

# Fukushima nuclear power plant and your health

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- (5) Radiation and radioactive materials released from the nuclear power plant
- (6) Contamination of air, water, and food with radioactive materials.
- (7) Radiation and health.



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There are only two episodes in human history :

Hundreds of thousands of people exposed **biologically significant dose**  
(= meaningful amount) of radiation

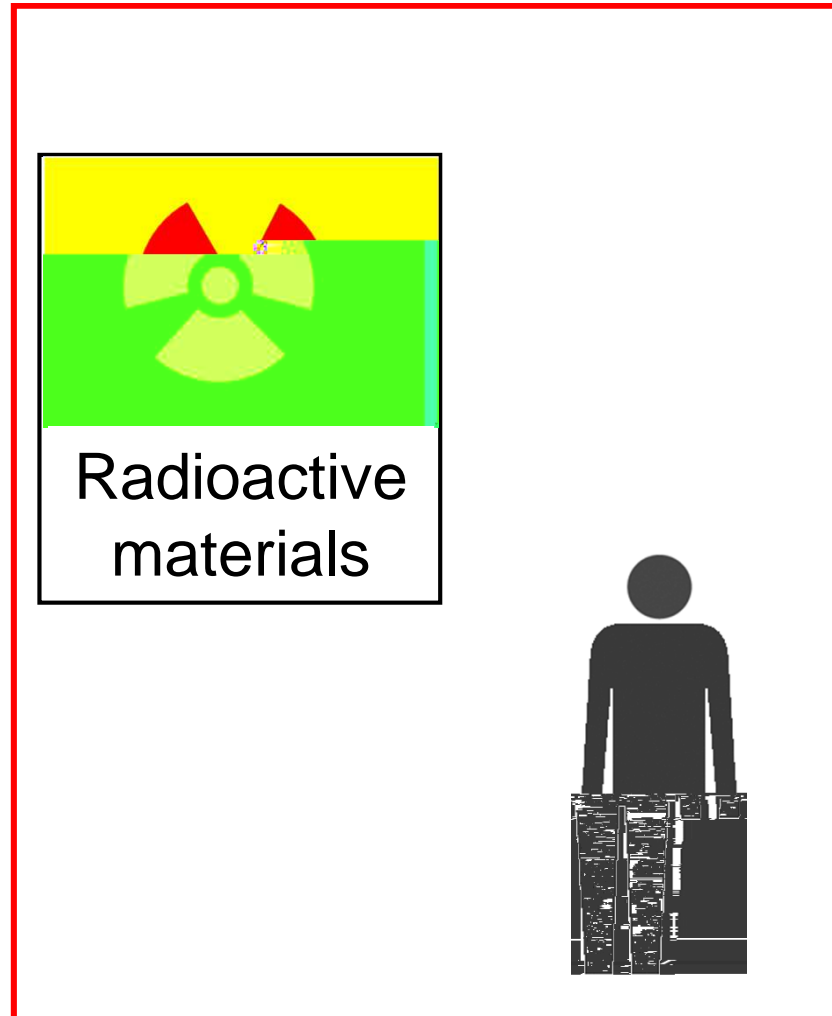
1. Hiroshima & Nagasaki, atomic bomb in 1945
2. Chernobyl, nuclear plant accident in 1986

