

Indoor and outdoor radon levels in Iceland

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Outlines

- Short history of radon measurements in Iceland
- Survey with Alpha track radon detectors
- Continuous radon measurements with the Autoradon system
- Conclusion/discussion



Short history of radon measurements in Iceland

- First done in 1906
- Mostly been done in geological research
- Two research that we found interesting before our survey
 - Natural Radiation in Iceland and the Faroe Islands (1982)
 - Indoor radon levels in Iceland. (2004)



Natural Radiation in Iceland and the Faroe Islands (1982)

Ennow K.R., Magnússon S.M.

- Measured 18 basements in Iceland
- Showed low radon levels
 - Average of 11 Bq³/m³
 - Highest value 26 Bq³/m³

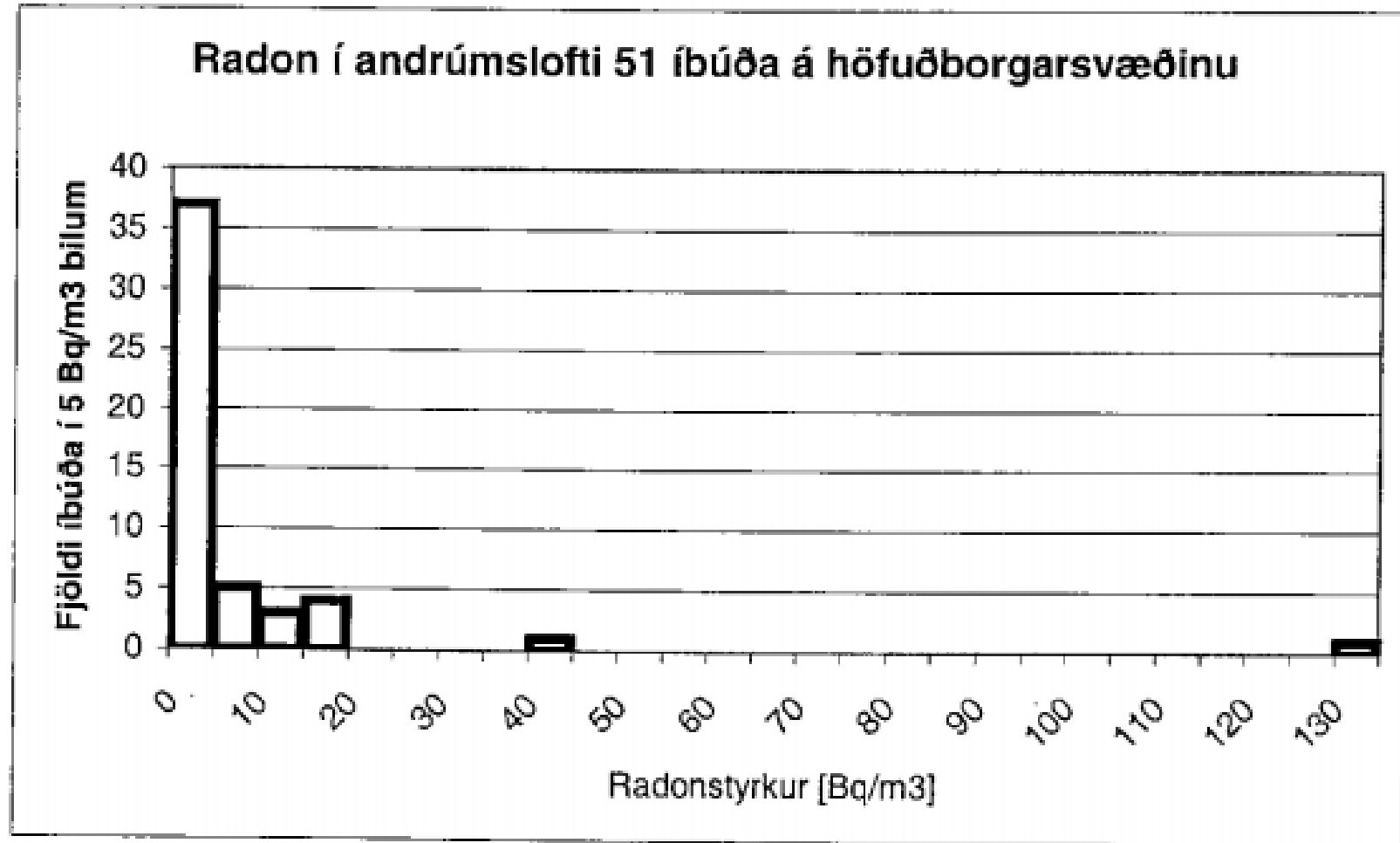


Indoor radon levels in Iceland (2004)

- Small study, focused on the method
- Study from 51 apartments in the capital area
- The results showed again low radon levels, with a mean of 4.7 Bq/m³ and median 2.8 Bq/m³



Indoor radon levels in Iceland (2004)

