ICRP Experiences in Dialogue in Japan: Measuring the Right Things

NKS Seminar

Nordic perspectives of Fukushima: Where are we now and where do we go?

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Views expressed are those of the presenter

What are the RIGHT THINGS to measure?

Take measurements for a reason:

- Help decide on protective actions
- Implement and adjust protective actions
- Assess actual exposures
- Empower people

In the beginning

Purpose

- Decide on urgent protective actions on-site and off-site
  - e.g. stay-in, evacuation, iodine prophylaxis, food restrictions
- Assess actual exposures

Measurements

- What to measure and how to measure it is pre-planned
  - e.g. plant conditions, weather conditions, general on-site and off-site radiological conditions
  - Plant personnel monitoring

Very early, assuming significant releases to the environment

Purpose

- Implement and adjust protective actions
- Assess actual exposures

Measurement

- Off-site area dose rates
- Thyroid radioiodine uptake
- Contamination levels
  - e.g. on clothes, in drinking water and foodstuff, in the environment

As soon as reasonably achievable

Purpose

- Implement and adjust protective actions
- Assess actual exposures
- Empower people

Measurements

1. Focus on doses to individuals (directly if possible)
   - Personal external dosimetry
   - Whole-body counting
2. Focus on levels in key pathways
   - Levels in foodstuff and drinking water
   - More detailed area dose rates

It's not just about measuring the RIGHT THINGS

It's also about working together to measure THINGS RIGHT

Experts must work **with** the effected people, not only **"for"** them

- This **co-expertise** approach:
  - Builds confidence and trust in the results
  - Allows people to see where they stand
  - Increases people's autonomy

Fukushima Dialogue Initiative

Fukushima Dialogue Initiative

- 12 main dialogue meetings
- International Workshop on the Fukushima Dialogue Initiative (December 2015)

- Discussions with:
  - Smaller communities
  - Individuals actively involved in recovery
  - Professional groups
  - National, prefectural, and local authorities
  - NPOs
- Exchanges of information and/or educational and outreach activities
- Discussions with key individuals on plans for future action

Coordinated by ICRP
In cooperation with:

Japanese

- Cabinet Office (Support Team for Residents Effected by Nuclear Incidents)
- Date City
- Ethos in Fukushima
- Fukushima Medical University
- Fukushima Prefecture
- Health Physics Society
- Iitate Village
- Ministry of Environment
- Nippon Foundation
- Nuclear Regulation Authority
- Radiation Safety Forum

International / Foreign

- Belarusian Branch of Russian-Belarusian Information Centre on the Problems of the Consequences of the Catastrophe at Chernobyl NPP
- Committee on Radiation Protection and Public Health/OECD-NEA
- French Nuclear Safety Authority
- French Institute of Radiation Protection and Nuclear Safety
- Norwegian Radiation Protection Authority

Fukushima Dialogue Initiative

- Transferring experience from communities affected by Chernobyl
- Facilitating discussions between stakeholders
- Learning for ICRP to improve future recommendations
- Sharing ICRP recommendations directly with communities

Typical Dialogue Meeting

- 2 days, facilitated by ICRP
- ~100 people, including ~30 direct participants
- Common language
- Series of short presentations & structured dialogues
- Timing and topics driven mainly by local interests

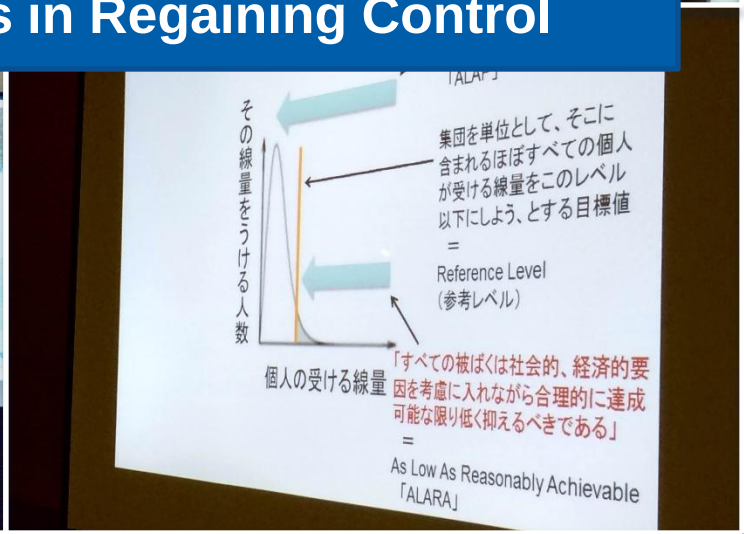
- Summarized in a few pages
- Some media attention, shared through Ethos in Fukushima website, summary information on ICRP website

