



CLIMATE-CHANGE AND DOCTORS IN ACTION TO SHARE AND PROMOTE EXPERIENCES:  
TO UNDERSTAND AND FACE ENVIRONMENTAL HEALTH ISSUES

*Bruxelles June 27<sup>th</sup>, 2018*



# Introduction to the Project on Sentinel Physicians for the Environment

*Paolo Lauriola*



# Environmental Impacts on Health

## WHAT IS THE BIG PICTURE?

FACT:

**23%**

of all global deaths are linked to the environment.

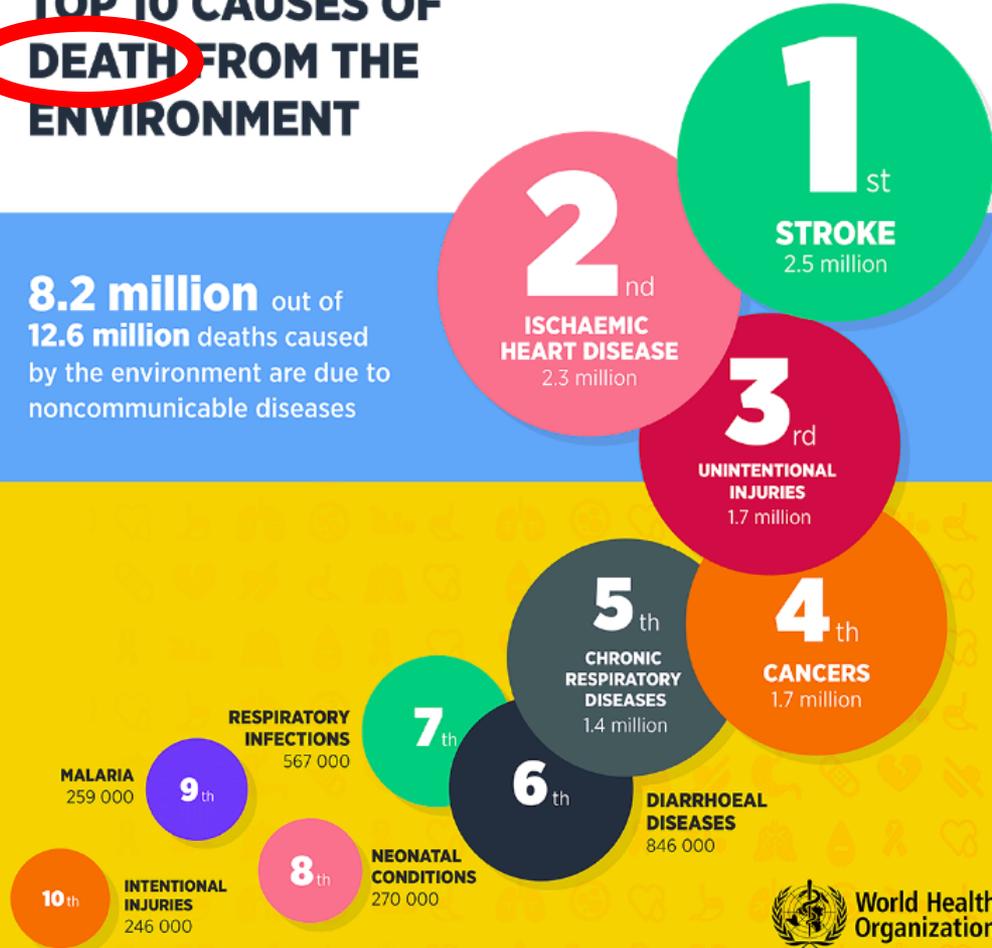
That's roughly **12.6 million deaths** a year.



World Health  
Organization

# TOP 10 CAUSES OF DEATH FROM THE ENVIRONMENT

**8.2 million** out of **12.6 million** deaths caused by the environment are due to noncommunicable diseases



World Health Organization

#EnvironmentalHealth

# Health impact of Climate Change: does it really matters?

Between 2030 and 2050 climate change is expected to cause

**250 000 ADDITIONAL DEATHS PER YEAR**

due to malaria, malnutrition, diarrhoea and heat stress.