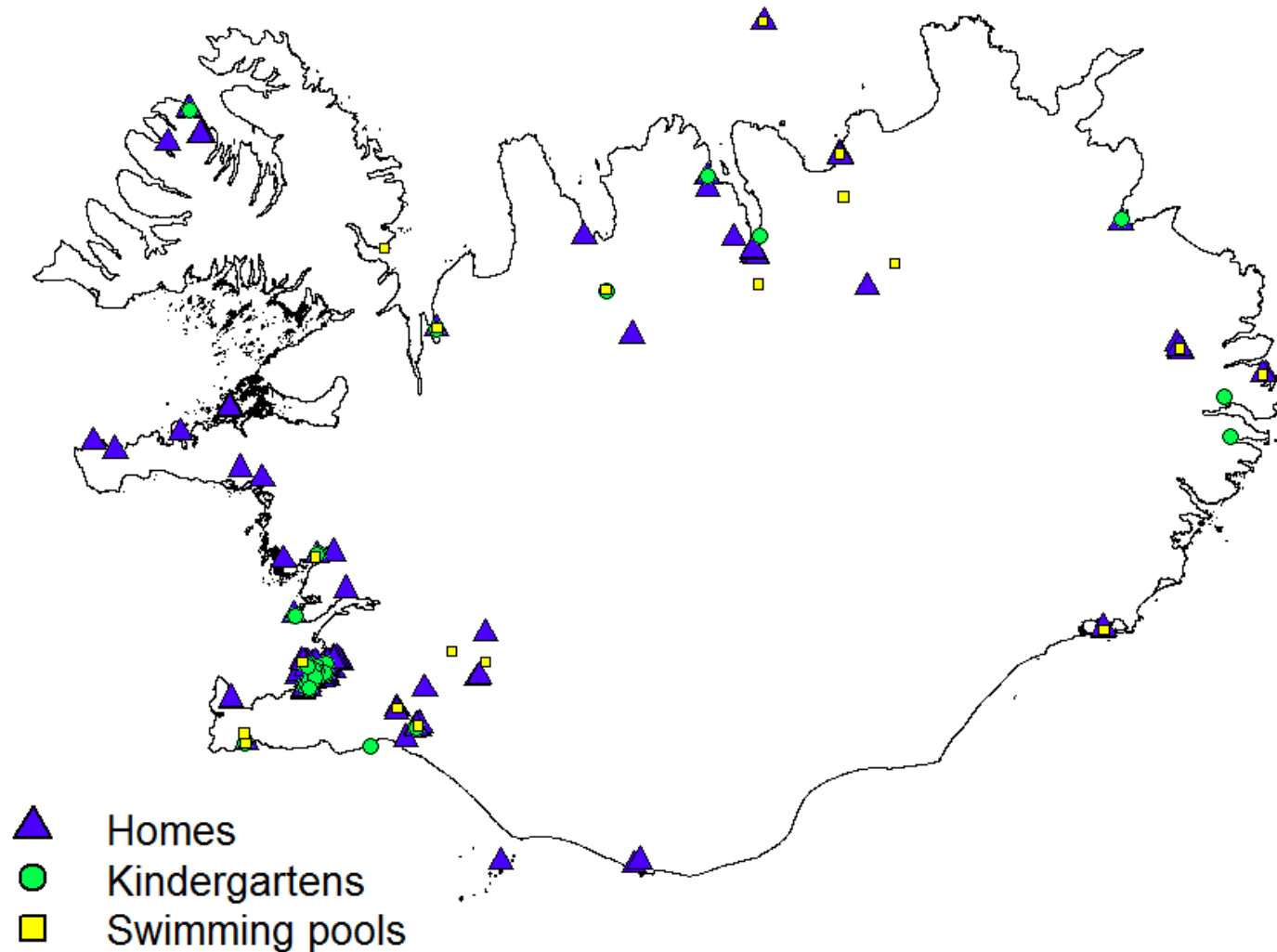


Method – Etch track detectors

- Etch track detectors from Radosys
- Around 12 months sampling period, because of low radons levels. Achiving lower limit of detection (LLD) of 7 Bq/m³
- Volunteers were sought (not randomly selected)
- Were placed in homes, kindergartens and public swimming pools
- Placed in basements or ground floor



