WORLD FEDERATION OF HYDROTHERAPY AND CLIMATOTHERAPY
Non State Actor in official relation with World Health Organization (WHO)
Presidente: Umberto Solimene
www.femteconline.org

ASSOCIAZIONE NAZIONALE UFFICIALI DI STATO CIVILE ED ANAGRAFE
Presidente: Paride Gullini
www.anusca.it

In collaborazione con
GARD (Global Alliance Chronic Respiratory Diseases) **Italia** e **AIST** (Ass. It. Studio Tosse)
e
Terme di Castel San Pietro

GIORNATA INTERNAZIONALE DI STUDIO

ALLA RICERCA… DEL RESPIRO PERDUTO!

APPROCCIO MULTILATERALE E INTEGRATO PER LA PREVENZIONE, CURA E BENESSERE

Terme di Castel San Pietro (BO) – 27 maggio 2023

Effetti dei cambiamenti climatici e dell'inquinamento atmosferico sulla salute respiratoria

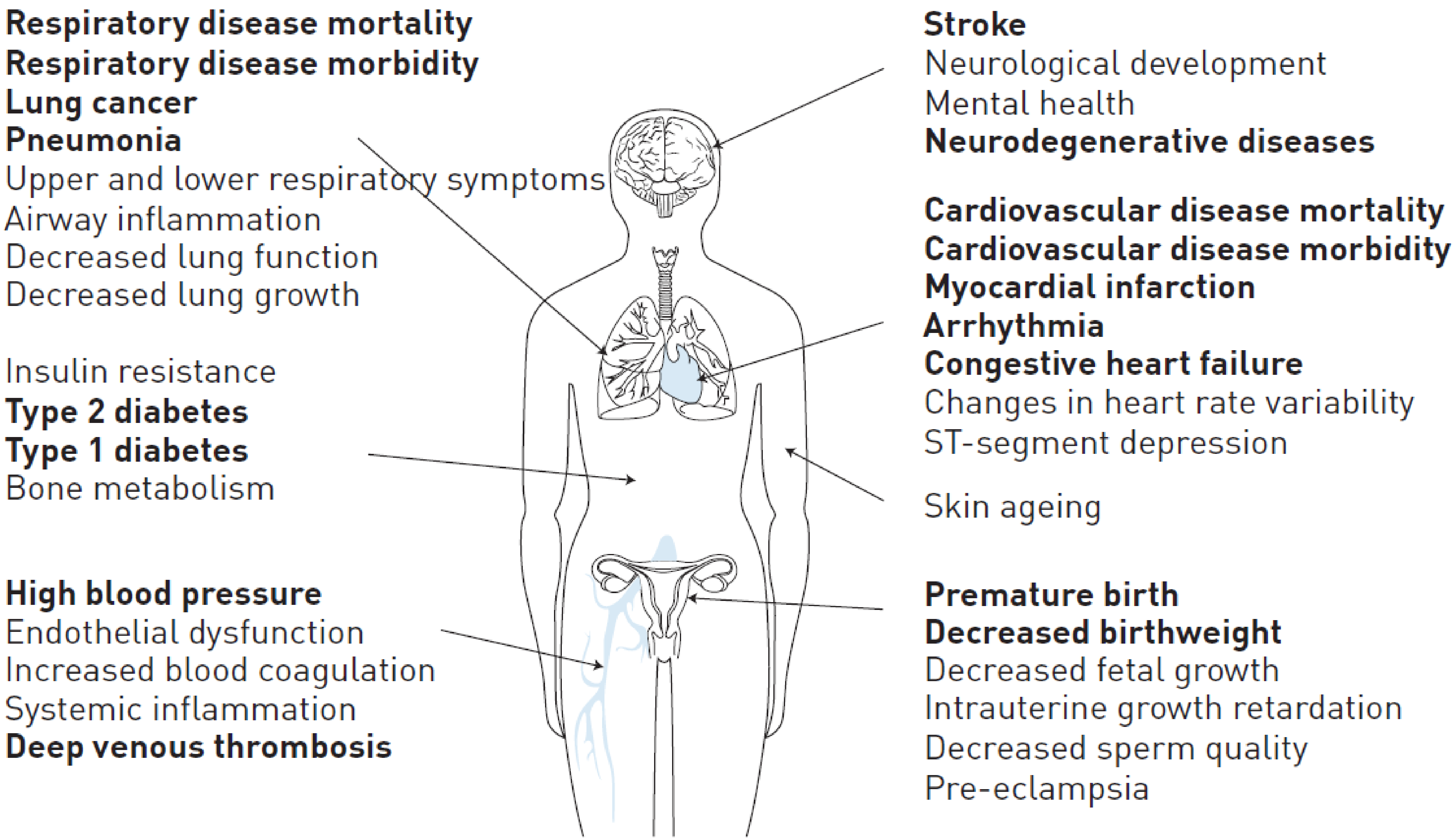
Giovanni Viegi, MD, FERS, ATSF

Retired CNR Director of Research
Senior Research Associate, CNR Institute of Clinical Physiology (IFC), Pisa
Professor of "Health Effects of Pollution", School of Environmental Sciences, University of Pisa, Italy
2005-06 President European Respiratory Society (ERS)
2017-22 WHO-GARD Planning Group Member

Durata 20'

STATI GENERALI DELLA QUALITÀ DELL'ARIA

Inquinamento ha effetto immediato e prolungato su diversi organi



ERS/ATS Statement. Adapted from: Thurston et al. ERJ 2017

INT J TUBERC LUNG DIS 27(1):7–12

Outdoor air pollution and respiratory health

S. Maio, G. Sarno, S. Tagliaferro, F. Pirona, I. Stanisci, S. Baldacci, G. Viegi

The need to address the impact of air pollution on health is reinforced by recent scientific evidence and the 2021 WHO Air Quality Guidelines (AQG). Air pollution is an avoidable risk factor causing a high burden for society with elevated deaths, health disorders, disabilities and huge socio-economic costs, especially in low- and middle-income countries. We have evaluated recent evidence from international reports, systematic reviews and official websites of international agencies. Growing evidence shows a causal relationship between air pollution exposure and acute lower respiratory infections, chronic obstructive pulmonary disease, asthma and lung cancer. Exposure to air pollution in both the short- and long-term has a serious impact on respiratory health. Harmful effects occur even at very low pollutant concentration levels, and there are no detectable thresholds below which exposure may be considered safe. The adverse respiratory health effects of air pollutants, even at low levels, are confirmed by recent epidemiological studies. Scientific respiratory societies and patient associations, along with other stakeholders in the health sector, should increase their engagement and advocacy to raise awareness of clean air policies and the latest WHO AQG.

KEY WORDS: particulate matter; $PM_{2.5}$; PM_{10}; asthma; COPD

Table 1 Outdoor pollutants and related health effects.*

Pollutant	Health effects
Short-term effects	
Particulate matter	• Premature respiratory mortality • Hospitalisation for respiratory diseases • COPD exacerbations • Lung function decline
NO_2	• Premature respiratory mortality • Asthma exacerbations • COPD exacerbations
O_3	• Asthma exacerbations • COPD exacerbations
Long-term effects	
Particulate matter	• Respiratory mortality • Asthma • COPD • Lung cancer • Lung function decline
NO_2	• Respiratory mortality • Asthma • COPD • Lung function decline
O_3	• Asthma • COPD

* See text for effect estimates.
NO_2 = nitrogen dioxide; O_3 = ozone; COPD = chronic obstructive pulmonary disease.

Maio, IJTLD 2023

Table 2 Comparison between WHO AQG and the EU directive on ambient air quality and cleaner air.[9,10,12]

Pollutant	2008 EU Directive		2005 WHO AQG		2021 WHO AQG	
	Averaging time	Limit or target value µg/m^3	Averaging time	AQG level µg/m^3	Averaging time	AQG level µg/m^3
$PM_{2.5}$	Annual	25	Annual	10	Annual	5
			24-h*	25	24-h†	15
PM_{10}	Annual	40	Annual	20	Annual	15
	24-h‡	50	24-h*	50	24-h†	45
O_3	Daily maximum: 8-h§	120	Daily maximum: 8-h	100	Peak season¶	60
					8-h†	100
NO_2	Annual	40	Annual	40	Annual	10
	1-h#	200	1-h	200	1-h	200
					24-h†	25

* 99th percentile (3 days/year).
† 99th percentile (i.e., 3–4 exceedance days per year).
‡ Not to be exceeded more than 35 times a year.
§ Not to be exceeded on more than 25 days per year averaged over 3 years.
# Not to be exceeded more than 18 times a year.
¶ Average of daily maximum 8-h mean O_3 concentration in the 6 consecutive months with the highest 6-month running-average O_3 concentration.
EU = European Union; AQG = Air Quality Guidelines; $PM_{2.5}$ = particulate matter with diameter ≤2.5 µm; PM_{10} = particulate matter with diameter ≤10 µm; O_3 = ozone; NO_2 = nitrogen dioxide.

