Sistema Socio Sanitario

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ATS Brescia

Il melanoma nei siti contaminati italiani

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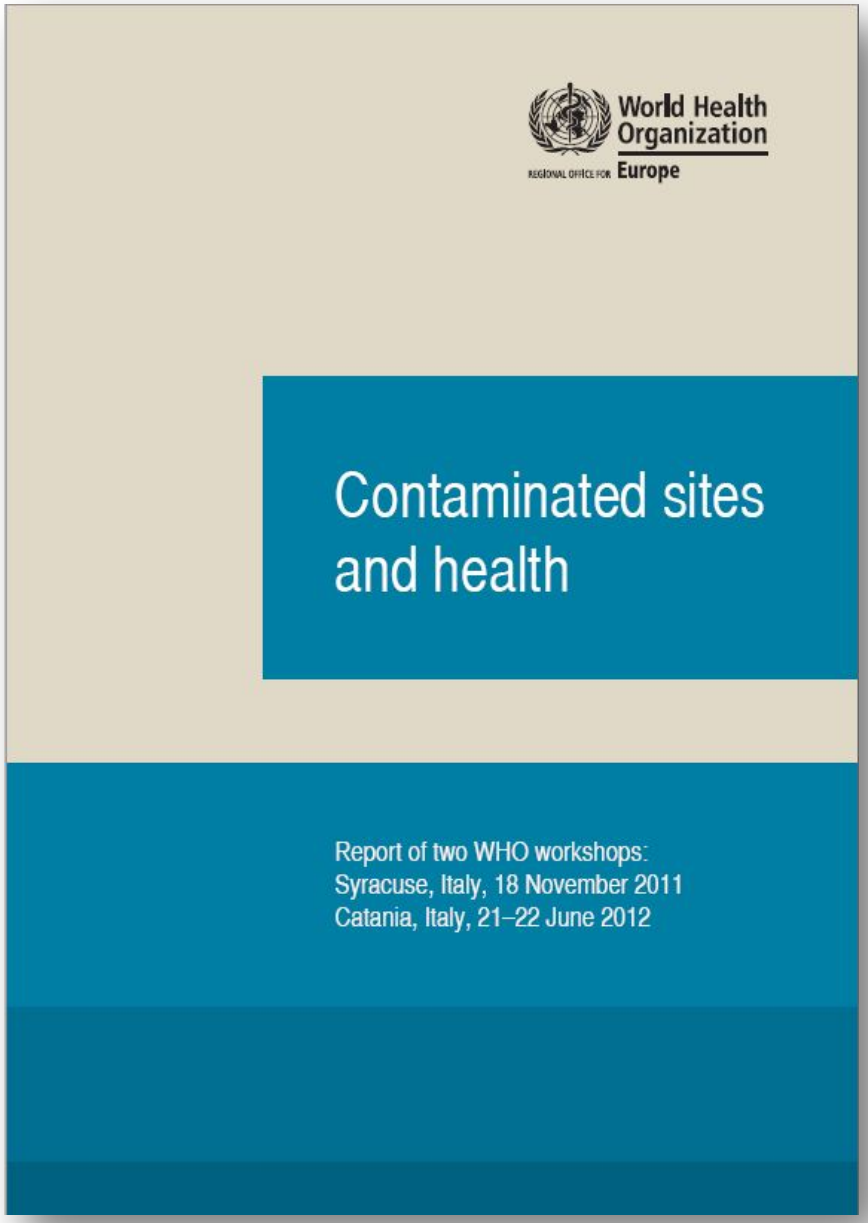
Dipartimento Ambiente e Salute,
Istituto Superiore di Sanità, Roma

Brescia
12 dicembre 2016



WHO Collaborating Centre for Environmental Health in Contaminated Sites

http://www.iss.it/binary/chis/cont/COMS_Ambiente.pdf

“Areas hosting or having hosted human activities which have produced or might produce environmental contamination of soil, surface or groundwater, air, food-chain, resulting or being able to result in human health impacts”

