



# **Iodine Thyroid Blocking ITB**



**Continious professional development for  
Occupational Medicine Physicians**

**FANC, Brussels**  
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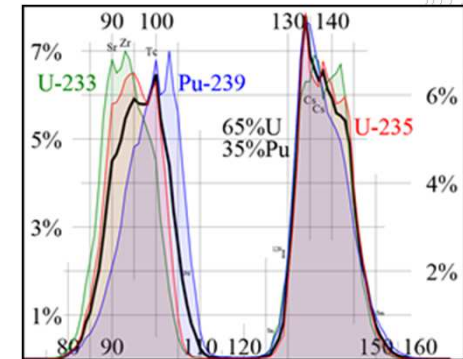
# Outline

- 1. Radio-iodines**
- 2. Health risks**
- 3. Protective measures**
- 4. ITB in practice**
- 5. Key learning points**

# Radio-iodines

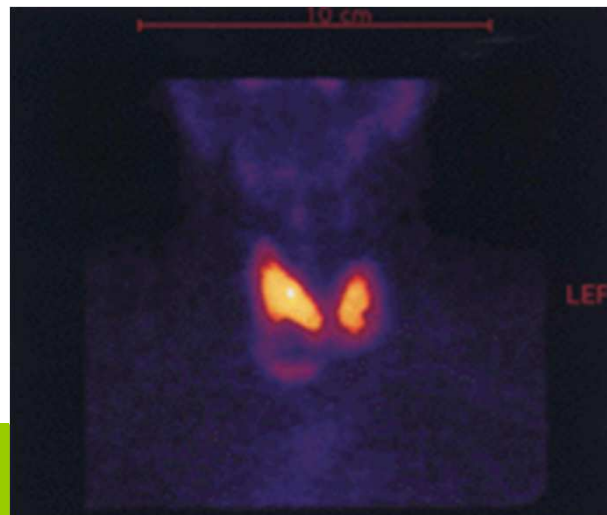
- **High yield fission product**
- **Widespread use in industry, research, medicine**

⇒ **Incidents, accidents, terror**



# Health risks of I\*

- Thyroid “eager” to take up iodine, because scarce (oligo-!)element
  - No isotopic selectivity: I\* taken up just as well as stable iodine (I-127)
- ⇒ Irradiation from within the thyroid



# Health risks of I\*

- 1. Thyroid ca**
- 2. Ablation of thyroid at very high doses**
- 3. Other: thyroiditis, salivary glands, breast,...**

# Thyroid ca risk

- 1. The younger, the more vulnerable**
- 2. Even before birth**
- 3. Breast-fed baby**
- 4. Influence of diet**