Maio, IJTLD 2023

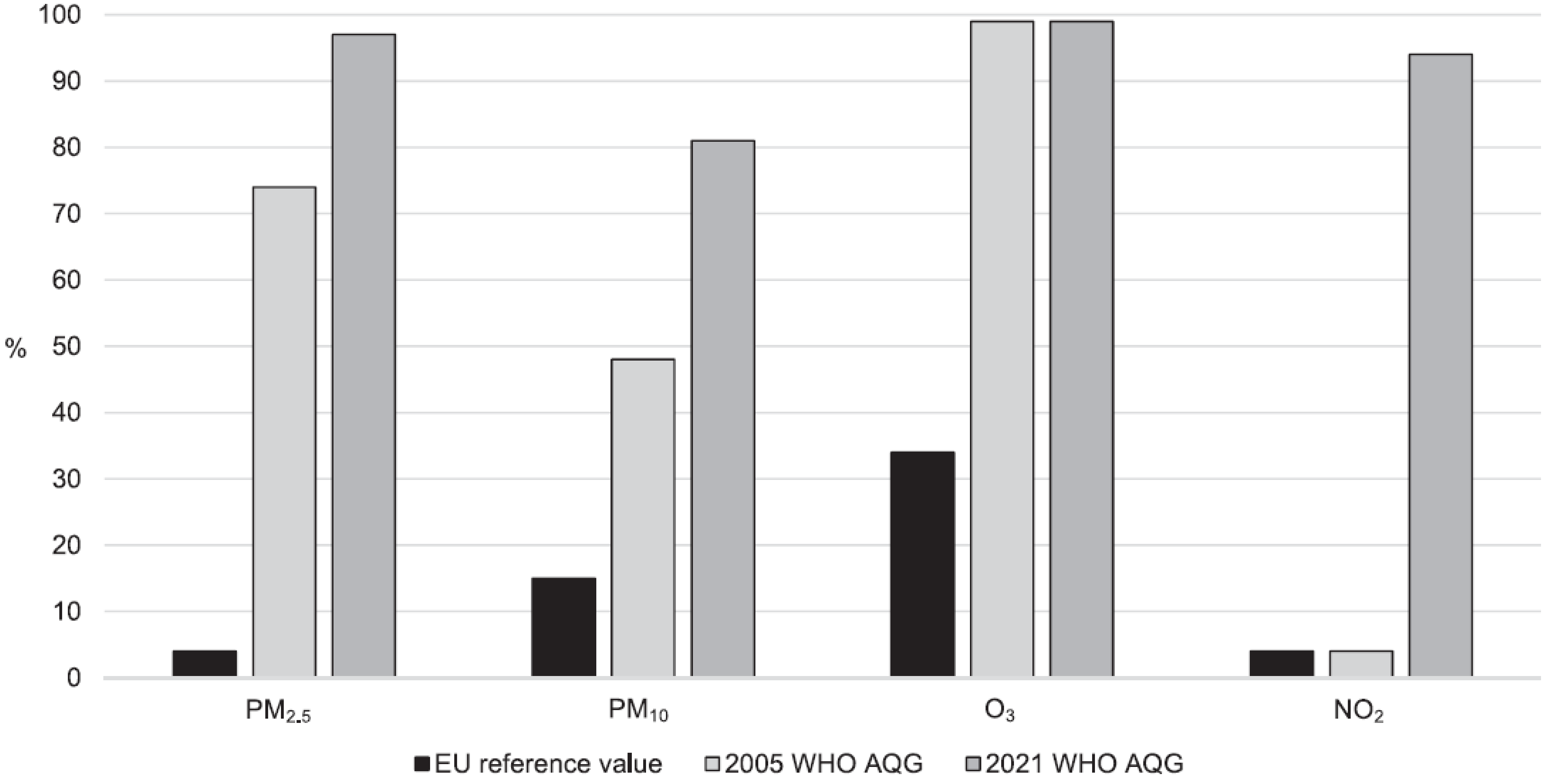


Figure Proportions of urban population exposed to air pollution concentrations above EU reference values (period 2012–2014), 2005 WHO AQG (period 2012–2014) and 2021 WHO AQG (period 2019) in the EU-28* and in the EU-27†.[11,13] *28 EU member countries (including the UK) until 1 February 2020. †27 countries currently members of the EU. EU = European Union; AQG = Air Quality Guidelines; $PM_{2.5}$ = particulate matter with diameter ≤2.5 µm; PM_{10} = particulate matter with diameter ≤10 µm; O_3 = ozone; NO_2 = nitrogen dioxide.

Maio, IJTLD 2023

CNR-IFC Study design: longitudinal, general population studies

PO Delta 1

(1980-82, n=3284, 8-64 yrs**)**

. Sampling

. CNR questionnaire

. Lung function test

Pisa 1

(1985-88,n=3865, 5-97yrs**)**

. Sampling

. CNR questionnaire

PO Delta 2

(1988-91, n=2841, 8-73yrs)

. CNR questionnaire

. Lung function test.

. Bronchial responsiveness

. Skin prick tests - Total serum IgE

.Nested: indoor

Pisa 2

(1991-93, n=2841, 8-97 yrs**)**

. CNR questionnaire

. Lung function tests

. Bronchial responsiveness

. Skin prick tests - Total serum IgE

. Mutagenetic determinations

. Nested indoor

SEASD *

(1997-98**,** n=2335, 13-99)

. Sub - sampling

. CNR questionnaire

. Blood sample collection

Urine sample collection

. Blood pressure, height, weight

IMCAII °

(2006-11, n=1620, 18-103yrs)

. Sub - sampling

. CNR questionnaire

. Lung function test

. Blood sample. Pulseoximeter

. Blood pressure, height, weight

Prevalence Rates of Respiratory Symptoms in Italian General Population Samples Exposed to Different Levels of Air Pollution

by G. Viegi,*† P. Paoletti,* L. Carrozzi,* M. Vellutini,* E. Diviggiano,* C. Di Pede,†‡ G. Pistelli,* G. Giutini,* and M. D. Lebowitz†

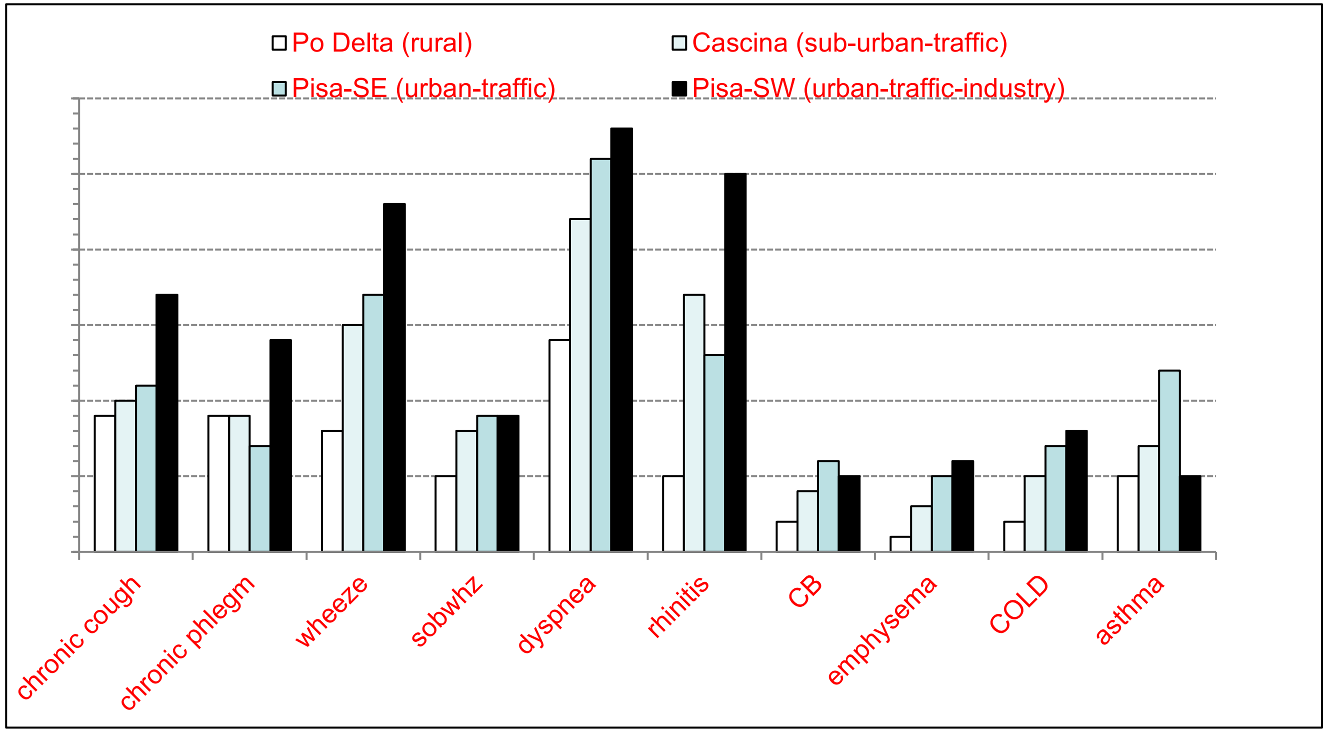
STATI GENERALI DELLA QUALITÀ **DELL'ARIA**

The Proportional Venn Diagram of Obstructive Lung Disease in the Italian General Population*

Chest 2004;126;1093-1101

Giovanni Viegi, MD; Gabriella Matteelli, MD; Anna Angino, BS; Antonio Scognamiglio, MD; Sandra Baldacci, BSc; Joan B. Soriano, MD, PhD; and Laura Carrozzi, MD

Environmental Health Perspectives Vol. 94, pp. 95–99, 1991



From original data in Table 2 and Table 3

Table 2—*Prevalence Rates of CB, Emphysema, and Asthma in the Two Italian General Population Samples*

Disease	Po River Delta, % (n = 2,463)	Pisa, % (n = 1,890)	p Value*
OLD	6.9	10.9	0.000
Asthma only	4.54	5.82	
Asthma + CB	0.28	0.21	
Asthma + emphysema	0.20	0.26	
CB only	0.89	1.22	
CB + emphysema	0.12	0.85	
Emphysema only	0.61	2.28	
CB + emphysema + asthma	0.24	0.21	
	Zona rurale	**Zona urbana**	

*By χ^2 test.

