

Ciências ULisboa

Faculdade
de Ciências
da Universidade
de Lisboa

Eng. Energy & Environment

move ▶ green



Sustainable Mobility

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- 8 Individual assignments;
- Excel+pdf 10 minute presentation
- 100% continuous evaluation

SDG – Sustainable Development Goals

<https://sdgs.un.org/goals>

United Nations Department of Economic and Social Affairs Sustainable Development

Home | SDG Knowledge | Intergovernmental Processes | HLPF | SDS | Partnerships | Engage | News | About

THE 17 GOALS | **169** Targets | **3124** Events | **1318** Publications | Actions

1 NO POVERTY | 2 ZERO HUNGER | 3 GOOD HEALTH AND WELL-BEING | 4 QUALITY EDUCATION | 5 GENDER EQUALITY | 6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY | 8 DECENT WORK AND ECONOMIC GROWTH | 9 INDUSTRY INNOVATION AND INFRASTRUCTURE | 10 REDUCED INEQUALITIES | 11 SUSTAINABLE CITIES AND COMMUNITIES | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION | 14 LIFE BELOW WATER | 15 LIFE ON LAND | 16 PEACE, JUSTICE AND STRONG INSTITUTIONS | 17 PARTNERSHIPS FOR THE GOALS

See all

11 SUSTAINABLE CITIES
AND COMMUNITIES



**MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE,
SAFE, RESILIENT AND SUSTAINABLE**

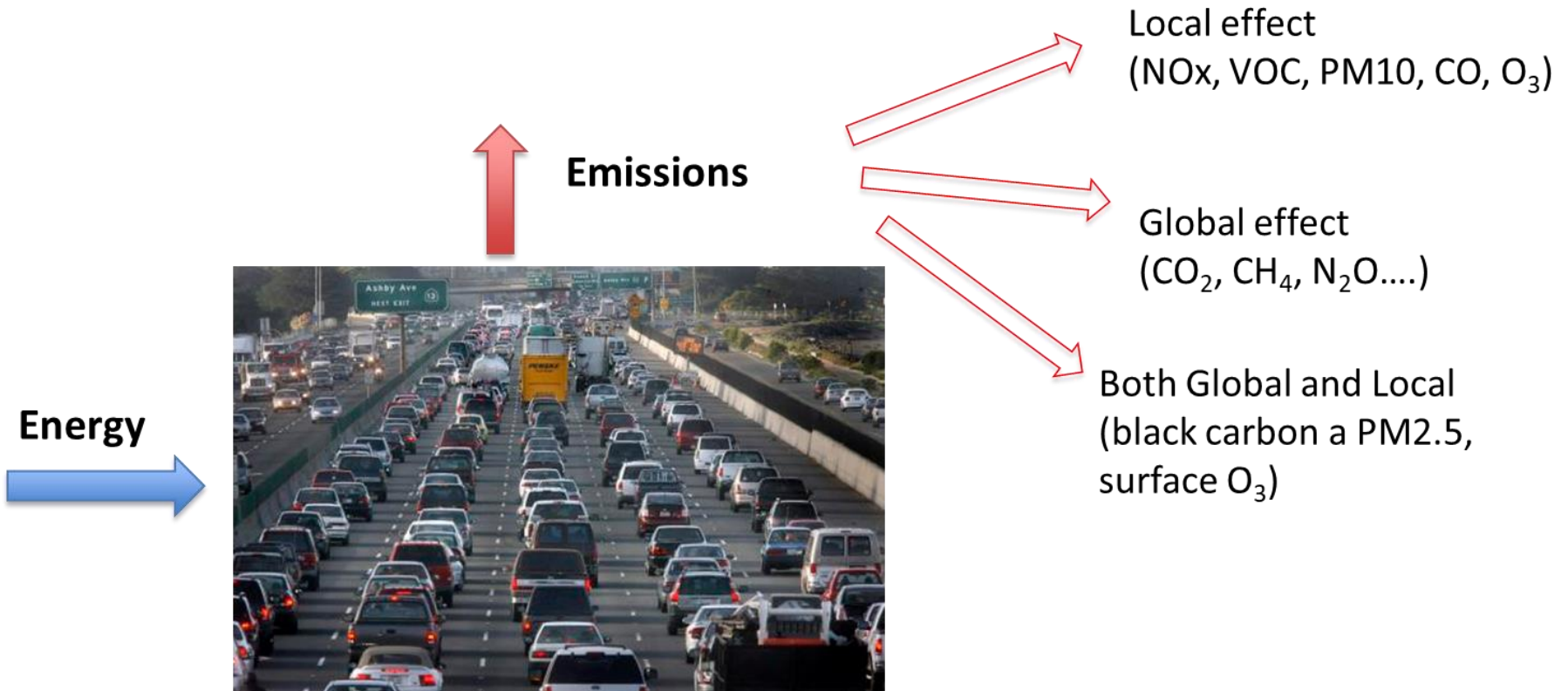
Mobility and the SDGs: A safe, affordable, accessible and sustainable transport system for all



