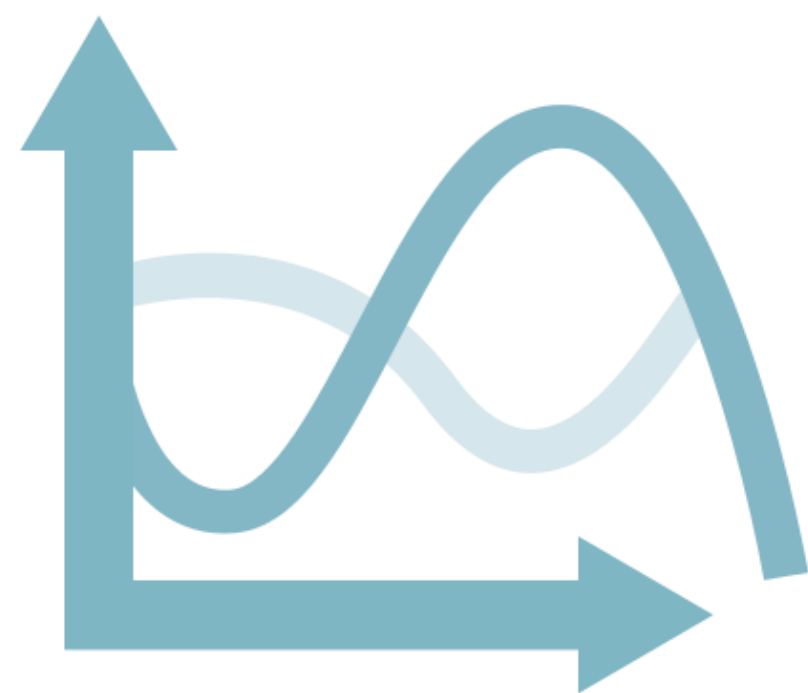




Air quality: the bright side of COVID pandemic

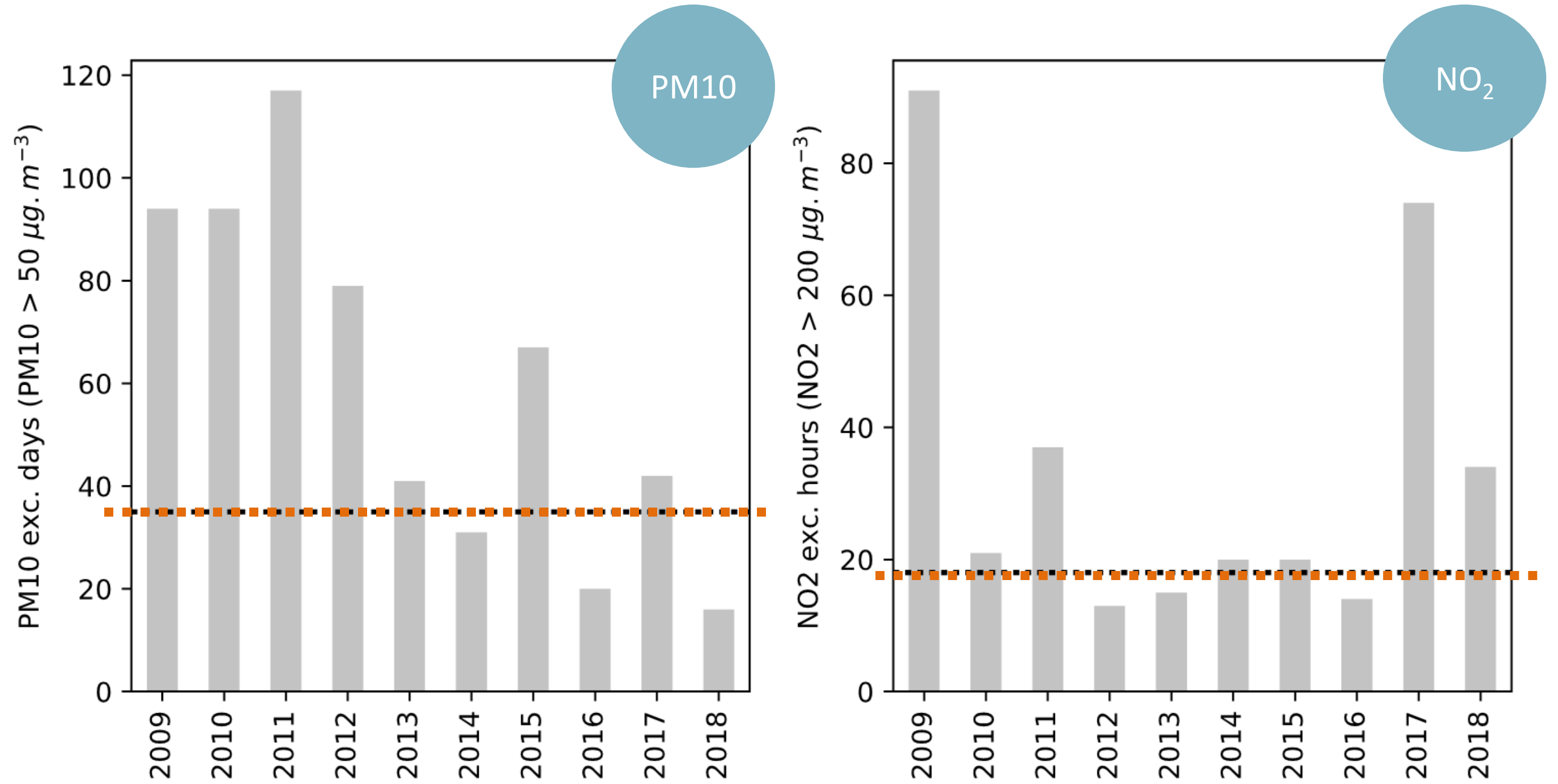
Alexandra Monteiro

Universidade de Aveiro, Portugal



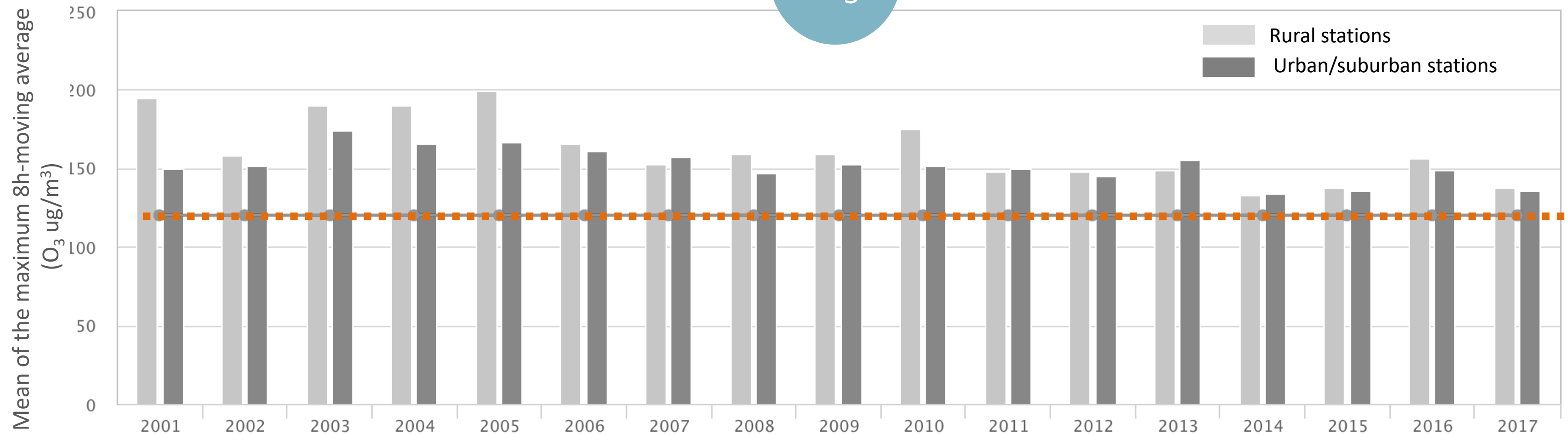
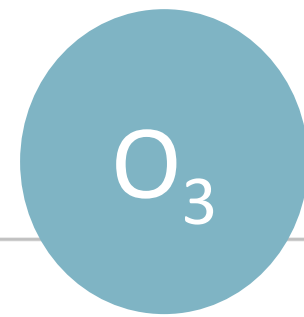
The AQ problems in Portugal

Exceedances to legislation urban areas



The AQ problems in Portugal

Exceedances to legislation rural/urban areas



Air quality in Portugal

media

Bairrada BAIRRADA ECONOMIA DESPORTO OPINIÃO LIFESTYLE

Poluição do ar em Aveiro, Ílhavo e Estarreja leva Comissão Europeia a advertir Portugal

Publicado por Oriana Pataco | Set 25, 2014 | Aveiro, Ílhavo, Região | 0 | ★★★★★

Portugal não está a proteger os cidadãos da poluição causada pelas «poeiras finas» (PM10). As partículas de PM10 provêm das emissões da indústria, do tráfego e do aquecimento doméstico e podem causar asma, problemas cardiovasculares, cancro do pulmão e morte prematura. Por força da legislação da UE, os Estados-Membros devem limitar a exposição dos cidadãos a estas

Diário de Notícias

As 15 cidades e áreas mais poluídas de Portugal, segundo a OMS

Em causa está a poluição com partículas minúsculas que entram nos pulmões e no sistema cardiovascular

DN

registada poluição excessiva

https://www.jn.pt/sociedade/registada-poluicao-excessiva

JN JN Direto Nacional Local Justiça Mundo Economia Desporto Pessoas Inovação Mais Secções

Sociedade

Registada poluição excessiva do ar em Coimbra

Refinitiv offers the widest coverage across Environmental, Sustainability, and Governance metrics. Get a more detailed picture. LEARN MORE

REFINITIV DATA IS JUST THE BEGINNING

RELACIONADAS

- Helicóptero bombardeiro accionado em Marco de Canaveses
- Detido pastor suspeito de atear dez incêndios florestais
- Helicóptero Kamov combate incêndio em Braga
- Incêndio obriga ao corte do tráfego ferroviário na Linha da Beira Alta
- Bombeiros conseguiram dominar as chamas na serra do Marão

OBSERVADOR

Assinar

Coimbra, Ílhavo, Aveiro e zona do Baixo Vouga ultrapassam limite de alerta de ozono

4/8/2018, 17:57

Freguesias dos concelhos de Coimbra, Ílhavo, Aveiro e a Zona Litoral Noroeste do Baixo Vouga acima do limite de concentração de ozono. Populações alertadas devido a potenciais danos para a saúde.