Method – Sampling locations

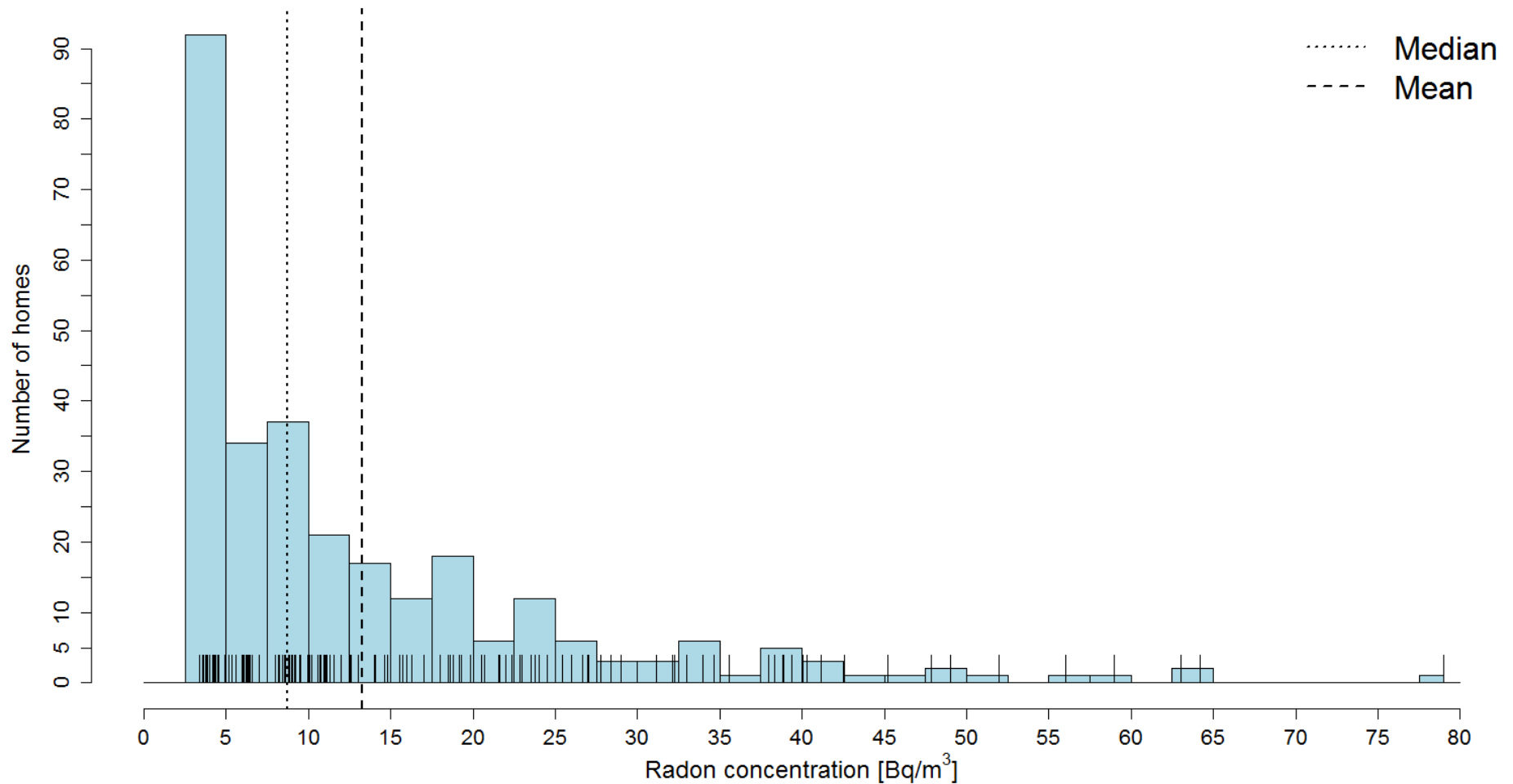


Results – etch track

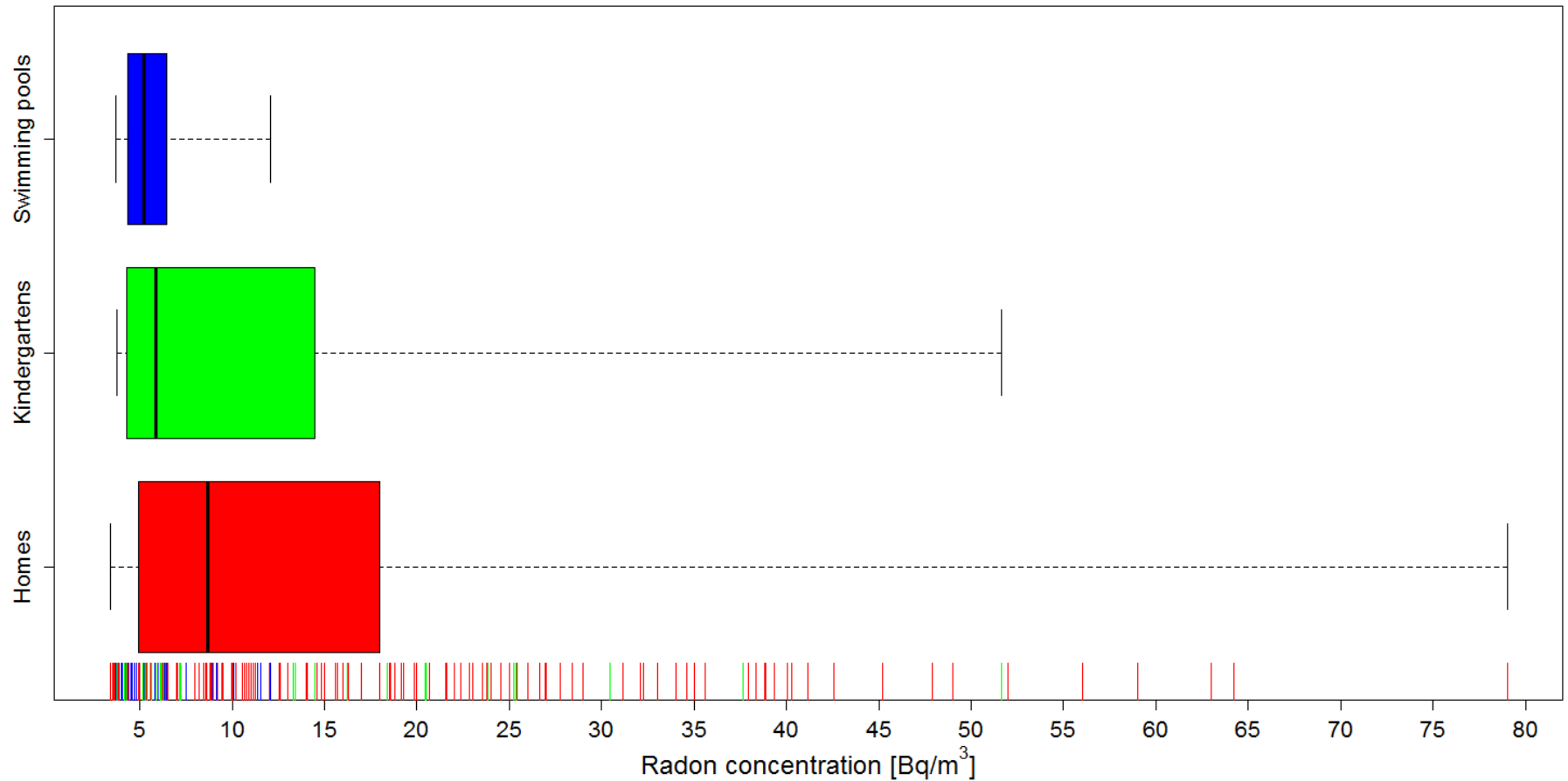
- Radon levels in homes (from 250 homes):
 - Mean 13 Bq/m³ and median 9 Bq/m³
- Radon levels in kindergardens (from 31 kindergardens):
 - Mean 11 Bq/m³ and median 6 Bq/m³
- Radon levels in public swimming pools (from 19 swimming pools):
 - Mean 6 Bq/m³ and median 5 Bq/m³