CHALLENGE

Is Lisbon mobility more sustainable than New York?

Q1 How to quantify and monitor the sustainability of how people move in a metropolitan area?



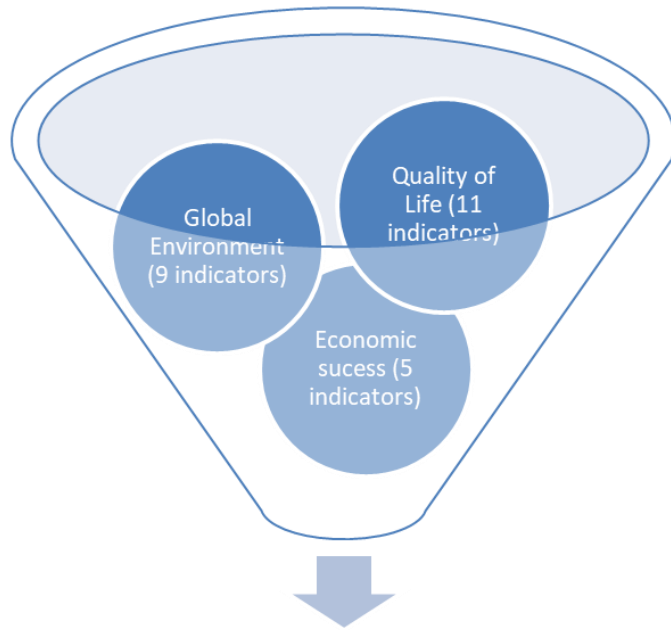
ANS1: Using the internationally recognized World Business Council for Sustainable development SMP2.0



