## Appendix

*Table A1: Controlled campaigns included in systematic review.*

| Authors (year) | Setting | Campaign objectives, channels and theoretical model used | Target behavior and determinants | Evaluation | Process evaluation | Communication material available for the analysis |
| --- | --- | --- | --- | --- | --- | --- |
| Butler et al. (2019); Hahn, Huntington-Moskos et al. (2019); Hahn, Rayens, Kercsmar, Adkins, et al. (2014); Hahn, Wiggins, et al. (2019) | Kentucky, United States  Radon-prone: Yes  Participants: Homeowners | To test a personalized report-back intervention based on testing results  **Channel**: Direct communication  Model: Precaution Adoption Process Model | Target behavior:   * Testing (+) * Intention to mitigate (+)\* * Stage of action (+)\*   Determinants:   * Risk perception (+)\* * Self-efficacy (+)\* | Pre-measure  Post-measure  Control group  Random assignment | / | No |
| Gold et al. (2018) | Iowa, United States  Radon-prone: Unclear  Participants: Adults | To investigate whether risk messages relevant to smokers (high-risk) have an unintended impact on non-smokers  **Channel**: Brochures  Model: / | Target behavior:   * intention to test (+)\*   Determinants:   * Concern (+)\* * Perceived susceptibility (+)\* | Post-measure  Control group  Random assignment | / | Yes |
| Kim et al. (2020) | North Dakota, United States  Radon-prone: Yes  Participants: Students | To increase radon knowledge and testing with a radon-education app for smartphones  **Channel**: Application, social media  Model: Protection Motivation Theory (implicit) | Target behavior:   * Intention to test (+) * Increase testing (+)   Determinants:   * Attitudes (+)\* * Knowledge (+)\* * Self-efficacy (+)\* * Perceived severity (+) * Perceived susceptibility (+) * Response efficacy (+)\* | Pre-measure  Post-measure | / | Partially |
| LaTour and Tanner (2003) | Karst region, United States  Radon-prone: Yes  Participants: Adults | To stimulate information inquiries due to high threat message in public service announcement on television  **Channel**: Video/television  Model: Protection Motivation Theory | Target behavior:   * Information requests (+)\* * Intention to test   Determinants:   * Attitudes (+)\* * Self-efficacy (+)\* * Perceived susceptibility (+)\* * Tension, arousal (fear) (+)\* | Post-measure  Control group  Random assignment | / | Yes |
| Niemeyer and Keller (1999) | Nebraska, United States  Radon-prone: Unclear  Participants: Female homeowners | To determine the effectiveness of an informational publication on knowledge, attitudes and intention to act  **Channel**: Brochures  Model: / | Target behavior:   * Intention to test (+)\*   Determinants:   * Attitudes (+)\* * Knowledge (+)\* * Risk perception (+)\* * Perceived susceptibility (+)\* | Pre-measure  Post-measure | / | Partially |
| Nissen et al. (2012) | Minnesota, United States  Radon-prone: Yes  Participants: Homeowners | To test the effectiveness of radon information delivery in a primary care environment  **Channel**: Brochures  Model: / | Target behavior:   * Intention to test (+) * Testing (+) * Mitigating (=)   Determinants: / | Pre-measure  Post-measure | / | Partially |
| Weinstein et al. (1992) | New Jersey, United States  Radon-prone: Yes  Participants: Homeowners | To test the effectiveness of personalized letters and phone calls to increase compliance to mitigation advice  **Channel**: Direct communication  Model: / | Target behavior:   * Intention to mitigate (=) * Mitigation (=)   Determinants:   * Response-efficacy (=) | Post-measure  Control group  Random assignment | Satisfaction of communication materials | No |
| Weinstein and Lyon (1999); Weinstein et al. (1998) | Ohio, United States  Radon-prone: Yes  Participants: Homeowners | To test the effectiveness of videos based on stage of action on increasing stage of action  **Channel**: Video  Model: Precaution Adoption Process Model | Target behavior:   * Intention to test (+)\* * Testing * Stage of action (+)\*   Determinants:   * Risk perception (+)\* * Self-efficacy (+)\* | Pre-measure  Post-measure  Control group  Random assignment | Quality of sound and video | Yes |
| Witte et al. (1998) | Michigan, United States  Radon-prone: Yes  Participants: Adults | To evaluate campaign materials according to the Extended Parallel Process Model  **Channel**: Brochures, trinkets  Model: Extended Parallel Process Model | Target behavior: /  Determinants:   * Attitudes * Self-efficacy * Perceived severity * Perceived susceptibility * Response-efficacy | Post-measure (focus groups) | Understandable and appreciation | Partially |
| \* Significant differences were found.  (+) Increase; (-) decrease; (=) no difference compared to situation before campaign. | | | | | | |