## EVALUATION OF DATA ON THYROID CANCER IN REGIONS AFFECTED BY THE CHERNOBYL ACCIDENT

A white paper to guide the Scientific Committee's  
future programme of work

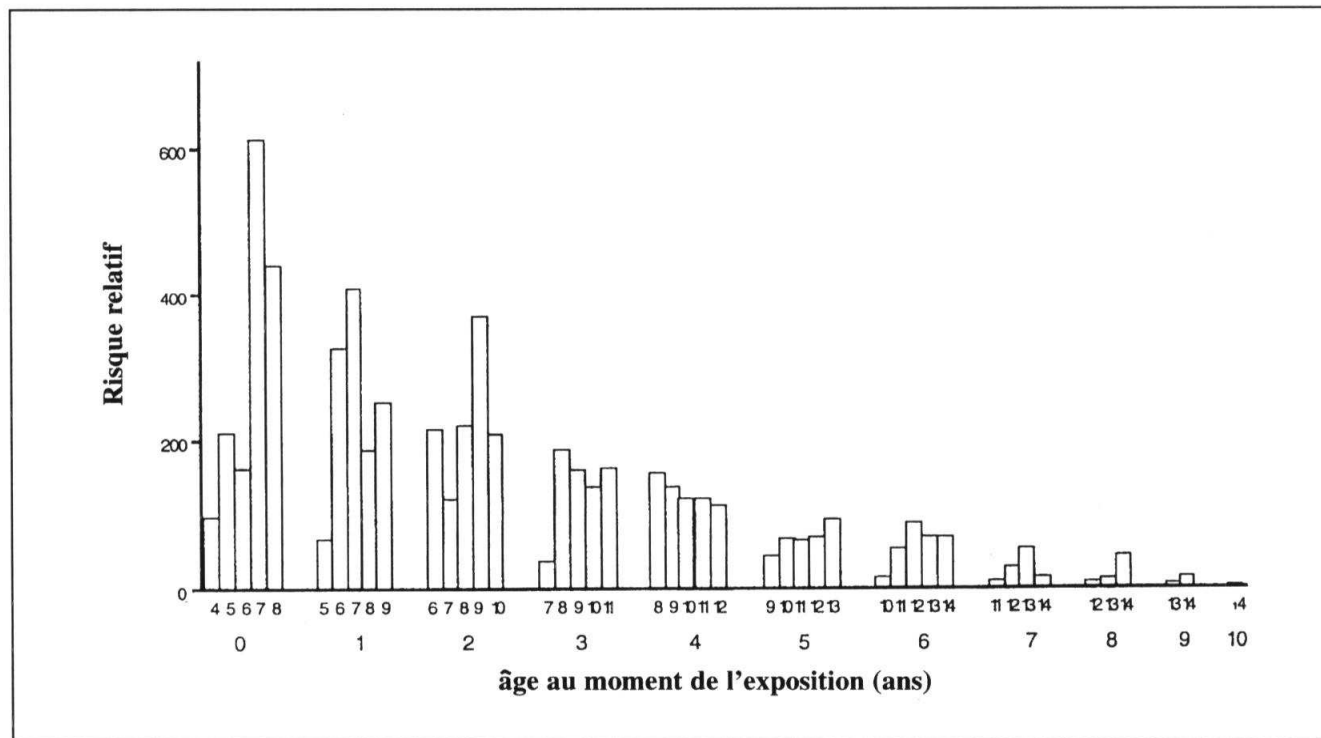
EVALUATING RADIATION SCIENCE FOR INFORMED DECISION-MAKING

*(a)* Both the total number of cases and the crude incidence rate (number of cases per 100,000 person-years) basically increased monotonically over the period 2006–2015. The total number of cases of thyroid cancer registered in the period 1991–2015 in males and females, who were under 18 in 1986 (for the whole of Belarus and Ukraine, and for the four most contaminated oblasts of the Russian Federation), approached 20,000. This number is almost three times higher than the number of thyroid cancer cases registered in the same cohort in the period 1991–2005;<sup>2</sup>



# Thyroid ca risk

## 1. The younger, the more vulnerable





# Thyroid ca risk

## 2. Even before birth:

From about week 12 of pregnancy onward, fetal thyroid gradually starts to function and in short time (few weeks) becomes very active

⇒ **“pregnant women”**

# Thyroid ca risk

## 3. Breast-feeding:

- Up to 30% of I\* ingested by mother can be passed on to baby by breast milk
- + Exposure of breast tissue!

⇒ **Protect baby and mother**

# Thyroid ca risk

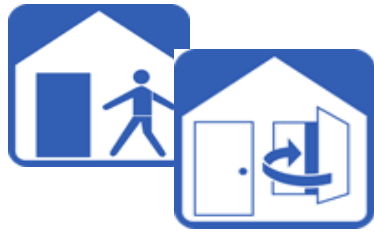
## 4. Influence of diet:

- **Belgian diet is borderline iodine deficient**
- **Gradual compensation by iodination of salt used for bread production ongoing**