https://docs.wbcspd.org/2015/12/SMP2.0_Sustainable-Mobility-Indicators_ENG.pdf

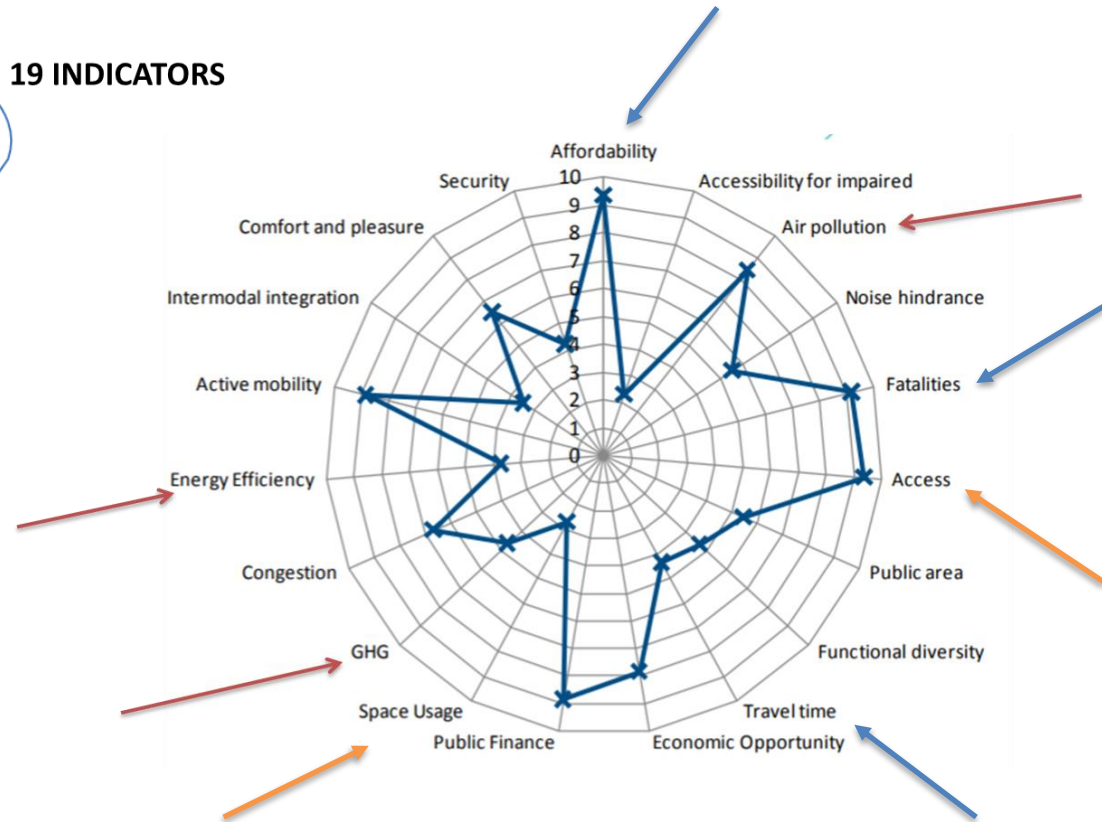
<https://www.wbcd.org/Programs/Cities-and-Mobility/Sustainable-Cities/City-Business-Collaboration/SiMPLify/Resources/SMP2.0-Sustainable-Mobility-Indicators-2nd-Edition>

SMP2.0 – Sustainable Mobility Project v2.0



19 INDICATORS

Radar graph



FATALITIES (page 40)

d Formula & calculation method

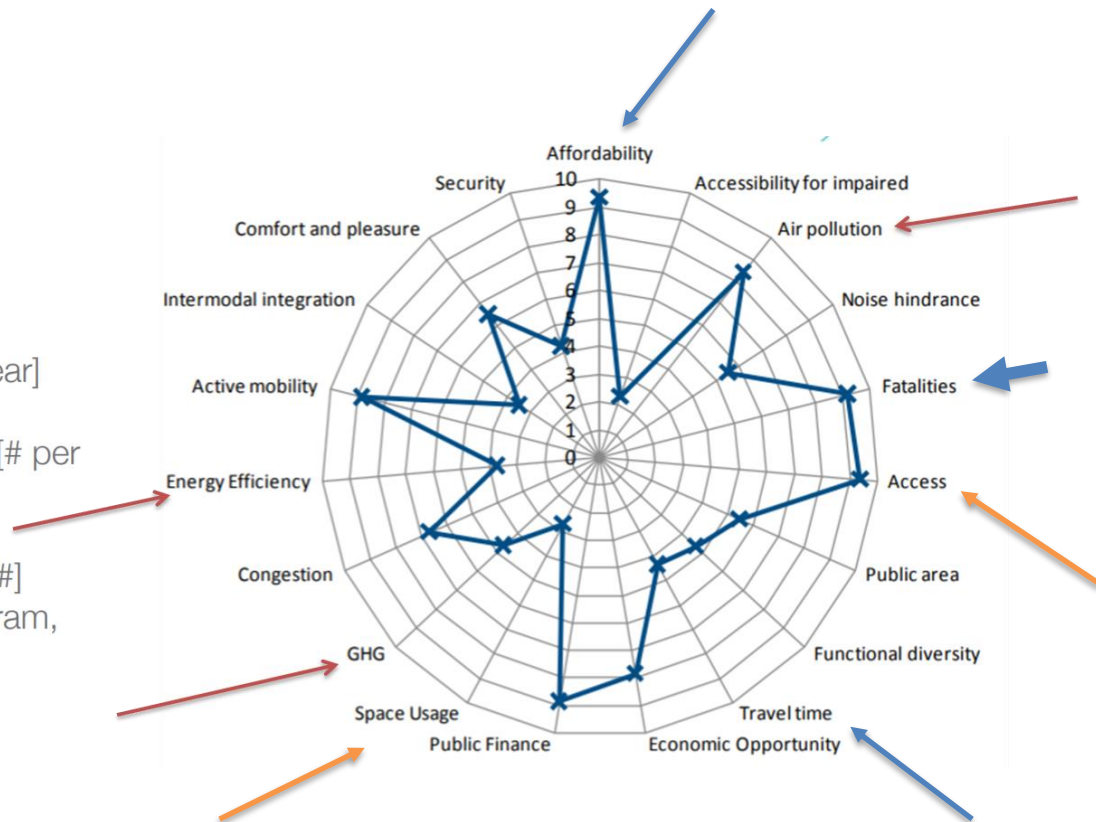
$$FR = \frac{\sum_i K_i * 100000}{Cap}$$