General Population: Urban factor

Urban residence is associated with bronchial hyper-responsiveness in Italian general population samples

STATI GENERALI
DELLA QUALITÀ
DELL'ARIA

Sara Maio, Sandra Baldacci, Laura Carrozzi, Eva Polverino, Anna Angino, Francesco Pistelli, Francesco Di Pede, Marzia Simoni, Duane Sherrill and Giovanni Viegi

Chest. 2009 Feb;135(2):434-441

Table 5. Effect of the independent variables on ln dose-response slope

	Odds Ratio	95% Confidence Interva
Gender:		
male	1	-
female	1.97	1.57-2.46
Groups of age:		
8-14	2.52	1.52-4.20
15-24	1.43	1.03-1.99
25-34	1	-
35-44	0.86	0.61-1.21
45-54	0.91	0.65-1.29
55-64	1.22	0.84-1.77
65-74	1.08	0.58-2.00
Smoking habits:		
never smoking	1	-
current smoking	1.39	1.05-1.83
ex smoking	1.11	0.84-1.46
Respiratory symptoms/diseases:		
others	1	-
chronic bronchitis	1.30	0.94-1.78
asthma	2.65	1.93-3.64
Prick test:		
negative	1	-
positive	1.32	1.05-1.67
log IgE values:		
< 1.93*	1	-
≥ 1.93	1.61	1.25-2.06
Residence:		
rural	1	-
urban	1.41	1.13-1.76
Airway caliber	0.66	0.61-0.73

*corresponding real number = 85.11 kU/l

STATI GENERALI DELLA QUALITÀ DELL'ARIA

Effects of Particulate Matter on the Incidence of Respiratory Diseases in the Pisan Longitudinal Study

Salvatore Fasola [1,*], Sara Maio [2], Sandra Baldacci [2], Stefania La Grutta [1], Giuliana Ferrante [3], Francesco Forastiere [1], Massimo Stafoggia [4], Claudio Gariazzo [5], Giovanni Viegi [1,2] and on behalf of the BEEP Collaborative Group †

Int. J. Environ. Res. Public Health **2020**, *17*, 2540

Table 2. Associations (odds ratio, OR, and 95% confidence intervals (CI)) between risk factors ascertained during the first survey (1991–1993) and cumulative incidences of asthma, rhinitis, Chronic Obstructive Pulmonary Disease (COPD) and chronic phlegm ascertained at the second survey (2009–2011), from multivariable logistic regression models with Firth's correction.

	Asthma	Rhinitis	COPD	Chronic Phlegm
Cumulative incidence:	4/284 (1.4%)	90/264 (34.1%)	29/282 (10.3%)	16/262 (6.1%)
Independent variables:	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
PM_{10} (1 $\mu g/m^3$ increase) [1]	- [2]	- [2]	**2.96 (1.50–7.15)**	- [2]
$PM_{2.5}$ (1 $\mu g/m^3$ increase) [1]	- [2]	**2.25 (1.07–4.98)**	- [2]	**4.17 (1.12–18.71)**
Age, years (10-year increase)	- [2]	- [2]	**1.87 (1.29–3.02)**	- [2]
Male gender	- [2]	- [2]	- [2]	- [2]
Smoker (ref = non-smoker)	**12.96 (1.25–∞)**	- [2]	**2.99 (1.08–9.39)**	- [2]
Ex-smoker (ref = non-smoker)	4.86 (0.27–∞)	- [2]	1.67 (0.60–4.89)	- [2]
Occupational exposure	- [2]	- [2]	1.91 (0.83–4.79)	**5.41 (1.88–21.79)**

[1] Estimated exposure levels at the residential address for the year 2011, 1 km^2 resolution. [2] Variables excluded by the stepwise selection procedure. Significant odds ratios are reported in bold.

BEEP

Bigdata in **E**nvironmental and occupational **EP**idemiology

A Project Funded by
Call Research Collaboration
BRiC 2016-2018

INAIL
ISTITUTO NAZIONALE PER L'ASSICURAZIONE CONTRO GLI INFORTUNI SUL LAVORO

WHY BEEP

One of the big challenges of the modern environmental epidemiology is to collect and link a huge amount of heterogeneous geographic, environmental and health data to get information otherwise not available.

The General Objective of the **BEEP** project is to estimate, using **BIGDATA**, the health effects of air pollution, noise and meteorological parameters on the Italian general population, and to evaluate the risk of occupational injuries in sub-populations of workers.

The Project is structured in Specific Objectives focused on different spatial domains, from the whole national territory to the urban micro-scale. A special focus will be devoted to the risk of hospitalizations and mortality at the national level and within the major metropolitan areas, the risk of occupational injuries in relation to environmental risk factors, and the risk of road accidents related to the mobility of the population and extreme meteorological conditions.

Results provided by the **BEEP** project, in addition to address new directions in the scientific research, will provide indications to decision makers in the fields of air quality, urban planning and public health.

With the participation of:

ibim cnr
INAIL DIPARTIMENTO MEDICINA EPIDEMIOLOGIA IGIENE DEL LAVORO AMBIENTALE (INAIL DIMEILA)
D/EP/Lazio Dipartimento di Epidemiologia Servizio Sanitario Regionale Regione Lazio
SISTEMA SANITARIO REGIONALE ASL ROMA 1 REGIONE LAZIO
arpae emilia-romagna
SERVIZIO SANITARIO REGIONALE EMILIA-ROMAGNA
AZIENDA OSPEDALIERO-UNIVERSITARIA Città della Salute e della Scienza di Torino
IPCF
AReS PUGLIA
Regione Siciliana
ISAC

Information: www.progettobeep.it

Project coordinators:

Giovanni Viegi
CNR - Istituto di Biomedicina e Immunologia Molecolare "Alberto Monroy" (CNR-IBIM)
Tel: +39 091 6809194 / 6809501 - mail: viegi@ibim.cnr.it

Massimo Stafoggia
Dipartimento di Epidemiologia SSR Lazio (ASL Roma 1)
Tel: +39 06 99722185 - mail: m.stafoggia@deplazio.it

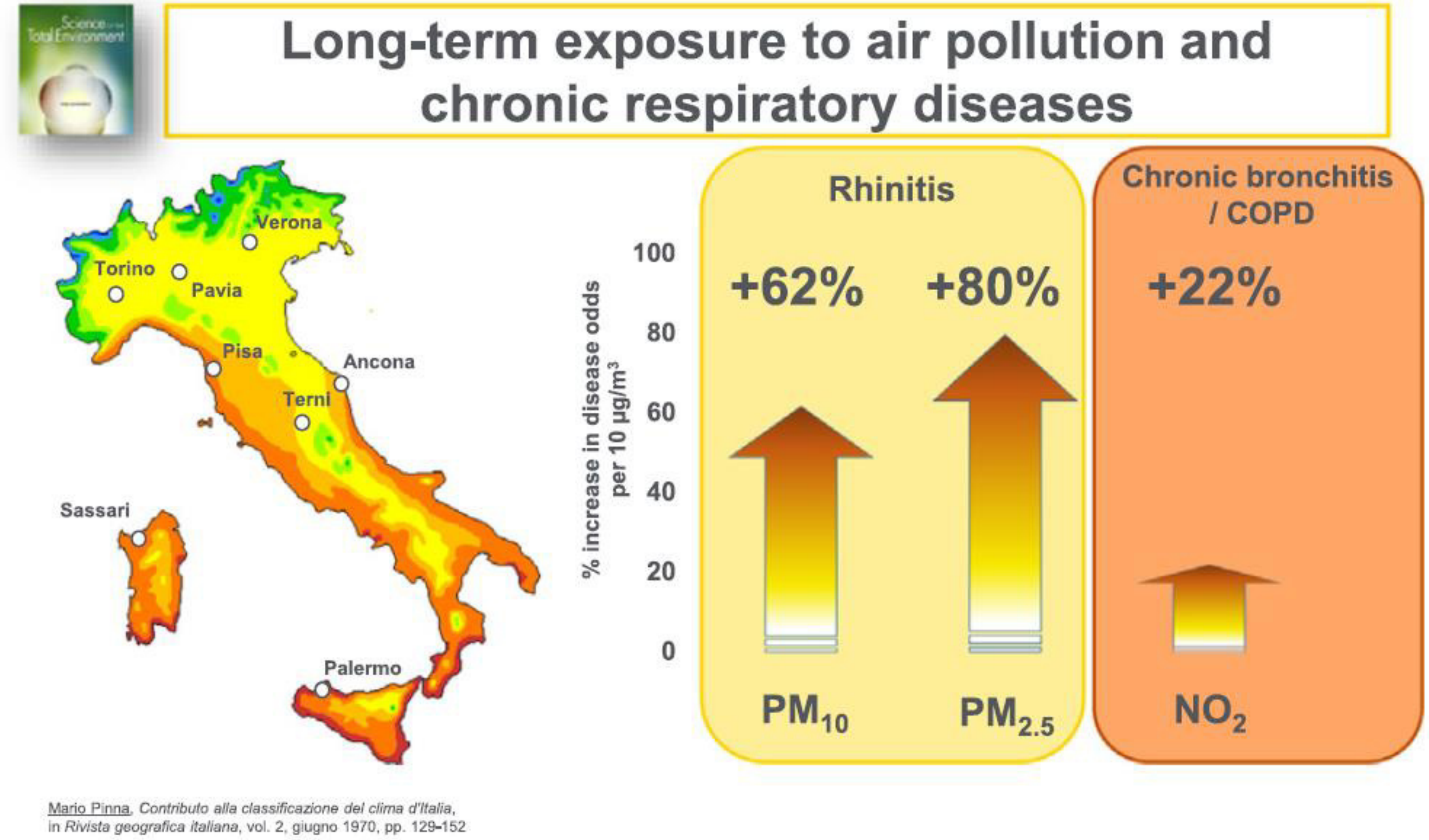
INAIL Coordinator:

Claudio Gariazzo
INAIL - Dipartimento Medicina Epidemiologia Igiene del Lavoro Ambientale (INAIL-DIMEILA)
Tel: +39 06 94181525 - mail: c.gariazzo@inail.it

Long-term residential exposure to air pollution and risk of chronic respiratory diseases in Italy: The BIGEPI study

Science of the Total Environment 884 (2023) 163802

Pierpaolo Marchetti [a], Jessica Miotti [a], Francesca Locatelli [a], Leonardo Antonicelli [b], Sandra Baldacci [c], Salvatore Battaglia [d], Roberto Bono [e], Angelo Corsico [f,g], Claudio Gariazzo [h], Sara Maio [c], Nicola Murgia [i], Pietro Pirina [j], Camillo Silibello [k], Massimo Stafoggia [l], Lorena Torroni [a], Giovanni Viegi [c], Giuseppe Verlato [a], Alessandro Marcon [a,*], on behalf of the BIGEPI group [1]



Air pollution and climate change closely linked

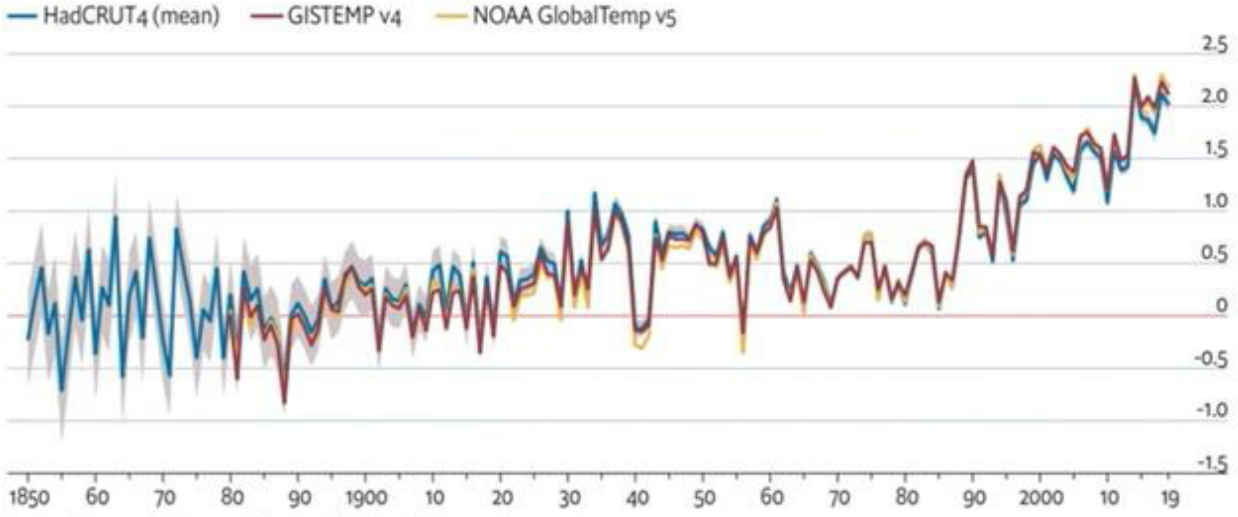
ERS | Satellites

Burning fossil fuels (coal, wood, oil) produces carbon pollution that is:

- major source of outdoor air pollution (directly harmful to health)
- major driver of climate change / global warming, by changing natural composition of Earth's atmosphere (that impacts human health through a number of mechanisms)

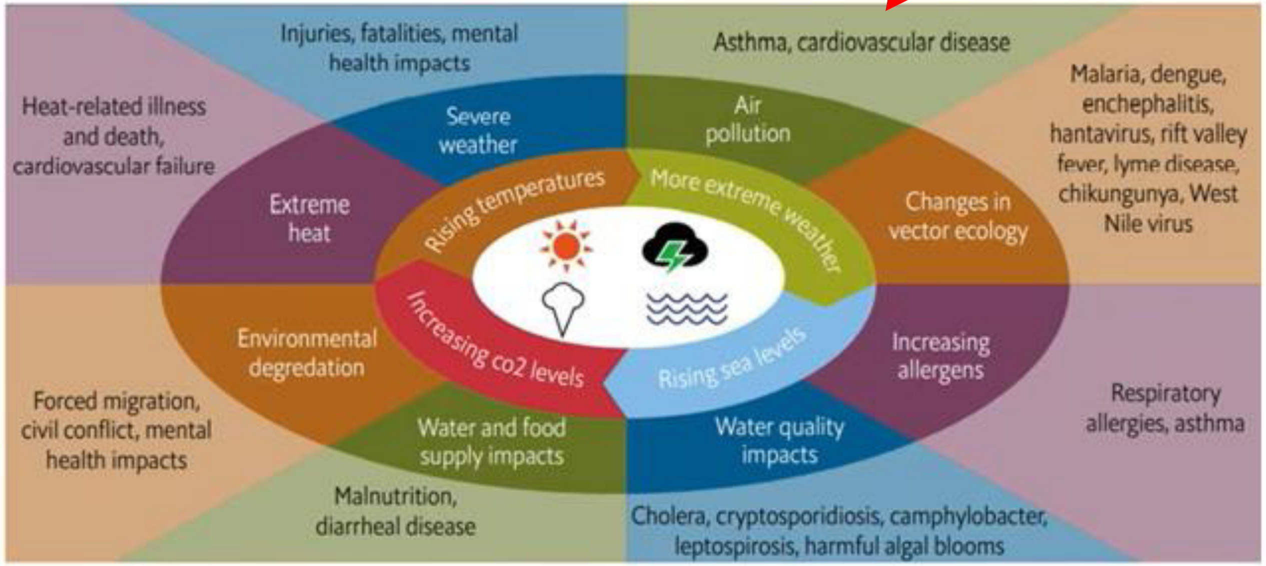
Figure 1: European average temperature relative to a 'pre-industrial' period between 1850 and 1899

(data from different monitoring stations indicated by different colours)



Source: European Environment Agency. Global and European temperatures. https://www.eea.europa.eu/data-and-maps/indicators/global-and-european-temperature-10/assessment.

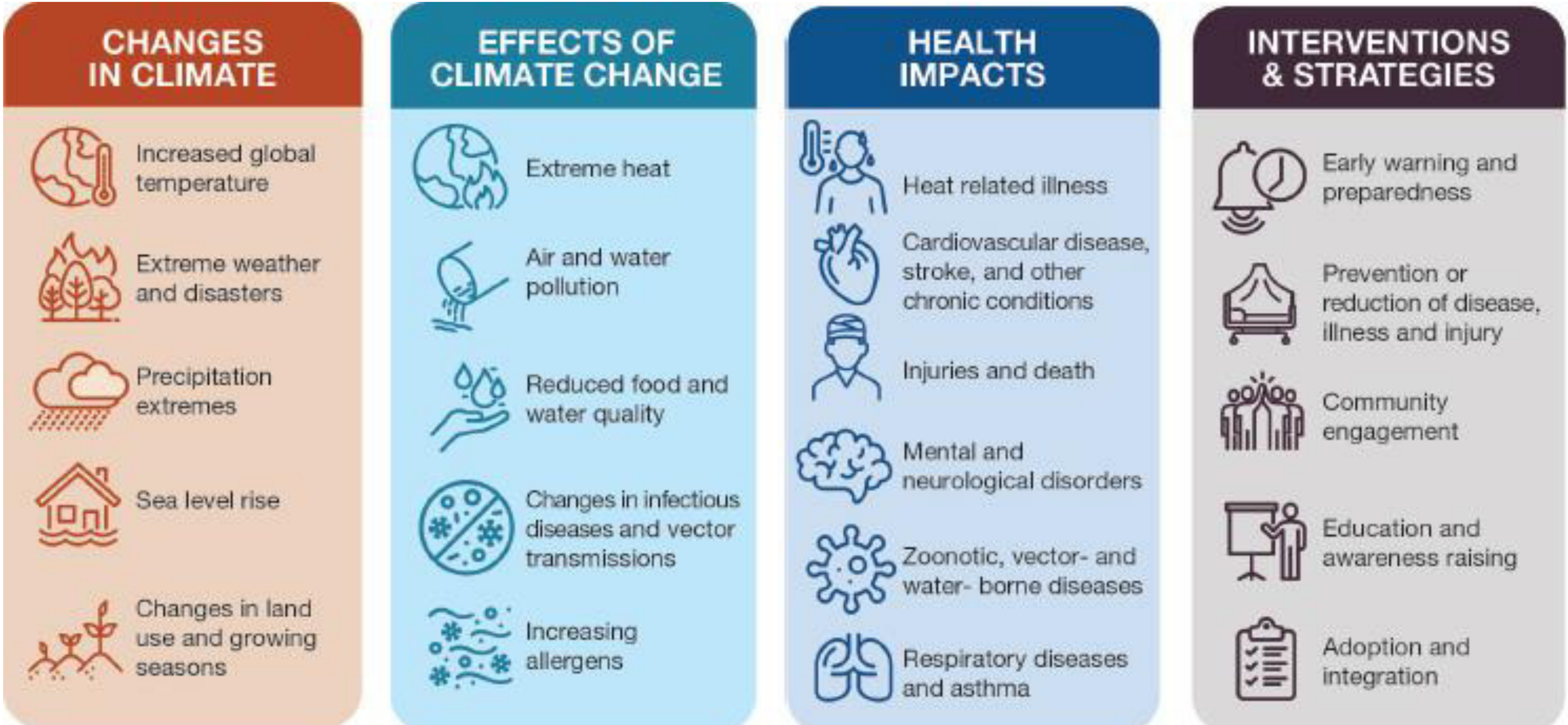
Figure 2: Impacts of climate change on human health



Source: Ebi KL, Hess JJ, Watkiss P. Health Risks and Costs of Climate Variability and Change. Injury Prevention and Environmental Health. 3rd edition. 2017 Oct 27. Chapter 8. Available from: https://www.ncbi.nlm.nih.gov/books/NBK525226/ doi: 10.1596/978-1-4648-0522-6_ch8.