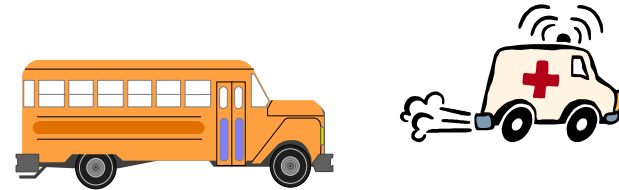
⇒ **Risk X 2**



# Seldom or never one single and isolated countermeasure



SHELTERING



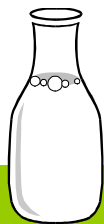
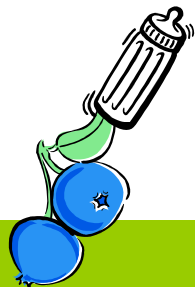
EVACUATION



ITB

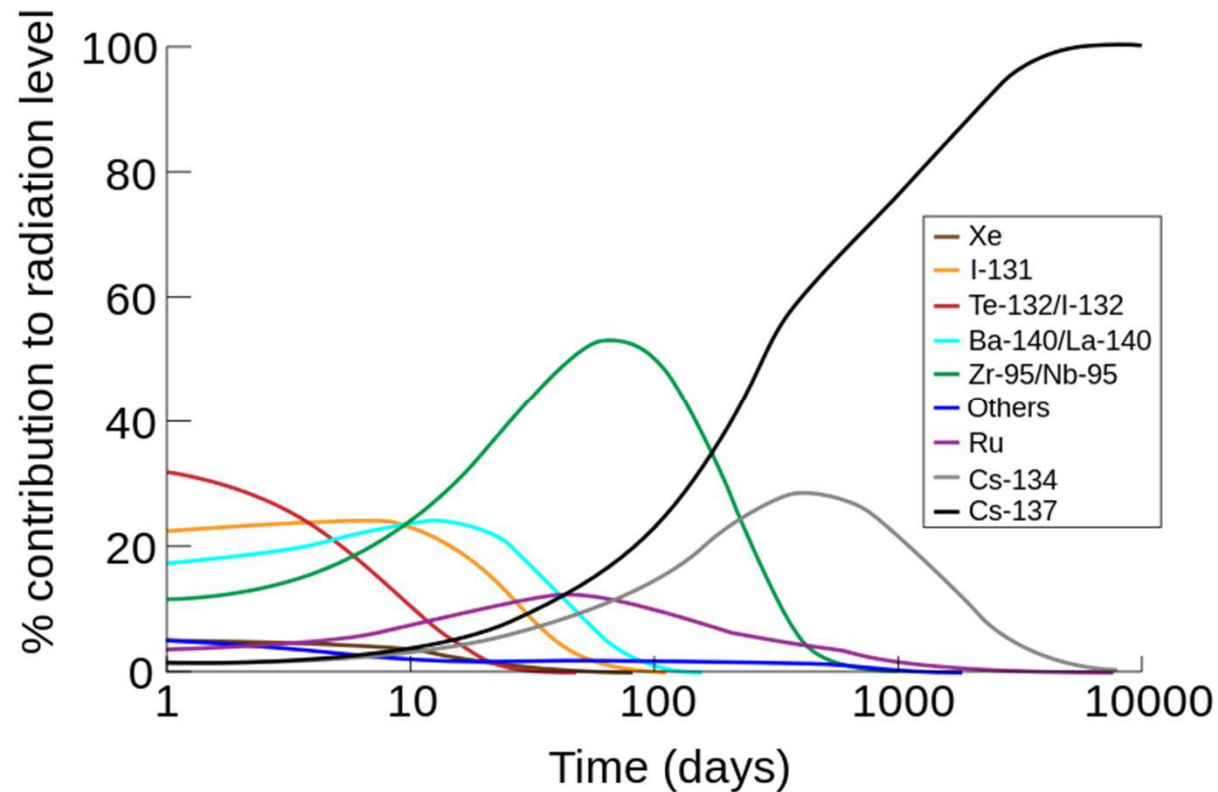


DECONTAMINATION



FOOD CHAIN RESTRICTIONS

# Radio-iodine in nuclear accident

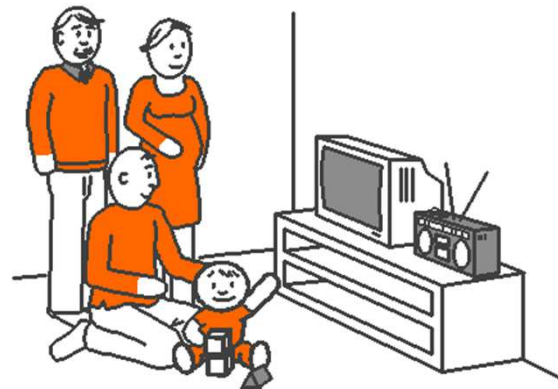


