



Istituto Superiore di Sanità

# The Italian National Radon Action Plan: some results and perspectives



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# Introduction

- The protection of population and workers from the health risk due to exposure to ionizing radiation emitted from inhaled radon and its decay products requires many different actions and involves many different institutions, both national and local ones.
- Radon is an issue that involves several aspects: radioprotection, building regulations and codes, health issues connected to smoke, geology, etc.
- In order to optimize the protection, it is necessary to set up a **national program to coordinate all the required actions.**
- A national strategy is particularly important for countries with a federal organization (Italy has a federal approach as regards health organization).

# The Italian National Radon Action Plan (INRAP)

- The **National Radon Program in Italy** was prepared by a group of experts set up by the **Ministry of Health** between 2000 and 2002.
- The working group included experts from national and regional institutes and authorities related to the radon issue.
- The Istituto Superiore di Sanità (the **Italian National Institute of Health**) was asked by the Ministry of Health to **coordinate** (since 2005) the implementation of the INRAP.

# National Radon Action Plans

Since 2009 a **NRAP is recommended by the WHO and now it is also required by the recently published EU-BSS** (European Basic Safety Standard) Directive:

According to the 2013/59/Euratom NRAP has to include several issues, e.g.:

- strategy for conducting radon survey,
- strategy for reducing radon exposure in dwellings
- strategy for facilitating post construction remedial action and to introduce preventive measures in new buildings
- assignment of responsibilities and coordination mechanisms

The NRAP has to be updated on a regular basis.

## **NRAP is a useful tool to:**

- Program and realize (in a coordinate way) **actions to reduce health risk** due to radon exposure
- correctly (and periodically) **evaluate the efficiency of these actions** and, when necessary, to **improve their cost-effectiveness.**

# Activities of the Italian National Radon Action Plan (INRAP)

- ✧ **Radon National Coordination Group**
- ✧ **National Radon Archive (NRA)**
- ✧ Design and realization of **radon surveys** at national and regional level **using a common approach**
- ✧ Evaluation of the **health risks due to radon exposure**
- ✧ Elaboration of proposals for **radon regulations**
- ✧ Improve radon **awareness** of population and develop **training** of professionals



# Radon National Coordination Group (RNCG)



- ✧ RNCG is coordinated by the Italian National Institute of Health, and its role is to coordinate and harmonize the activities carried out by different institutions and in different Regions.
- ✧ It includes **representatives from all the 21 Italian Regions** as well as representatives from public national institutes and ministries involved in radon issues.
  - ✧ For each Italian Region, there are two representatives: one with a technical role from Environmental Regional Agencies and one with a management role from the Regional Departments of Health or Environment.

# The National Radon Archive (NRA)

The **National Radon Archive** was set-up to collect data useful to evaluate the effectiveness of radon policy and to plan future actions.

Since 2008 it has been organized and maintained by the *Italian Institute of Health*, in collaboration with other regional and national institutions.

In particular, NRA contains information and data on:

- ✧ Radon surveys in dwellings, schools and workplaces
  - ✧ the NRA includes radon concentration **measurements** and all the **relevant building type characteristics** in order to identify which are the main factors that may influence radon entrance in buildings.
- ✧ Remedial actions
- ✧ Training courses and information activities
- ✧ Local regulations and guidelines

# Regional radon surveys

Since, in the past, several regional surveys were carried out with different designs (→ results are not easily comparable with each other), in the framework of the INRP **a protocol to harmonize survey design and data analysis has been developed.**

**Several regional radon surveys were performed using such common approach.** Several objectives have been reached, such as the estimate of radon distribution representative of the population and a first (or updated) identification of radon-prone areas.

In particular, **representative estimates of radon distribution**, e.g. of the number of dwellings and workplaces with radon concentration above possible reference levels, **are particularly important** to optimize the search of such dwellings and to optimize regulation, e.g. the choice of national reference levels.



