



# Results of analysis of MetroRADON questionnaire data on indoor radon surveys

European Radon Week 2020, MetroRADON workshop

*Carpentieri C., Trevisi R., Cinelli G.*

# Key question



**Are existing indoor radon measurement procedures\* in different surveys comparable in Europe?**



**\*include rationale, design, measurement methods, data analysis etc.**

# A questionnaire for answering

**Main objective:** get information from indoor radon surveys

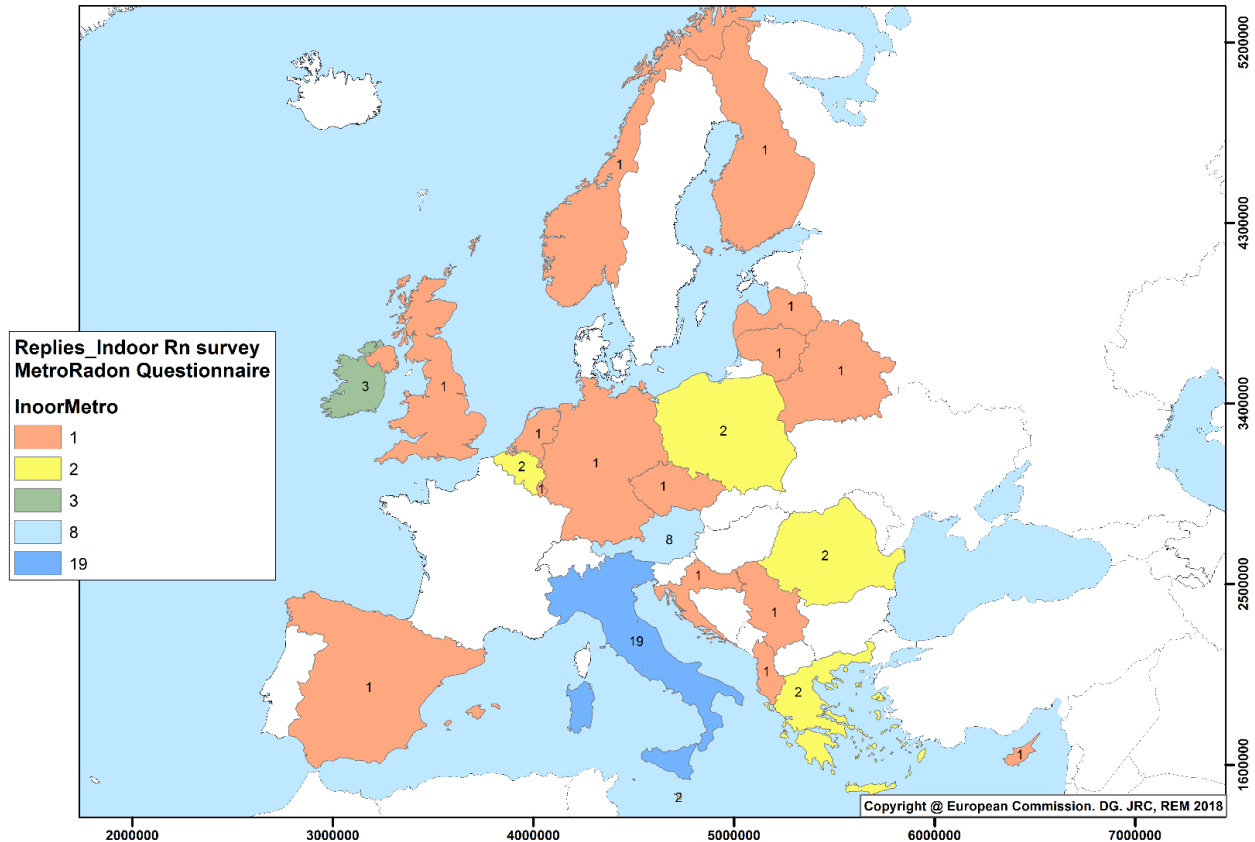
The questionnaire has been addressed to all European institutions working on this field:

- national authorities;
- regional administrations;
- universities;
- research centres;