To tell the conclusion first,

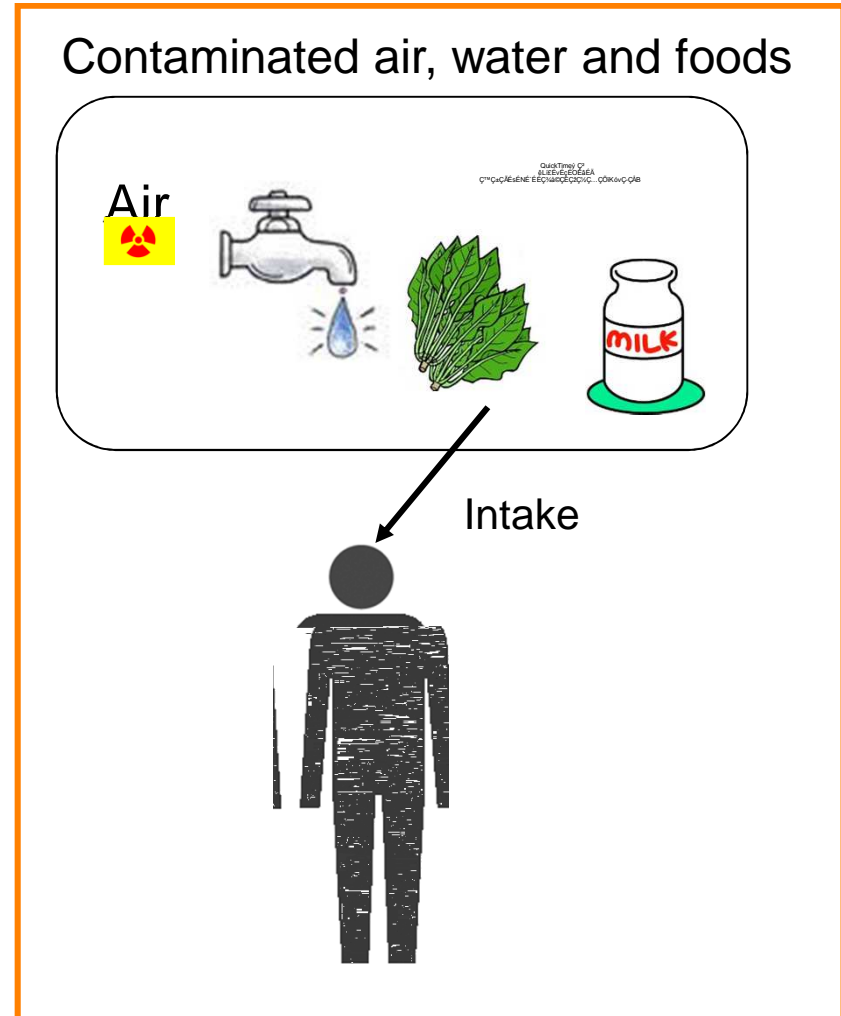
'Fukushima' *unlikely* becomes the third episode.