# Radon surveys in Italy

## (data from NRA)

### Radon surveys in dwellings, workplaces and schools

Italian macro area	Dwellings		Workplaces		Schools
	National	Regional or sub regional	National	Regional or sub regional	Regional or sub regional
North-West	2 794	4 715	848	1 510	1 208
North-East	2 354	9 626	559	1 223	4 974
Center	2 045	9 082	557	1 226	855
South and islands	3 669	1 995	1 199	411	1 251
<b>Total</b>	<b>10 862</b>	<b>25 418</b>	<b>3 163</b>	<b>4 370</b>	<b>8 288</b>

Data refers to the situation up to 2013 and are reported for each Italian macro area as defined by the Italian Institute of Statistics

Two **nationwide surveys in dwellings** were organized. The first one was carried out in the '90s. The second was performed in the period 2010–2012 (data analysis is on-going).

The number of **nationwide surveys in workplaces** is 3 (2 carried out in underground workplaces and 1 in above ground workplaces).

# Evaluation of the health risks due to radon

The **annual number of lung cancers attributable to radon** exposure was calculated for the whole country and for each Region.

	Males	Females	Total
Current smokers	1860	433	2293
Former smokers	620	89	709
Never smokers	112	212	324
<b>Total</b>	<b>2592</b>	<b>734</b>	<b>3326</b>

- The overall fraction of lung cancer deaths attributable to radon in Italy is about 10%, with values in individual Regions ranging from 4% to 16%.
- The greater part of the lung cancers attributable to radon is estimated to occur among current smokers for both males and females (72% and 60%, respectively).

# Proposals for radon regulations

A coordinated system of regulations, recommendations and guidelines is needed for addressing the radon problem.

Since 2000, in Italy there is a regulation for radon in workplaces, but no national regulation on radon in dwellings.

- ❖ Action Level = 500 Bq/m<sup>3</sup> (EU recommended 500–1000)

INRAP include the preparation of proposals for a national regulation on radon in dwellings and an update of the regulation on radon in workplaces (taking into account the new Eu-BSS Directive which include new requirements both workplaces and dwellings).

# Regulations: preventive measures in new buildings

A “**Recommendation for the introduction of radon preventive measures in all the new buildings**” was approved on 2009 by the RNCG (the Italian Radon National Coordination Group).

It **recommends to include** in the building regulations **simple and inexpensive preventive measures** in order to reduce the radon entry in **ALL the new buildings** (as well as **in existing buildings in case of relevant renovations**).

Several Regions have already adopted this Recommendation in their building regulations.

# Remedial actions in buildings

(data from NRA)

**Radon remedial actions** (completed, in progress and planned), **designed and coordinated by public institutions**, in dwellings, schools and other different type of rooms. (*Last update: end of 2013*).

	Completed	In progress	Planned	Total
Dwellings	85	2		87
Schools	162	36	64	262
Other (offices, etc.)	48	2		50
Total	295	40	64	399

Overall, a total of about 300 buildings have been “remediated”, mostly schools and workplaces, for which the Italian legislation requires remedial actions in case of radon concentration higher than the action level of 500 Bq m<sup>-3</sup>.

# How to improve the INRAP

A **new Italian National Radon Action Plan will be developed** in order to take into account the new European Directive

→ **The discussion is already started**

The new INRAP will take into account the experiences of the present INRAP (both negative and positive) and of other Countries.

- ✧ Since Italy has a federal organization regarding health policies, a key point for an effective radon program was the national coordination of the many activities carried out by the local and the regional institutions and authorities.
- ✧ Despite the effort spent to identify radon-prone areas (**high number of measurements**), a **small number of remedial actions has been carried out** up to now.
- ✧ Collaboration with institutions involved in **smoke cessation** (and **energy saving**) can play an important role (as recommended by WHO and EC) and will be part of future activities in Italy.

**Thank you for your attention**