FR = Fatality rate [# per 100.000 population per year]

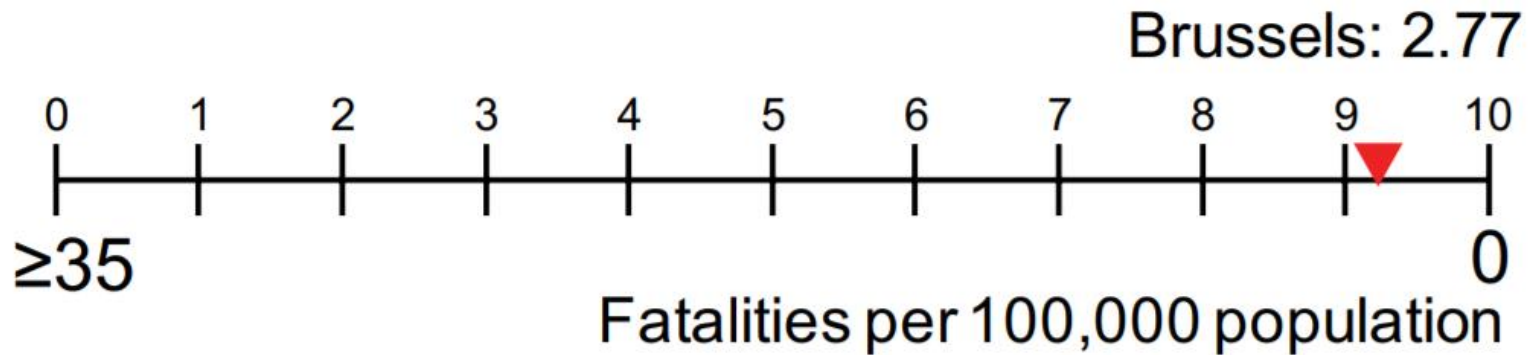
K_i = Number of persons killed in transport mode *i* [# per year]

Cap = Capita or number of inhabitants in the city [#]

i = Transport mode (passenger car, freight traffic, tram, bus, train, motorcycle, river transport, etc.) [type]