# How people are exposed to radiation?

## External exposure



## Internal exposure

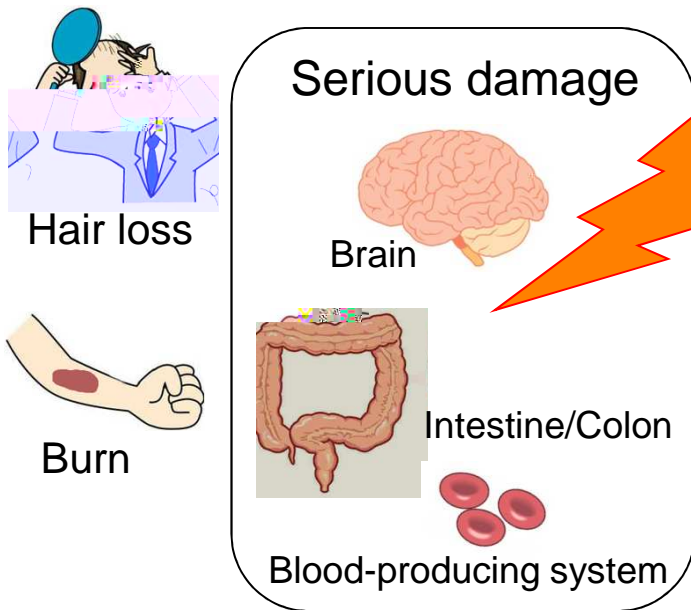


# How radiation harms your health

*Discriminate* these two clearly

