



ISDE ASSEMBLY GENERAL MEETING
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Centre of Public Health
Vienna, October 25th-26th, 2109

Measuring and counteracting environmental-health threats: *Sentinel Physicians for the Environment*

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Map of presentation

- Introduction
 - *Environment and health: which data?*
 - *How doctors can close the gap?*
- Sentinel Physicians for the Environment: Who? Why? When?...
- The Italian experience
 - *Criticalities & opportunities*
- Next steps
 - *Italy/Europe*
 - *Isde Int'l*
- Conclusions

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.

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

5

**Counting
deaths..**



**but not
only!**

6

European Journal of General Practice, 2009; 15: 243–250

informa
healthcare

BACKGROUND PAPER



The Research Agenda for General Practice/Family Medicine and Primary Health Care in Europe. Part 1. Background and methodology¹

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).



7

Why targeting FDs is so important?

There are many other diseases linked to different kind and level of exposures to 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**.

8

Why targeting FDs is so important? (cnt'd)

The 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 socio-economic and cultural/historical setting



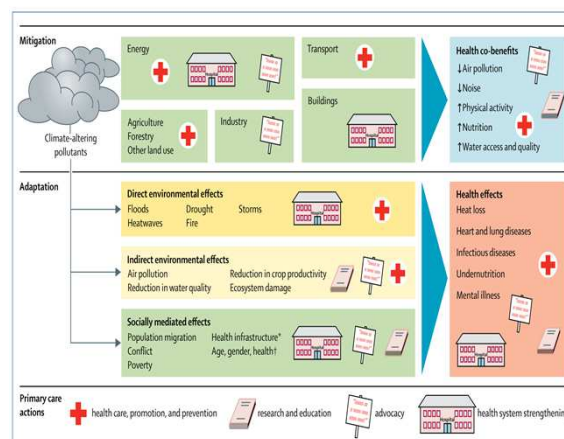
- ★ **The influential role of GPs and PEDs**, both on individual patients and communities;
- ★ **GPs and PEDs could really play a helpful role in connecting global concerns with local actions**;

RCP policy statement 2010

How doctors can close the gap

9

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

10

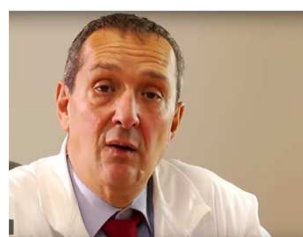
Sentinel Physicians for the Environment

Some significant anecdotes



In 1993, Dr. Gardner published on a child leukaemia cluster around a nuclear power plant based in Sellafield (UK). Afterward, local authorities admitted that a military nuclear waste site had once existed in the area, later transformed into a nuclear power plant. After some years the Sellafield power plant was closed

In 2016, huge concern over Perfluoroalkylated substances (PFAS) in drinking water raised following some early observations of Vincenzo Cordiano, haematologist. Owing to a wide and trenchant popular pressure, numerous legislative and technological measures have been implemented and the factory which discharged such substances, closed




11

Sentinel Practitioners and Environment: some significant anecdotes

Name	Job	Year	Location	Outcomes	Due to	Alert consequences
J. Snow ³⁵⁻³⁷	Anesthesiologist	1854	London (UK)	V.Cholerae mortality	Drinkable water contaminated by sewage system	Change of tapping point upstream of London
G.Franco ^{38,39}	Pediatrician	1980	Augusta-Priolo (SR) (I)	Birth malformations	industries leaking Mercury in the sea	Industry closure
G. Porcile,	Oncologist	1980	Genoa (I)	Cancers	Incinerator	Incinerator closure
MJ Gardner ⁴⁰	Professor Medical Science	1993	Sellafield (UK)	Lymphoma	Nuclear Plant	Nuclear Plant Closure
G. Costanti ⁴¹	Family Doctor	1998	Mantova (I)	Soft tissue sarcoma	Industrial waste incinerator	Environmental Surveillance ongoing
V. Cordiano ^{42,43,44}	Hematologist	2016	Treviso (I)	Higher mortality levels for some causes of death	Teflon and Goretex production	Water safety limits set up