World Health  
Organization

**Counting the  
dead...**



**but not  
only!**

BACKGROUND PAPER



## The Research Agenda for General Practice/Family Medicine and Primary Health Care in Europe. Part 1. Background and methodology<sup>1</sup>

### Background

General practice/family medicine is the core discipline of primary medical care and the cornerstone of many healthcare systems in Europe. It's potential is large: the large majority of European citizens have a general practitioner (GP) and regular contact with him or her. In healthcare systems where the GP acts as a gate keeper, 90–95% of all patient complaints remain in long time primary care (even when specialists are temporarily involved). Of all reasons for encounter, 80% can definitely be solved in primary care (3,4).



# Why is it important targeting GPs?

There are many other diseases linked to different kind and level of exposures to the climate change, characterized **by moderate symptoms** and **solved within Primary Care (80%)**

These conditions **should not be ignored**, because they may represent an **early indicator** of environmental-related critical health issues, as:

- ★ Allergic diseases, asthma;
- ★ Endocrine and metabolic diseases;
- ★ Panic attacks and alteration of the neurocognitive development;
- ★ Modifications in spermatic quality and concentration
- ★ .....and some local specific concerns such as arthropod-borne infectious diseases in particular those transmitted by *Aedes albopictus*, a permanently present vector throughout Italy..... **“focal diseases”**

A delay in quantifying all these conditions could yield **disarrangement** of the overall health organization and healthcare systems, with **remarkable effects on individual and public health.**

# Why is it important targeting FDs?

## Environment as a determinant of health

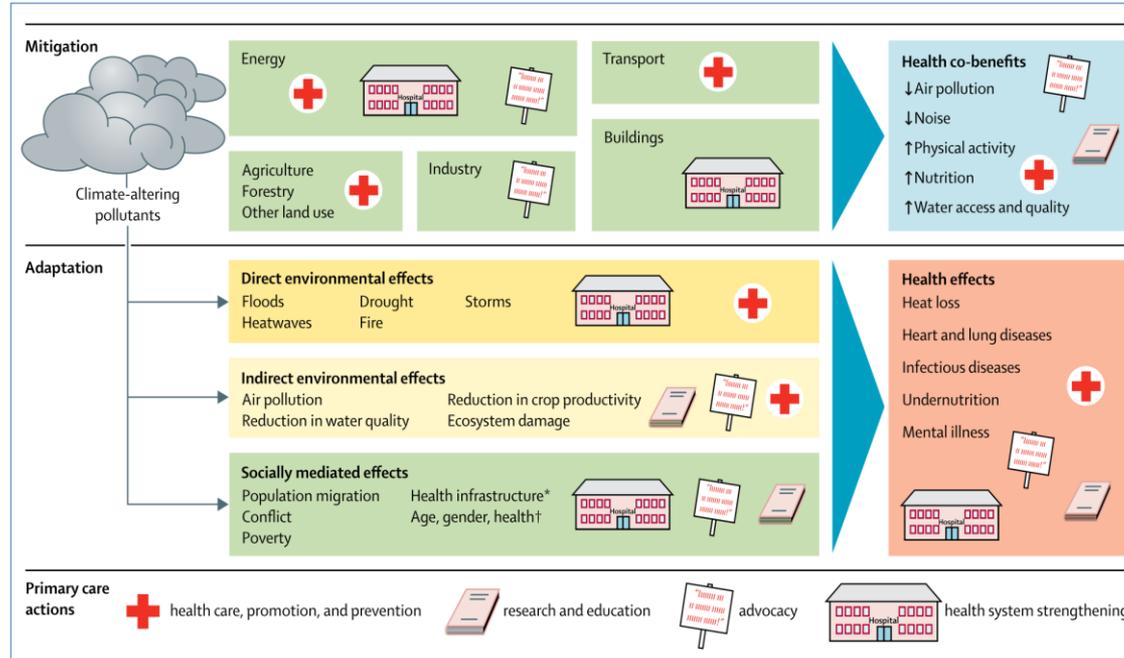
A gap still exists between the activities of clinical doctors with regards to the relationship between **health and the environment**:

- ★ **FDs totally embedded** in the local socioeconomic, capacity and cultural/historical features
- 
- ★ **Influential role of GPs and PEDs**, both on individual patients and communities;
  - ★ GPs and PEDs could really play a helpful role in **connecting global concerns with local actions**;

RCP policy statement 2010

**How doctors can  
close the gap**

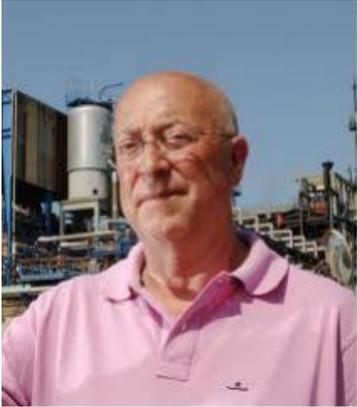
# Framework for primary care actions to create health co-benefits, and mitigate or adapt to the health effects of climate change



Source: The Lancet 2018

# Sentinel Practitioners

Some (Italian) significant anecdotes



**Giacinto Franco,**

Pediatricians from Augusta (Sicily) that noted and described a link between an excess of malformation in the newborn and the Mercury pollution of the sea.

**Gloria Costani**

A GP from Mantua that noted an excess of a rare soft tissue sarcoma within her patient, that was later confirmed by further studies and promoted the beginning of an epidemiology cohort study to investigate the reasons.



# Sentinel Practitioners and Environment: some significant anecdotes

Name	Job	Year	Location	Outcomes	Due to	Alert consequences
<b>J. Snow</b> <sup>35,37</sup>	Anesthesiologist	1854	London (UK)	V.Cholerae mortality	Drinkable water contaminated by sewage system	Change of tapping point upstream of London
<b>G.Franco</b> <sup>38,39</sup>	Pediatrician	1980	Augusta-Priolo (SR) (I)	Birth malformations	industries leaking Mercury in the sea	Industry closure
<b>G. Porcile,</b>	Oncologist	1980	Genoa (I)	Cancers	Incinerator	Incinerator closure
<b>MJ Gardner</b> <sup>40</sup>	Professor Medical Science	1993	Sellafield (UK)	Lymphoma	Nuclear Plant	Nuclear Plant Closure
<b>G. Costani</b> <sup>41</sup>	Family Doctor	1998	Mantova (I)	Soft tissue sarcoma	Industrial waste incinerator	Environmental Surveillance ongoing
<b>V. Cordiano</b> <sup>42,434</sup>	Hematologist	2016	Treviso (I)	Higher mortality levels for some causes of death.	Teflon and Goretex production	Water safety limits set up



## PREPARATORY PROCESS

G7 Health Experts Working Group (G7-HEWG)

Towards the  
DECLARATION OF THE G7 HEALTH MINISTERS'  
5 – 6 NOVEMBER 2017 IN MILAN

*Global Strategy for action  
to reduce the effects of Climate Change on Global Health*

CLIMATE AND HEALTH COUNTRY PROFILE  
ITALY



**United Nations**  
Framework Convention on  
Climate Change



# Italy: a living lab on climate and environmental changes

- ✓ located in the middle of the Mediterranean basin
- ✓ continental northern sector, peninsular central-southern sector, two large islands and archipelagos, minor islands
- ✓ heterogeneous climate which leads to differences in the immediate risks posed by CC throughout the country
- ✓ impacts of CC and environmental changes are already exacerbating existing infrastructural deficiencies, post-industrial pollution phenomena (e.g., soil, water) and the intrinsic hydro-geological and seismic vulnerability of the country



[jrc.ec.europa.eu](http://jrc.ec.europa.eu)