Main Dialogue Meetings

1) Rehabilitation after the Fukushima Accident: Lessons from Chernobyl and ICRP Recommendations (Nov 2011, Fukushima City)
2) Accomplishments in Date City, and obstacles to and opportunities for further improvement (Feb 2012, Date City)
3) Foodstuff: Examining the challenges (Jul 2012, Date City)
4) Education of children (Nov 2012, Date City)
5) To return or not, to stay or leave (Mar 2013, Date City)
6) Focus on Iitate Village (Jul 2013, Fukushima City)
7) Self-help actions in Iwaki and Hamadōri (Nov 2013, Iwaki City)
8) Focus on Minamisoma City (May 2014, Minamisoma City)
9) Raising children in Fukushima (Aug 2014, Date City)
10) The value of tradition and culture (Dec 2014, Date City)
11) The Role of Measurements in Regaining Control (May 2015, Fukushima City)
12) Experience We Have Gained Together (September 2015, Date City)

11th Dialogue: May 2015, Fukushima City

Role of Measurements in Regaining Control



Dialogue on Measurements
Doses to People

The doses that matter most are those actually received by people

There is no average person

(so individual measurements are important)

- Today's technology makes individual external dosimetry, recorded hour-by-hour, relatively simple and affordable

- Whole body counting, paired with monitoring of foodstuff

Dialogue on Measurements
Measurements by People

Individuals making their own measurements help bolster confidence, autonomy, and freedom

- Measurements reveal the invisible, allowing people to “see the ghost” and so better understand and control their own situation
- Capacity building to ensure reasonable quality measurements and good interpretation is important
- Precision is not as important as accuracy, accessibility, and confidence

Dialogue on Measurements

Measurements Can Open Dialogue

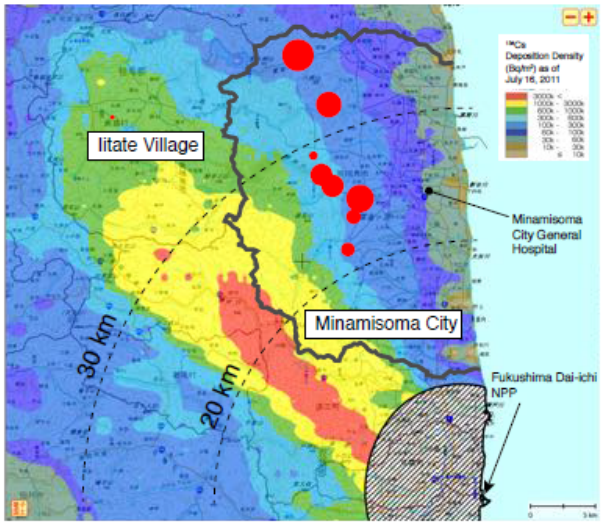
Measurements can provide an opportunity for dialogue and sharing of information

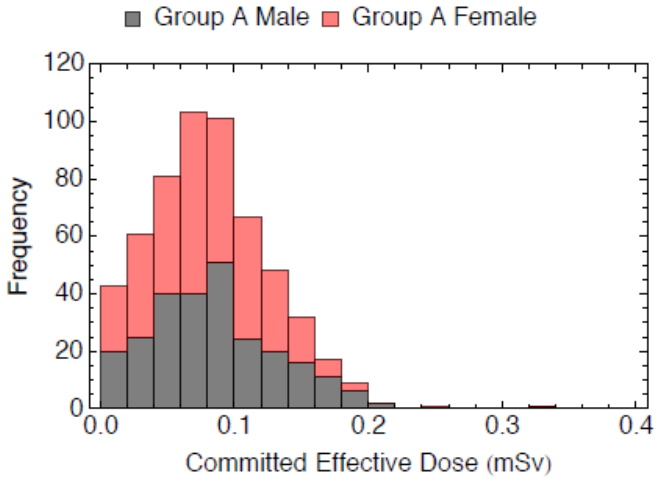
- Sitting together to review hourly personal external dose results
- Sharing and comparing personal external doses
- WBC results discussed and put in perspective on the spot
- Discussing results of various foodstuff measurements e.g. while waiting to measure a sample

