

# Health surveillance & practical radiological protection culture: two complementary pillars for improving living conditions in a contaminated territory

---

*NERIS Workshop*

Pascal Croüail Sylvie Charron,  
with contributions from: Makoto Miyasaki, Raïssa Misyura

*Milano, Italy, 27-29 April 2015*

## Medical doctor and RP experts are facing people's questioning long-term after an accident

- *My young son/daughter is always sick. Is it because our family lives in a contaminated area?*
- *Can I eat or give food to my children if it is above MPLs (norms)? They will be sick because of me!?*
- *My children are more contaminated than their classmates and neighbours although I did my best to protect them! What can I do? What did the others do?*
- *The health status is very bad in our village if compared with the neighbour city, which is nonetheless located in a more affected area, why?*
- *My daughter got thyroid problems although she was born after the releases, why?*
- *What are the illnesses and diseases induced by the ingestion of contaminated foodstuff, and exposure to radiations? Is my cancer related with the accident?*
- *The healthcare provisions and indemnifications are not the same for everyone within the contaminated area, why?*
- *What are the health consequences if my individual dose exceeds one of the 'dose limit' (e.g. 1, 5, 20 or 100 mSv a year)? Is it the same for my children and for my wife who is pregnant for months?*
- *Can my children play outside for hours, although experts say that they are much more radiosensitive than adults?*
- *Is our baby contaminated (he/she was not measured because the equipment is not adapted for small bodies, the WBC operator told me)?*
- *What does the recent reduction in terms of 'dose limits' (or reference levels) mean? Our health was previously endangered and neglected!?*
- *You, as a foreign medical doctor/expert, claim that it is not dangerous to live here but my feeling is that you would not live here if you had the choice... Why should I trust you?*
- *Is it safe and healthy enough to return home now? Give me your expert's advice! I'm really scared of endangering my family.*
- ...



« Don't worry, be happy,  
doses are very low, there is no risk! »



Drawn by Tignous killed in the Charlie Hebdo shooting on 7 January 2015

## To improve medical structures and equipment

---

- Long-term post-accident context:
  - Decline in local medical infrastructures and 'brain drain' (experienced medical doctors and professionals leave the contaminated territory as soon as they can)
  - Decrease and ageing of the population (only 4% of people < 30years old are ready to return evacuated areas near Fukushima)
  - Growing sense of abandonment, especially for the youngest generations of parents and oldest people
  - The health status of the children is the most important factor to decide whether one will stay or leave a contaminated territory
- Improve accommodation and care of children and their parents at hospital, as well as assistance to seniors
- Prioritize modernization in paediatrics and gynaecology
- Improve the diagnosis of childhood diseases (not only those well known as being potentially radiation-induced)
- keeping in mind that health includes welfare (WHO)

## To identify factors that influence the children's health

---

- Need to reconsider the protocol and content of health surveys in post-accident situations (which pathologies have to be followed and registered, other parameters and aspects to consider such as social, economic and psychological issues)
- Health surveys must be implemented ensuring the follow-up of thousands of people (2 millions in Japan) and sustained for decades
  - Not to be confined in a pure epidemiological logic, which would aim at making correlations between a cause (living in a contaminated territory) and observed effects (mortality, diseases, morbidity, etc.)
  - Epidemiological results will be easily questionable and criticized by scientists and activists...
- Need to prioritize actions that could improve the well-being and health status of people living in the affected territory (it challenges the public health policy)
- Avoid simplistic discourse: at low doses = good health and, bad health = because of stress
- Accept to say that there is no absolute scientific truth and the lack of knowledge about dose-effect relationship in a chronic exposure situation makes the analysis of the situation very uncertain

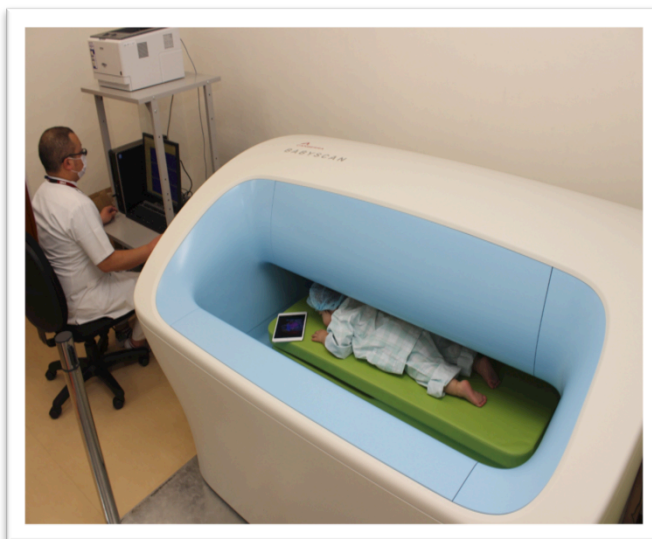
## To adapt the role of the Whole Body Counting measurements

