Studi epidemiologici in siti industriali contaminati: obiettivi ed esempi di opzioni disponibili

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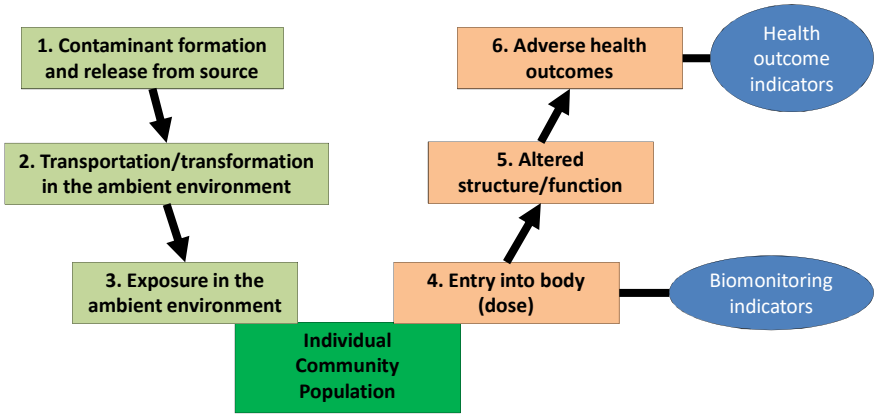
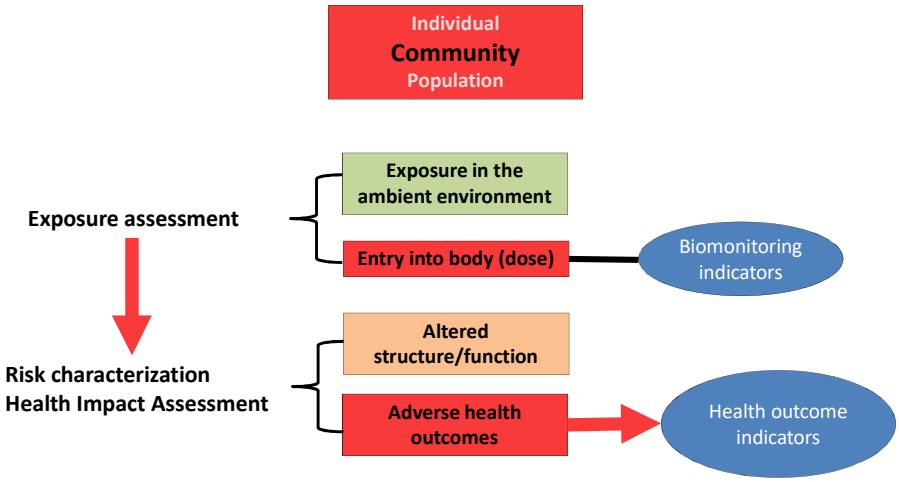
WORKSHOP

PROGETTARE UNO STUDIO EPIDEMIOLOGICO RELATIVO ALLA POPOLAZIONE DELLA REGIONE VENETO ESPOSTA A PFAS

ENVIRONMENTAL PUBLIC HEALTH PARADIGM



INDUSTRIALLY CONTAMINATED SITES (ICS) EPIDEMIOLOGY



MONOGRAPHIC SECTION

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Exploring available options in characterising the health impact of industrially contaminated sites

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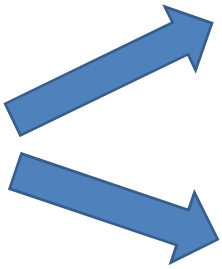
Adverse Health outcomes



MODELING the risk in the population using parameters on the contaminants, exposure, and population

ASSESSING the risk of the population using quali-quantitative exposure assessments, diseases from the population

EPIDEMIOLOGICAL STUDIES

Aims of Epi studies in ICS

- DESCRIPTION of the health profile of communities
AGGREGATED STUDIES

- ANALYSIS of the associations between environmental exposures and health outcomes and their causal nature ANALYTICAL STUDIES

- SURVEILLANCE of the evolving pattern of the communities health profile BOTH AGGREGATED AND ANALYTICAL STUDIES

- contribution to the local Health Impact Assessment
BOTH AGREGATED AND ANALYTICAL STUDIES

Role of Epidemiological studies in ICS
one specific contaminant

Two possible scenario:

- **The evidence on risks is ascertained – PCB**
- **The evidence on risks is not ascertained - PFAS**

The evidence on risks is ascertained
PCB

PCB evidence on health risks

IARC Monograph 107 - **Polychlorinated Biphenyls (PCB) and Polybrominated Biphenyl**