Whole-Body Counting

南相馬：初期被ばくリスクが高い566人の測定, 2011年7月

566 high-risk Minamisoma citizens were measured, July 2011





あれ？　高くない

Much lower than we feared

Hayano et al., "Whole-body counter survey results 4 months after the Fukushima Dai-ichi NPP accident in Minamisoma City, Fukushima ", J. Radiol. Prot. 34 (2014) 787–799

Individual External Dose Measurement

D-Shuttle Project

~ Measurement and Comparison
of Individual Doses of High School Students
Inside and Outside of Fukushima Prefecture~

Physics team from the Super Science Club of Fukushima High School
Haruka Onodera Kota Suzuki Mikoto Kiya Ryo Suzuki Minori Saito

四カ国216人の高校生がD-シャトルを2週間着けた結果を論文に

“D-shuttle” project - 216 high school students from 4 countries wore D-shuttle for 2 weeks, and write a paper

D-シャトルは１時間ごとの積算線量を記録

- 自然放射線の寄与を含む -

D-shuttle records hourly individual doses
- including natural radiation contribution -

Date and time	Dose rate	Location
2014/06/27 15h	0.12	school
2014/06/27 16h	0.07	school
2014/06/27 17h	0.10	school
2014/06/27 18h	0.10	school
2014/06/27 19h	0.14	school
2014/06/27 20h	0.04	home
2014/06/27 21h	0.06	home
2014/06/27 22h	0.12	home
2014/06/27 23h	0.13	home
2014/06/28 00h	0.07	home

同じ線量計，同じ装着方法と行動記録

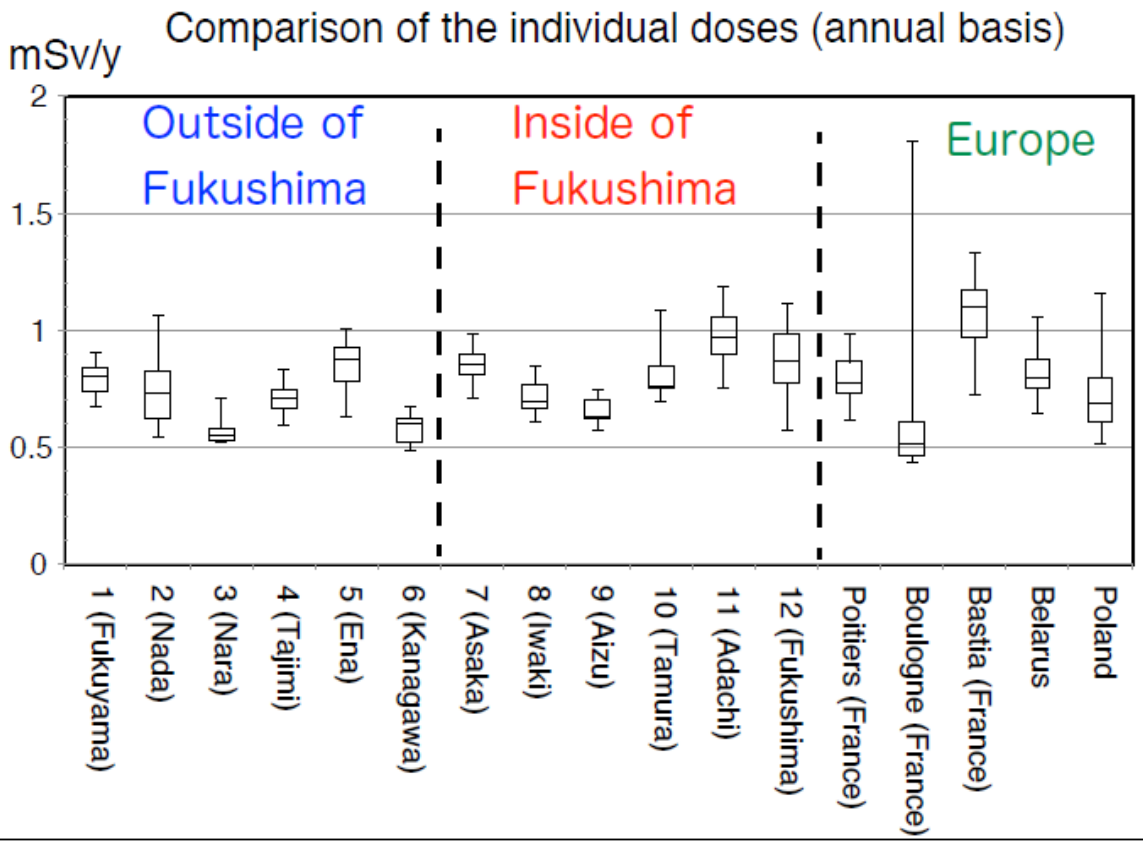
Same personal dosimeter, standardized protocol and activity journal