Source: https://impact.economist.com/sustainability/social-sustainability/climate-change-and-its-impact-on-lung-health-a-focus-on-europe

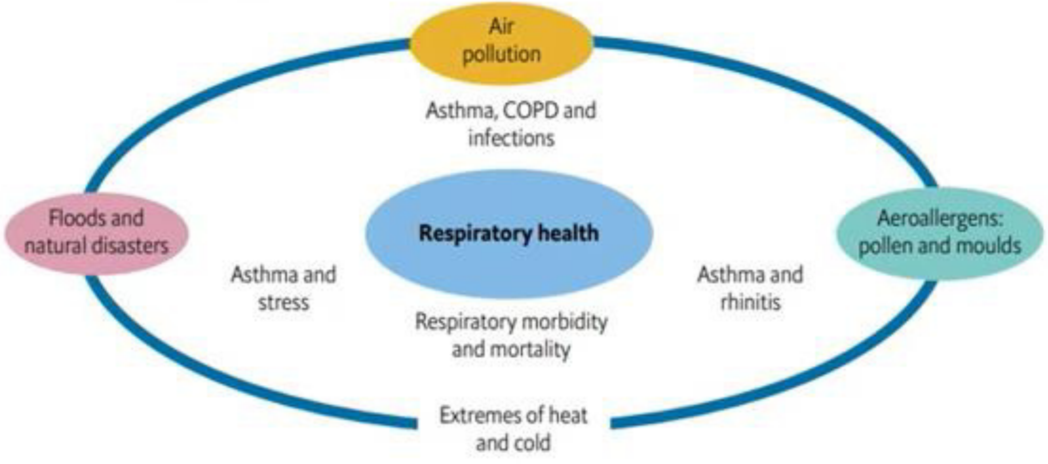
Effetti diretti e indiretti dei cambiamenti climatici sulla salute



Climate change and lung health

ERS | Satellites

- spreading of aeroallergens: warmer climate, longer aeroallergen seasons, allergens spread to new areas
- heat waves: high temperature/humidity/dehydration, warmer weather will lead to increase in ozone
- thunderstorms: high winds, heavy precipitation, bursts of allergen release
- droughts: high winds, more frequent (desert) dust and sand storms
- floods: moisture from rainfall increases dampness and mould indoors
- wildfires: … miles)

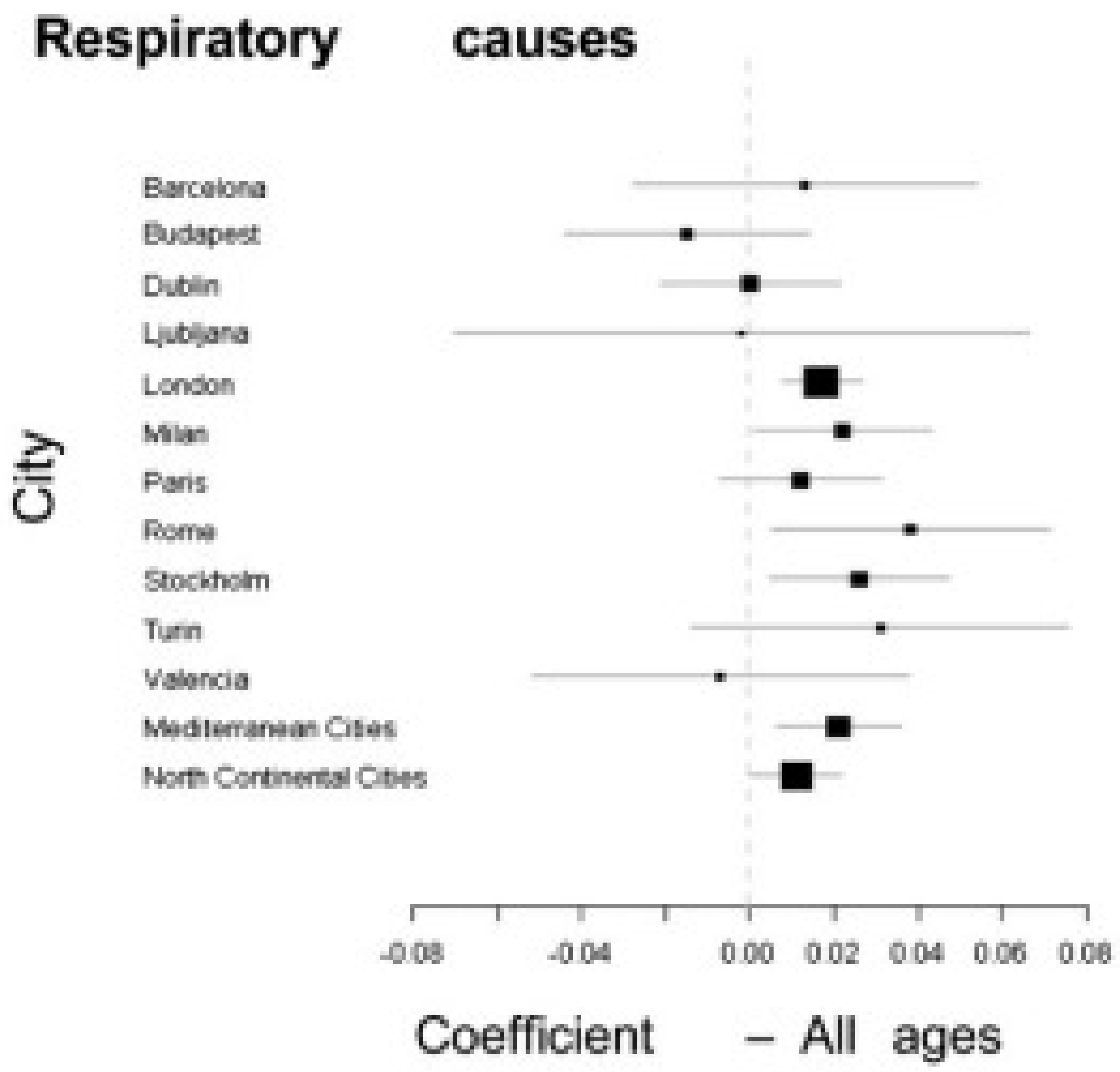


Source: D'Amato, G., Cecchi, L., D'Amato, M., Annesi-Maesano, I. Climate Change and Respiratory Disease. European Respiratory Review Jun 2014, 23 (132) 161-169.

Effetti a breve termine sulla mortalità e sui ricoveri ospedalieri per cause respiratorie associato al caldo (anziani più suscettibili)
Studio PHEWE

Mediterranean cities
+2.1% (0.6 to 3.6) **increase for 1°C increase over the 90th percentile of maximum apparent temperature** (°C) (lag 0–3) **hospital admissions**

Michelozzi AJRCCM 2009



Pazienti con BPCO: maggior rischio di decesso associato ad ondate di calore

	65-74 ages									
	Deaths		MR *1000		RD *1000	(95% IC)	RR	(95% IC)	REM Index	p-value
	Heat wave		Heat wave							
	no	yes	no	yes						
Chronic pulmonary diseases										
no	2435	1209	10.5	11.2	0.7	*(0.0; 1.5)*	1.07	*(1.00 - 1.15)*	1.00	
yes	318	177	59.9	72.8	12.9	*(0.3; 25.5)*	1.23	*(1.03 - 1.48)*	1.15	*0.155*

variazione % nella mortalità in pazienti con BPCO = +23% nei giorni di ondata di calore, vs +7% nei pazienti senza BPCO