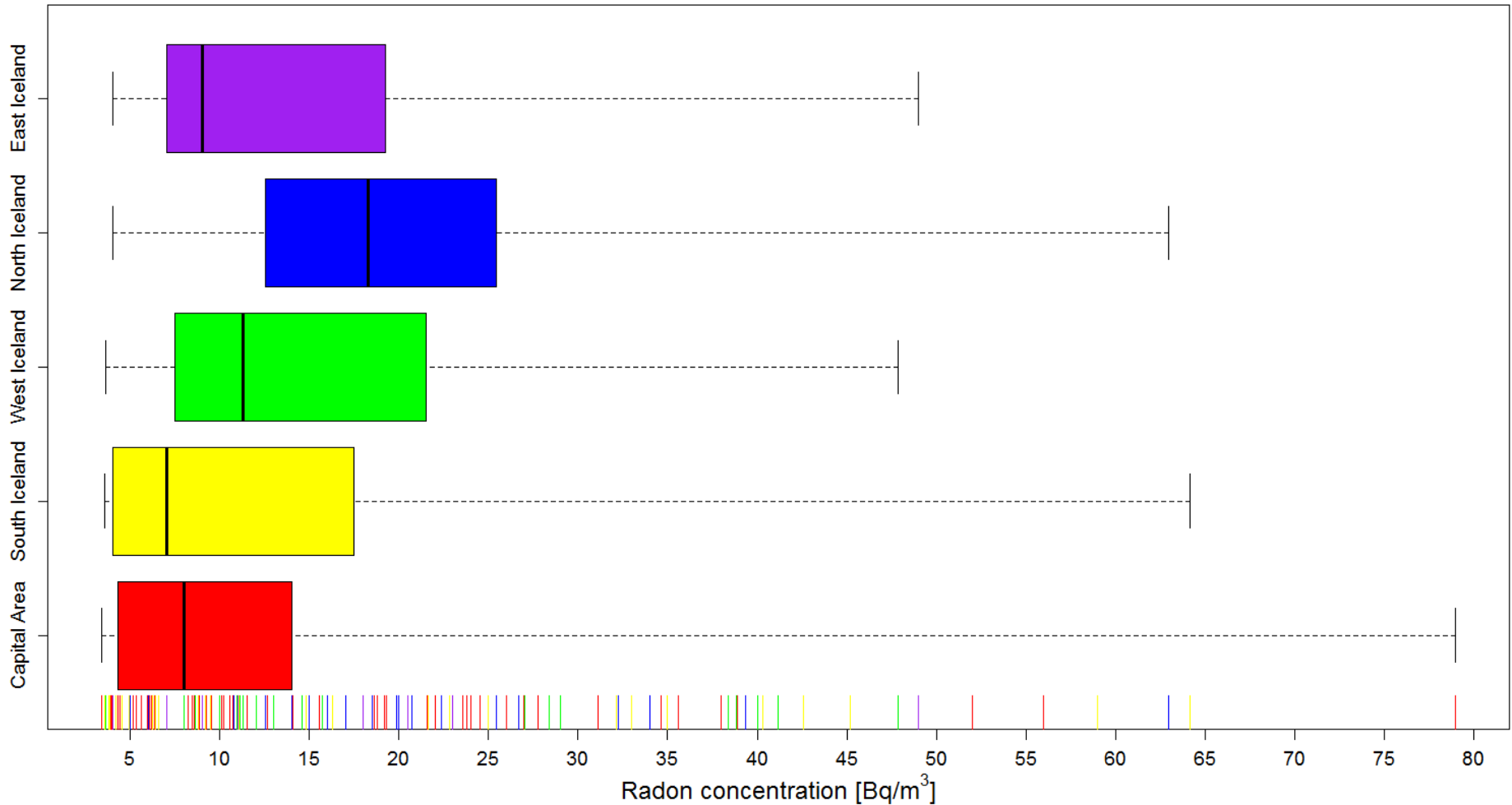
Results – Etch track



Results – Etch track



Results – Etch track



Method – Autoradon system

- Liquid scintillation system (15 ml)
- Continuously pumps air through the scintillator
- Continuous measurement (1 hour interval)
- Uses Po-214 counting
- Background: 6 counts/24 hour in a 5 cm lead shield
- The LLD of the system is 0.9 Bq/m^3 for 24 hour measurements
- Two system measuring indoor and outdoor radon levels