From Ryugo Hayano

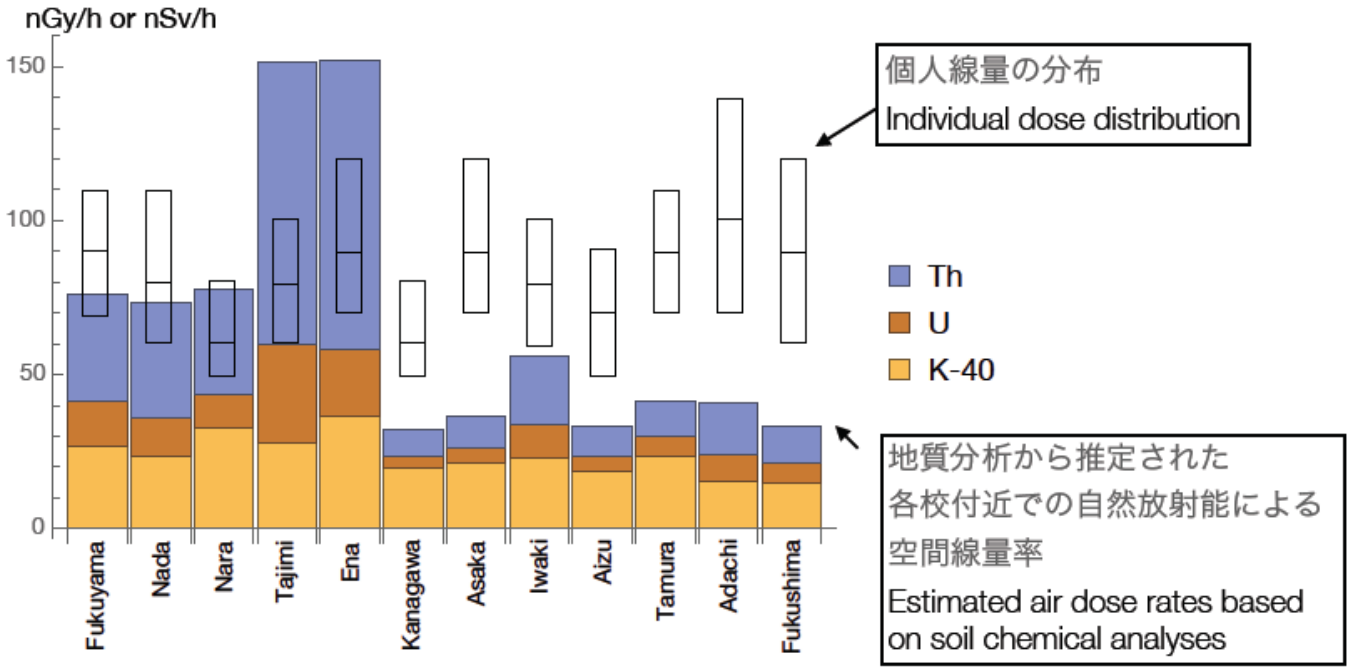
自然放射線の寄与を含めた測定：

福島の高校生の個人線量は国内外の他の地域に比べて特に高くない

The individual doses of Fukushima High-school students (including natural radiation) are not higher than in other areas



From Ryugo Hayano



セシウムの寄与があるのに個人線量がそれほど高くないのは,
福島では自然放射能による寄与が少ないため

The individual doses in Fukushima are not high despite the fall out, since the natural radiation contribution is low in Fukushima