Partilhe



11 Agosto 2011 às 16:27

A Comissão de Coordenação e Desenvolvimento Regional do Centro informou, que o nível da poluição do ar por concentração excessiva de ozono atingiu, esta quinta-feira de manhã, em Coimbra, os 431 microgramas por metro cúbico.

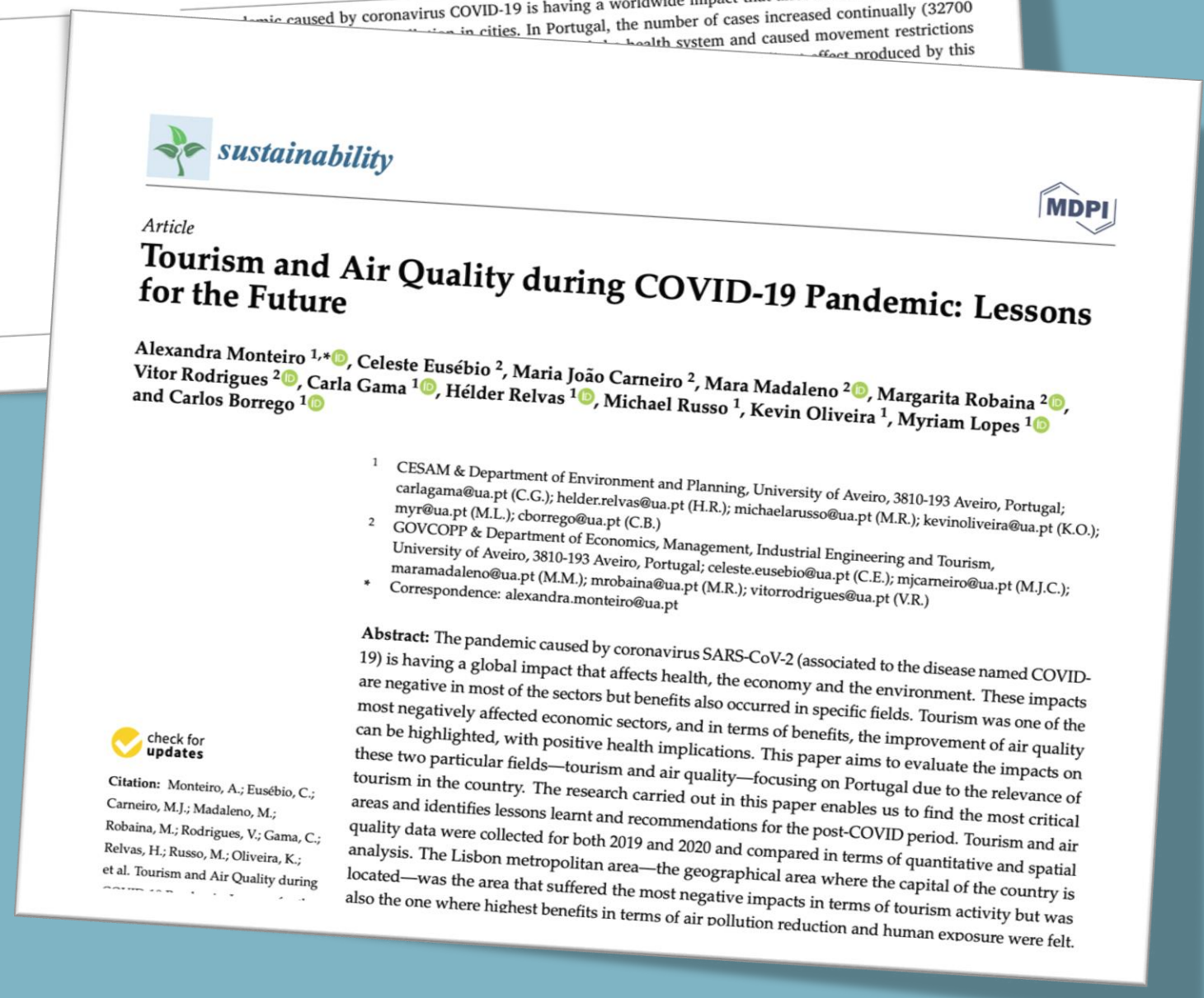
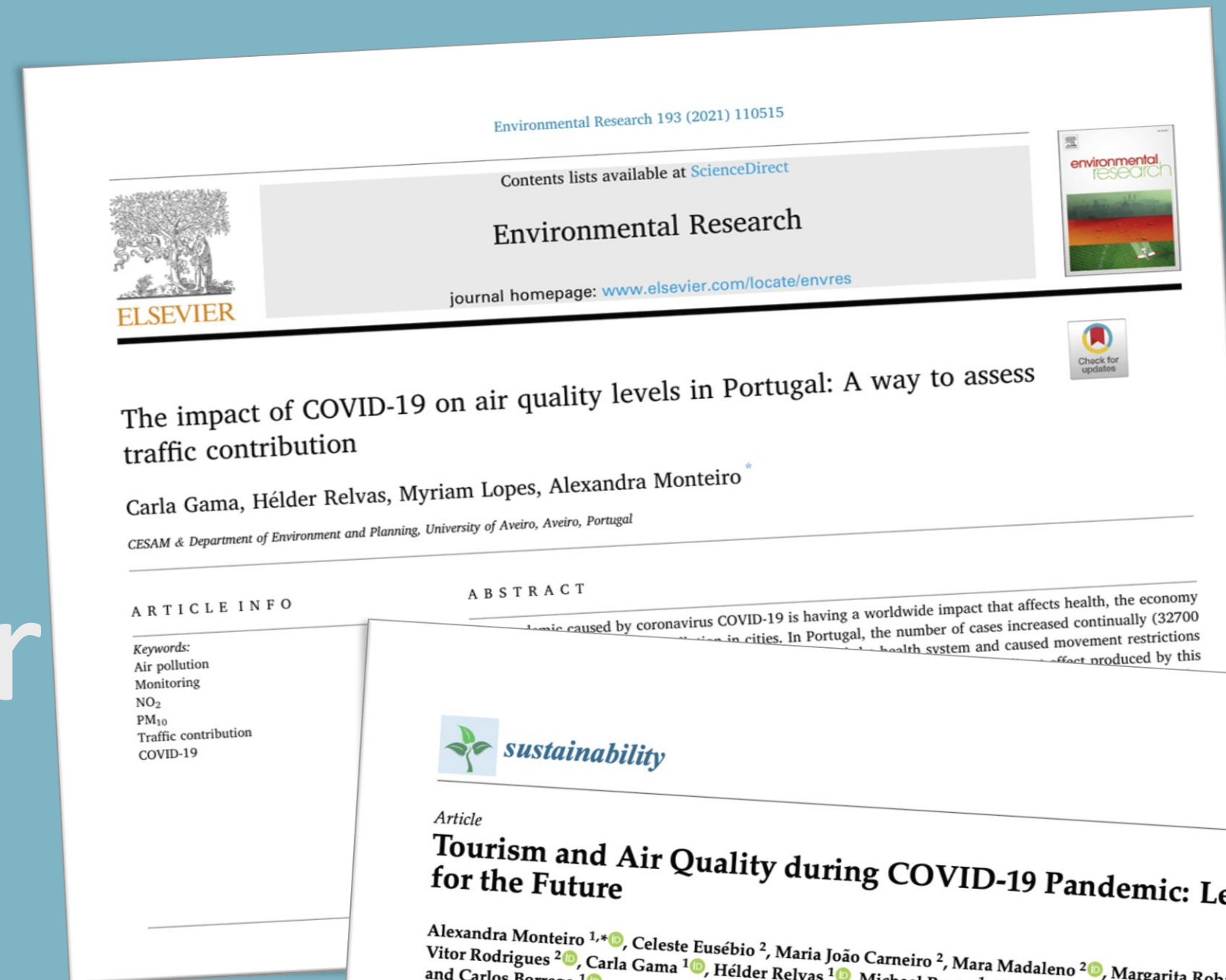


The scientific answer

Impact of COVID lockdown on air quality

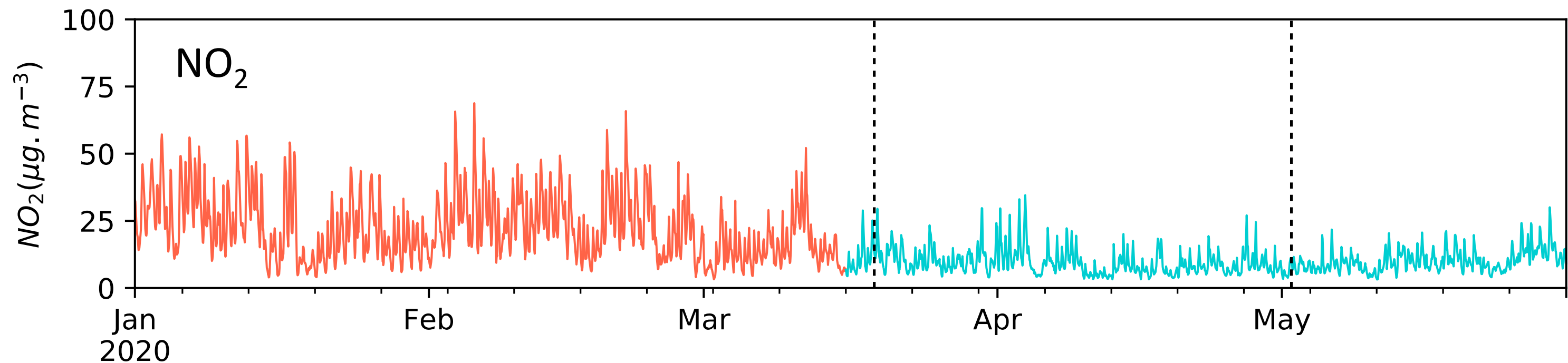
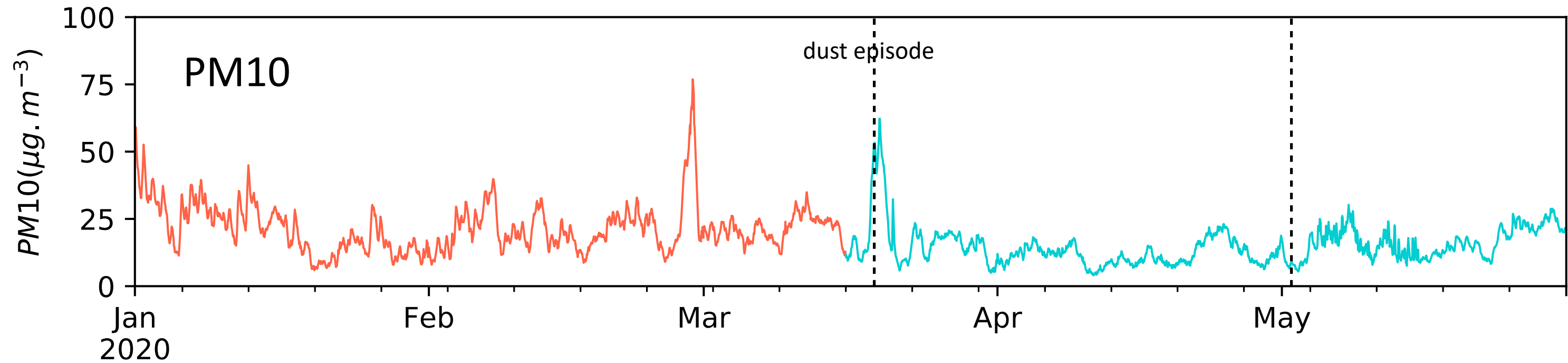
Assessing traffic contribution