**We asked to fill a questionnaire for each survey**

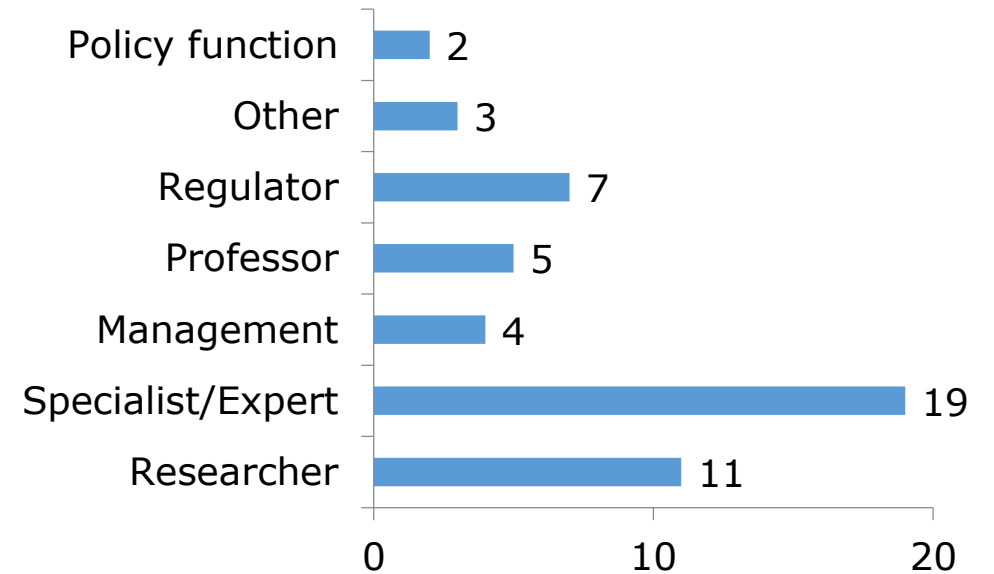
# A questionnaire for answering

- December 2017 and July 2018
- 56 replies from 24 countries



Source:  
European Commission, Joint Research Centre (JRC),  
Directorate G - Nuclear Safety & Security, REM project

## Role of the respondent



# A questionnaire for answering

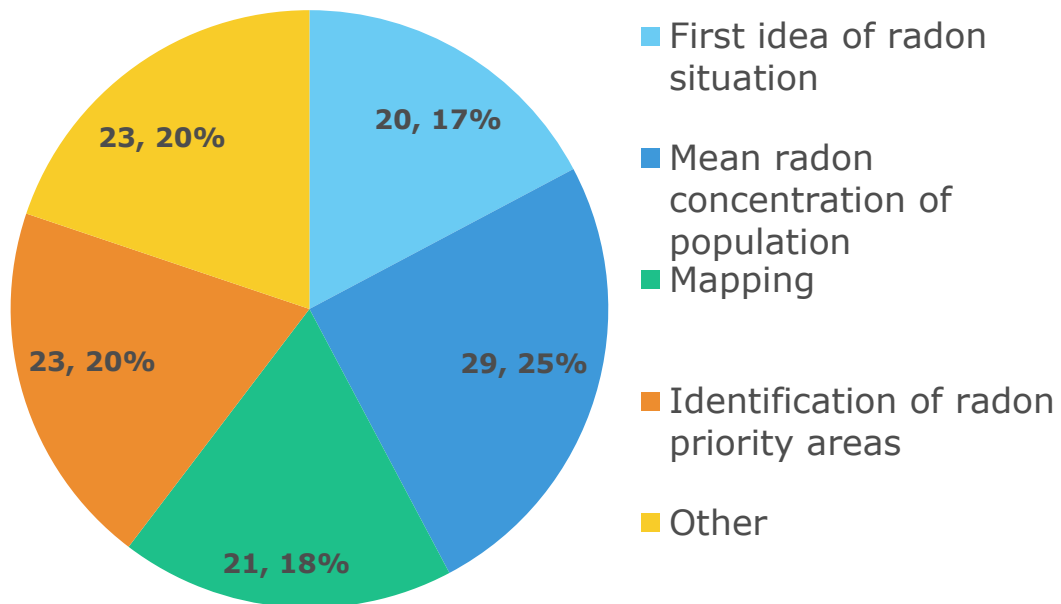
Focus on **3 main topics (sections of the questionnaires)** for answering our key question:

- Introduction
- 1) Characteristics of indoor radon surveys - design
- 2) Measurements methods
- 3) Data management, statistical treatment, aggregate and mapping
- Policy on Indoor Radon