From Ryugo Hayano

Measuring Foodstuff

行者ニンニク

前の畑

年	2012	2013	2014	2015
セシウム137	557.0	15.6	19.6	ND
セシウム134	248.2	11.0	ND	ND
合　計	805.2	26.6	19.6	ND
備　考	飯舘村			

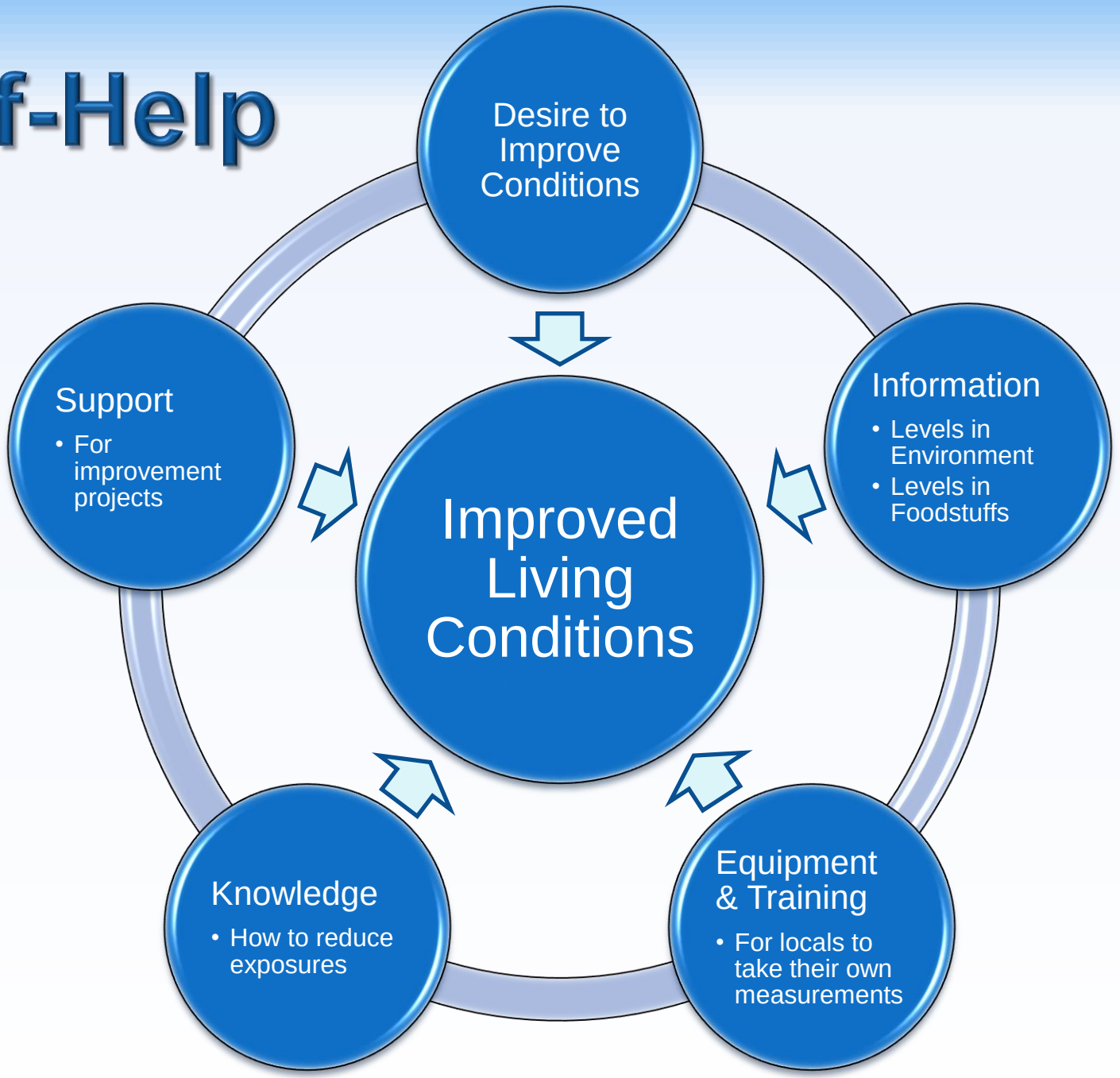
コ　ゴ

年	2012	2013	2014	2015
セシウム137	2251.3	326	195	92.9
セシウム134	1171.3	191	97.5	34.5
合　計	3422.6	517	292.5	127.4
備　考	飯舘村			