Estimating health benefits



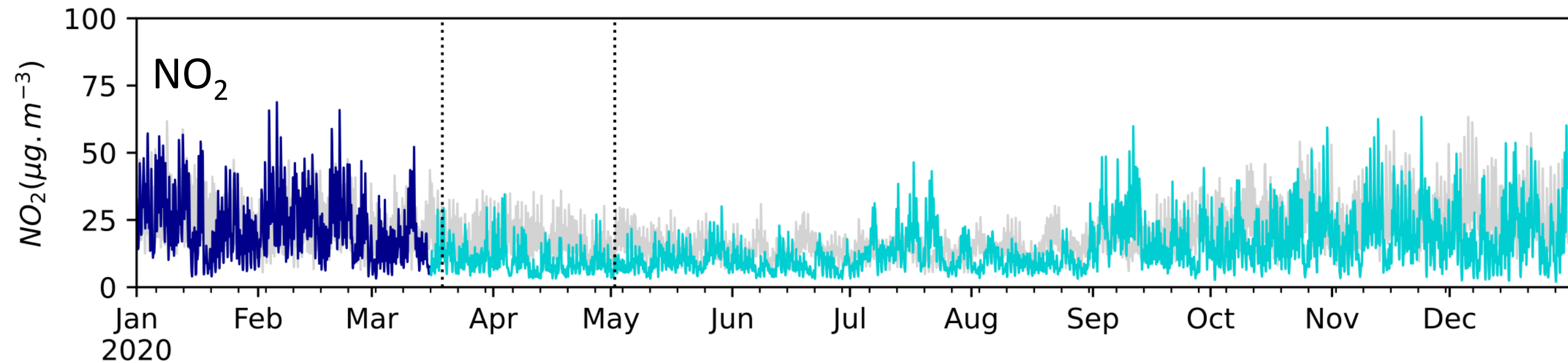
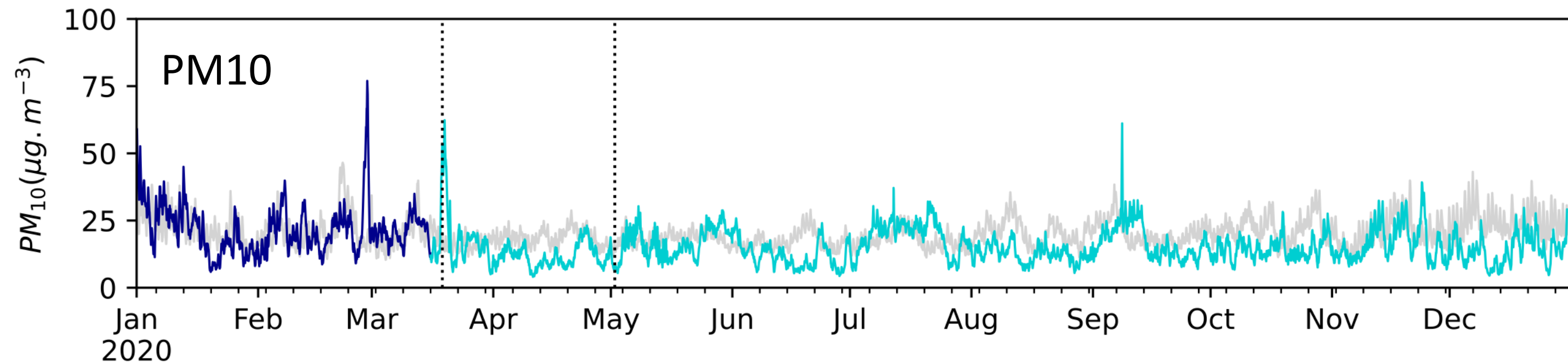
Air quality in Portugal

before & after COVID lockdown



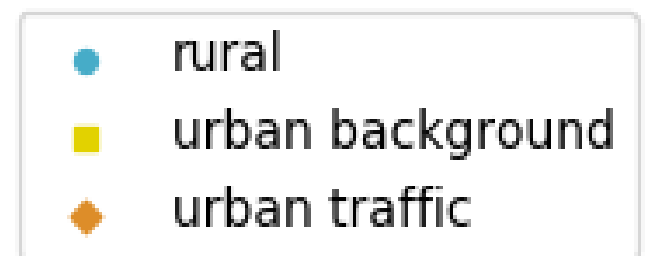
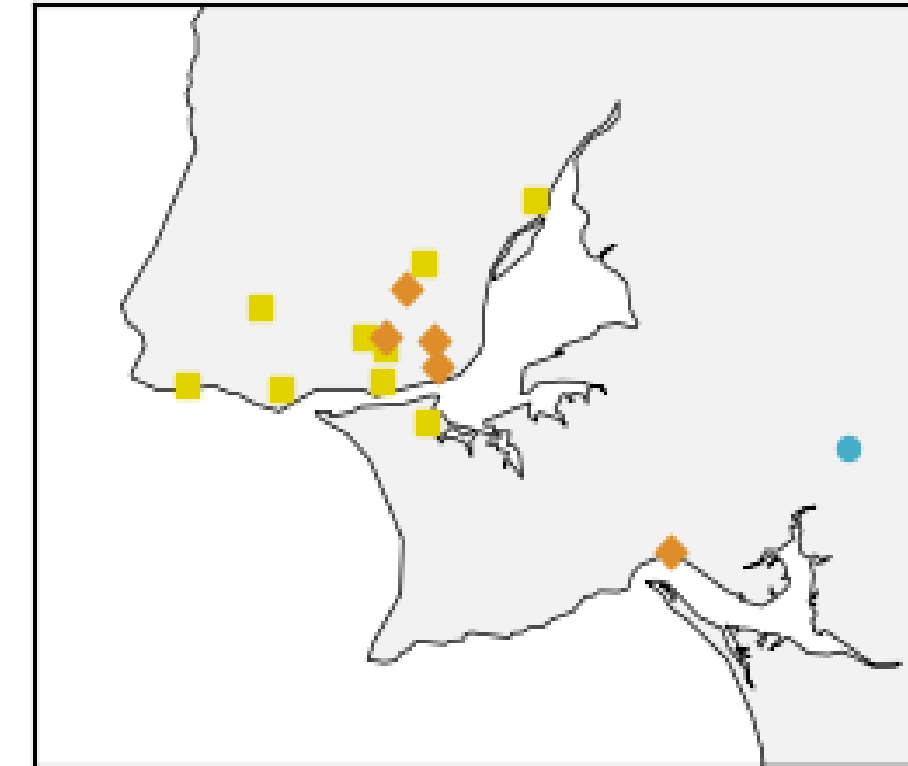
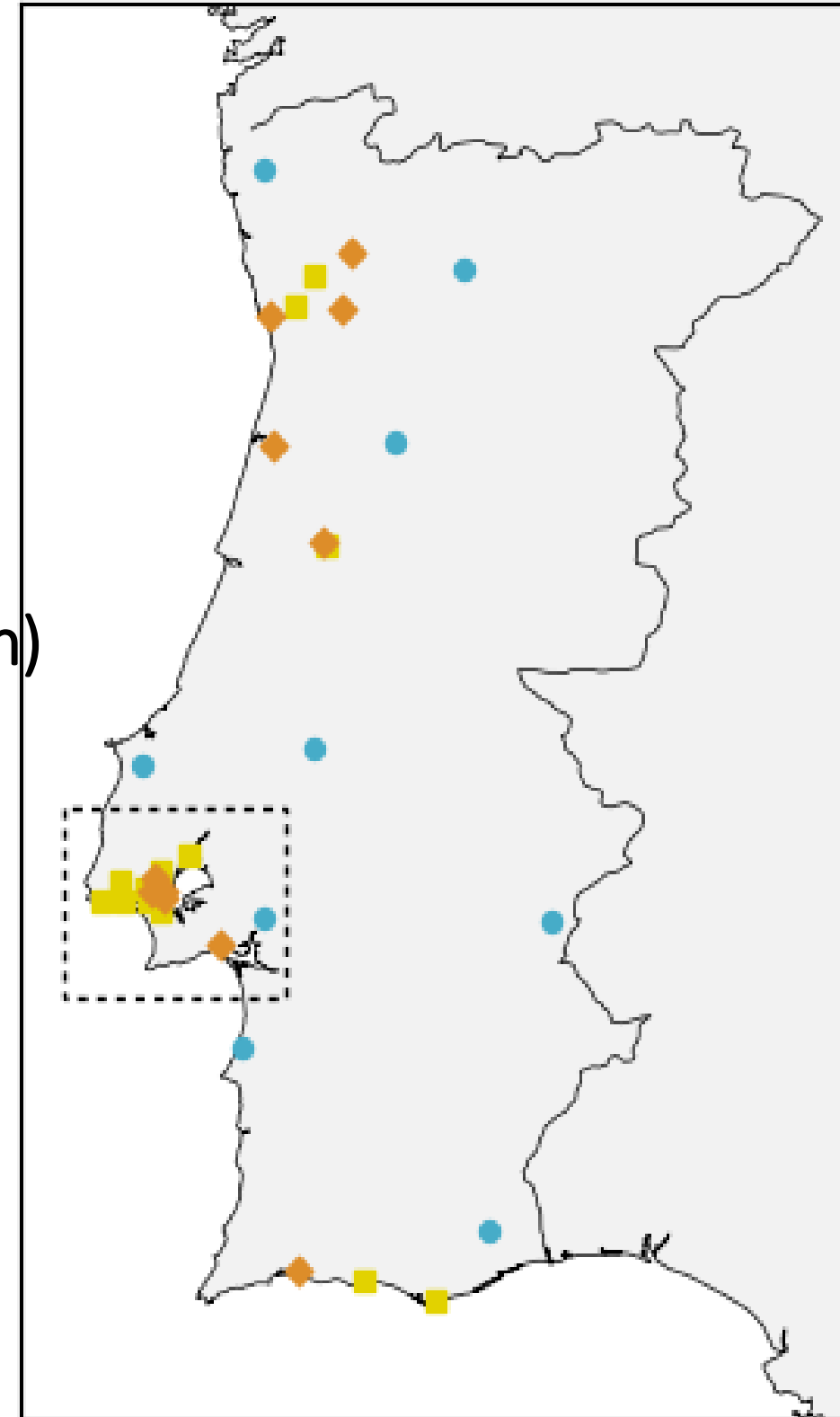
Air quality in Portugal