Immediate damage within weeks

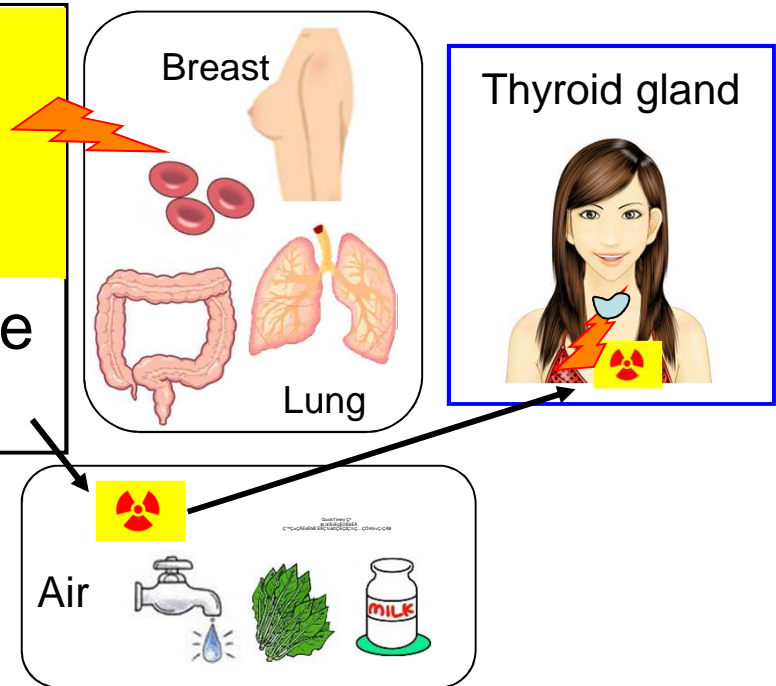
Very high dose (=amount)  
by mainly external exposure



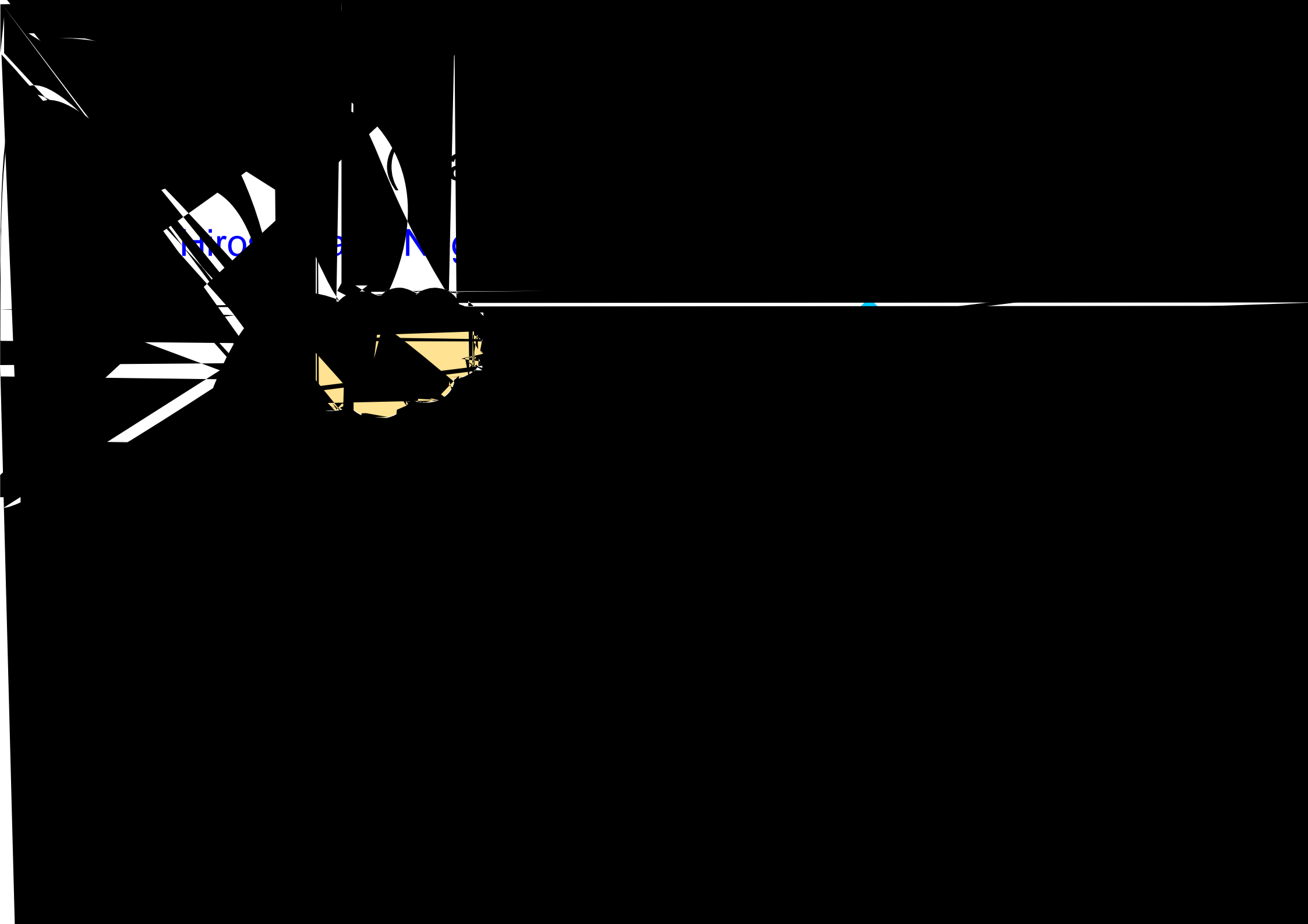
(It will *never* happen to you)