- Does not provide much help in the assessment of internal individual doses (biological half-life is only ~3 months for caesium which means that the measurements would have to be frequently repeated: then, people feel to become guinea pigs)
- A moment - several minutes during the measurements - to be used as an opportunity to engage a dialogue with the people at risk ... and then develop the radiological protection culture within families (preferable to make WBC measurement in the presence of the entire family)
- Allow to detect inappropriate (eating) behaviours (e.g. consumption of contaminated game, mushrooms, berries, etc.) and to enter into a dialogue with children and their parents to identify daily margin of manoeuvre
- Not focussing on measurements results (because of the high uncertainties), not stigmatising or reprimanding those who are the most exposed persons
- WBC operators and medical doctors must be trained adequately (interpretation of results, wording to use)
- “Unnecessary but indispensable” (Pr R. Hayano said)

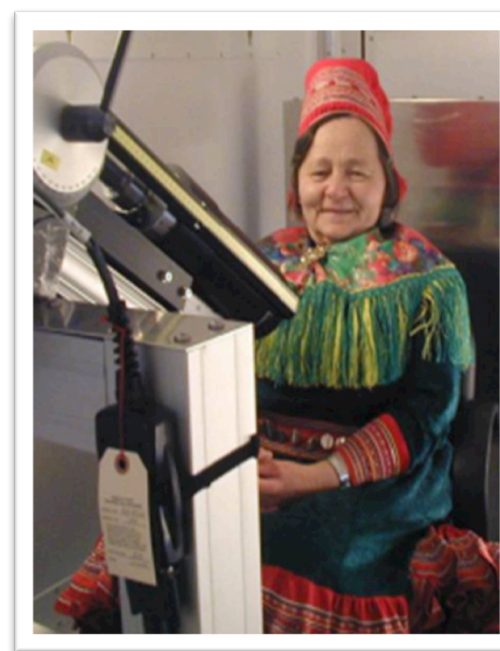
# “WBC is likely unnecessary but absolutely indispensable!” \*



photo: Stolyn hospital (Dr. R. Misyura), WBC seats, Belarus (2014)



source: Babyscan™, a whole body counter for children (\*Pr. Hayano), Japan (2014)



source: NRPA (L. Skuterud, A. Liland), measurement of Saami reindeer herders after the Chernobyl accident, Norway (2014)

## To increase the awareness and training of the medical professionals

---

- Important role of routine medical care (i.e. local medical doctors and professionals)
- Medical doctors, nurses, pharmacists are not enough trained in RP (even those who have made the personal choice to stay in a contaminated territory)
- Encourage medical professionals to foster dialogue with people at risk (not being too much alarmist, fatalistic, nor complacent) taking into account psychological and social aspects
- Training, tools and documentation needed
- Encourage those who faced these situations to share their experience



## To develop a practical radiological protection culture

---

- Children's voice is a very good vector to disseminate the radiological protection culture within the family
- The participation of children to measurements, characterisation of the situation, and small recovery projects is a good way to improve their attractiveness and motivation
- Numerous examples of practical experiences have been developed in Belarus and Japan (need to be shared)
- Local – national – international exchange and valorisation of projects is necessary
- Must be sustainable (for decades)
  - Role of scientific institutes (maintenance of scientific equipment, valuation of works, financial support, etc.)
  - Role of local and national authorities (facilitation, inclusion in official educational programmes, etc.)
  - Sponsoring
  - Train the teachers (not only science teachers!)
  - “Connecting people” (be inclusive)

## To increase the awareness and skills of the general population to prevent risky behaviours and change attitudes

СЕРП

### Developed and Published Materials

#### Recommendations and Handbooks:

- “What Everyone Should Know about Radiation”
- “Honey Production”
- “Wild Berries and Mushrooms”
- “A Handbook for a Hunter”
- “Private-Farm Vegetables”
- “Food Produce of Forests”
- “Cows and Goats”

*and many others*

#### Informational Video:

- “Food Produce of Forests in Contaminated Areas”
- “Life in a Village: Food Production and Consumption in Contaminated Areas”



- 2 key and complementary pillars for the rehabilitation of living conditions in a contaminated territory:

- An **inclusive radiation monitoring system** involving the people at risk, giving them the ability for making measurements (dose, dose rates, activity concentration) by themselves, and implementing adequate self-help protective actions
- A **comprehensive health surveillance system** whose protocol and content are based upon inhabitants questioning and worries, allowing to (re-)orient public health policies (i.e. not only built for the epidemiological surveillance) and contributing to the improvement of welfare

photo: D-Shuttle™ system, individual 'real time' cumulated dosimetry, Chiyoda Technol – AIST, Japan



photo: Equipment of a local center for developing practical radiological protection culture Institute of radiology, Gomel, Belarus



photo: Ethos in Fukushima, Medical doctor dialoguing with people relocated after the Fukushima accident, Japan (ethos-fukushima.blogspot.fr/)