the all 2020 year



Methodology

1. Impact on the **different pollutants**
2. Impact on the **different environments (rural/urban)**
3. Estimating **traffic contribution to NO₂**
4. Estimating **health benefits & economic outcomes**



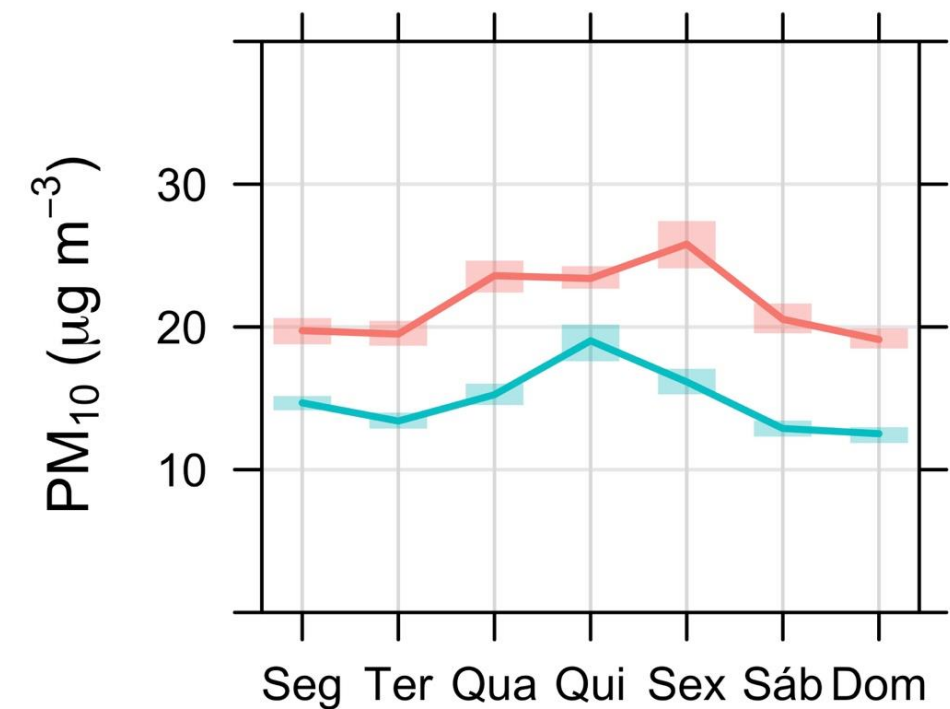
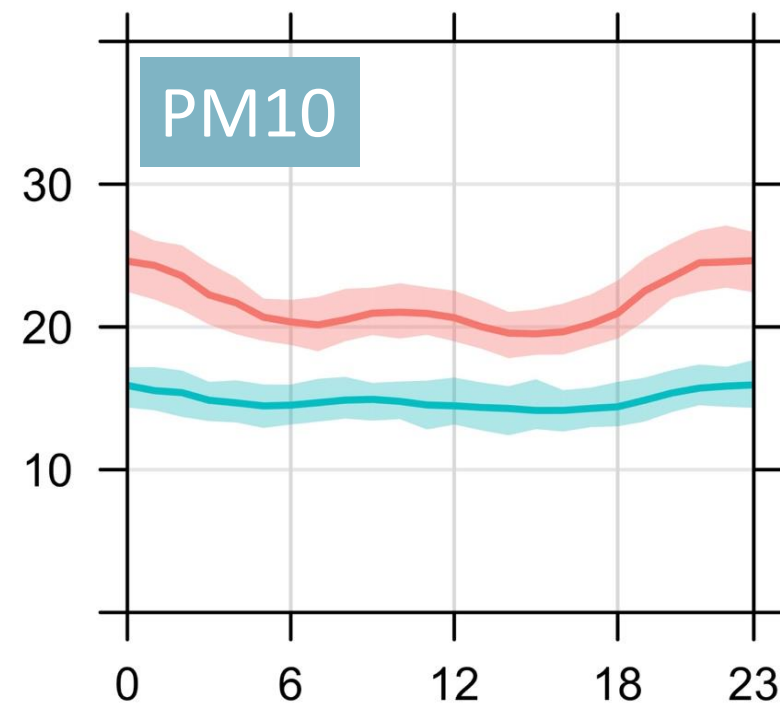
Impact on different pollutants

PM10

Other emission sources besides traffic
Domestic heating!

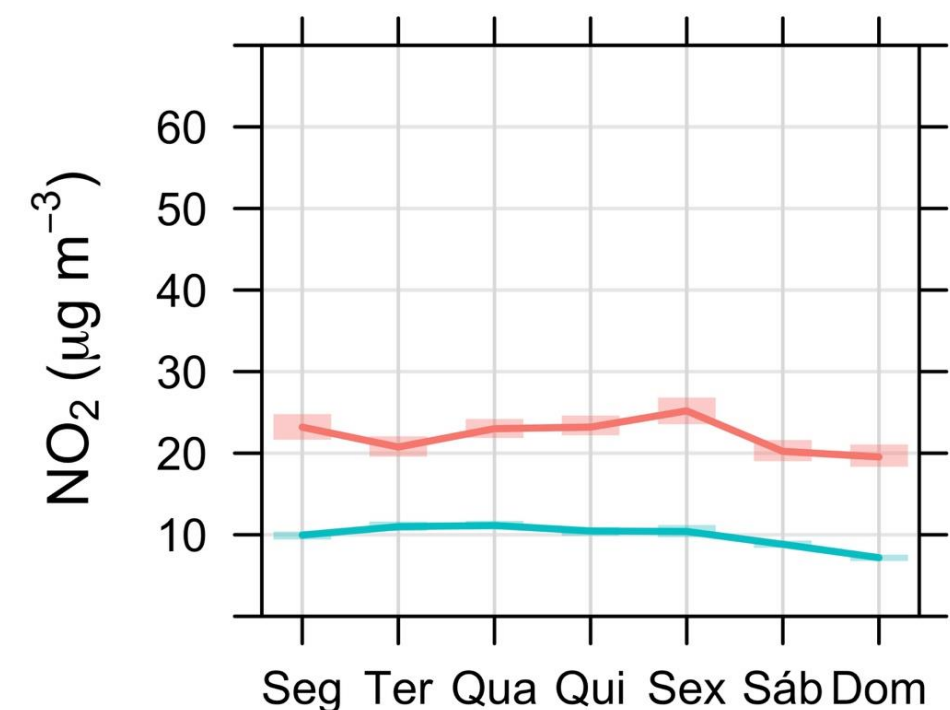
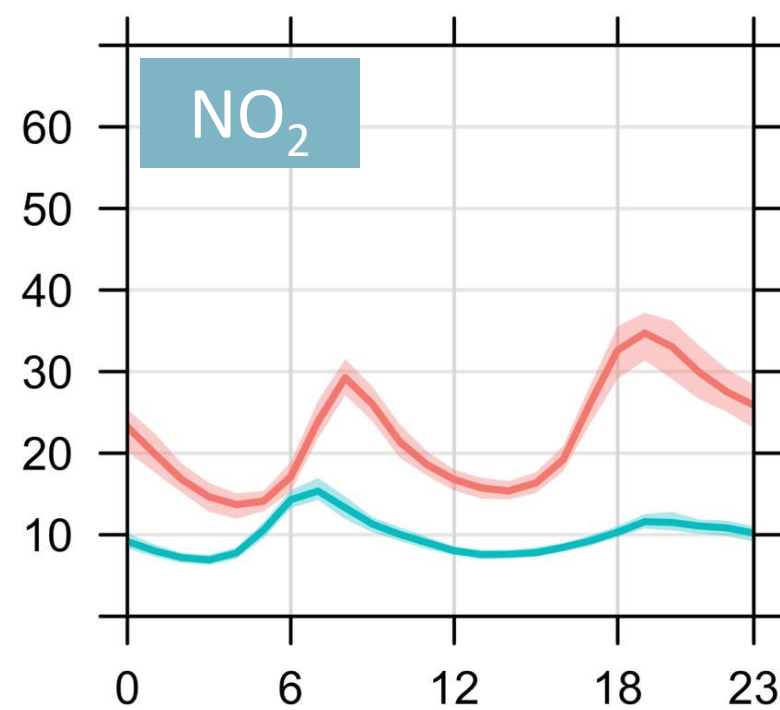
NO₂