# Characteristics of indoor radon surveys - Design

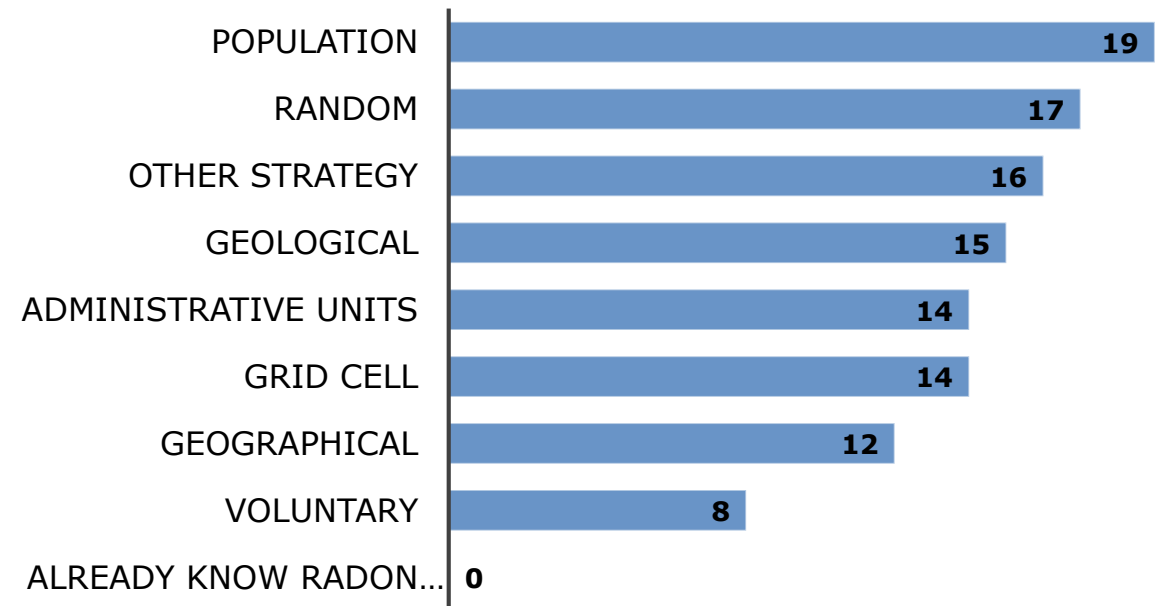


Please select the main purpose of the survey:



- More than 60% of surveys have more than one purpose
- Among other: risk assessment of workers and limited target population

Please select the main sampling strategy on which the survey was based:

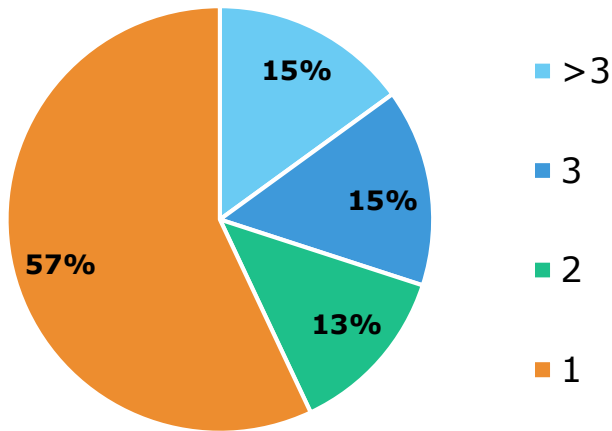


# Characteristics of indoor radon surveys - Design

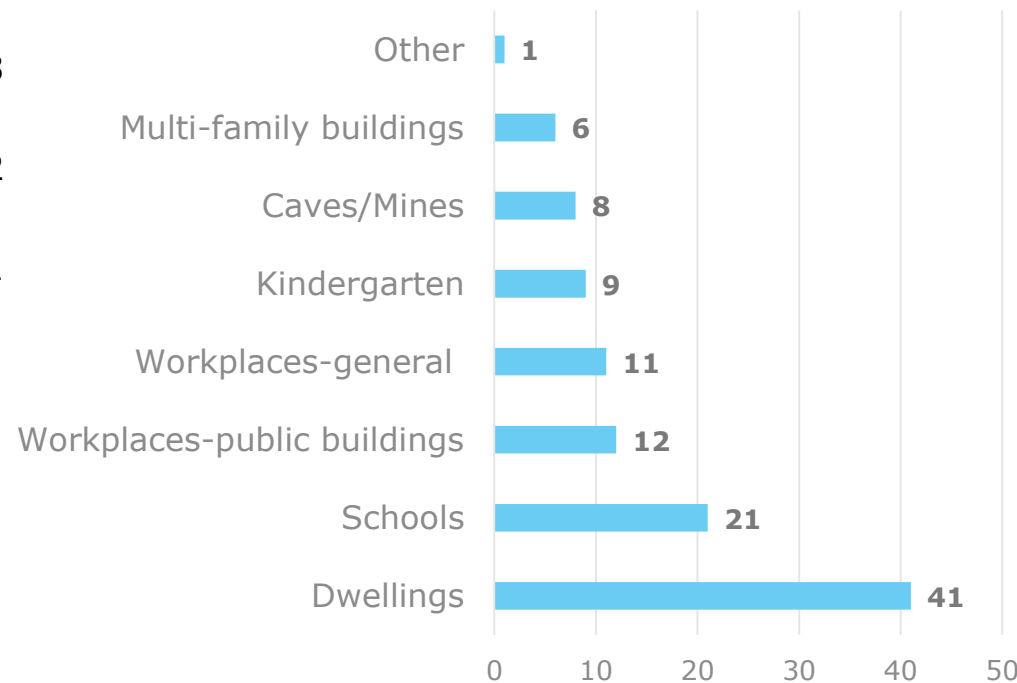


Which building types have you considered in your survey:

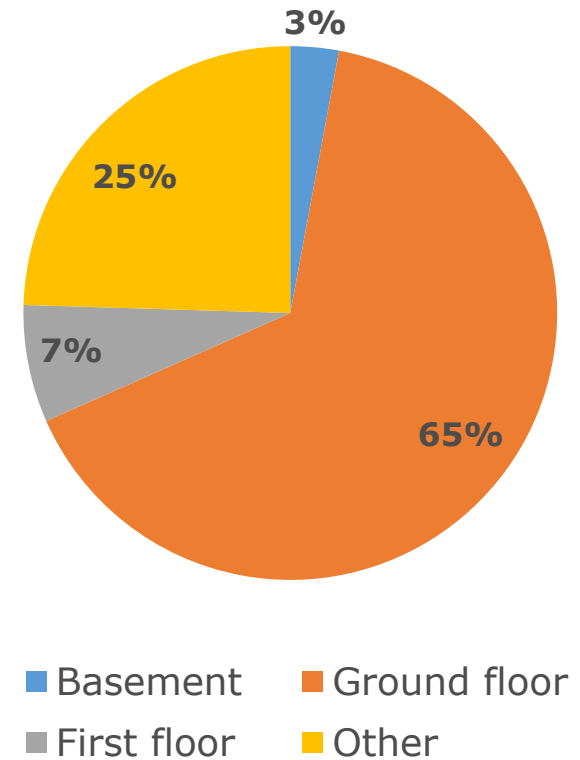
Number of building types considered in surveys