Schifano et al. 2009

Pazienti con BPCO/asma: maggior rischio di esacerbazioni associato al caldo

incrementi associati a 10°F incremento di temperatura

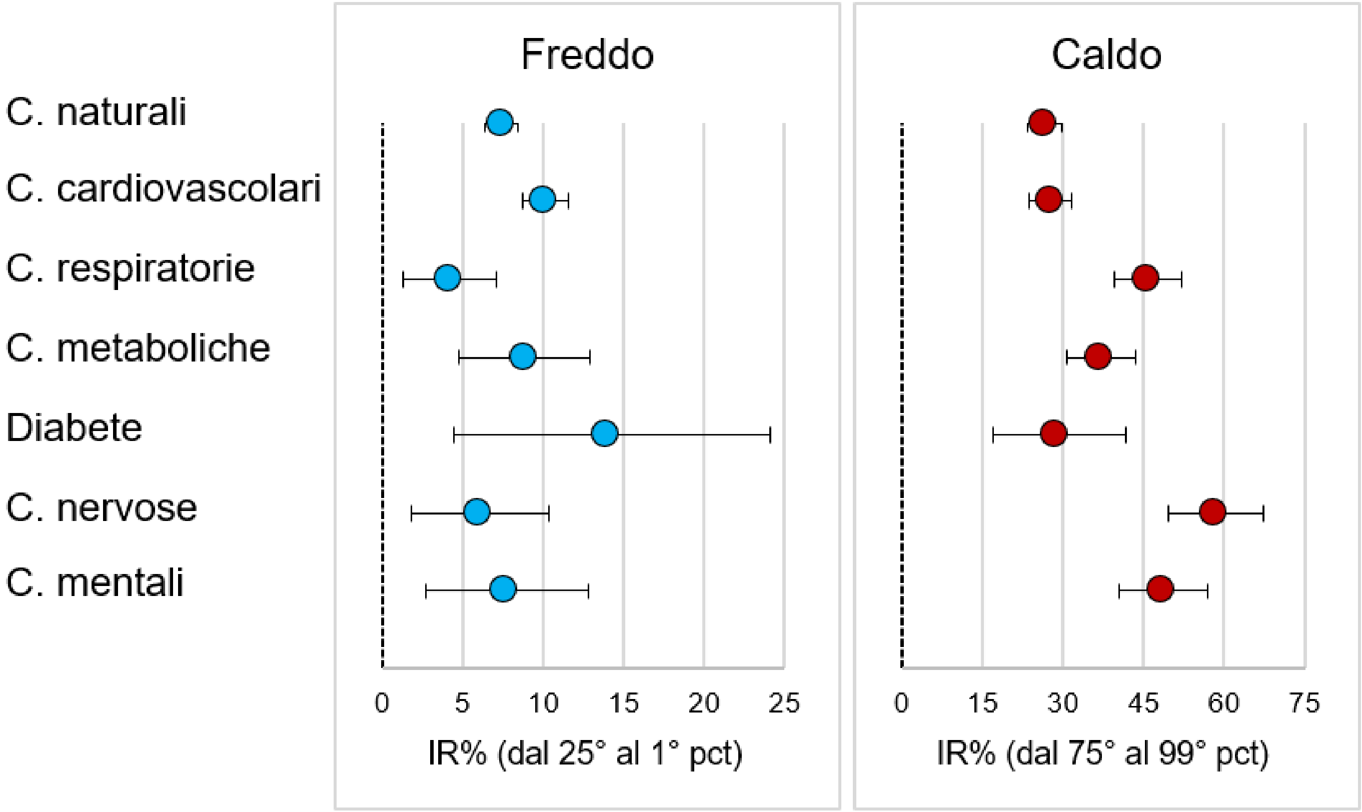
Outcome	Coefficient*	95% Confidence Interval	*P* Value
Breathlessness, Cough, and Sputum Scale			
Daily temperature (limited model)†	0.30	0.00–0.59	0.048
Daily temperature (with humidity, NO_2, $PM_{2.5}$)	0.38	0.01–0.67	0.013

- **incremento anche nell'utilizzo farmaci sintomatici inalatori** associato alle temperature
- maggiore effetto delle temperature per aumento di PM2.5 e NO_2

la broncocostrizione sembra essere scatenata dalla risposta colinergica attivata dall'iperventilazione caldo-correlata

McCormack 2016

RISULTATI – stime di effetto delle temperature sulla mortalità per causa



Mortalità per cause	Freddo			Caldo		
	RR	IC 95%		RR	IC 95%	
Naturali	1.074	1.064	1.084	**1.265**	**1.233**	**1.297**
Cardiovascolari	**1.101**	**1.087**	**1.116**	**1.277**	**1.238**	**1.318**
Cardiache	1.099	1.082	1.115	**1.253**	**1.219**	**1.288**
Ischemiche	**1.141**	**1.104**	**1.180**	1.095	1.057	1.134
Cerebrovascolari	1.121	1.088	1.155	**1.270**	**1.216**	**1.327**
Respiratorie	1.042	1.013	1.071	**1.458**	**1.397**	**1.521**
Nervose	1.060	1.018	1.104	**1.583**	**1.497**	**1.675**
Mentali	1.076	1.027	1.128	**1.484**	**1.404**	**1.569**
Metaboliche	1.088	1.048	1.129	**1.369**	**1.306**	**1.435**
Diabete	**1.139**	**1.045**	**1.241**	**1.287**	**1.169**	**1.418**

BIGEPI
BIG data per la valutazione degli Effetti sanitari dell'inquinamento atmosferico nella Popolazione Italiana

INAIL
ISTITUTO NAZIONALE PER L'ASSICURAZIONE CONTRO GLI INFORTUNI SUL LAVORO

IFC

- .
  - .
    - . 2022

Interazione tra eventi estremi

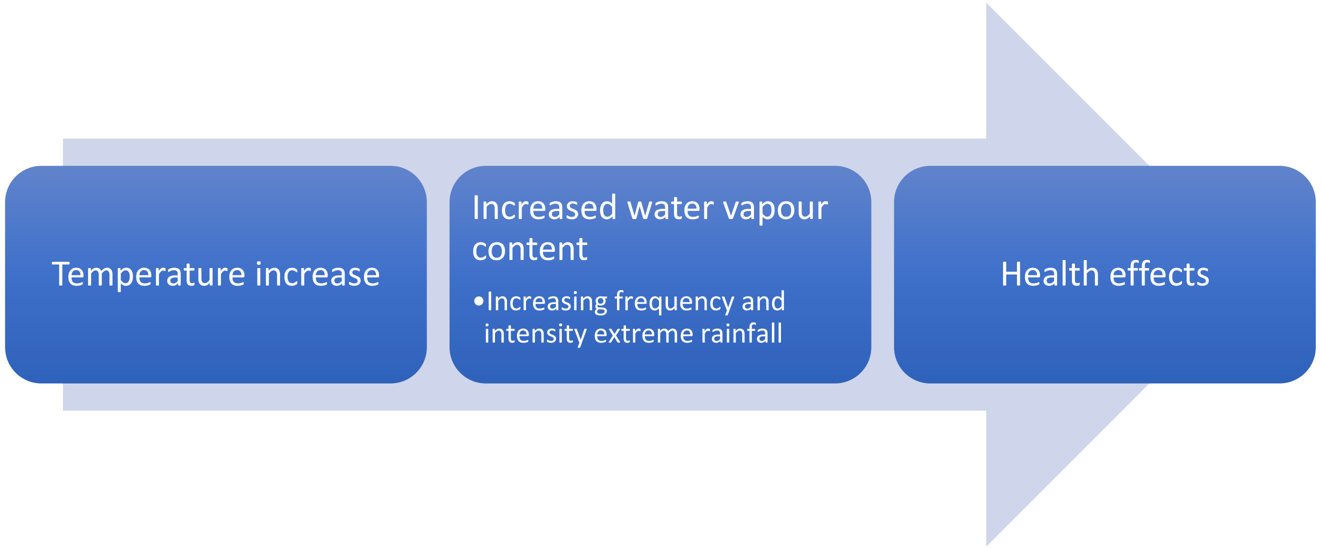
https://brewminate.com/heat-waves-combined-with-air-pollution-are-a-deadly-combination/

[Rahman Am J Respir Crit Care Med. 2022]

Temperature and flood events – Health effects

Climate change alters hydrological cycles, tending to make dry areas drier and wet areas wetter. Additionally, altered precipitation patterns increase the risk of localised flood events, resulting in **direct injury, the spread of infectious diseases, and impacts on mental health.**

From 1990 to 2019, there were clear, significant increasing trends in the number of occurrences of weather-related disasters, but no significant difference in the number of people affected per event or the number of deaths per event. (Lancet, 2021)



•water- and vector-borne diseases, such as cholera, typhoid or malaria
•injuries, such as lacerations or punctures from evacuations and disaster cleanup
•chemical hazards
•mental health effects associated with emergency situations
•**disrupted health systems, facilities and services, leaving communities without access to health care**
•damaged basic infrastructure, such as food and water supplies, and safe shelter.
(WHO, 2017)

Temperature, air pollution and pollen – Health effects

Received: 24 July 2019 | Revised: 20 December 2019 | Accepted: 27 December 2019
DOI: 10.1111/all.14177

Check for updates

Allergy WILEY

REVIEW

The need for clean air: The way air pollution and climate change affect allergic rhinitis and asthma

Ibon Eguiluz-Gracia[1] | Alexander G. Mathioudakis[2,3] | Sabine Bartel[4,5] | Susanne J. H. Vijverberg[6] | Elaine Fuertes[7] | Pasquale Comberiati[8,9] | Yutong Samuel Cai[10,11] | Peter Valentin Tomazic[12] | Zuzana Diamant[13,14] | Jørgen Vestbo[2,3] | Carmen Galan[15] | Barbara Hoffmann[16]