The highest impact of COVID lockdown: NO₂ (reductions >50%)



before 16 Mar

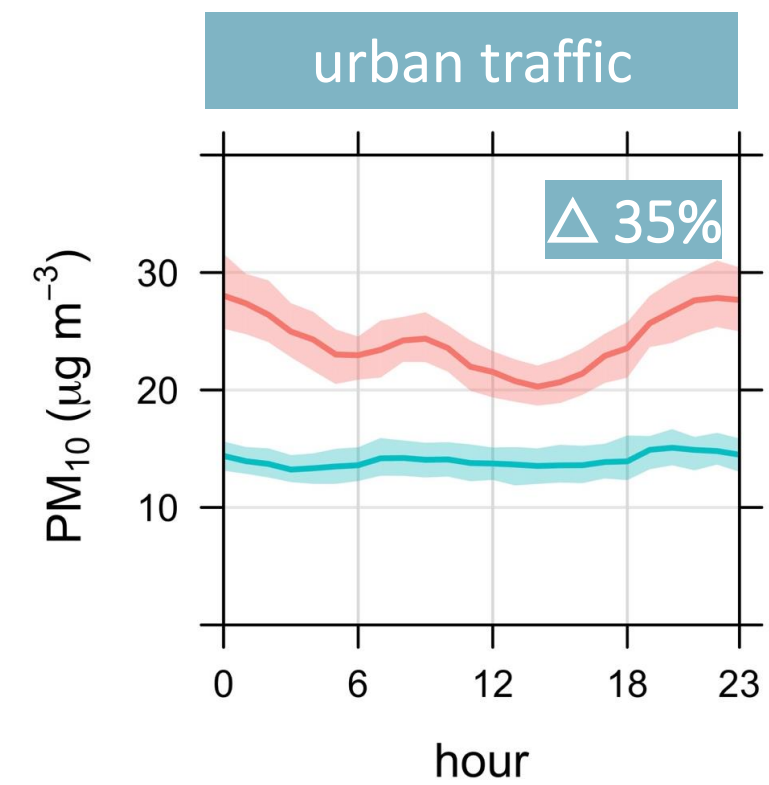
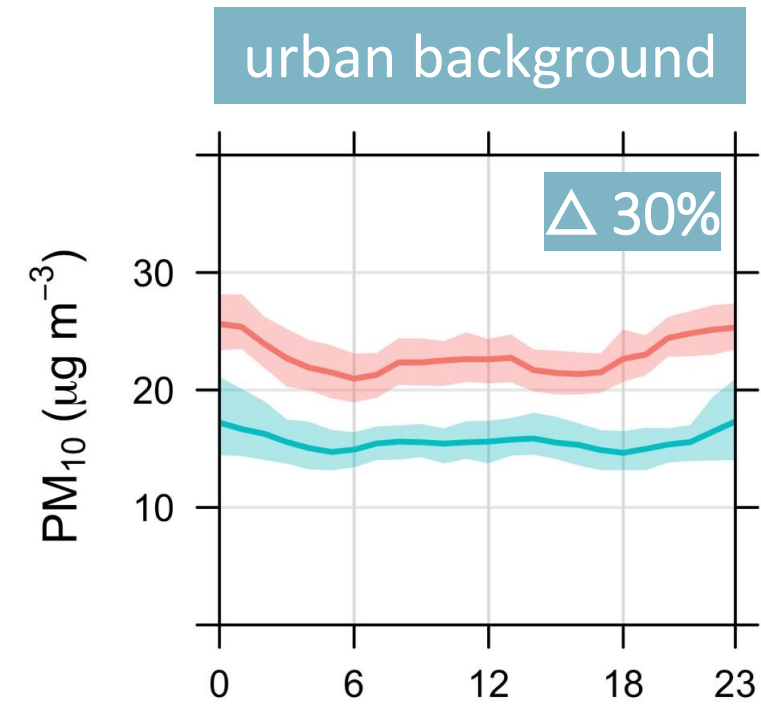
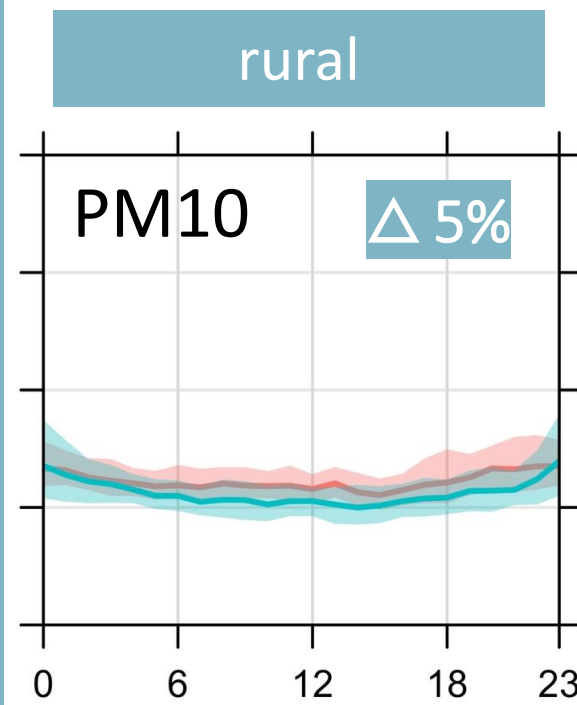
after 16 Mar



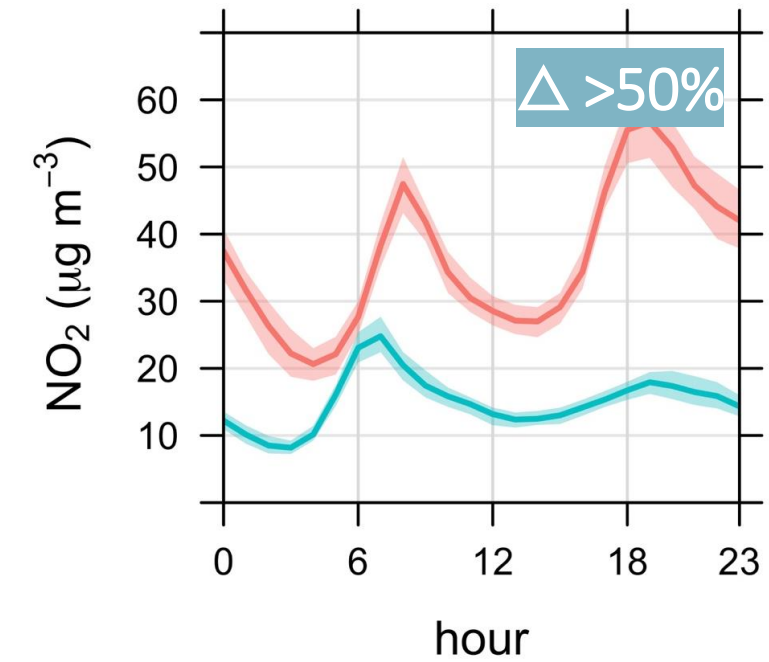
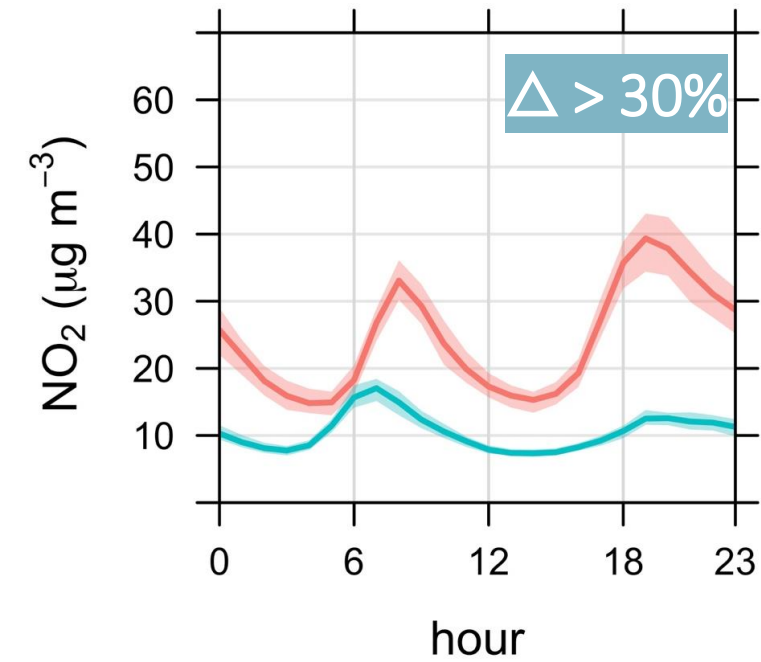
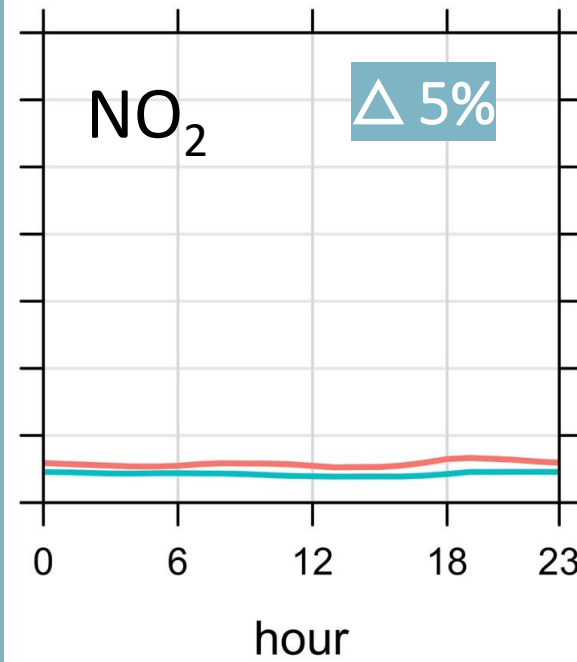
hour