- Cool Temperate Dry
- Warm Temperate Dry
- Cool Temperate Moist
- Warm Temperate Moist
- Polar Moist

## DEMOGRAPHIC ESTIMATES

Population (2017)	60,579,000
Population growth rate (2017)	0%
Population living in urban areas (2017)	69.3%
Population age average, years (2017)	44.9
Population 65 years or over (2017)	22,3%
Economic & development indicators	
GDP per capita (current US\$, 2016)	30,527
Expenditure on health % of GDP (2014)	9.3%
Average annual HDI growth, 2010–2015 (%)	0.34

- ✓ acute climate changes have severely impacted natural disasters
- ✓ chronic CC are affecting our coastal areas, cities and water sources

# Main project objectives

In order to develop a GPs and PEDs structured **Surveillance System** named **RIMSA (Rete Italiana Medici Sentinella per l'Ambiente/Italian Network of Sentinel Physicians for the Environment)**, a project has been carried out aiming at developing:

- **EPIDEMIOLOGICAL SURVEILLANCE:** studying and monitoring the effects of environmental critical issues on the health of population;
- **ADVOCACY DUTIES:** raising awareness and informing citizen about connection between health and environment and sustainable lifestyles;



# Secondary goals:

- Promote in Italy a more “**effective**” profile of GPs and PEDs in the perspective of an **Environmental Health prevention activity**, especially in the **areas of greatest impact of Climate Change**



- Reaffirm the role of GPs and PLS in **promoting healthy habits and sustainable lifestyles**, not only in terms of individual health but also within a **collective perspective of Planetary Health**.



# Some examples of Practice Based Research Network:



# Sentinel General Practice

A sentinel general practice network, or sentinel network of general practitioners can be defined as a system that keeps a watchful eye on a sample of the (overall) population by supplying regular and standardized reports on the incidence and the main epidemiological characteristics of specific diseases and of procedures in primary health care.