*Table A2: Field campaigns included in systematic review.*

| Authors (year) | Setting | Campaign objectives, channels and theoretical model used | Target behavior and determinants | Evaluation | Process evaluation | Communication material available for the analysis |
| --- | --- | --- | --- | --- | --- | --- |
| Adams et al. (1993) | Connecticut, United States  Radon-prone: Unclear  Participants: Adults | To test intentions to change environmental health behavior after reading a personalized brochure  **Channel**: Brochure  Model: / | Target behavior:   * Information requests (+) * Intention to test (+)   Determinants:   * Awareness (+) * Knowledge (+) | Pre-measure  Post-measure | / | No |
| Desvousges et al. (1992) | Maryland, United States  Radon-prone: Yes  Participants: Homeowners/residents | To test and develop public risk communication program for radon  **Channel**: Newspaper, radio, direct communication  Model: / | Target behavior:   * Testing (+)\*   Determinants:   * Awareness (+)\* * Attitudes (+)\* * Knowledge (+)\* | Pre-measure  Post-measure  Control group | Understood | Yes |
| Johnson and Fisher (1989); Johnson et al. (1988); Smith and Desvousges (1990); Smith et al. (1988); Smith et al. (1990); Smith et al. (1995) | New York State, United States  Radon-prone: Yes  Participants: Homeowners | To test different approaches to communicate radon risk information with brochures  **Channel**: Brochure  Model: / | Target behavior:   * Information requests (-)   Determinants:   * Knowledge (+) * Risk perception (+/-) | Pre-measure  Post-measure  Control group  Random assignment | Message as intended and understood | Yes |
| Johnson and Luken (1987); Smith and Johnson (1988) | Maine, United States  Radon-prone: Yes  Participants: Homeowners | To test perceived risk and mitigation behavior after receiving new information about radon  **Channel**: Brochure  Model: / | Target behavior:   * Mitigation (+)   Determinants:   * Risk perception | Post-measure | Perceived as intended and understood | No |
| Hahn, Rayens, Kercsmar, Robertson, and Adkins (2014) | Kentucky, United States  Radon-prone: Unclear  Participants: Homeowners | To assess the success of a test and win contest to promote radon testing  **Channel**: Newspaper, television, radio, internet, brochure, cinema  Model: / | Target behavior:   * Intention to test (+) * Testing (+)   Determinants: / | Post-measure | Reach | No |
| Golding et al. (1992) | Massachusetts, United States  Radon-prone: Yes  Participants: Adults | To test whether narrative or technical forms of radon information were more effective at changing behavior  **Channel**: Newspaper articles series  Model: / | Target behavior:   * Intention to test * Intention to mitigate   Determinants:   * Awareness (+) * Attitudes (+) * Concern (+) * Knowledge (+) | Pre-measure  Post-measure  Control group | / | Yes |
| Weinstein et al. (1990) | New Jersey, United States  Radon-prone: Yes  Participants: Homeowners | To explore the use of informational brochures to encourage home testing for radon  **Channel**: Brochure  Model: / | Target behavior:   * Information requests * Intention to test (+)\*   Determinants:   * Concern (+)\* * Ease of testing (+)\* * Perceived susceptibility (+)\* * Risk perception (+)\* | Post-measure  Control group | Perceived as intended and understood | No |
| Weinstein et al. (1991) | New Jersey, United States  Radon-prone: Yes  Participants: Homeowners | To test the effect of a personalized letter and phone call (and recognition of perceived susceptibility) on increasing intentions to test  **Channel**: Direct communication  Model: / | Target behavior:   * Intention to test (+)\*   Determinants:   * Ease of testing * Risk perception (+)\* * Perceived severity (+)\* * Perceived susceptibility * Response efficacy | Pre-measure  Post-measure  Control group | / | No |
| \* Significant differences were found.  (+) Increase; (-) decrease; (=) no difference compared to situation before campaign. | | | | | | |