Surveys in which the following building types were considered:



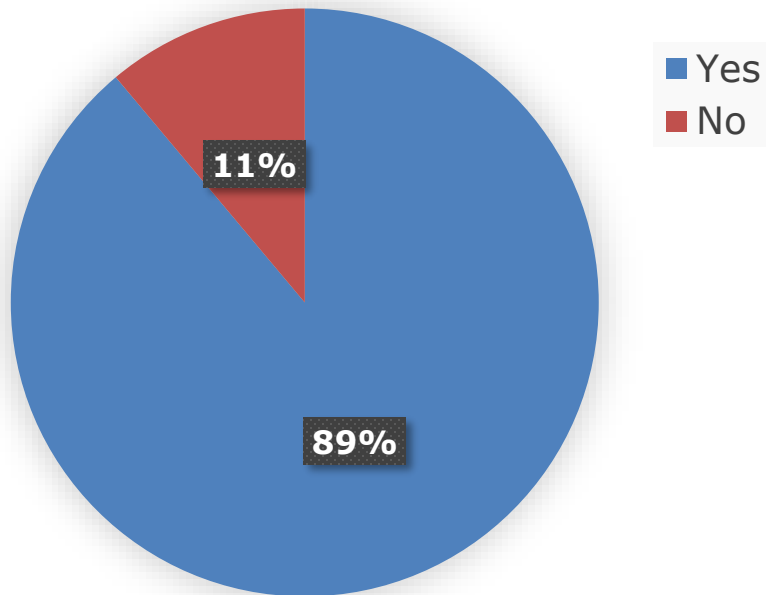
Preferred measurements location in dwellings



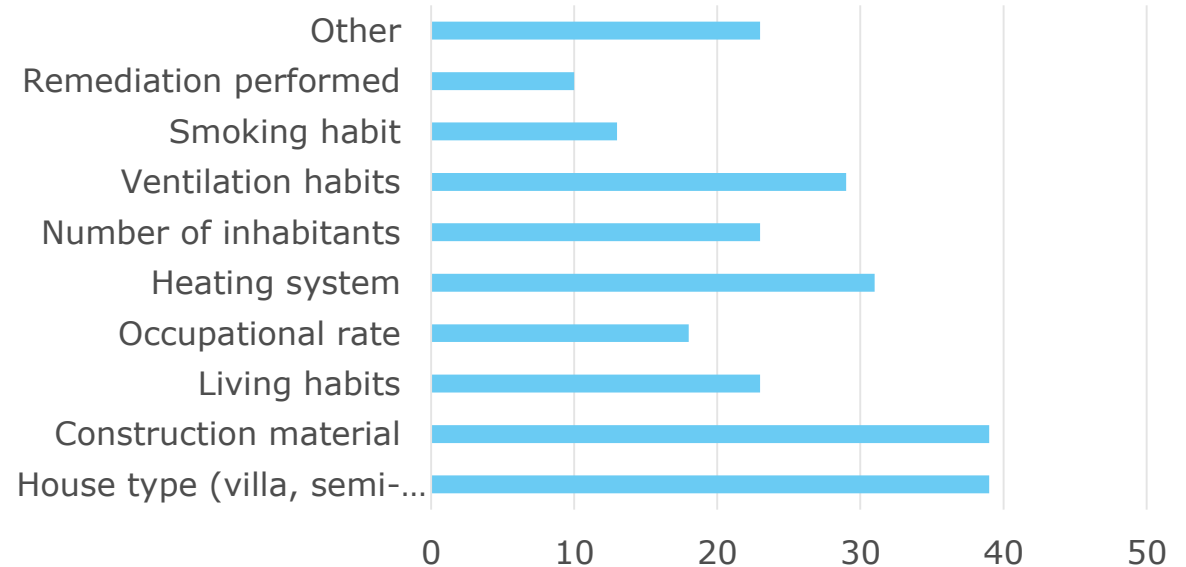
# Characteristics of indoor radon surveys - Design



Have you collected information about the measurement site through a questionnaire?