From Kuni Kanno, Iitate Village

Knowledge is Power

Self-Help


Desire to Improve Conditions
Information
• Levels in Environment
• Levels in Foodstuffs
Equipment & Training
• For locals to take their own measurements
Knowledge
• How to reduce exposures
Support
• For improvement projects
Improved Living Conditions

Self-Help Protective Actions

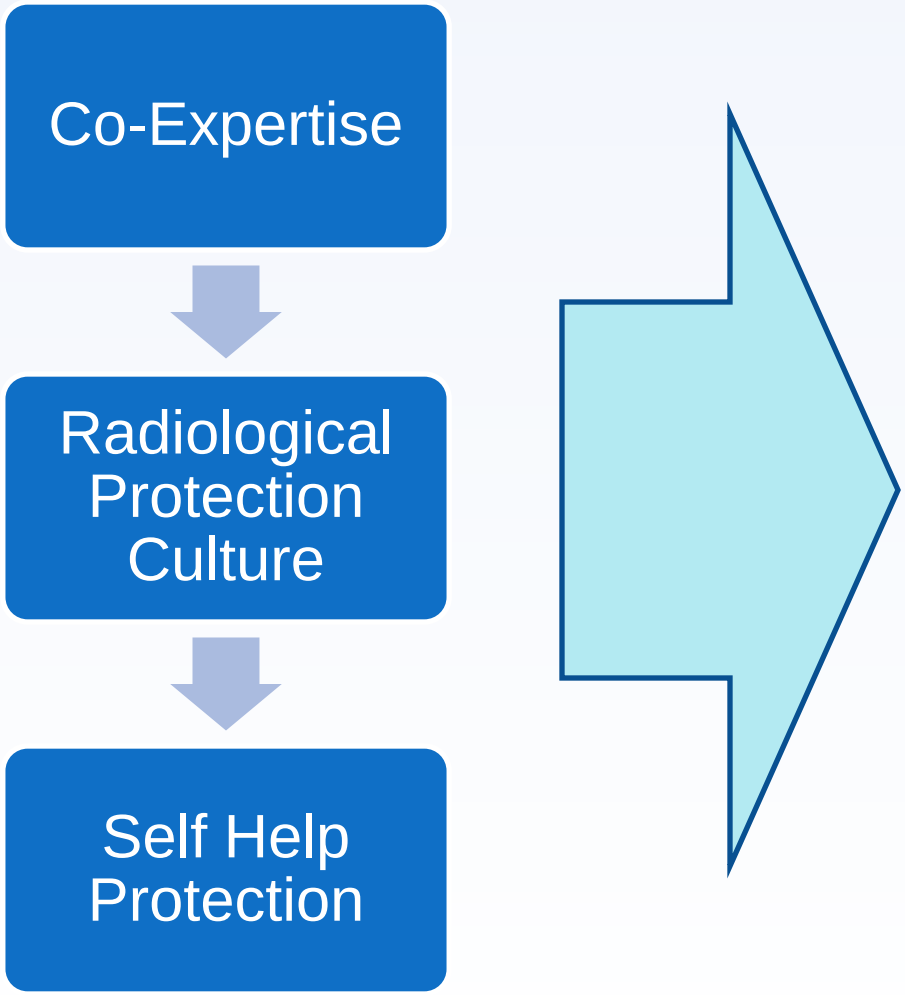
Informed actions taken by inhabitants with regard to exposures to radiation of themselves, their families, and their communities

Why?

- Exposure is largely driven by individual behaviour
- Inhabitants have local knowledge
- Individuals regain control of their situation

Self-help protective actions and actions taken by authorities are complimentary

Self-Help Protection: Effective Recovery



- **Citizens are informed, engaged, and supported**
- **Individuals take effective action to speed recovery**
- **Improved protection and well-being**

Key Points

- *Authorities have a duty to ensure people are safe, but people must also feel secure*
- *Measurements by authorities are necessary to guide actions and assess doses*
- *In recovery, experts must be at the service of people to empower them to take and interpret their own measurements*
- *There is no average person: individual results are essential*
- *Doses to people are more important than area dose rates*

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