12




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*

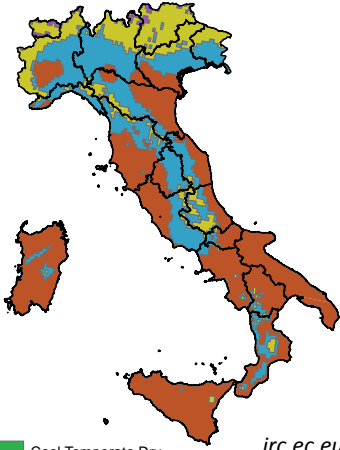
CLIMATE AND HEALTH COUNTRY PROFILE
ITALY



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
- ✓ a 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

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

10

Main project objectives

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:** to study and monitor the effects of environmental critical issues on the health of the population;
- **ADVOCACY DUTIES:** to raise awareness and inform citizen about the connection between health and environment and sustainable lifestyles;



17

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 PEDs in **promoting healthy habits and sustainable lifestyles**, not only in terms of individual health but also within a **collective perspective of Planetary Health**.



18

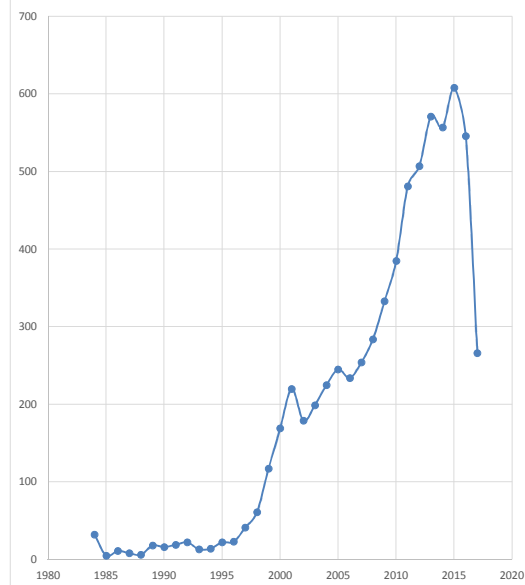
Sentinel General Practice

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 (1993)

The screenshot shows the CORDIS (Community Research and Development Information Service) website. The page displays details for the EUROSENTINEL project, including its ID (1954-10063), funding scheme (FP2-MHB4C), and project dates (1988-06-01 to 1991-06-30). It also lists project details such as total cost (not available), EU contribution (not available), and the funding scheme (CON - Coordination of research actions). The objective of the project is described as coordinating activities in the field of sentinel practices with GPs in EC member countries to establish a real European network of sentinel practices.

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



Author	Year	Country	Abstract
I Devoux ²¹	2001	France	Wastewater reuse raises the question of health risk and the epidemiological surveys needed.
J Litt et al. ²²	2004	USA	Survey of public health and environmental practitioners to uncover state and local health tracking needs and priorities
A Hussa et al. ²³	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. ²⁴	2005	USA	Editorial: community-based primary care providers must possess biomedical, epidemiologic, and environmental medicine skills.
A Flahault et al. ²⁵	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. ²⁶	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. ²⁷	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. ²⁸	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. ²⁹	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 ³⁰	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. ³¹	2014	USA	This experience allowed exploring the strengths and weaknesses of ambulatory Electronic Health Record (HER) 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.
Et Al. ³²	2014	France	How to describe the surveillance systems (GPs included) leading to the communication

Some examples of Practice Based Research Network:

The image displays a collection of logos for various Practice Based Research Networks (PBRNs). At the top left is 'Health Search' with a logo featuring a globe and a person. To its right is 'QRESEARCH' in a blue box. Below 'Health Search' is 'CPCSSN' and 'RCS SSP' with a red maple leaf logo. In the center is 'CPRD' with a colorful circular logo. To the right of 'CPRD' is 'niver' with a red and black logo. At the bottom left is 'Canadian Primary Care Sentinel' with a red 'm' logo. In the center bottom is 'QSURVEILLANCE' with the text 'Realtime infectious disease surveillance' and 'o que se fez em 2015'. To the right of 'QSURVEILLANCE' is 'Sentinelles Réseau Sentinelles' in large blue letters. At the bottom center, there is text: 'Departamento de Epidemiologia Ana Paula Rodrigues, Inês Batista, Mafalda Sousa Uva, Suzana Silva' and 'Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) 2014/01488-0'.

22

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. ✓

23

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.

24

2. training process:

1° SESSIONE		
1° sessione: introduzione aspetti metodologici, banche dati ed esperienze di Medici Sentinella		
9.45-10.00	Salute e introduzione al tema ambiente e salute e professione medica	Presidente CIAMCO che spiega il corso!
10.00-10.30	Introduzione al Corso: principi, obiettivi, organizzazione	Roberto Nemeo (ISDE), Emanuele Vinci (PROMICA) e Aldo Di Benedetto (Min. Salute)
10.30-11.00	Il Progetto strategico: CAMBIAMENTI CLIMATICI E SALUTE - VISION "PLANETARY HEALTH"	
11.15-11.45		
2° SESSIONE		
2° sessione: La Comunicazione Del Rischio e Advocacy per i Medici Sentinella		
9.00-9.45	Comunicazione e gestione del rischio: la fiducia e la partecipazione	Stefania Borgo (ISDE) e Liliana Cori (CNR)
9.45-10.30	Comunicazione e gestione del rischio: rischio misurato e rischio percepito	Pietro Greco (giornalista e scrittore)
10.30-11.15	I media (vecchi e nuovi) come attori della comunicazione: ruoli e potenzialità	
Break		
11.30-12.15	Strumenti legali ed economici per una buona advocacy	Paolo Maddalena (Giurista)
12.15-13.00	Principi ed esperienze efficaci in campo di advocacy	Ferdinando Laghi (ISDE)
Colazione di lavoro		
3° SESSIONE CORSO: La formazione e la gestione di gruppi		
3° sessione Corso: La formazione e la gestione di gruppi		
14.00-14.45	Tecniche e metodologie della formazione efficace	
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
16.30-17.00 DISCUSSIONE, PROPOSTE, CONCLUSIONI		

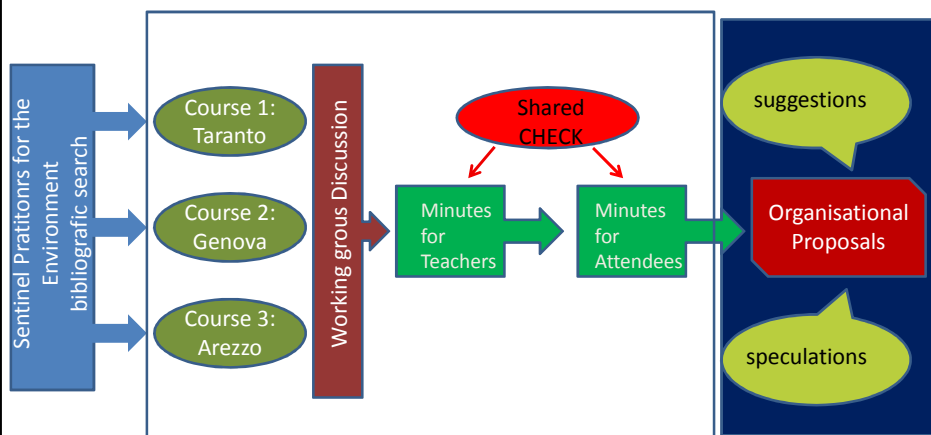
Topics:

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

25

2. Training process, cont'd:

RIMSA Organisation proposal development process



26

3. Project Strengthening

Website

Social Media

Scientific meetings

Scientific articles

What must be done?