Cancer may develop years later

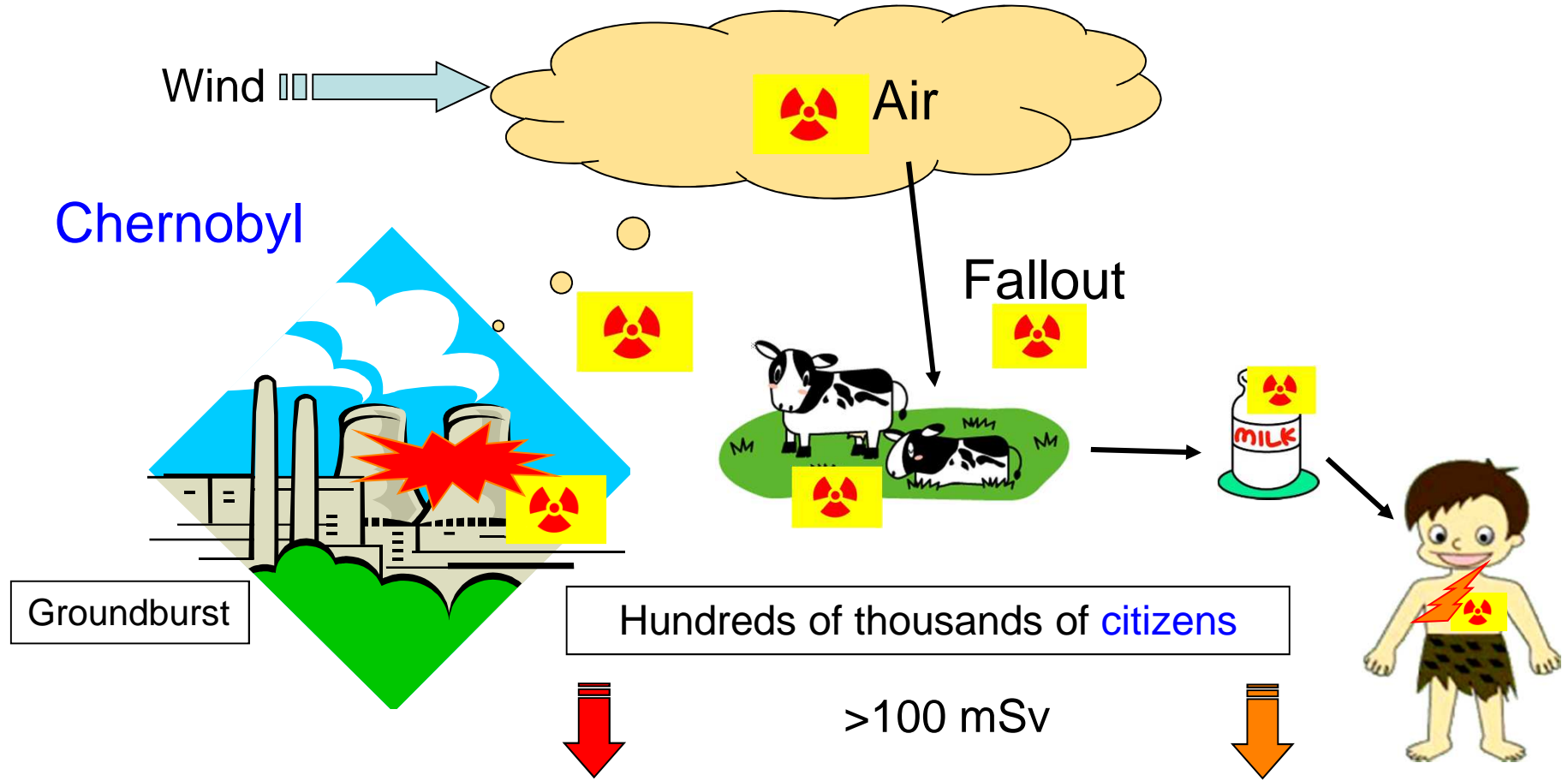
Relatively low dose  
by external & internal exposure