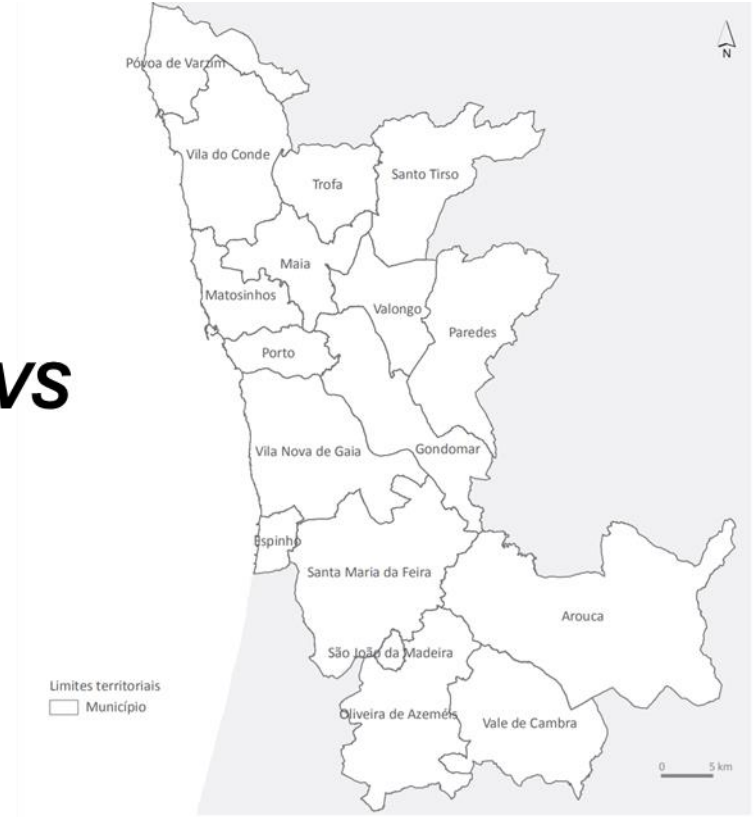
f Scale



- 0: 35 [fatalities/100.000 capita]
- 10: 0 [fatalities/100.000 capita]
- Reference for scale 0; “Vision zero” objective
- Reference for scale 10; Egypt, 2000: 42 fatalities per 100.000 pop.



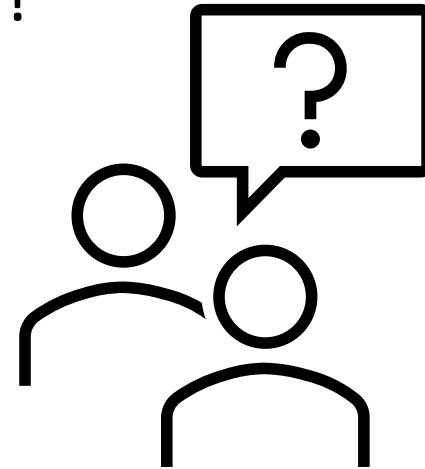
VS



Lisbon versus Oporto Metropolitan areas

WHY IS FATALITIES INDICATOR IMPORTANT??

Can I say: If I change the internal combustion engine cars to all electric cars reducing tailpipe emissions but the level of fatalities worsened due to more silent driving, I change to a more sustainable system?



Assignment #1

Excel calculation of FATALITIES and Fatalities+injuries for cities: Lisbon, New York, Amsterdam, Madrid, New Delhi, Beijing, Hong Kong

Indicate all assumptions and sources of data



2017

2020

2021

Assignment #1

Deadline: 1 March

Send via e-mail : camsilva@fc.ul.pt

(excel+presentation pdf)