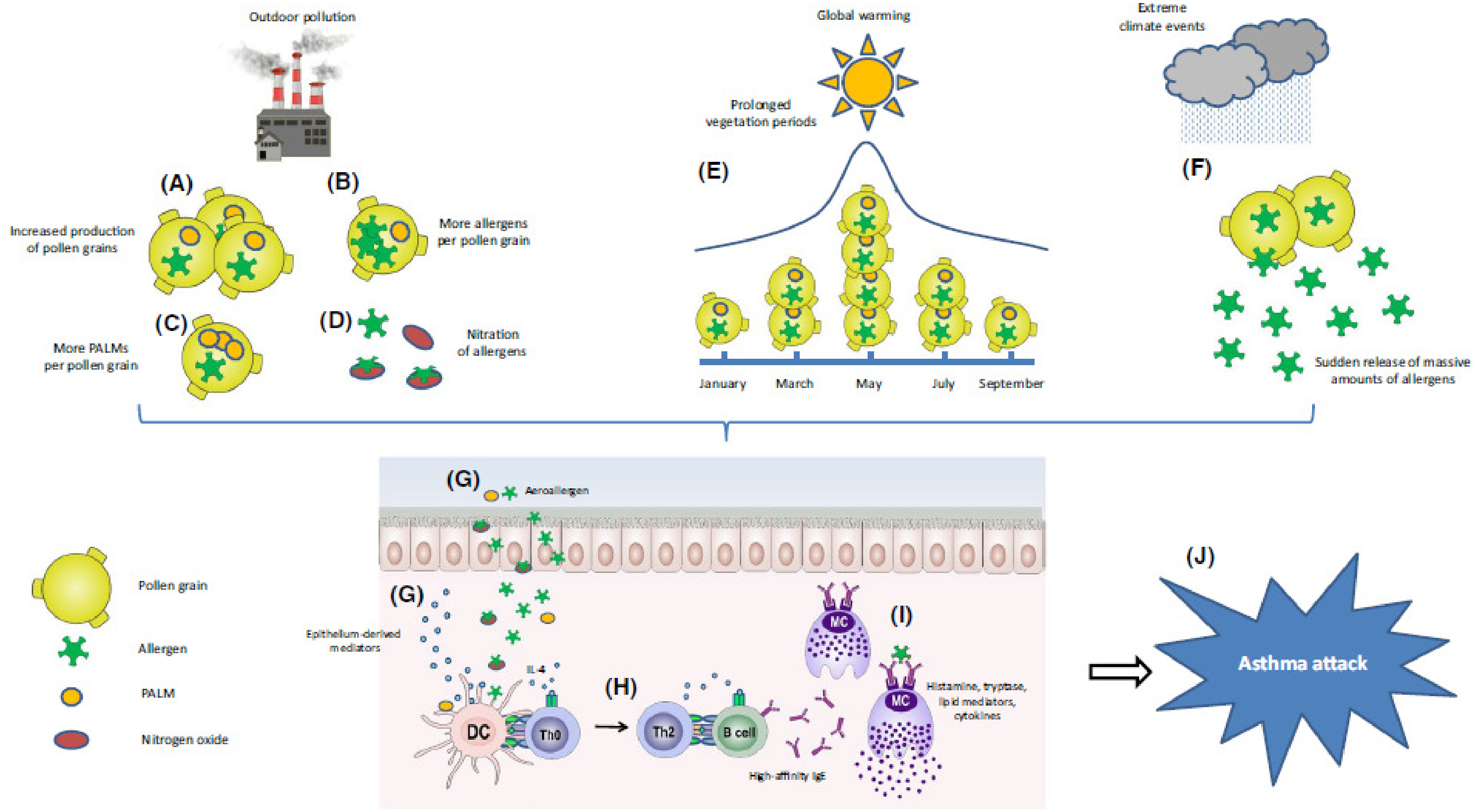


FIGURE 3 Effect of outdoor pollution and climate change over allergenic plant species: Outdoor pollution increases the amount of pollen grains produced by plants (A), and the amount of both allergens (B) and PALMs (C) per pollen grain. Moreover, aeroallergens can become chemically modified by outdoor pollutants like nitrogen oxides (D). The global warming induces prolonged vegetation periods of allergenic plants (E), and extreme climate events like thunderstorms, which provoke the sudden release of massive amounts of allergens to the atmosphere (F). All these effects result on a higher availability of aeroallergens, and they increase the chances of interaction between the allergens and the stromal and immune cells of the airway mucosa. The interaction of native and nitrated allergens with airway epithelial cells can result on the release of pro-inflammatory mediators (G), whereas allergen interaction with dendritic cells can result on IgE sensitizations (H). The chances of sensitization are further increased by the higher availability of PALMs and nitrated allergens (G). Moreover, allergen interaction with sensitized mast cells can induce the release of inflammatory mediators (I), ultimately inducing the onset of asthma attacks in pollen-allergic patients (J). *PALM: pollen-associated lipid mediator*

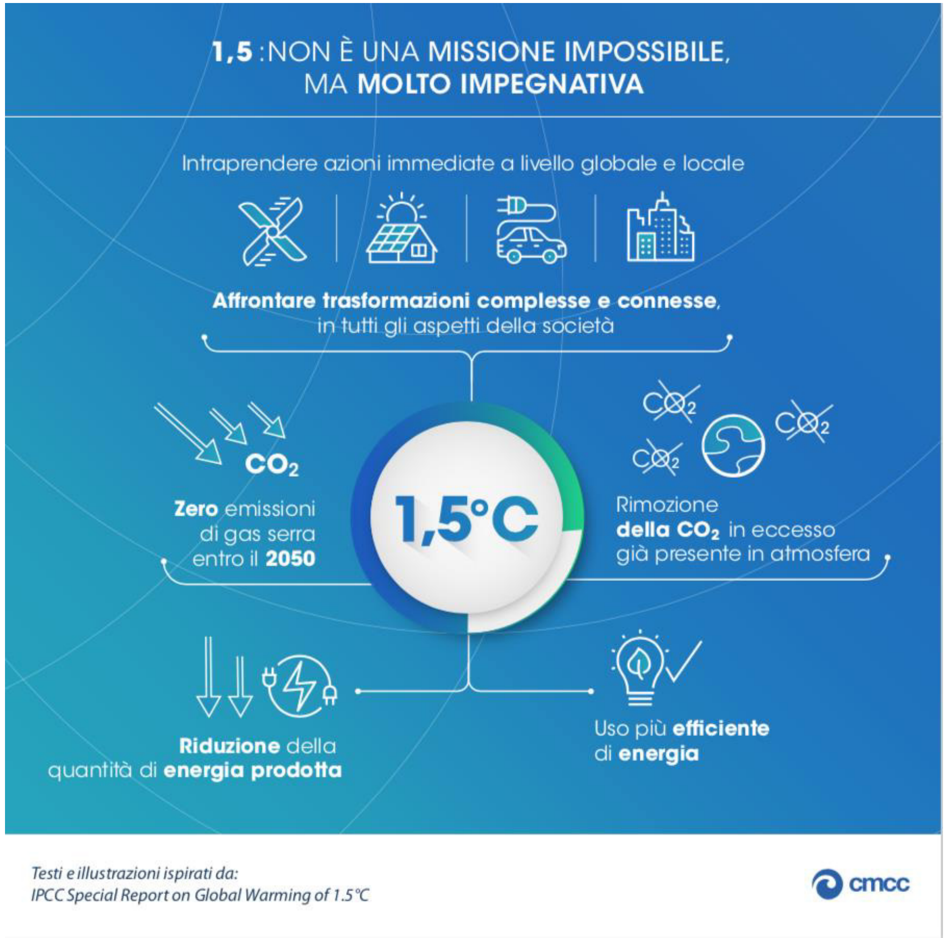
Patto di Glasgow per il clima

22. *Recognizes* that limiting global warming to 1.5 °C requires rapid, deep and sustained reductions in global greenhouse gas emissions, including reducing global carbon dioxide emissions by 45 per cent by 2030 relative to the 2010 level and to net zero around mid-century, as well as deep reductions in other greenhouse gases;

...riconosce l'importanza di coinvolgere la società civile e stakeholder a vari livelli

Climate change mitigation measures

Centro Euro-Mediterraneo sui Cambiamenti Climatici



https://ipccitalia.cmcc.it/riscaldamento-globale-di-1-5/#infografiche

Diverse strategie di riduzione delle emissioni possono essere messe in atto nelle nostre città, come **migliorare l'isolamento energetico degli edifici**, **promuovere il trasporto non motorizzato e il trasporto pubblico** (*high confidence*).

Ad esempio, strategie di mitigazione nel settore dei trasporti possono avere vari **cobenefici, come miglioramento della qualità dell'aria, promozione di stili di vita salutari, maggiore equità nell'accesso ai trasporti pubblici** (*high confidence*).

https://www.theguardian.com/cities/guardianwitness-blog/2015/jun/01/cycle-friendly-cities-world-your-pictures-and-stories

International Panel on Climate Change Working Group III report, 2022

Esistono inoltre **misure di adattamento** efficaci e fattibili per ridurre i rischi per la salute umana e del pianeta (*very high confidence*).

Il **verde urbano può contribuire a ridurre localmente le temperature nelle città** (*very high confidence*).