Method – Autoradon system

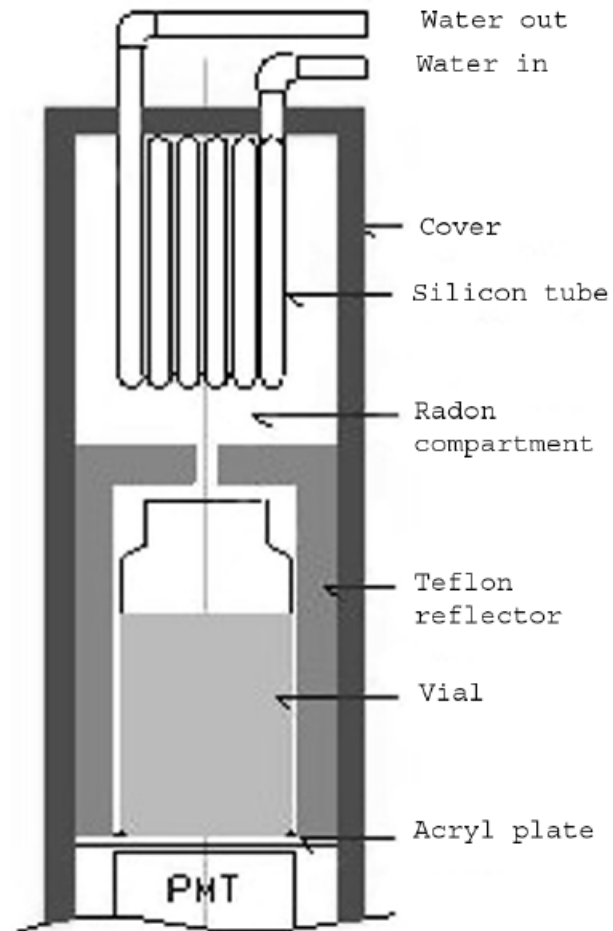


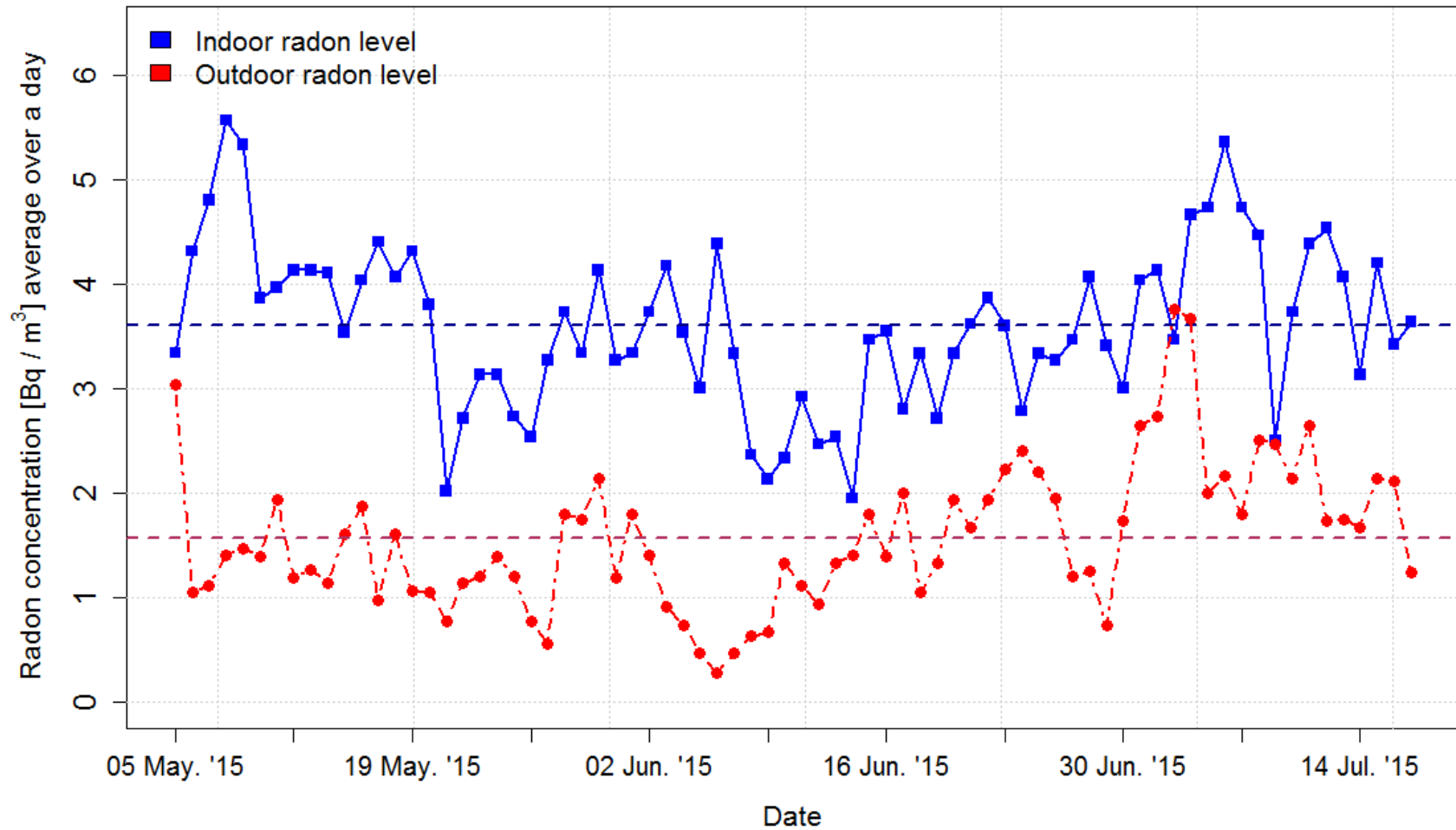
Figure 1 Scheme of the detector unit

Results – Autoradon

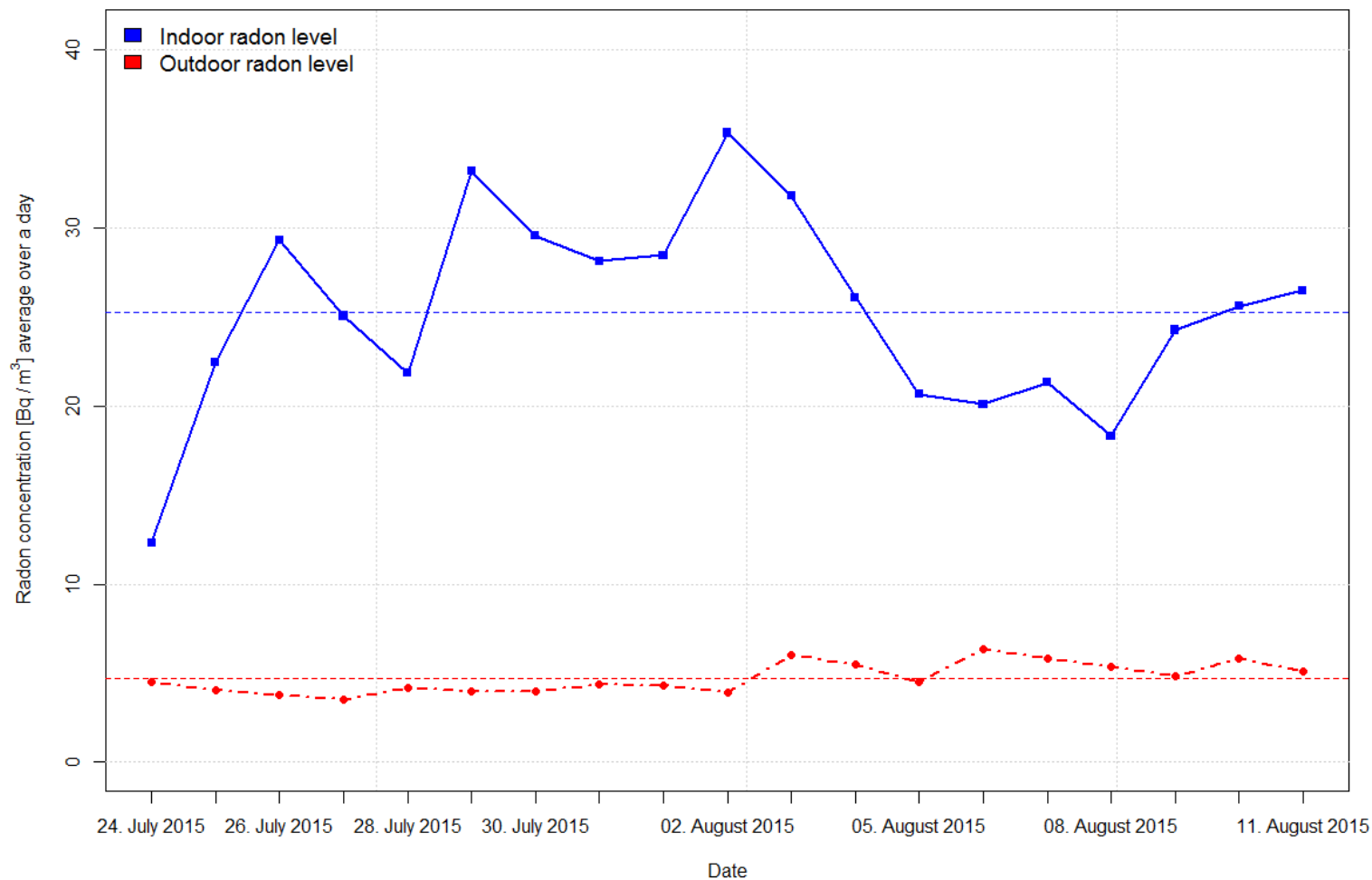
- Radon levels from early May to mid-July
 - Mean radon level indoor, 3.6 Bq/m³
 - Mean radon level outdoor, 1.6 Bq/m³
- We did not see any noticeable variation within the day or the week



Results – Autoradon



Results – Autoradon



Conclusion

- Our measurements show very low radon levels in Iceland
- Based on our survey we made a conservative estimate of a 0.2 mSv/year dose to the public from radon in Iceland
- radon is not a health concern in Icelandic homes or workplaces



Thank you for listening

See conference proceeding for further information
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