Description of the content of questionnaire



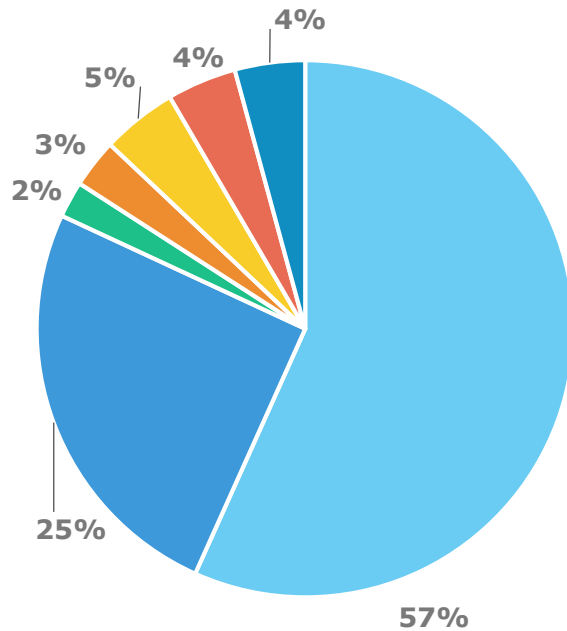


# Measurements methods

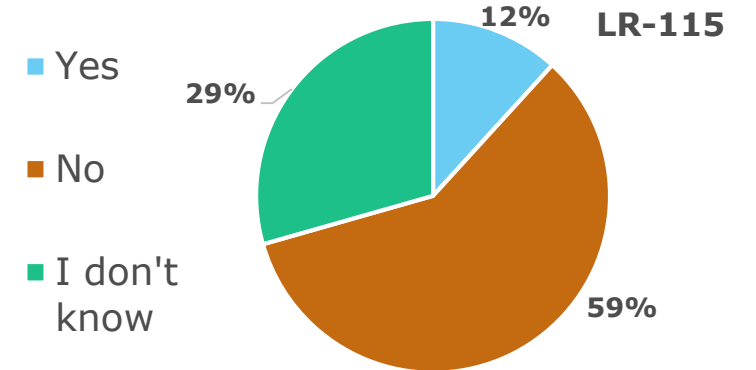
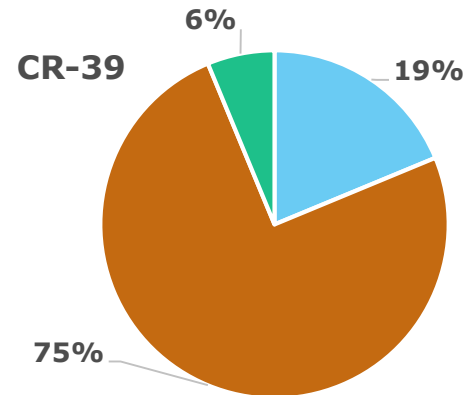


## Detectors used in the surveys

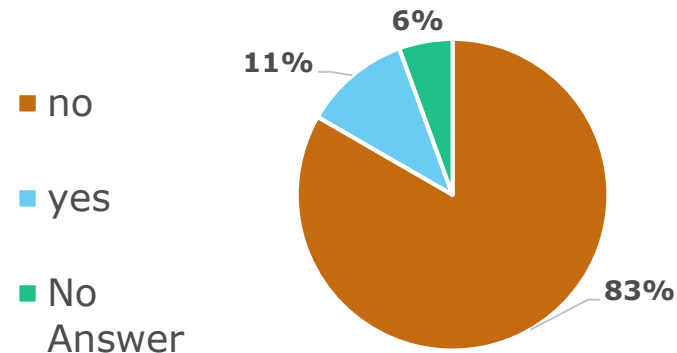
- Track etch CR-39
- Track etch LR-115
- Charcoal/gamma spectrometry
- Charcoal/LSC
- Electret
- Active
- Other



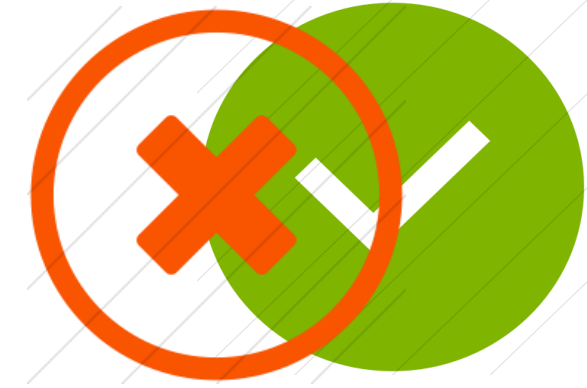
## Are the detectors you used sensitive to thoron?