weekday

Impact on different environments



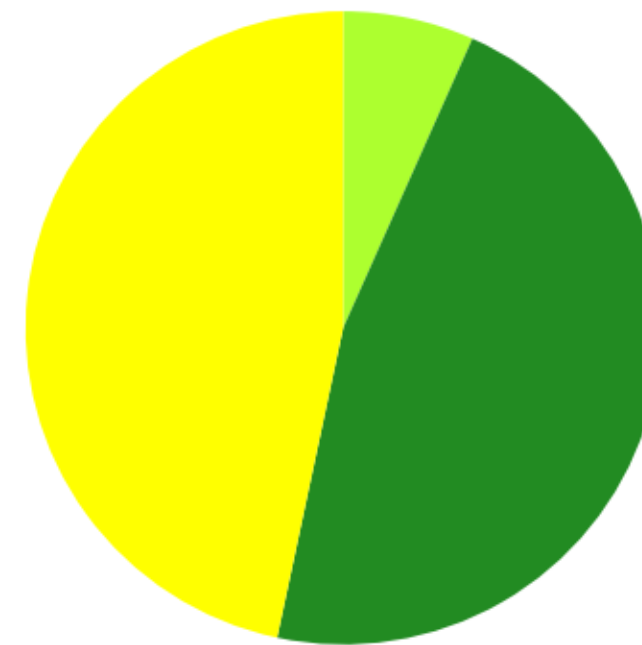
before 16 Mar after 16 Mar



AQI comparison

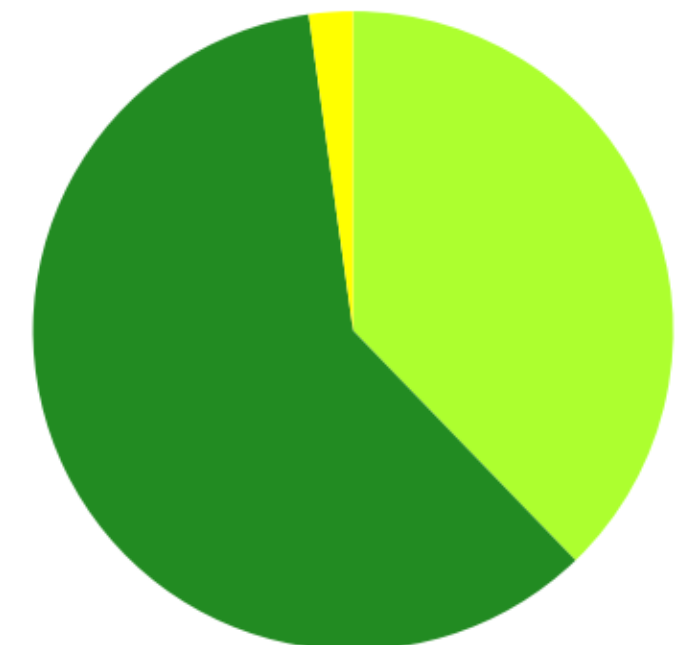
Lisbon AQ stations

Estação trafego



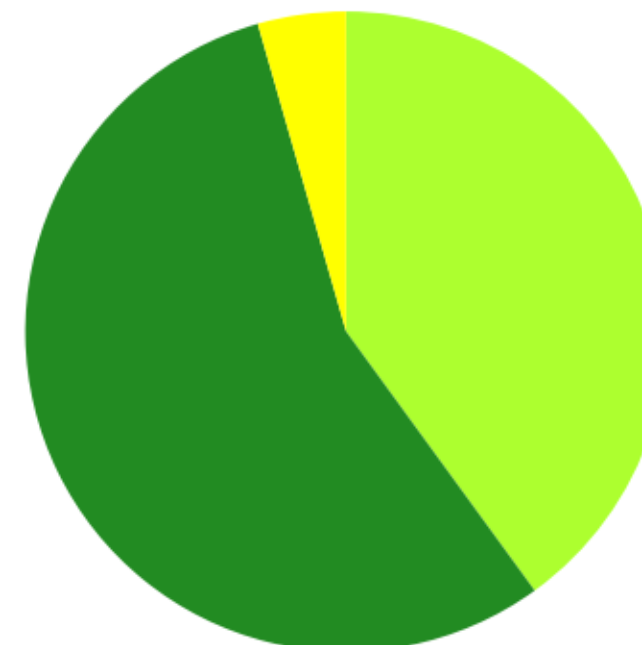
Março-Maio
2019

COVID
→



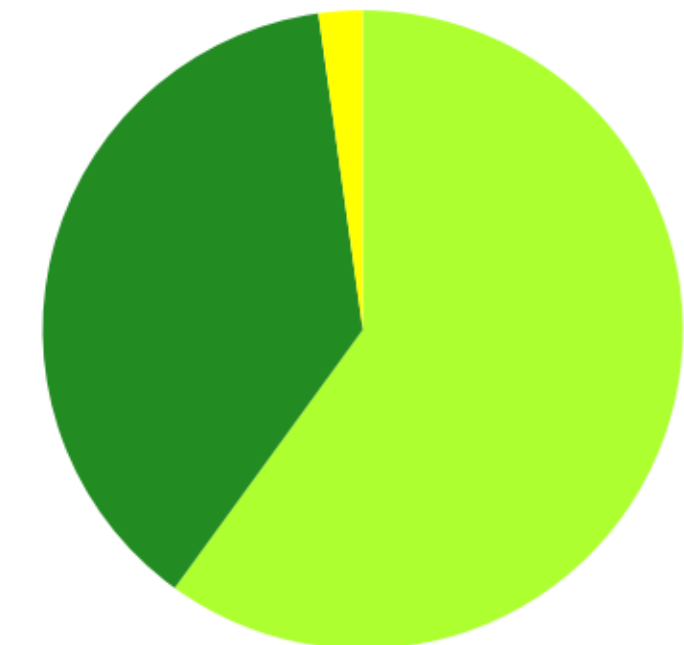
Março-Maio
2020

Estação fundo



Março-Maio
2019

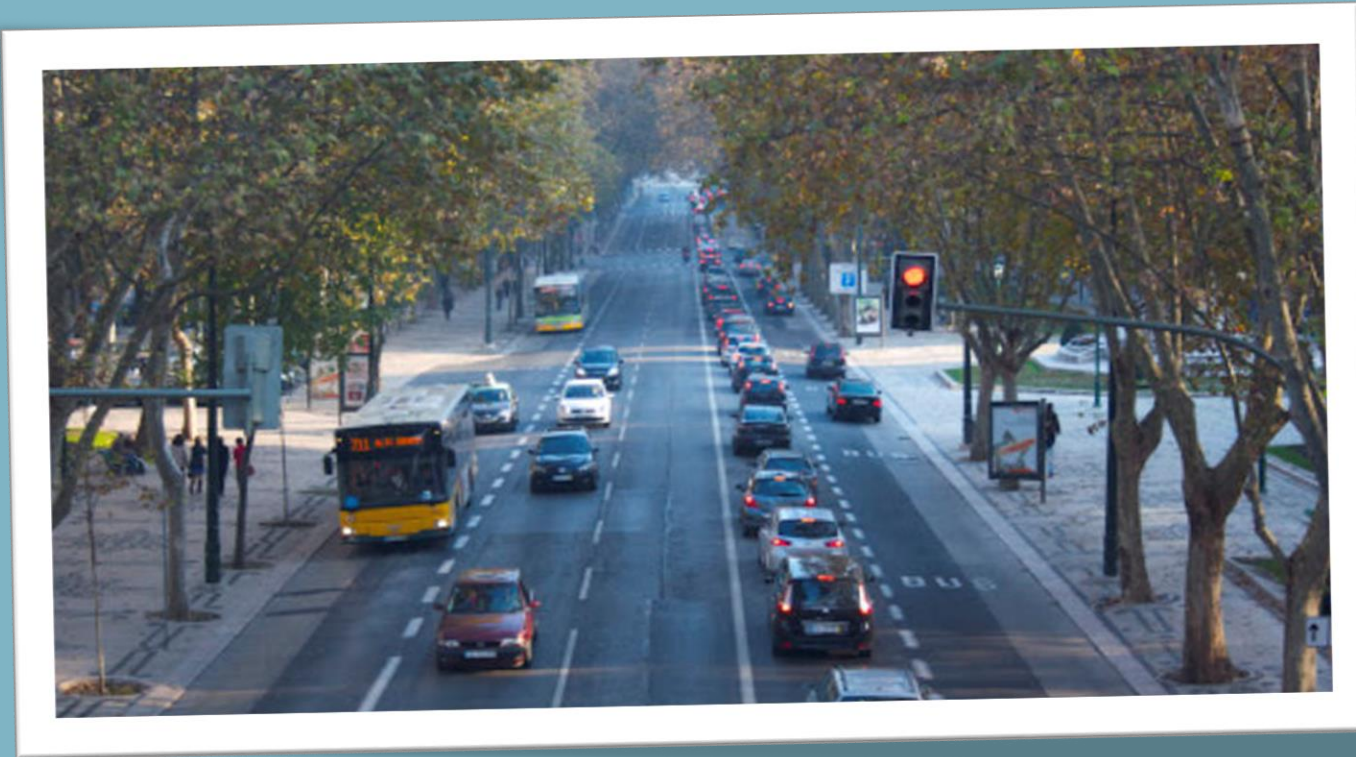