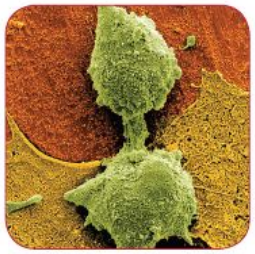
WHO 2013

Journal of Environmental and Public Health

Industrially Contaminated Sites and Health

Guest Editors: Marco Martuzzi, Roberto Pasetto, and Piedad Martin-Olmedo

www.hindawi.com/journals/jeph/si/480565



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MONOGRAPHIC SECTION

Contaminated sites: a global health issue

Edited by *Pietro Comba, Roberto Pasetto, Daniela Marsili and Paola De Castro*

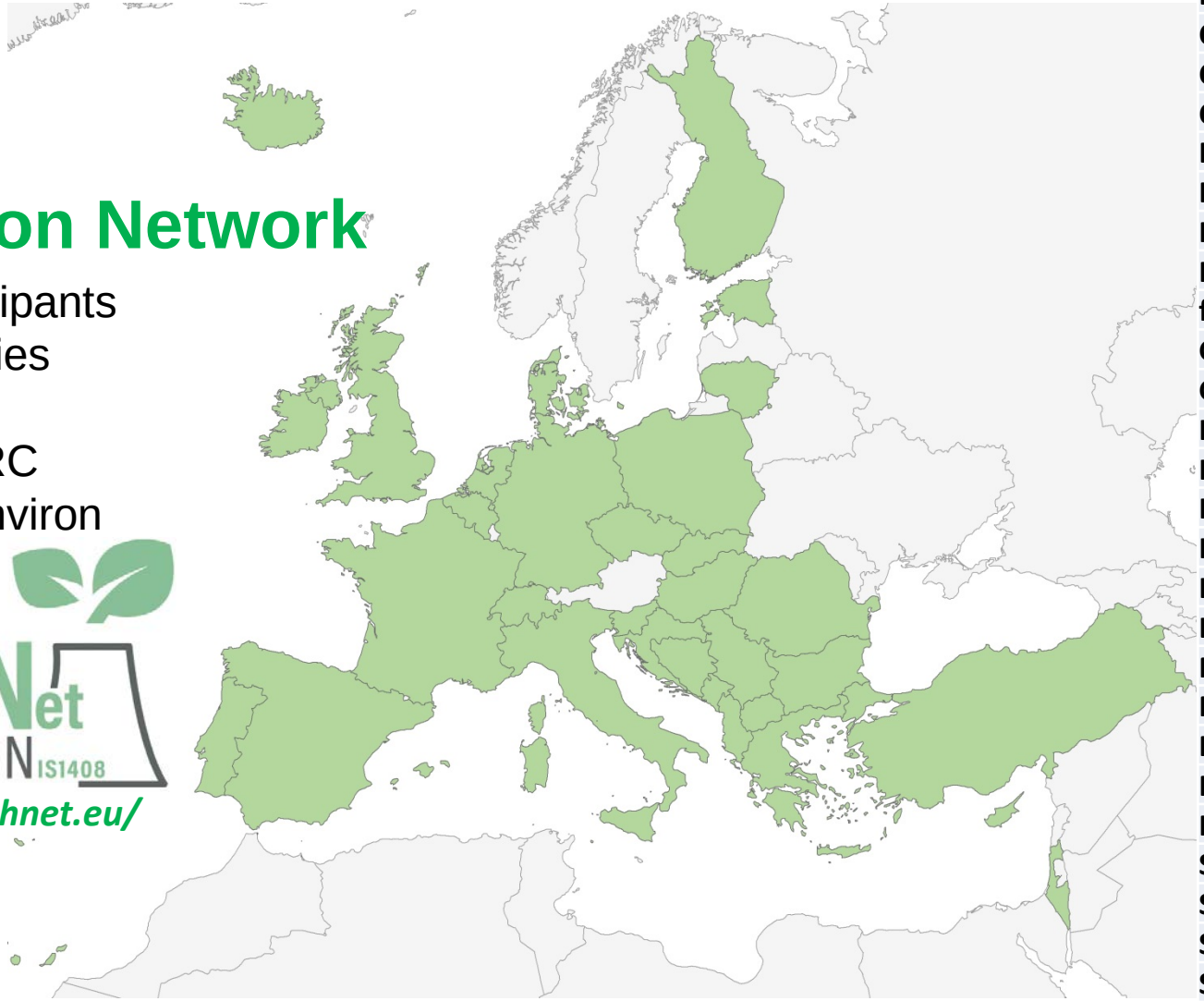
On-going related activities in Europe within the Industrially Contaminated Sites and Health Network (ICSHNet) COST Action