⇒ **Acute phase: gaseous release, inhalation risk**

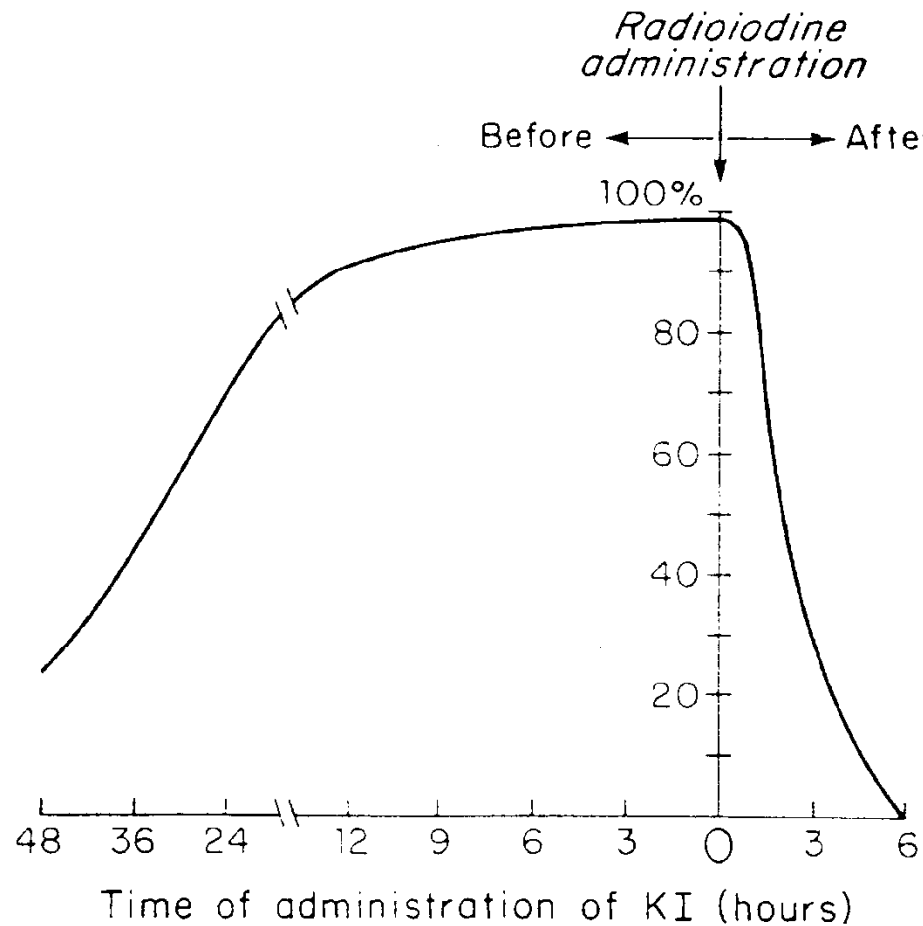
⇒ **days to few months: food chain contamination risk**

# Iodine thyroid blocking ITB

The timely administration of a high dose of stable iodine blocks the uptake of radioactive iodine



# The timely administration...



(from Il'in; Blum; Wolff)