COVID
→



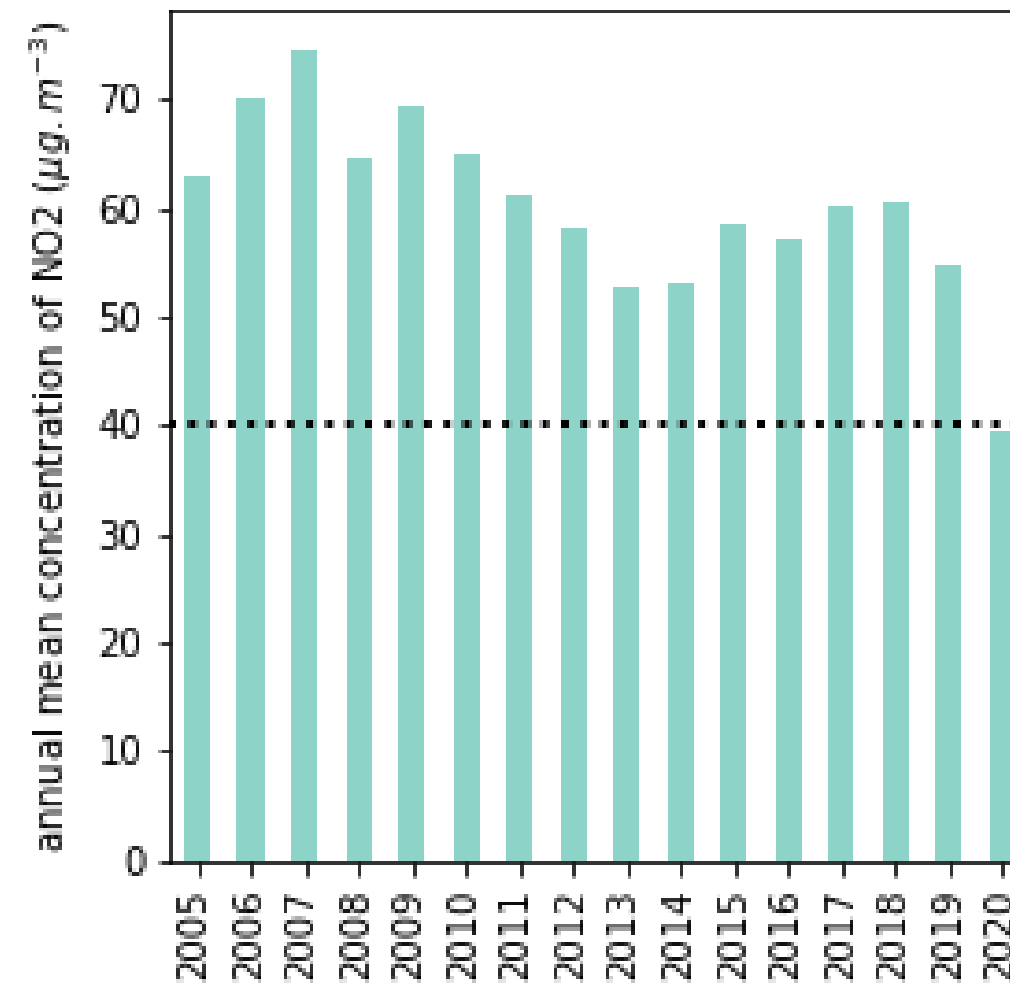
Março-Maio
2020

Av Liberdade

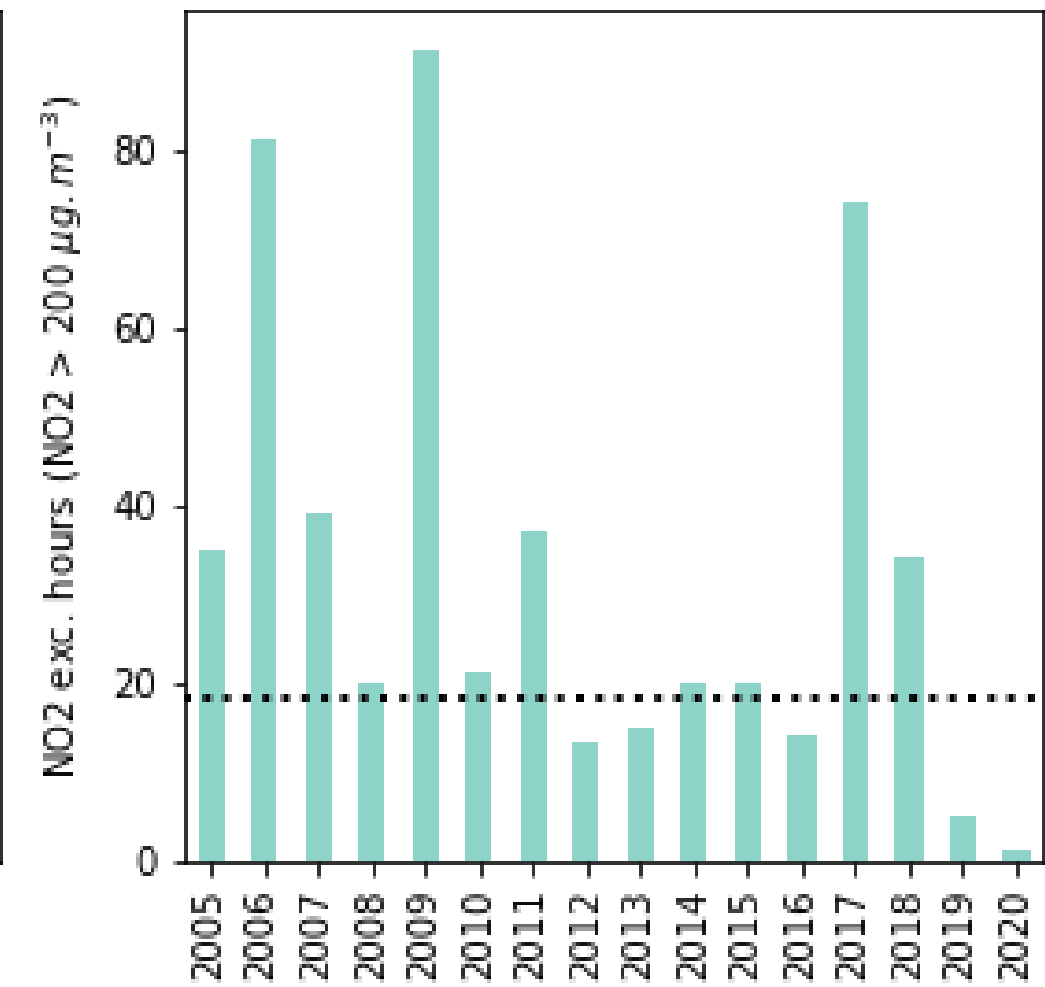
main avenue Lisbon



NO₂ anual mean



NO₂ exceedances to hourly LV



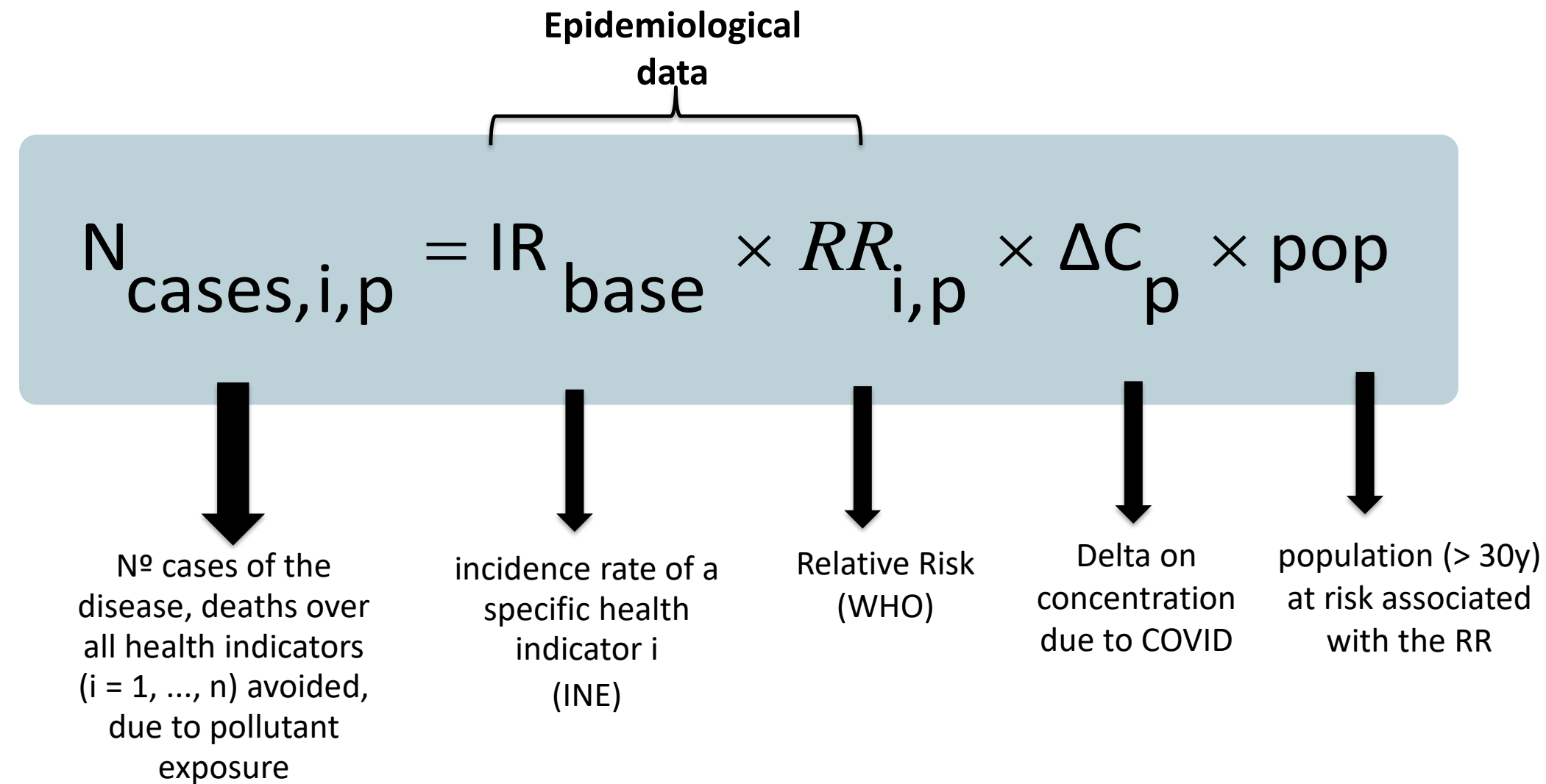
Health impacts from air pollution

AirQ+ tool (version 2.0; WHO)

Pollutants: NO₂, PM_{2.5} (short-term effects)

Period: 1 Jan - 30 Sep (2020 & average 2015–2019)