Expected results and planned methods

1. Consolidation, development, and spreading of the **training process**:
2. Creation of a **national working group** and start with some **pilot experiences**
3. **Defintion of the work plan** to forward relevant health data via EMR packages which will be integrated with **environmental/ occupational/ metheorological ones**



= a lot of work!

AT PRESENT



29

Criticalities/opportunities, 1

- The health effects of environmentally-driven phenomena are extremely complex to be interpreted;
- To couple the epidemiological mission with the influential role of FDs;
- To integrate with other organisations/ disciplines: environment, meteorology, occupation (collect/understand data).

30

Criticalities/opportunities, 2

Professional Profile of SPE

- **Epidemiological Duties**
 - extrapolate some significant signals of an environmentally-driven threat from a patient;
 - collect information for a case history which can make plausible the relation;
 - gather evidence of the exposure to a consistent risk factor;
 - investigate the health problem by choosing the most appropriate and suitable human biomarker (pre-morbidity ones);
 - report properly the environmentally-driven health issue to the institutional referents;
 - investigate if the problem could involve any other member of the community.

31

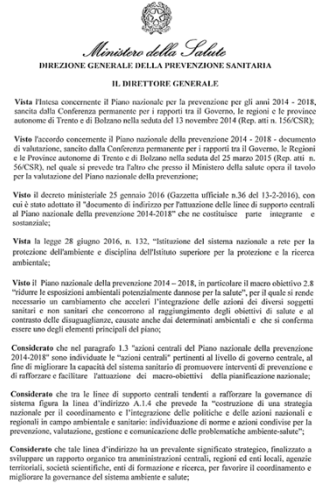
Criticalities/opportunities, 3

- **Advocacy duties**
 - adopt precautionary and responsibility principles;
 - Influence, and support the decisional authority ;
 - promote collaborative actions among associations, movements, citizens' committees, political parties and institutions;
 - represent a sort of clearinghouse among population and institutions ;
 - inform the local Authorities about possible environmental problems that could represent risks for their patients' health;
 - collaborate and pool with other disciplines/institutions, experts and consultants ;
 - publish experiences;
 - educate his/her patients and their own family (behaviour, exposure, save natural resources).

32

Opportunities

- The Italian MoH recognised the experience;
- MoH committed FNOMCeO and ISDE to strengthen and develop the experience;
- Other issues: e-Learning on EH run by FNOMCeO and ISDE, in-training GPs in-depth tuition on EH;
- MoH envisages SPE Ph.D. Programmes in collaboration with available Universities.



33

Italy/Europe, next steps , 1

Underway

- To set up a uniform data collection process, defining protocols, standards, and core datasets taking into due account ethical issues;
- we are aiming at the creation of a European "structure", which should support, 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).

34

Italy/Europe, next steps, 2

Underway

- development and application of guidelines.
- a capacity building which must be: consistent with the role of SPE, sustainable and effective.
- transfer of knowledge from a more developed system to the less developed



ISDE Int'l, next steps, 3

Proposals

- Agree/assess the general/global SPE aims to finalise suitable and proactive collaborations with other organisations: WONCA, HEAL, *Mèdecins du Monde*...
- Collect experiences of SPE networks across the world (starting from the WONCA experiences¹)
- Develop some informative, educational tools for FDs on SPE, in collaboration with WONCA-ENV and WHO (website, newsletter, movies, leaflet, ...)
- Capacity building on Environmental Health issues with particular attention to SPE.
- Set up an ISDE Int'l working Group on SPE



¹Blaskhi G, Abelson A, Flegg KM, Parkes MW (2014) Family doctors in the field: Environmental stories from across the globe. World Organization of Family Doctors (WONCA)

Conclusions

**All work and not play
...all together!!!**



37

Thanks



for your attention

38