The Action Network

- **130** Participants
- **32** Countries
- WHO
- EC DG JRC
- EC DG Environ

ICSHNet COST ACTION IS1408

http://www.icshnet.eu/



- Albany
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- Denmark
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- Turkey
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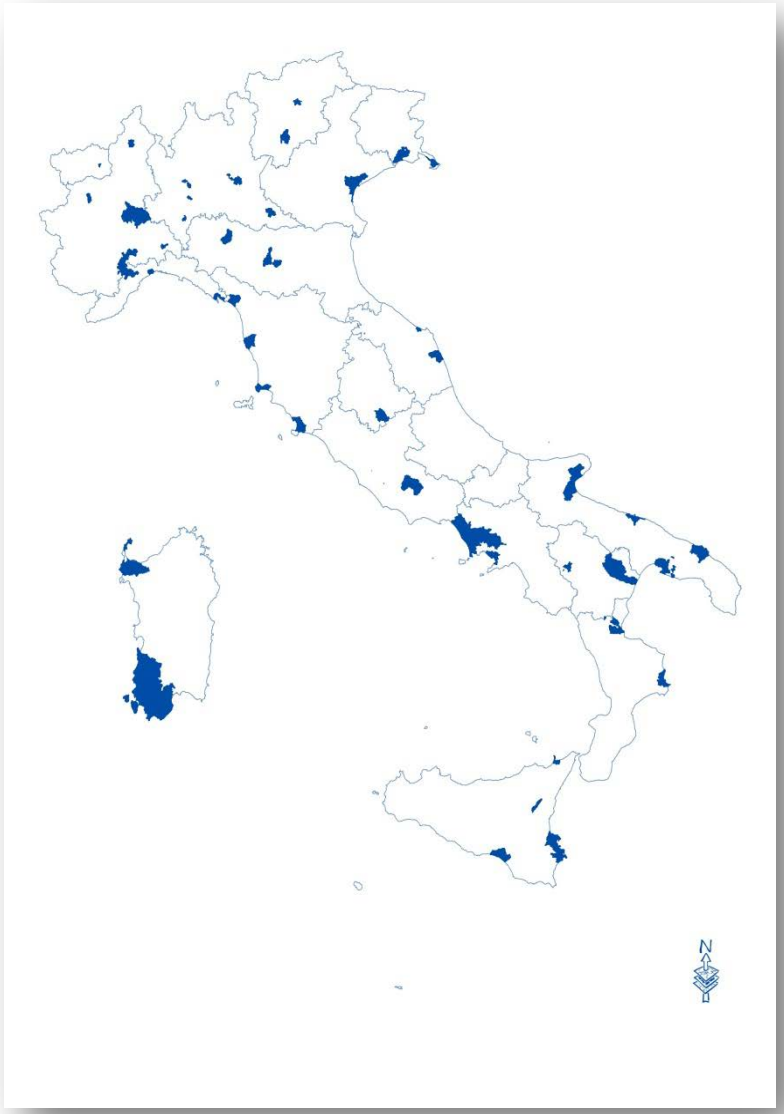
http://www.cost.eu/COST_Actions/isch/IS1408

SENTIERI is for surveillance of health status of residents in contaminated sites

Aims of SENTIERI Project

To collect, store and interpret data on the health status of populations resident in National Priority Contaminated Sites (NPCS) recognized by the Ministry of Environment based on soil and groundwater contamination



CONTAMINATED SITES (44)

- STEEL INDUSTRY
- ASBESTOS/OTHER MINERAL FIBRES
- LANDFILL/WASTE DUMP
- OIL INDUSTRY
- HARBOUR
- ELECTRIC POWER PLANT
- MINE/QUARRY
- CHEMICAL PLANTS

ESTIMATED NUMBER of CHILDREN and ADOLESCENTS 1 million (0-19 years old)

Main features of SENTIERI Project

- **Multidisciplinary working group**
- **Area based study - municipality level**
- ***A priori* evaluation of scientific evidence in order to define specific etiological hypotheses**
- **Categorization of environmental exposures based on the sources of contaminant agents explicitely mentioned in the decrees of NPCS institution**

