Central America is mainly touched by hurricane.

## Impact on population

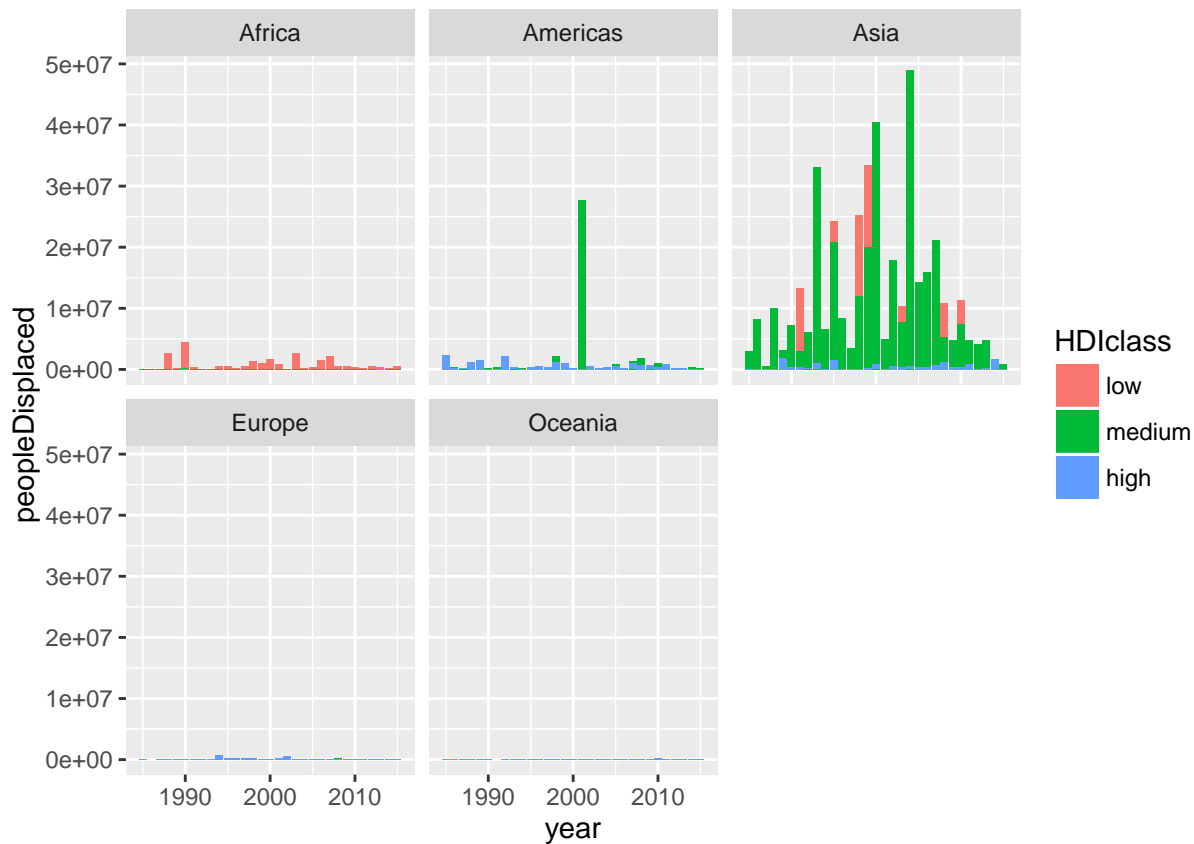


Based on these 2 graphs, we note 2 things:

- Some floods have terrible impact on human lives. For example, in Thailand, in 2004 when 160,000 people died in a tsunami. Therefore, we assume that the number of dead is not linked to the characteristic of the country.
- When we look at the number of people displaced, we see a very different pattern. It is quite stable and the main event that pushes people to move is Monsoon. Furthermore, we know that monsoons tend to happen in a very specific region of the world, mainly south east Asia.

## Characteristics of country and floods' impact

In what type of countries does flood have a greater impact on population? To answer this question we will gather and merge data about Human development index (HDI), life expectancy, expected number of school year, Gross National Income (GNI) per capita.



When we look at people displaced, we see that it mainly affect Asian and African countries and mainly countries with low (below 0.6) or medium (between 0.6 and 0.75) HDI.

## Regression Model

```
##               Estimate Std. Error   t value   Pr(>|t|)
## (Intercept)  -582.5722965 686.734554  -0.8483224 0.39630772
## HDI          -1532.8972850 777.478162  -1.9716274 0.04871894
## lifeExp      25.8339559 15.253336   1.6936594 0.09040560
## GNIPerCapita  -0.7485036  1.219345  -0.6138573 0.53934354
```

The regression analysis confirm that country characteristics does not impact the number of dead people per flood.

```
##
## Call:
## lm(formula = peopleDisplaced ~ HDI + lifeExp + GNIPerCapita,
##     data = flood2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -607416 -184480 -116856   -3324 39738981
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -688620.7   263012.8  -2.618  0.00887 **
## HDI          -2024673.1   297766.7  -6.800 1.20e-11 ***
## lifeExp       30766.7     5841.9    5.267 1.46e-07 ***
## GNIPerCapita    808.3      467.0    1.731  0.08354 .
```

```
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## Residual standard error: 1272000 on 4121 degrees of freedom  
## Multiple R-squared:  0.01174,    Adjusted R-squared:  0.01102  
## F-statistic: 16.31 on 3 and 4121 DF,  p-value: 1.541e-10
```

There is a true correlation between the stage of development of a country and the number of displaced people during floods.

## Main finding

When it comes to death toll, no country is protected against a huge event as a huge tsunami or a hurricane. But facing heavy rain, developed country have better infrastructure and a greater capacity to take care of the people touched by such event. They also have the ability to quickly repair in order to make the population suffer a minimum time so that they don't have to move.