(It *might* concern you)



# Internal exposure (Irradiation from inside)



Groundburst

Hundreds of thousands of citizens

Died within 1 month  
0

>100 mSv  
~4000 thyroid cancer, mainly children  
Other cancers did not increase significantly



What's going on in Fukushima

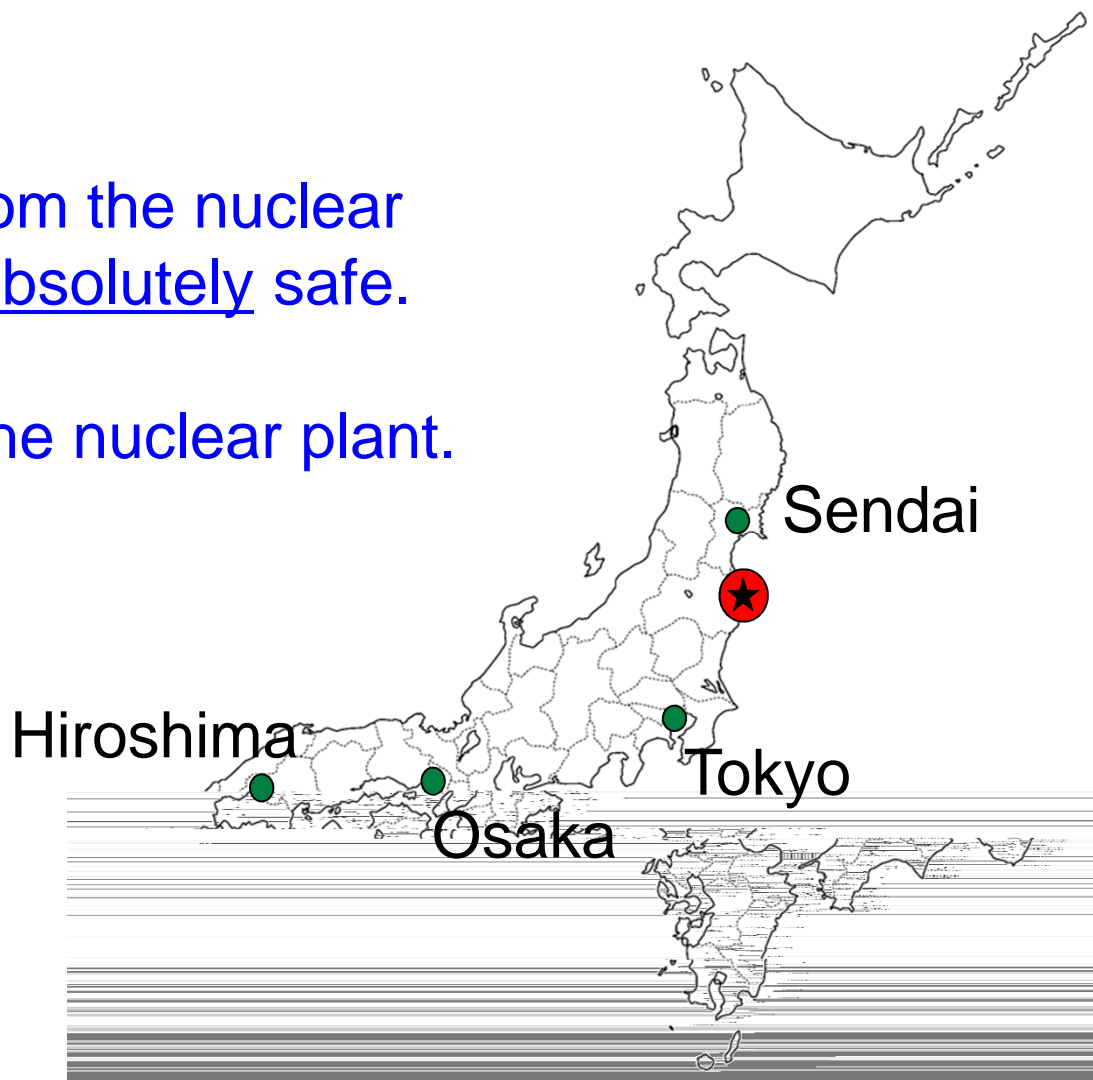




# Fukushima : To avoid external exposure what you should do?

Stay 20 km away from the nuclear plant, and you are absolutely safe.