I Piani di risposta alle ondate di calore che includono sistemi di allarme e interventi di prevenzione sono efficaci nel ridurre gli impatti delle temperature estreme (*high confidence*).

https://www.scientificamerican.com/article/who-benefits-from-public-green-space/

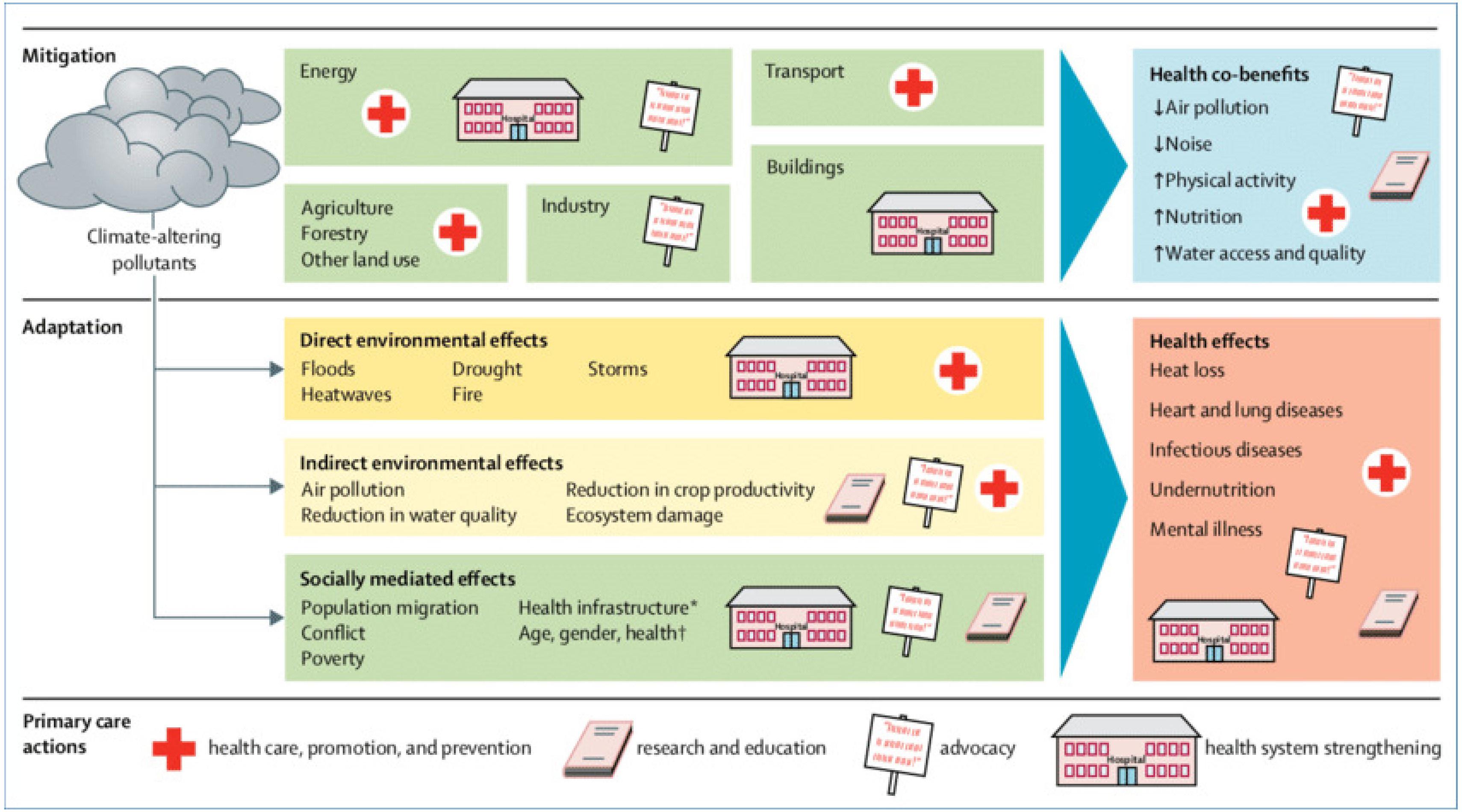
International Panel on Climate Change Working Group II report, 2022

I medici di famiglia e gli specialisti in pneumologia, immunologia e allergologia hanno un ruolo cruciale nel **sensibilizzare i pazienti e le loro famiglie** per proteggerli dagli effetti dell’inquinamento e raccomandare uno stile di vita sostenibile attraverso:

- ❖ **un’accurata anamnesi del paziente**, che includa anche **fattori di rischio ambientali** come l’inquinamento atmosferico
- ❖ una **informazione ai pazienti e alle loro famiglie su come ridurre proteggersi dall’inquinamento atmosferico**, e promuovere uno stile di vita fisicamente attivo e a minore impatto ambientale.
- ❖ un **ruolo di advocacy nei confronti delle autorità politico-amministrative**, dando priorità alle azioni di mitigazione in grado di produrre benefici su più settori e favorendo un cambiamento anche a livello del sistema sanitario

Ruolo della sanità nella mitigazione cambiamenti climatici

- Ridurre emissioni SSN (definire roadmap e interventi)
- Promuovere e monitorare azioni mitigazione con co-benefici di salute
- Investimenti in infrastrutture e tecnologie sostenibili
- Formazione personale sanitario
- Advocacy
- Leadership e Governance



GARD Italy UN MONDO DOVE RESPIRARE LIBERAMENTE

INQUINAMENTO ATMOSFERICO E CAMBIAMENTI CLIMATICI

Elementi per una strategia nazionale di prevenzione

GARD ITALIA

Novembre 2019

Sottogruppo di lavoro "Ambiente, Clima e Salute"

Ministero della Salute
Direzione Generale della Prevenzione Sanitaria

STATI GENERALI DELLA QUALITÀ **DELL'ARIA**

COMPONENTI DEL SOTTOGRUPPO

Annamaria de Martino [1], Stefania La Grutta [2], Guglielmo Bruno [3], Lorenzo Cecchi [4], Vincenzo Cilenti [5], Gennaro D'Amato [6], Salvatore D'Antonio [7], Claudio Donner F. [5], Fausta Franchi [7], Giada Adamo [8], Stefania Romano [8], Sandra Frateiacci [9], Claudio Maria Sanguinetti [10], Carlo Mereu [11], Maria Teresa Ventura,[12] Luciana Indinnimeo [13], Giovanni Viegi [14].

1)Direzione Generale della Prevenzione Sanitaria, Ministero della Salute, 2) Società Italiana Malattie Respiratorie Infantili (SIMRI), 3) Società Italiana di Allergologia, Asma e Immunologia Clinica (SIAAIC), 4) Associazione Allergologi Immunologi Italiani Territoriali e Ospedalieri (AAIITO), 5)Fondazione Mondo Respiro, Onlus, 6)Associazione Italiana Pneumologi Ospedalieri (AIPO), 7)Associazione Italiana Pazienti BPCO, Onlus, 8) Associazione Laziale Asma e Malattie Allergiche (ALAMA), 9) FederAsma e Allergie Onlus - Federazione Italiana Pazienti,10) Società Italiana di Pneumologia (SIP), 11) Società Italiana di Pneumologia - Italian Respiratory Society (SIP-IRS), 12)Associazione Italiana di Aerobiologia (AIA), 13) Società Italiana di Allergologia e Immunologia Pediatrica (SIAIP), 14) Consiglio Nazionale delle Ricerche (CNR),

Hanno inoltre collaborato alla stesura del documento:
Fabio Romeo, Direzione Generale per i Rifiuti e l'Inquinamento, Ministero dell'Ambiente e della Tutela del Territorio e del Mare.
Francesco Versaci, Ospedale Santa Maria Goretti, UOC UTIC emodinamica e cardiologia DEA, Latina.
Sara Bozzetto, Valeria Caldarelli, Antonino Francesco Capizzi, Maria Elisa Di Cicco, Giuliana Ferrante, Michele Ghezzi, in qualità di Junior Member SIMRI (JMs).

https://www.salute.gov.it/imgs/C_17_pubblicazioni_2945_allegato.pdf

«Salute in tutte le politiche»

GARD Italy UN MONDO DOVE RESPIRARE LIBERAMENTE

INQUINAMENTO ATMOSFERICO
E CAMBIAMENTI CLIMATICI
Elementi per una strategia nazionale di prevenzione

GARD ITALIA
Sottogruppo di lavoro "Ambiente, Clima e Salute"

Ministero della Salute
Direzione Generale della Prevenzione Sanitaria

STRATEGIE DI PREVENZIONE: MITIGAZIONE E ADATTAMENTO

1. Promuovere un approccio integrato per affrontare le problematiche legate all'inquinamento atmosferico ed ai CC
2. Integrare le politiche per ridurre le emissioni in atmosfera e per migliorare la qualità dell'aria con le altre politiche e conferirgli priorità
3. Ridurre le emissioni di gas serra e raggiungere i co-benefici di salute previsti dall'applicazione dell'Accordo di Parigi del 2015
4. Garantire il rispetto degli standard fissati dalle direttive dell'Unione Europea in un processo di miglioramento continuo della qualità dell'aria
5. Potenziare il trasporto attivo, ampliare le zone di aria pulita nelle aree urbane nell'ambito di programmi di riqualificazione urbana e di sviluppo sostenibile del territorio
6. Migliorare il monitoraggio ed estendere la valutazione ambientale e sanitaria dell'inquinamento atmosferico, in particolare nei luoghi frequentati dalle fasce di popolazioni più vulnerabili
7. Promuovere politiche energetiche "low carbon"
8. Promuovere specifiche misure e linee guida per migliorare la qualità dell'aria indoor (IAQ)
9. Sviluppare azioni di sistema, intersettoriali, che mettano al centro la promozione della salute e la prevenzione per creare ambienti di vita e di lavoro sani e sicuri
10. Promuovere la sostenibilità ambientale e l'adattamento del sistema sanitario in relazione ai cambiamenti climatici ed all'inquinamento atmosferico

“Many thanks for the invitation and for the attention”.

Giovanni Viegi

www.ifc.cnr

www.ersnet.org

Ex