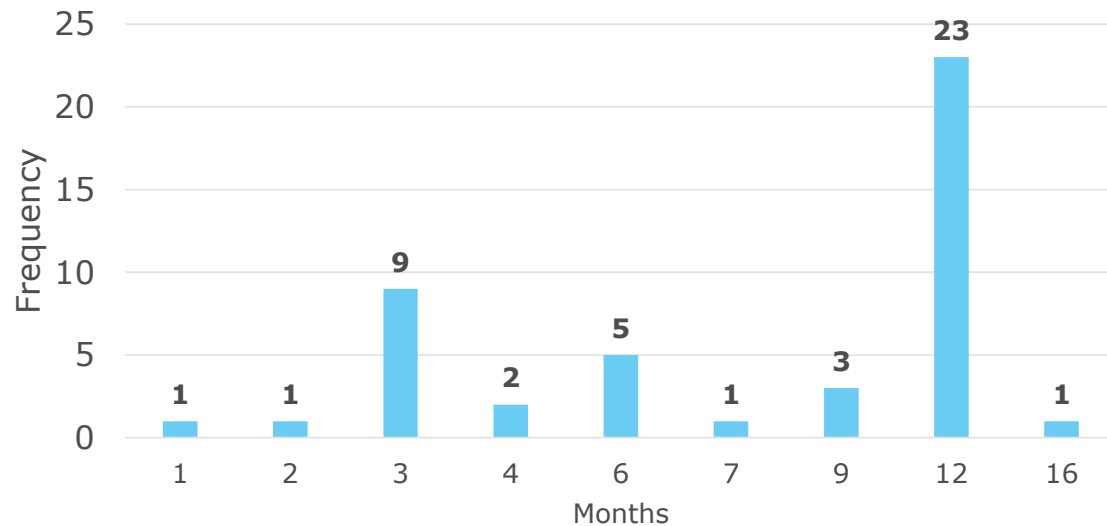
## Has thoron been measured



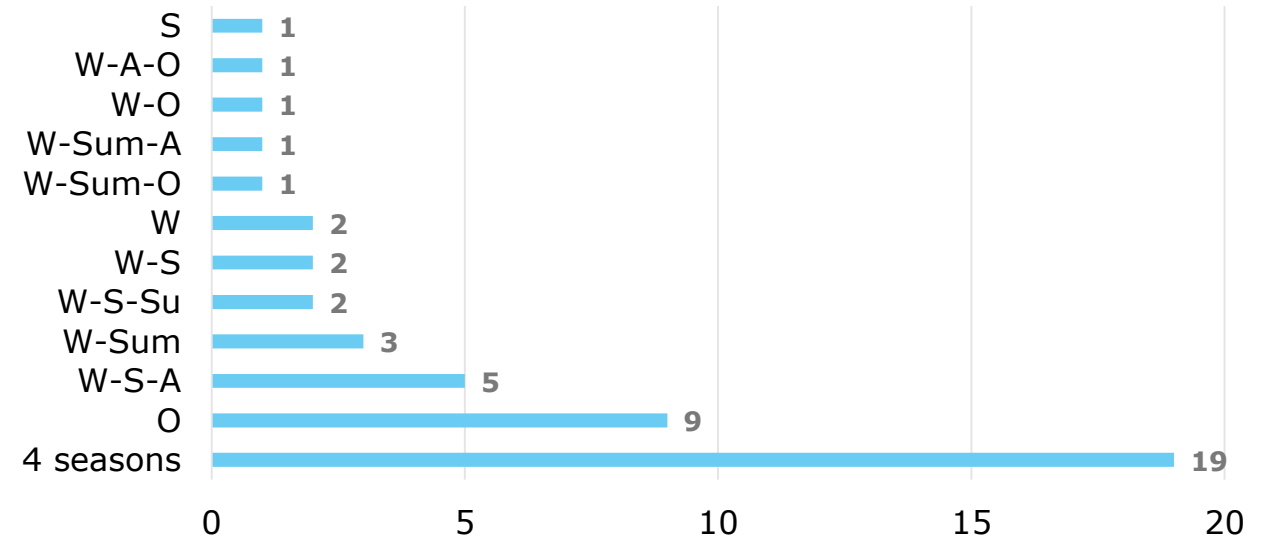
# Measurements methods



**Duration of measurements performed with SSNTD (CR-39, LR-115 and Makrofol)**



**Measurement seasons**



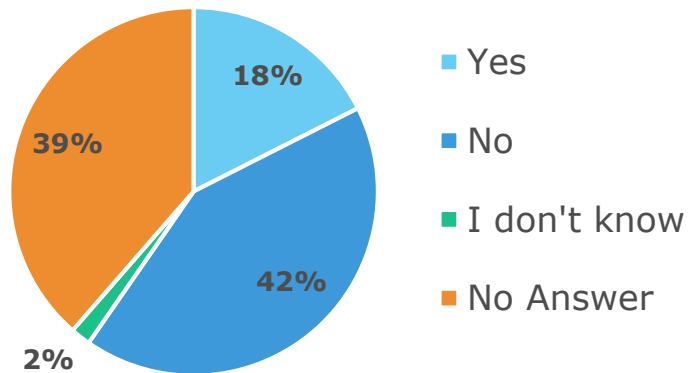
- 25 respondents (44%) performed 1-year measurements (indicating the 4 seasons or specifying it in other).
- In the other cases, measurements were performed mostly during the winter but often covered more than one season.

