EUROCARB BAP MODELLING AND IMPACTS ON HEALTH

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Status of the publication on BaP Modelling

Intercomparison of estimates of atmospheric Benzo(a)pyrene from four models in Europe

Authors to be finalised

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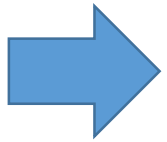

Intercomparison of estimates of atmospheric benzo(a)pyrene from four models in Europe and impacts on health.

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Publication on BaP Modelling and impacts on health

Contents:

- Air concentration intercomparison and evaluation: GLEMOS, CHIMERE, MINNI, SILAM

  - Gas/particle ratios: GLEMOS, CHIMERE, MINNI (almost all particle), SILAM (only gas)
  - Deposition intercomparison: total, dry , wet: GLEMOS, CHIMERE
  - Precipitation intercomparison: GLEMOS, CHIMERE

- Impacts on health

Health studies

- Colaboration with Mike Holland who has provided a tool for BaP impacts on health.

Cancers/year
Fatal cancers/year
Non-fatal cancers/year
Value (€M/year) unadjusted for latency
Value (€M/year) adjusted for latency

- For the moment, we have estimated impacts for Poland, for EMEP, CHIMERE, MINNI and SIRLAM, and for an ensemble (median).
- Next steps: estimation for the rest of European countries within the domain. (maps of impacts)

Impacts on health

Health impacts estimation methodology by Mike Holland

Example for Poland

Model	Pop_Weighted_Conc
CHIMERE	1.5465547
GLEMOS	1.1410679
MINNI	0.9184807
SILAM_v2	0.490744
ENSEMBLE	1.0256816

Poland					
	CHIMERE	GLEMOS	MINNI	SILAM_v2	ENSEMBLE (Median)
	2019,00	2019,00	2019,00	2019,00	2019,00
Population	37972812,00	37972812,00	37972812,00	37972812,00	37972812,00
Concentration BaP ng/m3	1,55	1,14	0,92	0,49	1,03
Cancers/year	72,99	53,85	43,35	23,16	48,41
Fatal cancers/year	58,99	43,53	35,04	18,72	39,12
Non-fatal cancers/year	14,00	10,33	8,31	4,44	9,28
Value (€M/year) unadjusted for latency	260,86	192,47	154,92	82,77	173,00
Value (€M/year) adjusted for latency	175,20	129,26	104,05	55,59	116,19

Potential Future work:

- Further analysis (meteo, deposition parameters, etc). Case studies where there are the largest differences in air concentration and deposition
- More experimental data, campaigns? Gas ratio, deposition
- Emissions? Spatial distribution? More inventories?
- Health studies (more countries)

Thanks!

Acknowledgments:

CIEMAT: Ministry for the Ecological Transition and the Demographic Challenge

Response function and valuation data											
One million	1.000.000	Used to (e.g.) convert € to M€									
Risk data											
Lung cancer, cases per 1 ng/m3	0,000087	Calibrated against a 70 year lifetime exposure to 1 ug/m3					http://cfpub.epa.gov/ncea/iris/iris_documents/docu				
Assumed life expectancy (years)	70										
Cases per ng/m3/year per person	0,0000012										
Survival rate for lung cancer	19%	https://ecis.jrc.ec.europa.eu/explorer.php?$0-4$1-All$4-1,2$3-22$6-0,85$5-2020,2040$7-7,8$21-0$CLongtermChart1_1$X0_-1-AE									
Valuation data (unadjusted)											
Value of statistical life, €2019	€ 3.900.000										
Value of cancer morbidity, €2019	€ 491.000										
Value of non fatal cancer, €2019	€ 130.000										
Annual economic growth	1%										
Annual discount rate	4%										
Latency period for lung cancers (years)	13,6										
Values adjusted to account for latency											
Value of statistical life, €2019	€ 2.619.280										
Value of cancer morbidity, €2019	€ 329.761										
Value of non fatal cancer, €2019	€ 87.309										