**Lab experiment !**

**If combined with sheltering: much more latitude**

# BE-Alert



Be alerted in case of an emergency

- [Home](#)
- [Be warned](#)
- [What is BE-Alert?](#)
- [How does BE-Alert work?](#)
- [Register now](#)
- [What's the correct reaction?](#)
- [FAQ](#)

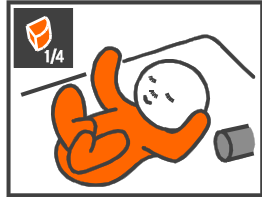
[Home](#) > [How does BE-Alert work?](#)

## How does BE-Alert work?



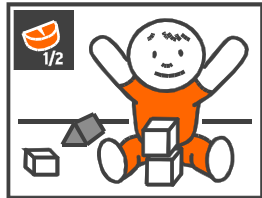


# a high dose of stable iodine: daily requirements X 1000



Up to 1mo

1/4 tablet, dissolved in milk/water.



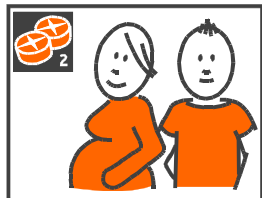
1 mo to 36 mo:

1/2 tablet, dissolved in milk/water



3 to 12 y:

1 tablet, preferably dissolved.

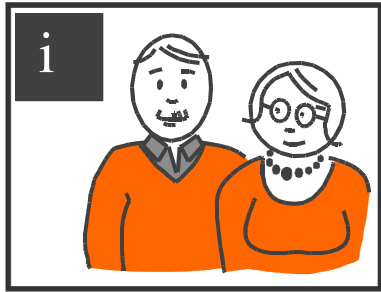


13 to 40 y

Pregnant and lactating, all ages

2 tablets at once, preferably dissolved.

**Just one single  
administration,  
one day only,  
unless...**



## 5. Adults over 40

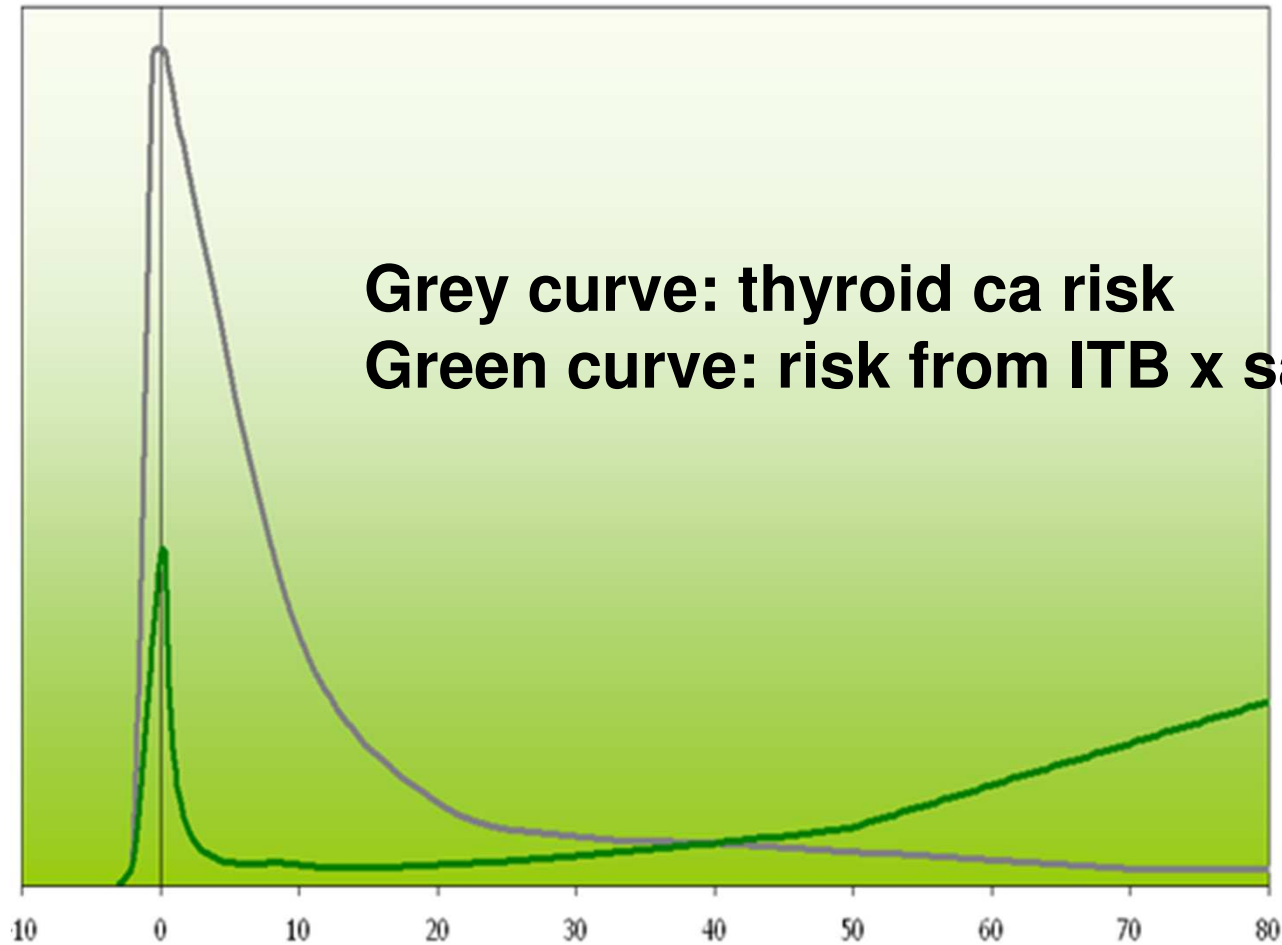
**Decision based on characteristics of the individual and of the expected risk of exposure**