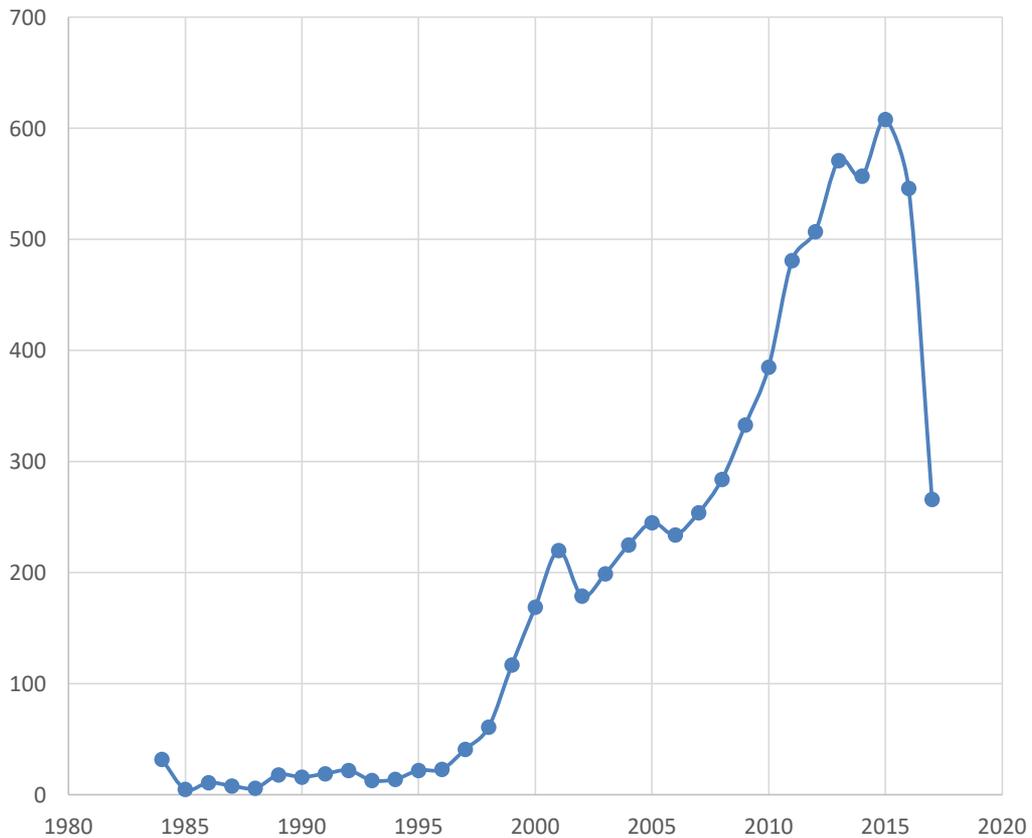
*Van Casteren V (1993)*



The screenshot displays the CORDIS (Community Research and Development Information Service) website. At the top, there is a navigation bar with the European Commission logo and the text 'CORDIS Community Research and Development Information Service'. Below this, a breadcrumb trail reads 'European Commission > CORDIS > Projects and Results > EUROSENTINEL'. A search bar and a 'Sign in' link are also visible. The main content area features a home icon and three menu items: 'NEWS & EVENTS', 'PROJECTS & RESULTS' (which is underlined), and 'RESEARCH\*EU MAGAZINES'. The 'EUROSENTINEL' project is highlighted, with the following details:

- Project ID:** MR4\*0063
- Funded under:** [FP2-MHR\\_4C](#)
- EUROSENTINEL**
- From:** 1988-06-01 **to:** 1991-06-30
- Project details:**
  - Total cost:** Not available
  - EU contribution:** Not available
  - Coordinated in:** Belgium
  - Topic(s):** **Funding scheme:** CON - Coordination of research actions
- Objective:** The purpose of the project was to coordinate activities in the field of sentinel practices with GPs in the EC-member countries (COST-countries included). The ultimate goal was to establish a real European network of sentinel practices. Activities in the field of sentinel practices have been coordinated with general practitioners (GP) in order to establish a real European network of sentinel practices. An international surveillance on measles,

*Fig. 2* Number of scientific publications dealing with Sentinel Physicians all over the world



Author(s)	Year	Country	Topic
I Devoux <sup>21</sup>	2001	France	Wastewater reuse raises the question of health risk and the epidemiological surveys needed.
J Litt et al. <sup>22</sup>	2004	USA	Survey of public health and environmental practitioners to uncover state and local health tracking needs and priorities
A Husa et al. <sup>23</sup>	2004	Switzerland	Estimates the scale of environmental medicine counselling in Switzerland by using two different data sources. The main source was the frequency of medical consultations due to environmental exposures in general practice the second using medical, psychological and environmental tools
BS Schwartz et al. <sup>24</sup>	2005	USA	Editorial: community-based primary care providers must possess biomedical, epidemiologic, and environmental medicine skills,.
A Flahault et al. <sup>25</sup>	2006	France	Description of <i>Réseau Sentinelles</i> : Database linkage with environmental information (e.g., remote sensing, surface variables, environmental factors) will be facilitated, allowing for the evaluation of the role of climate change, or pollution involvement in disease.
FH Johnston et al. <sup>26</sup>	2006	Australia	Investigates the relationship between particulate matter (PMPM10 and PM2.5) generated by vegetation fires and daily health outcomes in 251 adults and children with asthma over a 7-month period also recruited by GPs
AJ Elliot et al. <sup>27</sup>	2006	UK	Investigates the association between impetigo, insect bites and air temperature: a retrospective 5-year study (1999-2003) using morbidity data collected from a sentinel general practice network database.
SC Chen et al. <sup>28</sup>	2010	Taiwan	How to use a probability-based transmission modeling approach to examine the influenza risk of infection virus in indoor environments. This was based on 10 years of data gathered from influenza-like illness sentinel physician and laboratory surveillance, and experimental viral shedding data in Taiwan.
A Kolovos et al. <sup>29</sup>	2010	France	Development of model within an environmental health context which can be particularly important for prediction and decision-making in environmental health and risk studies, management, and planning, etc. Based on aggregated observations recorded by general physicians through the <i>Réseau Sentinelles</i>
S. Medina <sup>30</sup>	2014	France	The analysis of drug consumption estimated an excess of about 5000 treatments by psychotropic drugs as a consequence of the explosion of a chemical plant (AZF) in Toulouse (2001)
K Sebec et al. <sup>31</sup>	2014	USA	This experience allowed exploring the strengths and weaknesses of ambulatory Electronic Health Record (EHR) data in post-disaster settings. Data from ambulatory EHR networks can augment existing surveillance streams by providing sentinel population snapshots on clinically available indicators in near real time.
GL Nichols <sup>32</sup>	2014	Europe	They describe the surveillance systems (GP ones included), tracking tools, communication channels, information exchange and outputs in the light of environmental and climatic drivers of infectious diseases
C Klier et al. <sup>33</sup>	2016	Europe	This overview is aimed at providing current data on the incidence of Tick Borne Disease on longitudinal trends according to the environmental settings. Based on Sentinel physician results e.g. France, Netherlands, Switzerland. They indicate high reliability of collected data
F Giroud et al. <sup>34</sup>	2017	Madagascar	This study describes a system using various environmental and meteorological data with the support of new technologies to improve the performance of a sentinel Malaria-related data from 21 sentinel sites collected by Short Message Service which are automatically analysed to detect and forecast malaria trends and malaria outbreak alerts with automated feedback reports