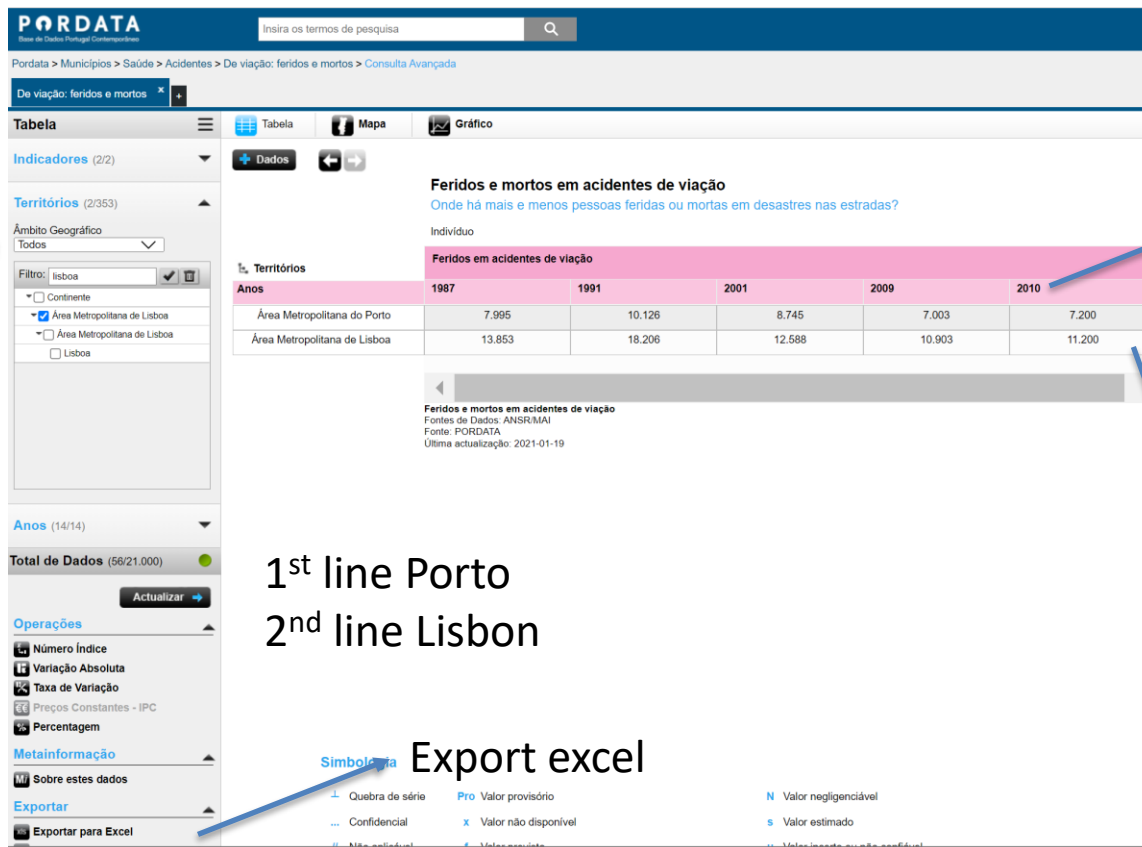
Mais opções e dados

Hint: go to PORDATA – Portuguese Database

Aprofunde a sua análise. Veja e compare dados e anos.