Higher age =  
increasing risk of  
serious side effects:  
Downsides become  
"heavier"



Higher age = smaller risk  
of thy ca induction:  
Benefits become "lighter"

# Age- dependance of thyroid ca risk vs risk from ITB



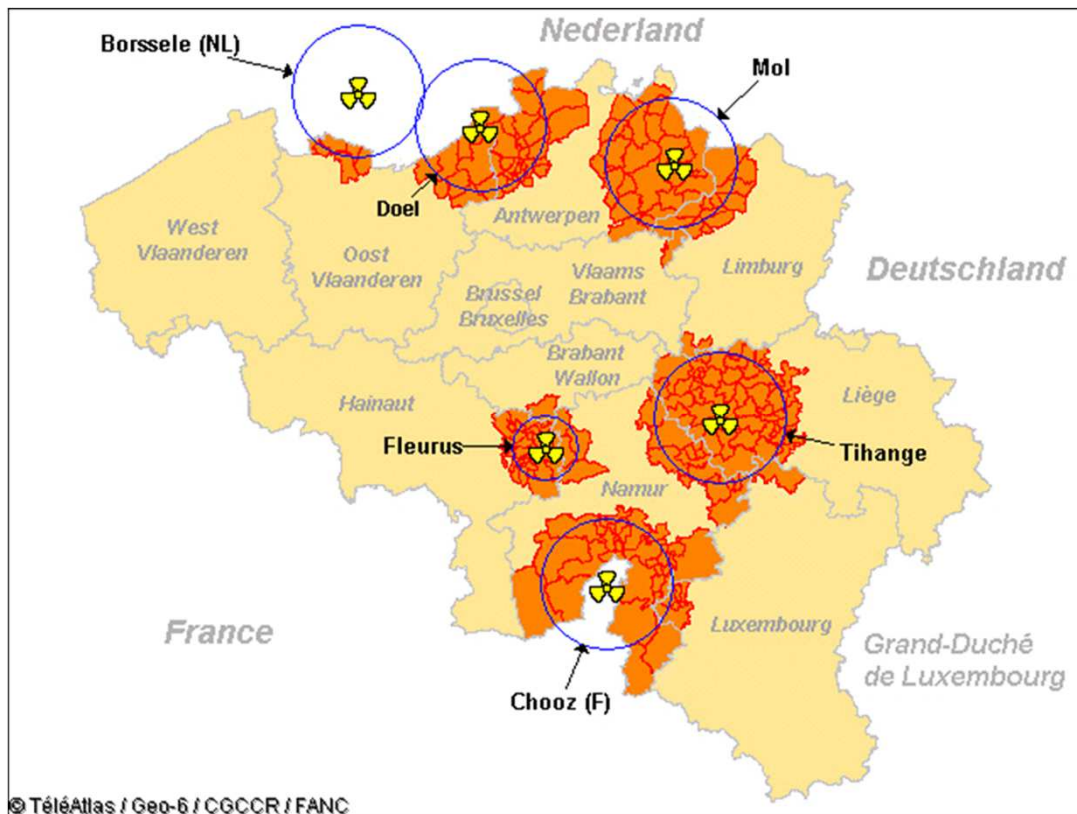
# CAUTIONS AND WARNINGS

**!!! NOT EXHAUSTIVE: Consult leaflet !!!!**

- **Over-sensitivity ( $\neq$  allergy!)**
- **Thyroid disorders, in particular hyperthyroidism in older adults, especially if combined with heart condition**
- **Newborns, "pregnant", "lactating": verify for possible hypothyroidism in babies after treatment**

# LOGISTICS and PRACTICE

**GOAL: Timely available KI, even when sheltering**  
⇒ **predistribution, decentralised stockpiling**

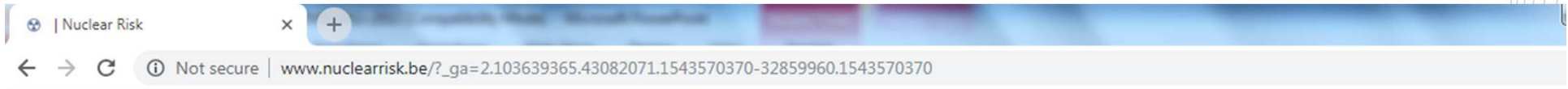


- In NEPZ: every household, company, institution
- Rest of country:
  - Sensitive subgroups
  - Local risk
    - In-house sources
    - Potential target

# KEY LEARNING POINTS

- **Radio-iodines very present**
- **Exposure may induce thyroid ca**
- **High inverse age/effect relationship**
- **Stable iodine close to 100% efficient, if timely administered = ITB**
- **Tablets available for free throughout the country**
- **YOU should (assist in):**
  - **Counsel, identify those who should NOT take KI**