# What has been done: obtained results and employed methods

1. **Funding** of the first RIMSA project: Italian Ministry of Health ✓
1. **Selection** of the Scientific Committee, Teaching Faculty and Organizational and Scientific Staff (O/S Staff): ✓
1. Selection of the **participants** and beginning of the **training process**: ✓
1. Promotion of the project: [website](#) ✓
1. Gathering of information about the participants to offer a tailored formation plan: **survey!** ✓
1. Training consolidation: a **Moodle platform** ✓
1. Definition of the **Professional Profile** of the Sentinel Physician for the Environment (SPE): ✓
1. **Manual** of Sentinel Physicians for the Environment: under editing process..



# 1. Selection of the participants



We selected **60 participants** (GPs and PEDs) across the country and we organized a 2-day residential course in the South (**Taranto**), Center (**Arezzo**) and North (**Genova**) of Italy.

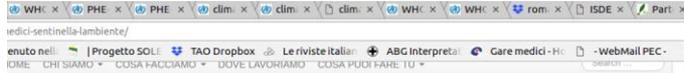
# 2. Beginning of the training process:

1° GIORNO		
<b>1° sessione: introduzione aspetti metodologici, banche dati ed esperienze di Medici Sentinella</b>		
9.45-10.00	Saluti e introduzione al tema ambiente e salute e professione medica	Presidente OMCeO che ospita il corso!
10.00-10.30	Introduzione al Corso: principi, obiettivi, organizzazione	Roberto Romizi (ISDE), Emanuele Vinci (FNOMCeO) Aldo di Benedetto (Min-Salute)
10.30-11.00	Il Progetto strategico: CAMBIAMENTI CLIMATICI E SALUTE VISION "PLANETARY HEALTH"	
11.15-11.45	Rapporti	
2° giorno		
<b>2° sessione: La Comunicazione Del Rischio e Advocacy per I Medici Sentinella</b>		
9.00-9.45	Comunicazione e gestione del rischio: la fiducia e la partecipazione	Stefania Borgo (ISDE)
9.45-10.30	Comunicazione e gestione del rischio: rischio misurato e rischio percepito	Liliana Cori (CNR)
10.30. 11.15	I media (vecchi e nuovi) come attori della comunicazione: ruoli e potenzialità	Pietro Greco (giornalista e scrittore)
<b>Break</b>		
11.30-12.15	Strumenti legali ed economici per una buona advocacy	Paolo Maddalena (Giudice)
12.15-13.00	Principi ed esperienze efficaci in campo di advocacy	Ferdinando Laghi (ISDE)
<b>Colazione di lavoro</b>		
<b>3° sessione Corso : La formazione e la gestione di gruppi</b>		
14.00-14.45	Tecniche e metodologie della formazione efficace	Beppe Ventriglia (SIMG)
14.45- 16.30	Esercitazioni in gruppi su specifici ambiti attività medici sentinella: informazione/conoscenza/ sorveglianza, advocacy, comunicazione, organizzazione della prevenzione	Docenti & Staff S/O
<b>DISCUSSIONE, PROPOSTE, CONCLUSIONI</b>		
16.30-17.00		