# Data management, statistical treatment, aggregate and mapping

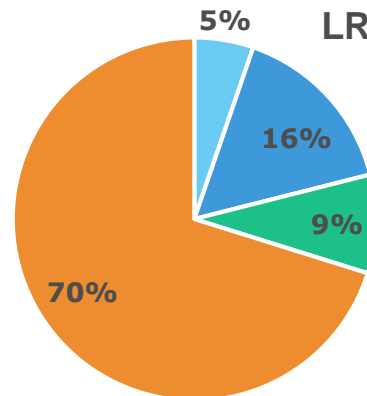


## Have you applied seasonal correction?

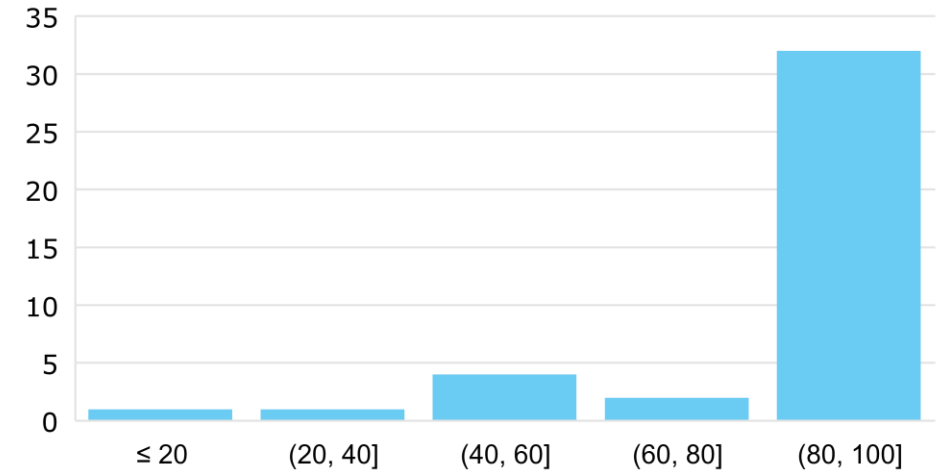
CR39



LR115

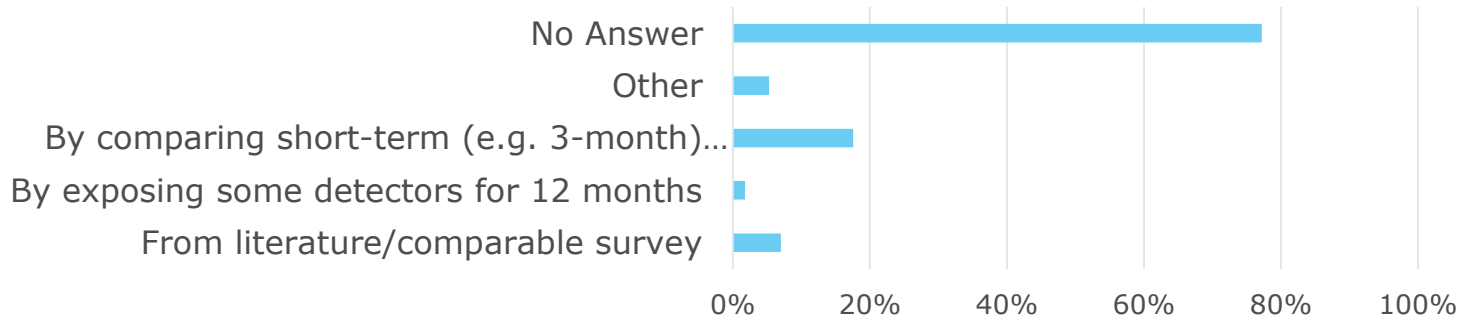


## Return rate %



Replies from more than 70% of respondents

## How the seasonal correction factor has been applied?

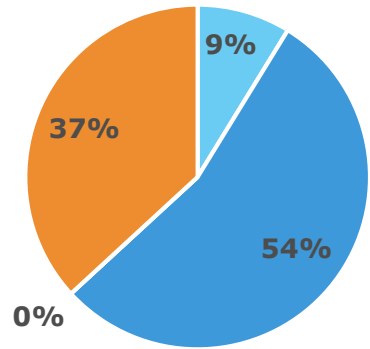


# Data management, statistical treatment, aggregate and mapping



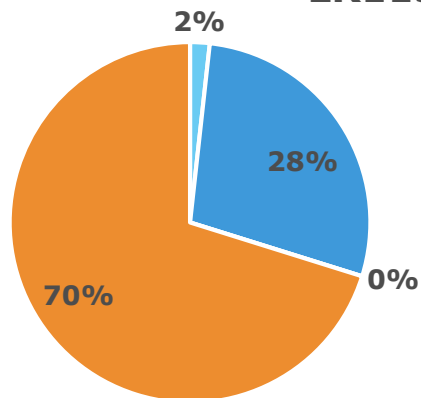
**Have you applied any correction linked to building characteristics, in particular floor level?**