SENTIERI

http://www.epiprev.it/pubblicazione/
epidemiol-prev-2010-34-5-6-suppl-3

http://www.epiprev.it/pubblicazione/
epidemiol-prev-2011-35-5-6-suppl-4

http://www.epiprev.it/pubblicazione/
epidemiol-prev-2014-38-2-suppl-1

(https://bit.ly/sentieri4)
epidemiol-prev-2016-40-5-suppl-1

Ann Ist Super Sanità 2014 | Vol. 50, No. 2: 186-191
DOI: 10.4415/ANN_14_02_13

Cancer incidence in Italian contaminated sites

Pietro Comba[a], Paolo Ricci[b, c], Ivano Iavarone[a], Roberta Pirastu[d], Carlotta Buzzoni[c, e], Mario Fusco[c, f], Stefano Ferretti[c, g], Lucia Fazzo[a], Roberto Pasetto[a], Amerigo Zona[a], Emanuele Crocetti[c, e], for ISS-AIRTUM Working Group for the study of cancer incidence in contaminated sites*

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[g] Registro Tumori di Ferrara, Dipartimento di Chirurgia e Medicina Sperimentale, Università degli Studi di Ferrara, Ferrara, Italy
** the Working Group members are cited before the References*

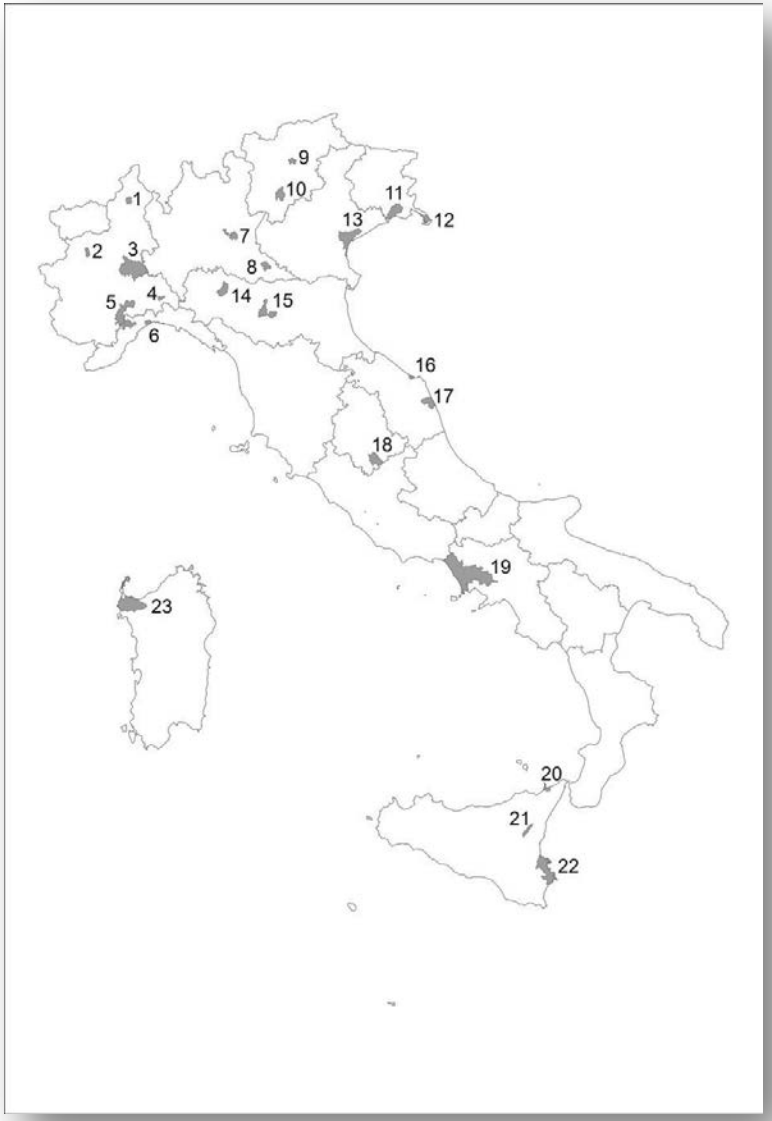

Figure 1.
Italian National Priority Contaminated Sites: Geographical distribution

Ann Ist Super Sanità 2014 | Vol. 50, No. 2: 186-191

Abstract

Introduction. The incidence of cancer among residents in sites contaminated by pollutants with a possible health impact is not adequately studied. In Italy, SENTIERI Project (Epidemiological study of residents in National Priority Contaminated Sites, NPCSs) was implemented to study major health outcomes for residents in 44 NPCSs.