Do not try to enter the nuclear plant.



# Fukushima

## Chernobyl



Hundreds of thousands



Died 0  
Seriously injured 0  
~4000  
increase  
, so far

0, so far

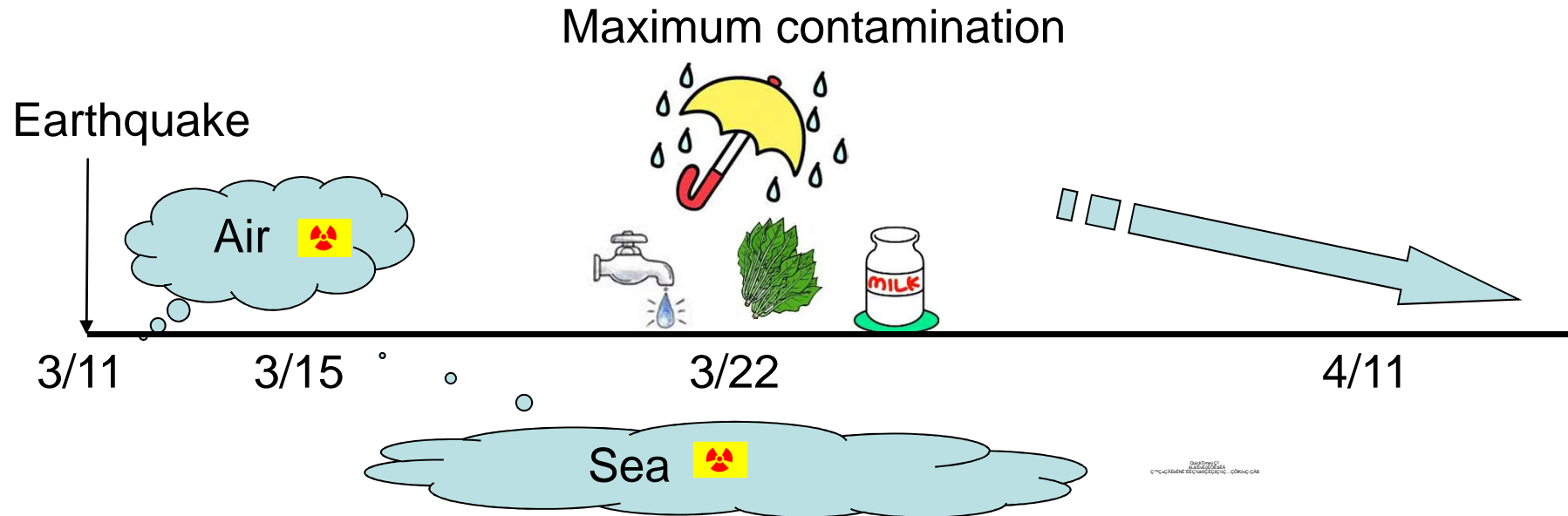


Died 0  
Seriously injured 0



No significant  
increase of **cancer**,  
most likely

# Fukushima : Time course of release of radioactive materials



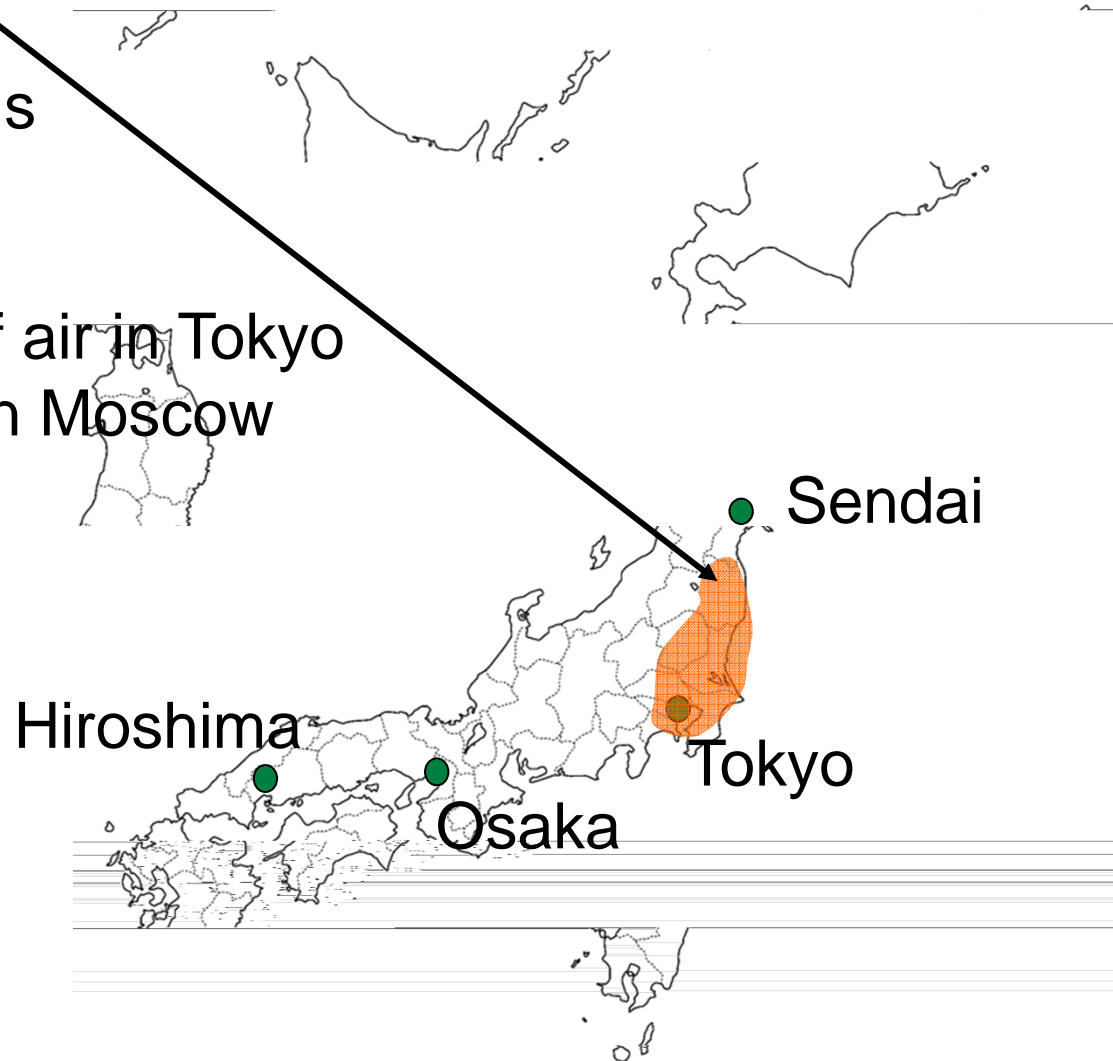
Contamination levels are **very low** even at maximum levels  
Contamination levels are improving

If you take in these contaminated water **more than 1Kg for 1 year**,  
you may get slightly increased risk for cancer.....

## 2. Inhalation of contaminated air (by breathing)

Once air in this area  
was contaminated  
with radioactive materials  
**at very low levels.**