<https://www.pordata.pt/DB/Municipios/Ambiente+de+Consulta/Tabela>

Tick
geographic
coverage



Year

1st line Porto
2nd line Lisbon

Number of
injuries or
deaths

Export excel

Mais opções e dados

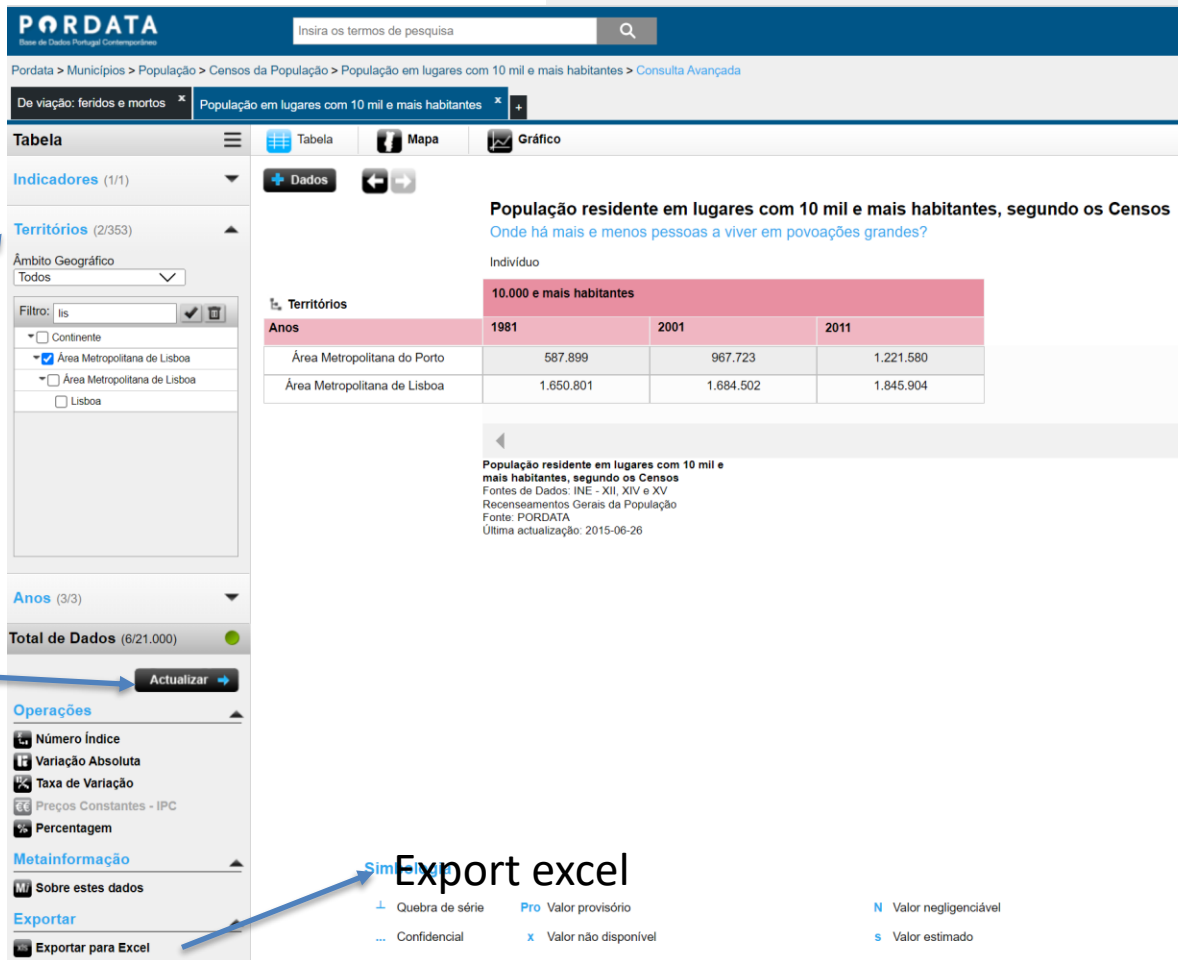
Hint: go to PORDATA – Portuguese Database

Aprofunde a sua análise. Veja e compare dados e anos.

Tick geographic coverage

Update

Export excel



PORDATA
 Base de Dados Portugal Contemporânea

Pordata > Municípios > População > Censos da População > População em lugares com 10 mil e mais habitantes > Consulta Avançada

De viação: feridos e mortos x População em lugares com 10 mil e mais habitantes x

Tabela | Tabela | Mapa | Gráfico

Indicadores (1/1)

Territórios (2/353)

Âmbito Geográfico: Todos

Filtro: lis

Continente
 Área Metropolitana de Lisboa
 Área Metropolitana de Lisboa
 Lisboa

Anos (3/3)

Total de Dados (6/21.000)

Operações

Número Índice
 Variação Absoluta
 Taxa de Variação
 Preços Constantes - IPC
 Percentagem

Metainformação

Sobre estes dados

Exportar

Exportar para Excel

População residente em lugares com 10 mil e mais habitantes, segundo os Censos
 Onde há mais e menos pessoas a viver em povoações grandes?

Indivíduo

Territórios	10.000 e mais habitantes		
Anos	1981	2001	2011
Área Metropolitana do Porto	587.899	967.723	1.221.580
Área Metropolitana de Lisboa	1.650.801	1.684.502	1.845.904

População residente em lugares com 10 mil e mais habitantes, segundo os Censos
 Fontes de Dados: INE - XII, XIV e XV
 Recenseamentos Gerais da População
 Fonte: PORDATA
 Última actualização: 2015-06-26