Methods. The Italian Association of Cancer Registries (AIRTUM) records cancer incidence in 23 NPCSs. For each NPCSs, the incidence of all malignant cancers combined and 35 cancer sites (coded according to ICD-10), was analysed (1996-2005). The observed cases were compared to the expected based on age (5-year period,18 classes), gender, calendar period (1996-2000; 2001-2005), geographical area (North-Centre and Centre-South) and cancer sites specific rates. Standardized Incidence Ratios (SIR) with 90% Confidence Intervals were computed.

Results. In both genders an excess was observed for overall cancer incidence (9% in men and 7% in women) as well as for specific cancer sites (colon and rectum, liver, gallbladder, pancreas, lung, skin melanoma, bladder and Non Hodgkin lymphoma). Deficits were observed for gastric cancer in both genders, chronic lymphoid leukemia (men), malignant thyroid neoplasms, corpus uteri and connective and soft-tissue tumours and sarcomas (women).

Discussion. This report is, to our knowledge, the first one on cancer risk of residents in NPCSs. The study, although not aiming to estimate the cancer burden attributable to the environment as compared to occupation or life-style, supports the credibility of an etiologic role of environmental exposures in contaminated sites. Ongoing analyses focus on the interpretation of risk factors for excesses of specific cancer types overall and in specific NPCSs in relation to the presence of carcinogenic pollutants.

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Table 1
Cancer incidence in National Priority Contaminated Sites (NPCSs) in Italy, 1996-2005

		Men				Women			
ICD X	cancer site	Observed	SIR, 90% CI			Observed	SIR, 90% CI		
C43	Skin melanoma	1280	1.24	1.18	1.29	1285	1.14	1.08	1.19
C50	Breast	117	0.98	0.84	1.14	14387	1.08	1.07	1.1
C82-85,96	Non-Hodgkin lymphoma	1926	1.06	1.02	1.1	1866	1.07	1.03	1.11

SIR: Standardized Incidence Ratio, 90% CI: 90% Confidence Interval.

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BREAST CANCER, MELANOMA AND NON-HODGKIN LYMPHOMA

Methods

- **The presence of PCBs was documented in 8 out of 18 NPCSs, in different environmental matrices (air, soil, ground and surface water, biota). Human biomonitoring data and food monitoring data were also taken into consideration.**

- **Standardized Incidence Ratios (SIRs), together with their 90% confidence intervals, were computed for each NPCS and cancer site with reference to the time window 1996-2005.**

- **Reference rates were provided by the pool of Cancer Registries from Northern-Central Italy or from Southern-Central Italy (depending on the localization of the study area).**

NPCSs' INFORMATION

NPCSs	PLANTS/POLLUTION SOURCES	PCBS AND OTHER AGENTS DETECTED IN ENVIRONMENTAL MATRICES	PCBS - OTHER AGENTS	
			BIOMONITORING	FOOD
Brescia Caffaro	Chemical plants, landfill	As, PCBs, PCDDs, chlorobenzene, other solvents	PCDDs/PCDFs (serum)	PCBs (food of animal and vegetable origin) PCDDs/PCDFs (cattle's meat and milk, forage)
Fidenza	Chemical plants, urban and hazardous waste landfills	AS, PCBs, PCDDs, benzene		
Litorale Domizio Flegreo	Urban waste landfills, illegal dumping sites, illegal burning of waste	As, PCDDs, PCBs, benzene, others solvents	PCDDs/PCDFs (breast milk)	PCDDs/PCDFs (cow and buffalo's milk)
Laghi Mantova	Metallurgic plants, paper plants, petrochemical plant, harbour area, industrial waste landfills, incinerator (hazardous waste)	As, Cd, PCDDs, ethylbenzene, other solvents		PCBs (fruit, vegetables)
Priolo	Chemical plants, petrochemical plant, refinery, harbour area, asbestos, hazardous waste landfills	PCBs, hexachlorobenzene	PCDDs, PCBs, HCB (breast milk and puerperae hair)	Cd, Pb, Hg, PCDDs, organochlorine compounds (fish and other seafood)
Taranto	Refinery, steel plant, harbour area, cement plant, landfills, illegal dumping sites	As, Cd, benzene, xilene, PCDDs, PCBs	As, Cd, PCDDs, PCBs (serum)	PCBs, HCB, PAHs (clams), PCDDs, PCBs (sheep and cow's meat and milk, clams)
Terni-Papigno	Steel plant, hazardous waste landfills	PCBs		
Venezia (Porto Marghera)	Chemical plants, petrochemical plant, refinery, harbour area, illegal dumping sites	As, Cd, PCBs, PCDDs, solvents		As, Cd, PCDDs, PCDFs (shellfish)