Currently radioactivity of air in Tokyo  
is less than half of that in Moscow

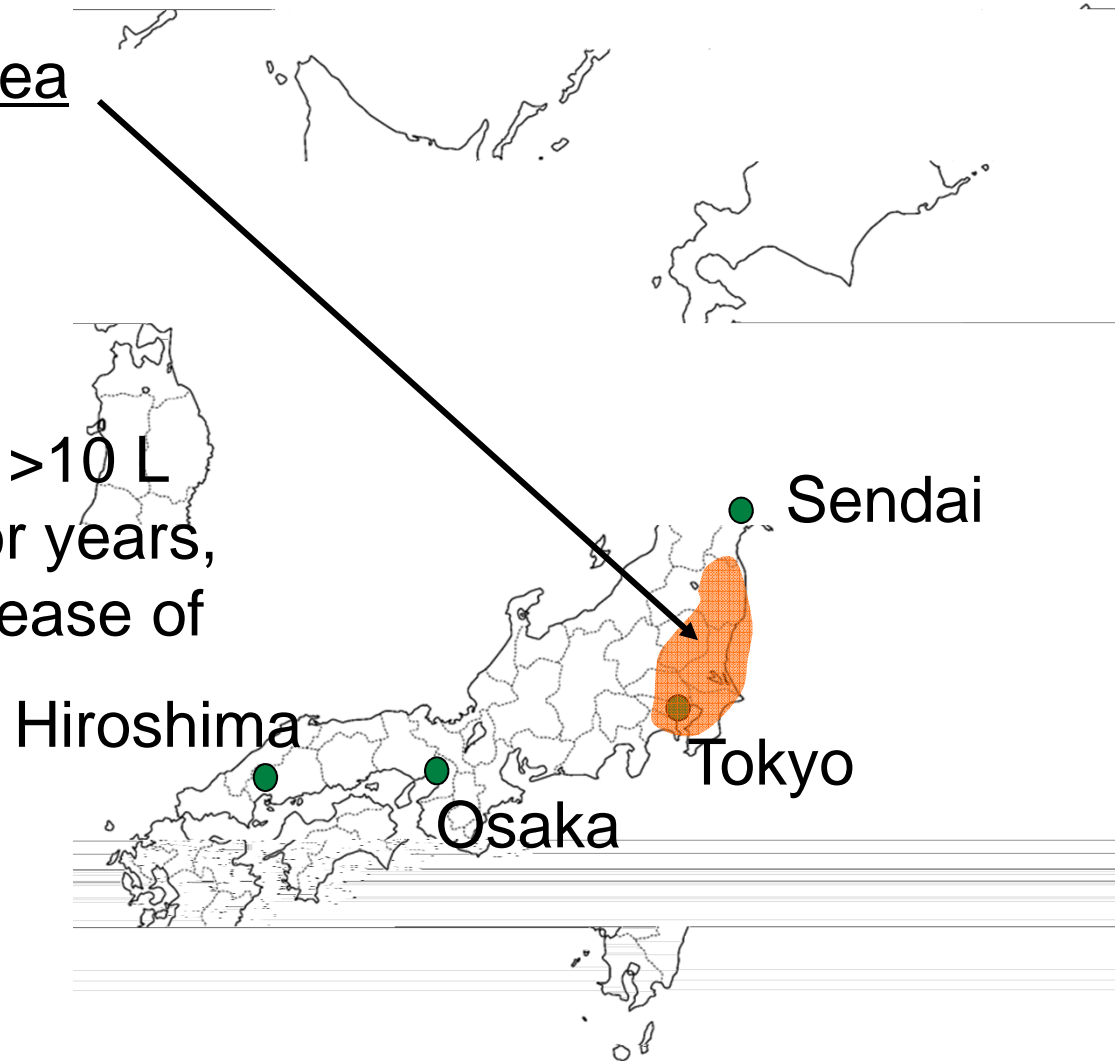


### 3. Tapwater



Once tapwater in this area was contaminated with radioactive materials **at very low levels**.

At that time, if you drink  $>10$  L of tapwater every day for years, you might get slight increase of cancer risk.



## 4. Food



Quantity of  
Cesium-137  
in the  
C137CesiumElectronMicroscopicImage.jpg

Vegetable, milk, and fish in this area might be contaminated with radioactive materials **at very low levels.**

If you have such food more than 1 Kg every day for years, you might get a slight increase of cancer risk.

Contaminated food won't be shipped to market.



## Possible question

Q: I have heard that Fukushima is now rated 'Level 7', the same as Chernobyl. If there is a big difference between Fukushima and Chernobyl, why the same level?

A: Many experts in United Nations, USA, France, Russia, and other countries think that this rating system is not good for evaluating big accident. I expect that the rating system will be changed in the future to avoid confusion. I think that if Fukushima is '7', Chernobyl should be '8' or even '9'. Many experts will agree.



# Do not worry too much

External exposure : you are absolutely safe as long as you stay 20 Km away from the plant.

Internal exposure : Air, tapwater, vegetable, milk, and fish near the nuclear power plant are once contaminated with radioactive materials **at very low levels**.

Overall, radioactivity is decreasing to normal levels.

If you take in (maximum) contaminated water/food **more than 1 Kg every day for 1 year**, you might get slightly increased cancer risk.

**Research Institute for Radiation Biology & Medicine** will inform you immediately if the situation worsens.