## Topics:

1. Environmental-health overview with particular regards to Climate Changes health effects: diseases, determinants, mechanisms;
1. Statistics and environmental epidemiology;
1. Introduction EH Bibliographic data-bases
1. Communication (doctor patient interactions) and advocacy elements (ethics, economics, laws)
1. Educational methodologies

# 3. Promotion of the Project



Website

Home » Rete Italiana Medici Sentinella per l'Ambiente  
Rete Italiana Medici Sentinella per l'Ambiente

 **ISDE - Associazione Medici per l'Ambiente**  
5 giugno 2017

Parte il progetto #RIMSA! <http://www.isde.it/parte-il-progetto-rete-italiana-di-medi.../>



Social Media

Scientific meetings

Parte il progetto "Rete Italiana Medici Sentinella per l'Ambiente"  
Lo scorso 30 Maggio (presso la sede ISDE, viale Ferdinando di Savoia, 1, Roma) si è svolto il primo incontro organizzativo.  
ISDE.IT



Home Program Registration Abstract Submission General Information Sponsorship Contact

**ISES-ISEE 2018 Joint Annual Meeting**  
**August 26-30, 2018**  
**Shaw Centre - Ottawa, Canada**



**23<sup>RD</sup> WONCA Europe Conference**  
24th-27th may 2018  
Kraków, Poland

# What remains to be done

Expected results and planned methods

1. Consolidation, development and spreading of the **training process**:
2. Creation of a **working group** and start with one or some **pilot experiences**
3. **Defintion of the workplan** to trasmit relevant health data via EMR to be integrated with **environmental/ occupational/ metheorological ones**

**= a lot of work!**



# AT PRESENT

Conferenza Nazionale

# CLIMA INQUINAMENTO ATMOSFERICO E SALUTE

TARANTO

**15 | 2018 | 05**

AULA MAGNA DEL DIPARTIMENTO JONICO  
UNIVERSITÀ ALDO MORO SEDE DI TARANTO

**16 | 2018 | 05**

SALONE DEGLI SPECCHI, COMUNE DI TARANTO



# Criticalities/opportunities

- The health effects of environmentally-driven phenomena are extremely complex to be interpret;
- to couple the epidemiological mission with the opportunity to put in place the influential role of FDs;
- To integrate with other organisation/disciplines: environment, meteorology, occupation (collect/intrepret data).

# Next steps, 1

- To set up a uniform data collection process, defining protocols, standards, and core datasets taking in due account of the ethical aspects.
- To implement a common EMR software, or at least procedures to allow comparable data extractions;
- To carry out geo-referencing (through GIS-based systems) of patients addresses and accordingly of environmental data which will be properly handled.

# Next steps, 2

- we are aiming at the creation of an a European “structure”, which should develop and share experiences and proposals in terms of training, data, analyzing and reporting;
- we are also committed to focusing on concerns that involve low-middle income countries (WHO Department of Public Health).

# Special thanks to:

The Staff: A. Serafini, A. Rossi  
M. Santamaria, S. Pegoraro

*the colleagues involved in RIMSA.*

*and*

*R. Agius, B. Behold, G. Leonardi  
R. Verheij, A. Zeha*