*Table A3: Implemented campaigns with direct behavior and self-reported behavior as outcome measures.*

| Authors (year) | Setting | Campaign objectives, channels and theoretical model used | Target behavior and determinants | Evaluation | Process evaluation | Communication material available for the analysis |
| --- | --- | --- | --- | --- | --- | --- |
| Doyle et al. (1991); Fisher et al. (1991) | Washington, United States  Radon-prone: unclear  Participants post-measure: Adults | To analyze the effectiveness of a mass-media radon information and testing campaign  **Channel:** Newspaper, television, radio, brochures, direct communication  Model: / | Target behavior:   * Intention to test (+) * Testing (-) * Intention to mitigate (=)   Determinants: / | Post-measure | / | No |
| Hobson (1992); Lee and Macdonald (1994) | United Kingdom  Radon-prone: Yes  Participants post-measure: Adults | To assess the effectiveness of the brochures and other forms of communication on the route to remediation  **Channel:** Posters, brochures  Model: / | Target behavior:   * Information requests (+) * Testing (+) * Mitigating (+)   Determinants: / | Post-measure | Media coverage | No |
| Lofstedt (2019) | Sweden  Radon-prone: Yes  Participants post-measure: Adults | To evaluate the communication actions conducted by SNBHP to increase radon action taken  **Channel:** Newspaper, magazines, internet, brochures, community kits  Model: / | Target behavior:   * Testing (+)   Determinants: / | Post-measure | Media coverage, reach | No |
| Wang et al. (2000) | New York State, United States  Radon-prone: Yes  Participants post-measure: Adults | To measure awareness, knowledge and prevalence of radon testing after public information program  **Channel:** Newspaper, television, radio  Model: / | Target behavior:   * Intention to test (+) * Testing (+) * Mitigating (=)   Determinants:   * Knowledge (+) | Post-measure | / | No |
| (+) Increase; (-) decrease; (=) no difference compared to situation before campaign. | | | | | | |

*Table A4: Implemented campaigns with direct behavior as outcome measures.*

| Authors (year) | Setting | Campaign objectives, channels and theoretical model used | Target behavior and determinants | Evaluation | Process evaluation | Communication material available for the analysis |
| --- | --- | --- | --- | --- | --- | --- |
| Baechler and Englin (1989, 1991) | Bonneville, United States  Radon-prone: No | To assess the responses of households to an in-person delivery of a radon brochure  **Channel**: Brochure, direct communication  Model: / | Performance objectives:   * Intention to test (+)   Change objectives: / | / | Reach,  Understood | Partially |
| Bain et al. (2016) | Iowa, United States  Radon-prone: Yes | To evaluate communication actions to increase levels of awareness, testing, and (if necessary) mitigation  **Channel**: Newspaper, television, radio, social media, brochure  Model: / | Target behavior:   * Testing (+) * Mitigating (+)   Determinants: / | / | Media coverage, reach | Partially |
| Burns et al. (1998) | Portland, United States  Radon-prone: Yes | To evaluate the effectiveness of radon maps presented to the public  **Channel**: Newspaper, television, radio  Model: / | Target behavior:   * Information requests (+)   Determinants: / | / | Media coverage, understood | No |
| Long and Fenton (2011) | Ireland  Radon-prone: Yes | To evaluate the communication activities of Ireland’s National Radon Policy  **Channel**: Newspaper, television, radio, internet  Model: / | Target behavior:   * Intention to test (+)   Determinants:   * Awareness (+) | / | Media coverage, reach | No |
| Makedonska et al. (2018) | Bulgaria  Radon-prone: Yes | To analyze the activities of radon risk communication under the National Radon Program  **Channel**: Magazines, television, radio, internet, social media, brochures  Model: / | Target behavior:   * Testing (=)   Determinants:   * Awareness (+) * Attitudes (+) | Pre-measure | Media coverage, reach | No |
| Moir et al. (2012) | Canada  Radon-prone: Yes | To evaluate the communication activities of the National Radon Program in Canada  **Channel**: Internet, brochure  Model: / | Target behavior:   * Information requests (+)   Determinants: / | Pre-measure | Reach | No |
| (+) Increase; (-) decrease; (=) no difference compared to situation before campaign. | | | | | | |