**CR39**



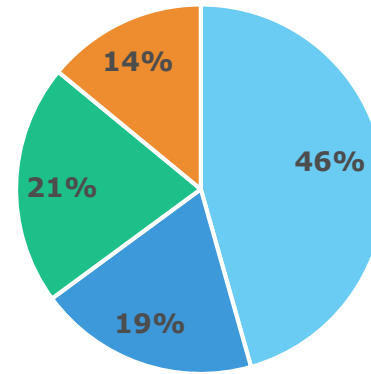
- Yes
- No
- I don't know
- No Answer

**LR115**



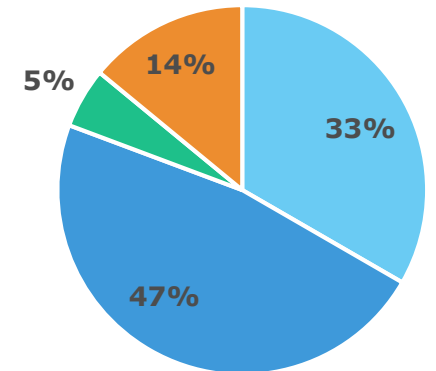
**Please indicate how data from the survey were aggregated:**

Simply target descriptive statistics of raw data



- Yes
- No
- I don't know
- No Answer

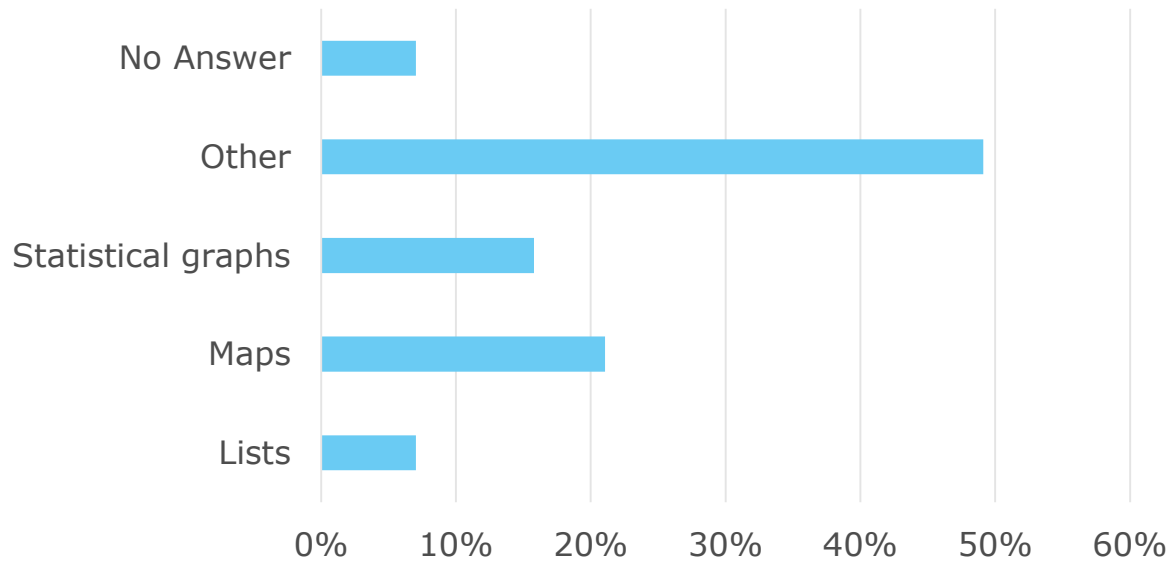
Modelling of raw data (standard house, spatial models - kriging, average within municipality, etc.)



# Data management, statistical treatment, aggregate and mapping



**Please indicate how data are presented to the population/authority**



## Other

- Direct communication (result letter) to the responsible of the administrative buildings, kindergartens, schools
- Result letter/single report to all households;
- Reports and scientific papers
- Reports for authorities
- Maps of web sites

# Key question



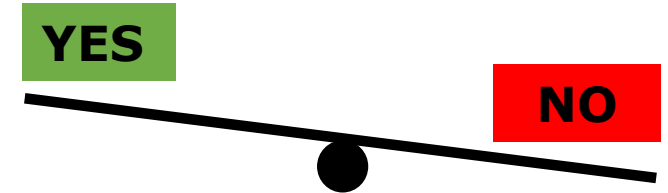
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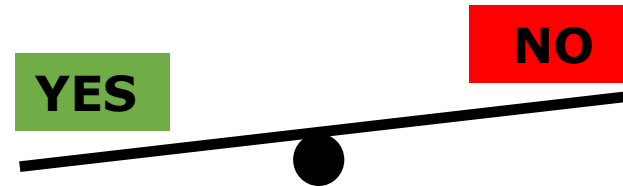
**\*include rationale, design, measurement methods, data analysis etc.**

# Conclusions

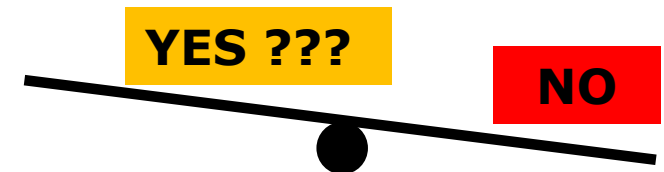
1. Characteristics of indoor radon surveys – design



2. Measurements methods



3. Data management, statistical treatment, aggregate and mapping



# Conclusions

**The detailed analysis of all the replies is presented in a report available on the MetroRADON website: [metroradon.eu](http://metroradon.eu)**





# Keep in touch



EU Science Hub: [ec.europa.eu/jrc](https://ec.europa.eu/jrc)



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# Thank you



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