There is sufficient evidence in humans for the carcinogenicity of polychlorinated biphenyls (PCBs)

- PCBs cause **malignant melanoma**
- positive associations have been observed for **non-Hodgkin lymphoma** and **breast cancer**

Contribution of AGGREGATED STUDIES

*"……if a causal association is well-established, **descriptive studies** can be useful for establishing the presence or absence of an environmental health problem in a local population and quantifying its impact"*

[Baker D, Nieuwenhuijsen MJ. Environmental epidemiology. Study methods and application. Oxford University Press. 2008]

SENTIERI - description of the health profile of communities in ICS and their epi. surveillance

‘BRESCIA CAFFARO’ ICS

Contamination Source | Environmental Contaminantion | Exposure | Health

- A chemical (Caffaro) plant located in the municipality of Brescia
- Production of **Polychlorinated Biphenyls (PCB)** in the period 1930-1984

Contamination Source | Environmental Contaminantion | Exposure | Health

PCB contamination of shallow water and agricultural soils through plants to the food chain

Data from **biomonitoring surveys**

- high levels of PCB in the local population
- highest levels in ex-workers of the factory and in consumers of local food

SENTIERI RISK ANALYSIS

Higher incindence risks (data from cancer registries):

- both genders for melanoma and Lymphoma non Hodgkin
- women for breast cancer

The evidence on risks is not ascertained PFAS

Contribution of AGGREGATED STUDIES

"Descriptive studies do not formally evaluate the association between exposure and health outcome, although they can be helpful in assessing the possibility that an association exists…."

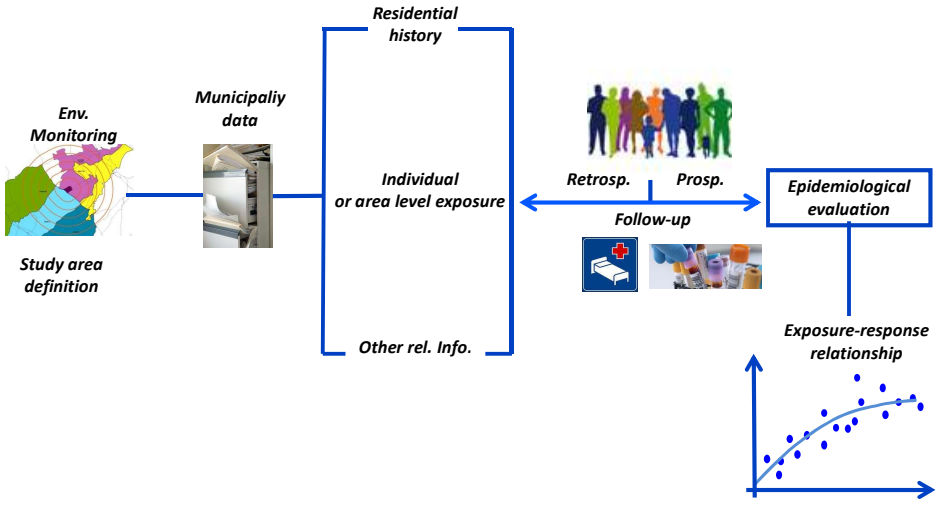
[Baker D, Nieuwenhuijsen MJ. Environmental epidemiology. Study methods and application. Oxford University Press. 2008]

In presence of uncertainties on causality

the main floor to ANALITYCAL STUDIES

Residential cohort study

Analysis of associations and epidemiological surveillance



[MODIFIED FROM: Ancona et al. Residential cohort studies to address environment and health in industrially contaminated sites. Rapporti ISTISAN 16/27]

Circumstances Favoring Conduct of epi. analytical studies

- Ability to accurately assess exposure
- Ability to accurately assess health concerns
- Exposures not highly susceptible to confounding
- Suitable comparison population
- Large enough population to provide informative results

[Savitz DA. When Is Epidemiologic Research a Helpful Response to Environmental Pollution and When Is It Not?. COST Action ICSHNet. Thessaloniki 6-7 Feb 2017]

To be considered

- Analytical studies are often quite expensive
- Require long time to be completed
- When risks are uncertain, epi studies in a given population cannot clarify the causal association, but contribute to this aim

If properly designed, epidemiological studies help in risk communication and management

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Fostering public health awareness on risks in contaminated sites. Capacity building and dissemination of scientific evidence

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epidemiological studies in a given ICS need of an overall architecture