NOTE: The agents listed in this table represent a fraction of all those detected or monitored in the NPCSs

Overall Standardized Incidence Ratios (SIRs) with 90% Confidence intervals (90% CI) between 1996-2005

NPCSs	*Breast*			*Melanoma*						*NHL*					
	females			males			females			males			females		
	N	SIR	CI (90%)	n	SIR	CI (90%)	n	SIR	CI (90%)	N	SIR	CI (90%)	N	SIR	CI (90%)
Brescia Caffaro	1187	125	120-132	98	127	106-150	100	119	100-140	136	114	99-132	151	125	109-143
Fidenza	403	102	94-111	28	86	61-118	30	86	62-116	45	80	61-102	64	122	98-150
Litorale Domizio Flegreo	1097	103	98-108	68	104	84-128	71	94	76-115	179	102	89-115	195	130	115-146
Laghi Mantova	472	113	105-122	37	111	83-146	37	102	76-134	62	119	95-147	56	104	83-130
Priolo	712	111	104-118	53	106	84-134	58	112	89-139	102	108	91-127	78	87	72-105
Taranto	497	145	134-156	55	225	178-282	46	152	117-195	58	142	113-176	40	98	74-128
Terni-Papigno	902	114	107-120	71	113	92-138	80	124	102-150	137	124	107-143	108	98	83-115
Venezia (Porto Marghera)	3045	110	107-114	283	125	113-138	263	111	100-123	343	95	87-104	373	105	96-114

Benedetti et al. ISEE 2016. *INCIDENCE OF BREAST, PROSTATE, TESTICULAR AND THYROID CANCER IN ITALIAN CONTAMINATED SITES WITH PRESENCE OF SUBSTANCES WITH ENDOCRINE DISTRUPTING PROPERTIES*

MAIN FINDINGS

- **A number of excesses in the incidence of neoplasms for which PCB exposure represents an ascertained (melanoma) or suspected (breast cancer, Non-Hodgkin Lymphomas) have been detected in several Contaminated Sites where the occurrence of PCB has been documented.**

Significantly increased SIRs were observed for:

Breast cancer (F)	**in 6 out of 8 NPCSs**
Melanoma (M)	**in 3 out of 8 NPCSs**
Melanoma (F)	**in 4 out of 8 NPCSs**
NHL (M)	**in 2 out of 8 NPCSs**
NHL (F)	**in 2 out of 8 NPCSs**

- **Excesses in melanoma incidence in both genders have been observed in Brescia, Porto Marghera and Taranto.**

Benedetti et al. ISEE 2016. *INCIDENCE OF BREAST, PROSTATE, TESTICULAR AND THYROID CANCER IN ITALIAN CONTAMINATED SITES WITH PRESENCE OF SUBSTANCES WITH ENDOCRINE DISTRUPTING PROPERTIES*

CONCLUDING REMARKS. 1

In light of the well-known limitations of geographic epidemiological studies, these figures do not provide causal clues, but rather suggest second generation studies, based on analytical epidemiological approaches. These studies should address firstly the risk of melanoma and, where appropriate/feasible, the risk of Non Hodgkin Lymphoma and breast cancer.

CONCLUDING REMARKS. 2

The role of contamination of the different environmental matrices should be better ascertained (where it has not yet been taken into account) through exposure and risk assessment studies.

CONCLUDING REMARKS. 3

Both exposure assessment and analytic epidemiological approaches have been adopted in the context of Brescia.

CONCLUDING REMARKS. 4

With specific reference to melanoma, for which there is sufficient evidence of a causal role of PCB exposure (IARC Monograph 107, 2016), the aim of these studies is not to re-assess the carcinogenic risk of PCBs to humans, but rather to estimate the health impact of PCB exposure in specific contexts, if feasible, taking into account issues such as latency time, statistical power and specific exposure pathways in the context at study.

CONCLUDING REMARKS. 5

The public health priority in contaminated sites is to pursue environmental clean-up. In this frame, epidemiological surveillance can be a valid tool for documenting reduction of exposure levels over time and, possibly, reduction in the incidence of diseases causally associated to the contaminant agents that characterize the sites of study.