  - **Envisage stockpiling KI in your institution**
  - **Prepare for combination sheltering + ITB**

# nucleairrisico.be / risquenucleaire.be / nuklearrisiko.be



- Home
- Nuclear risk
- What does the government do?
- What can you do ?
- Iodine tablets
- Target groups
- FAQ

**Do you live in an emergency planning zone?  
Get informed**

Community facility within an emergency planning zone?  
Community facility with children up to 18 years present?

**Calculate here how many boxes of iodine tables you need.**

## Tweets by @CrisiscenterBE

**CrisisCenter Belgium** @CrisiscenterBE  
Une situation d'urgence pouvant dépasser les frontières, la coopération internationale est essentielle. Ajd @CrisiscenterBE accueille des experts des centres de crise du Benelux. Une occasion idéale pour partager l'expertise & renforcer les liens #SdIS18  
[crisiscentrum.be/fr/news/gestio...](https://crisiscentrum.be/fr/news/gestio...)



22h

**CrisisCenter Belgium** @CrisiscenterBE  
Noodsituaties stoppen niet aan de grens. Daarom is een goede internationale samenwerking essentieel. Vandaag ontvangt @CrisiscenterBE deskundigen van de Benelux-crisiscentra. De ideale samenkomst



federal agency for nuclear control

Thank you for your  
attention...  
and for your contribution  
to radiation safety