Note: considered all-cause mortality in people +30 years old



Health benefits

N° avoided deaths

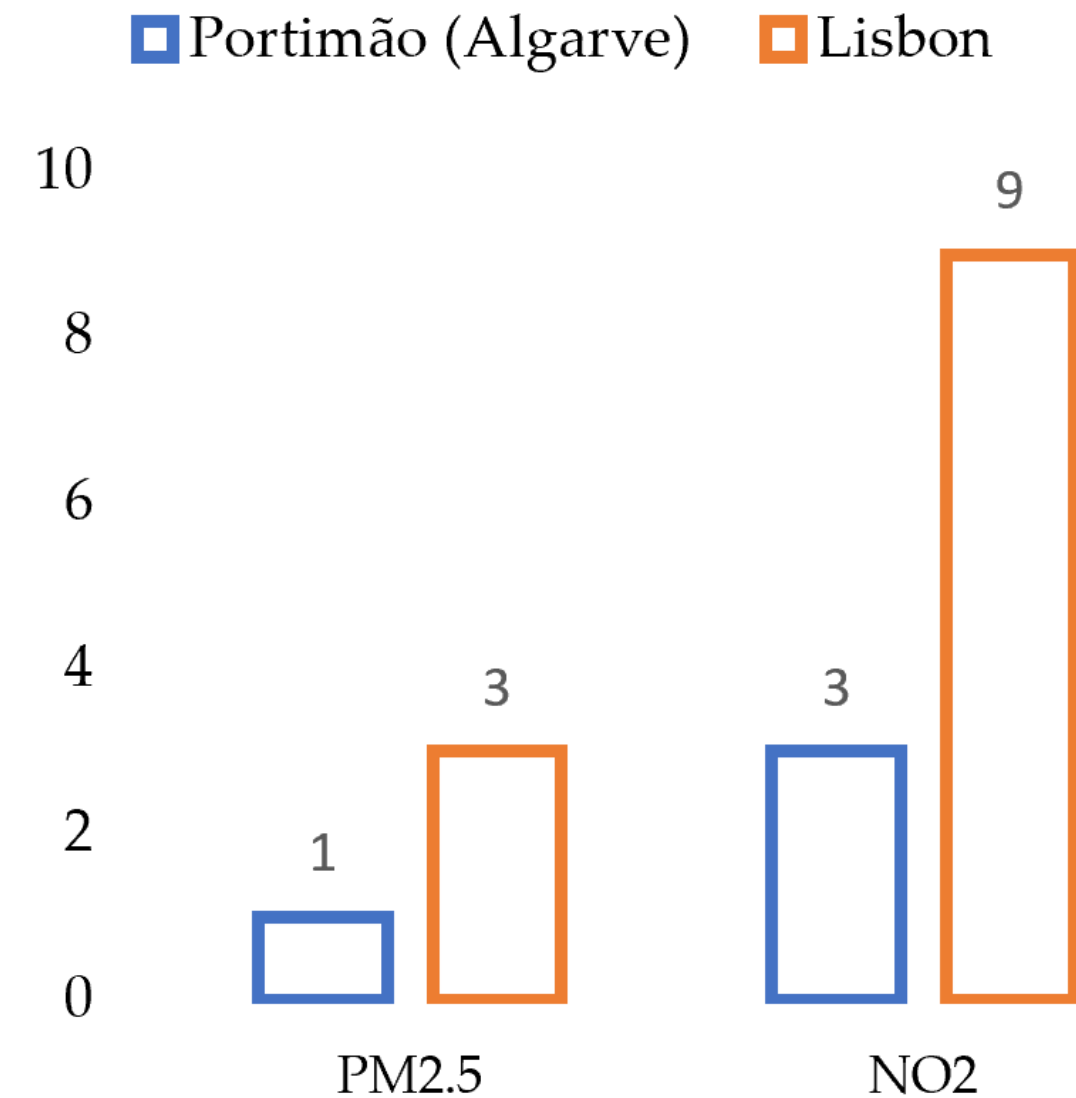
AirQ+ tool (version 2.0; WHO)

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Period: 1 Jan - 30 Sep (2020 & average 2015–2019)

Note: considered all-cause mortality in people +30 years old

Number of avoided deaths



Economic outcomes

From health benefits

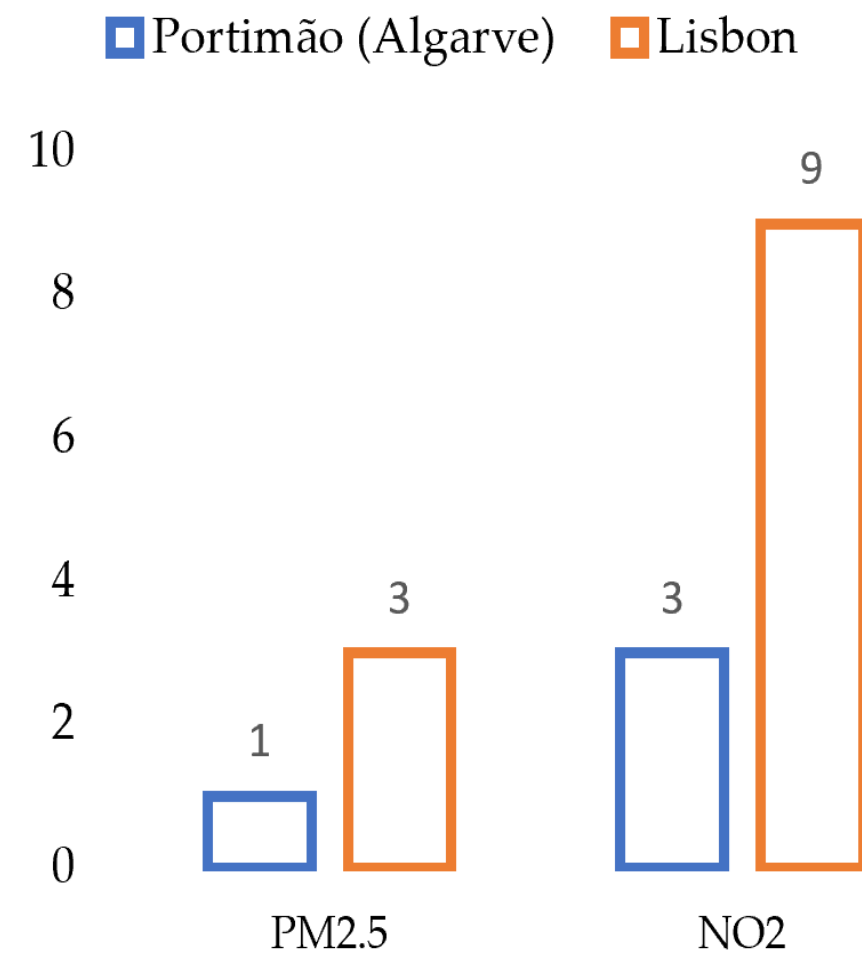
value of statistical life (VSL)

indicates how much individuals are willing to pay to reduce the risk of death)

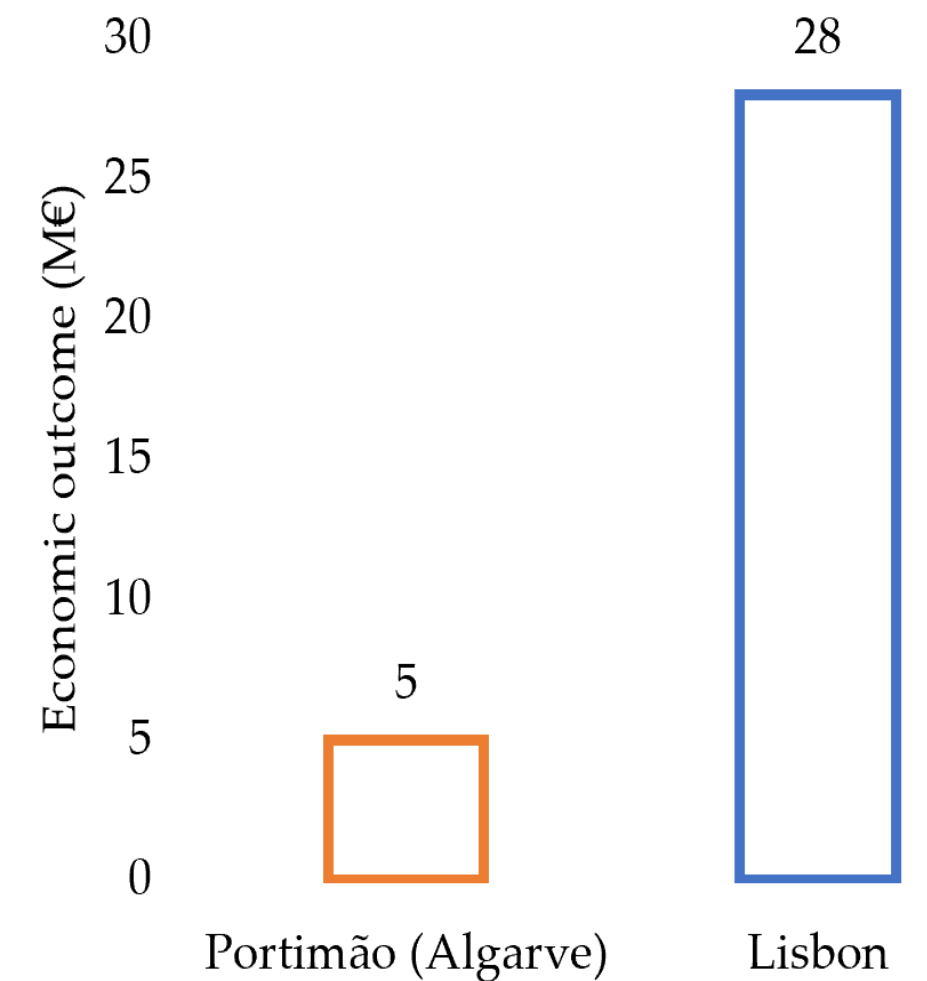
For each avoided death VSL (OECD):

USD 2.798 M ||| EUR 2.370 M

Number of avoided deaths



Economic outcomes (M€)



Past & Present -> any lesson to the future?

March 2019



March 2020

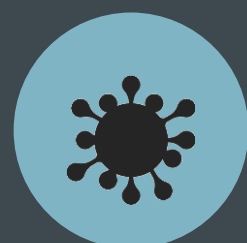


March 2021



NO₂ satellite images

Final notes



The comparison with 5-years data **allow to include meteorological variability** and to estimate mean concentration values representative of each specific period



Reductions higher for **NO₂** (traffic-related pollutant) with ranges between **50-65%** (contribution of traffic sector). Impact more expressive in urban areas, particular in traffic areas.



This improvement on air quality already change this year...back to normal. **Lessons should be learned** to better manage air quality and rethinking mobility strategies.



Thank you!

alexandra.monteiro@ua.pt