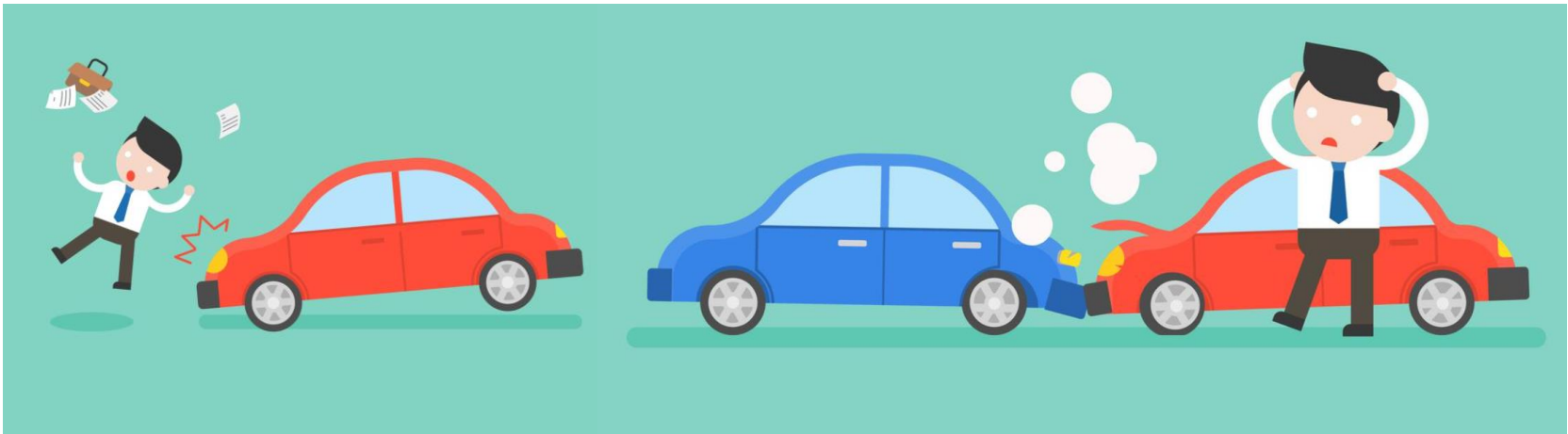
Similares

Quebra de série | Valor provisório | Valor negligenciável
 Confidencial | Valor não disponível | Valor estimado

Assignment #1

Calculate the indicator for 2017 , 2020 and 2021:

$$\frac{(NUMBER\ OF\ INJURIES + NUMBER\ OF\ DEATHS)}{POPULATION} * 100.000$$



[Acidente Vetores por Vecteezy](https://pt.vecteezy.com/vetor-gratis/acidente)

Assignment #1

Transform the outcome in a 0 to 10 scale

Linear Interpolation

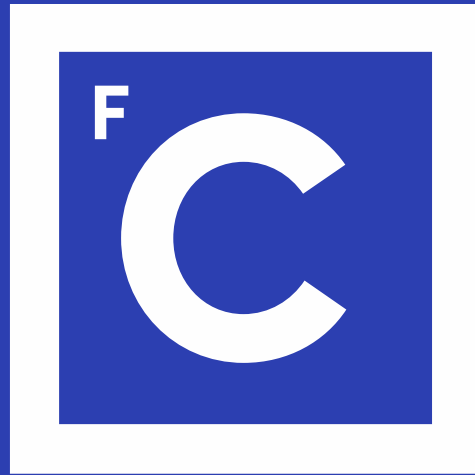


0 \geq ?? Injuries+fatalities per 100.000 inhabitants

10 0 fatalities per 100.000 inhabitants

Lisbon	https://www.pordata.pt/
Madrid	https://www.dgt.es/menusecundario/dgt-en-cifras/
Amsterdam	https://swov.nl/en/fact-sheet/road-deaths-netherlands
New York	https://www.health.ny.gov/statistics/prevention/injury_prevention/traffic/count_y_of_residence.htm#:~:text=On%20average%20there%20were%20292,New%20Yorkers%20ages%2020%2D24.
New Delhi	https://ncrb.gov.in/sites/default/files/chapter-1A-traffic-accidents-2017_0.pdf
Beijing	https://www.roadsafetyfacility.org/country/china
Honk Kong	https://www.police.gov.hk/ppp_en/09_statistics/tapi_tcpr_2021.html

Thanks



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