

Public Concern Regarding the Fukushima Accident

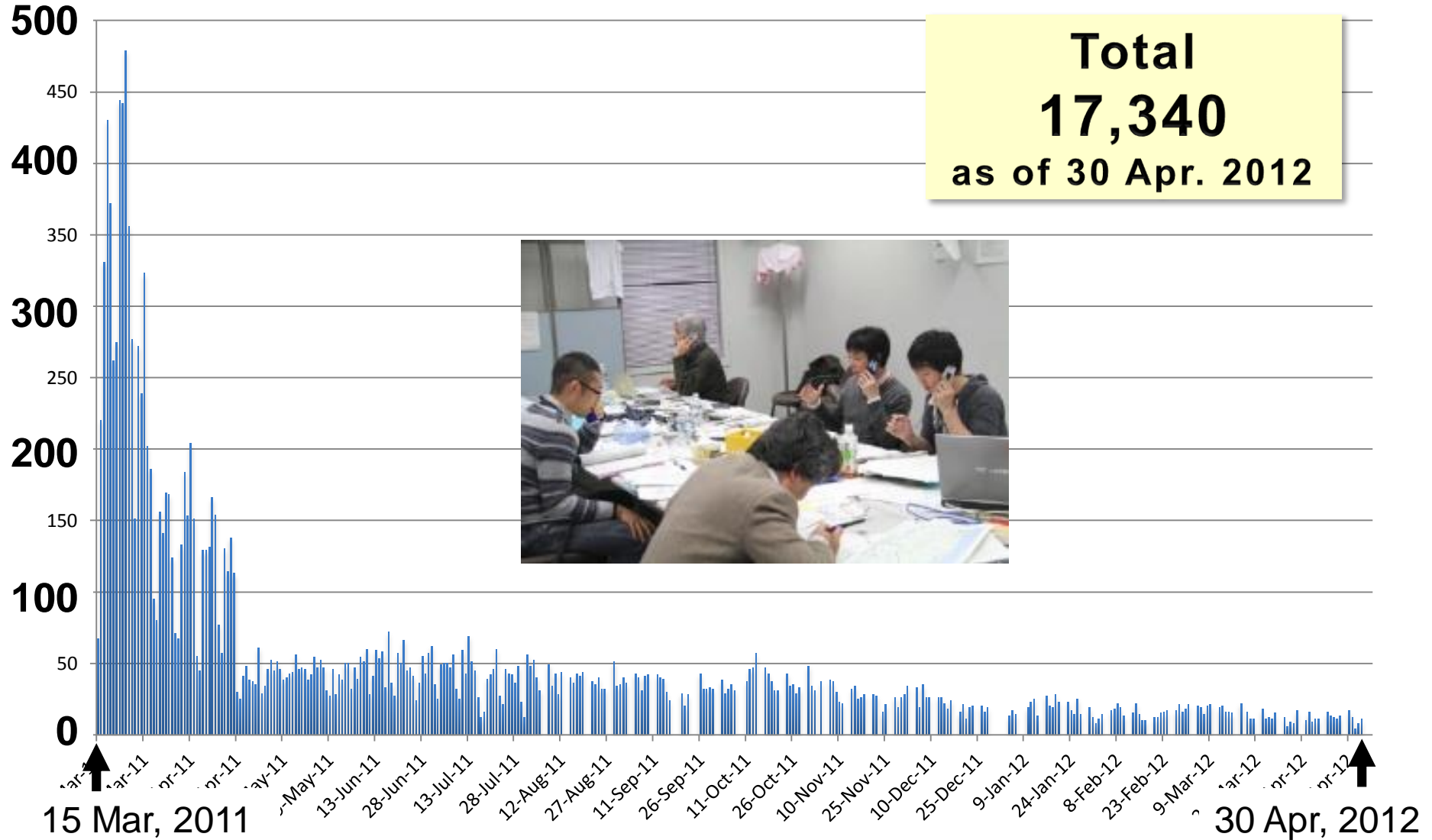
—Challenge to Radiation Protection Community

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Trend of telephone consultation

(Number of calls)



Public Concern

Due to...

- Lack of Information on Radiation Effect
- Misunderstanding about RP Concepts

Lack of Information on Radiation Effects (1)

School girls in Fukushima are not able to have a baby in future.

Tissue and Effect	Threshold	
	Total dose received in a single brief exposure (Gy)	Annual dose rate if received yearly in highly fractionated or protracted exposures for many years (Gy y^{-1})
Testes		
Temporary sterility	0.15	0.4
Permanent sterility	3.5-6.0	2.0
Ovary Sterility	2.5-6.0	>0.2

Lack of Information on Radiation Effects (2)

I was told to terminate my pregnancy.

- Lack of knowledge is responsible for great anxiety and probably unnecessary termination of pregnancies.
- Termination of pregnancy at fetal doses of less than 100 mGy is **NOT** justified based upon radiation risk.

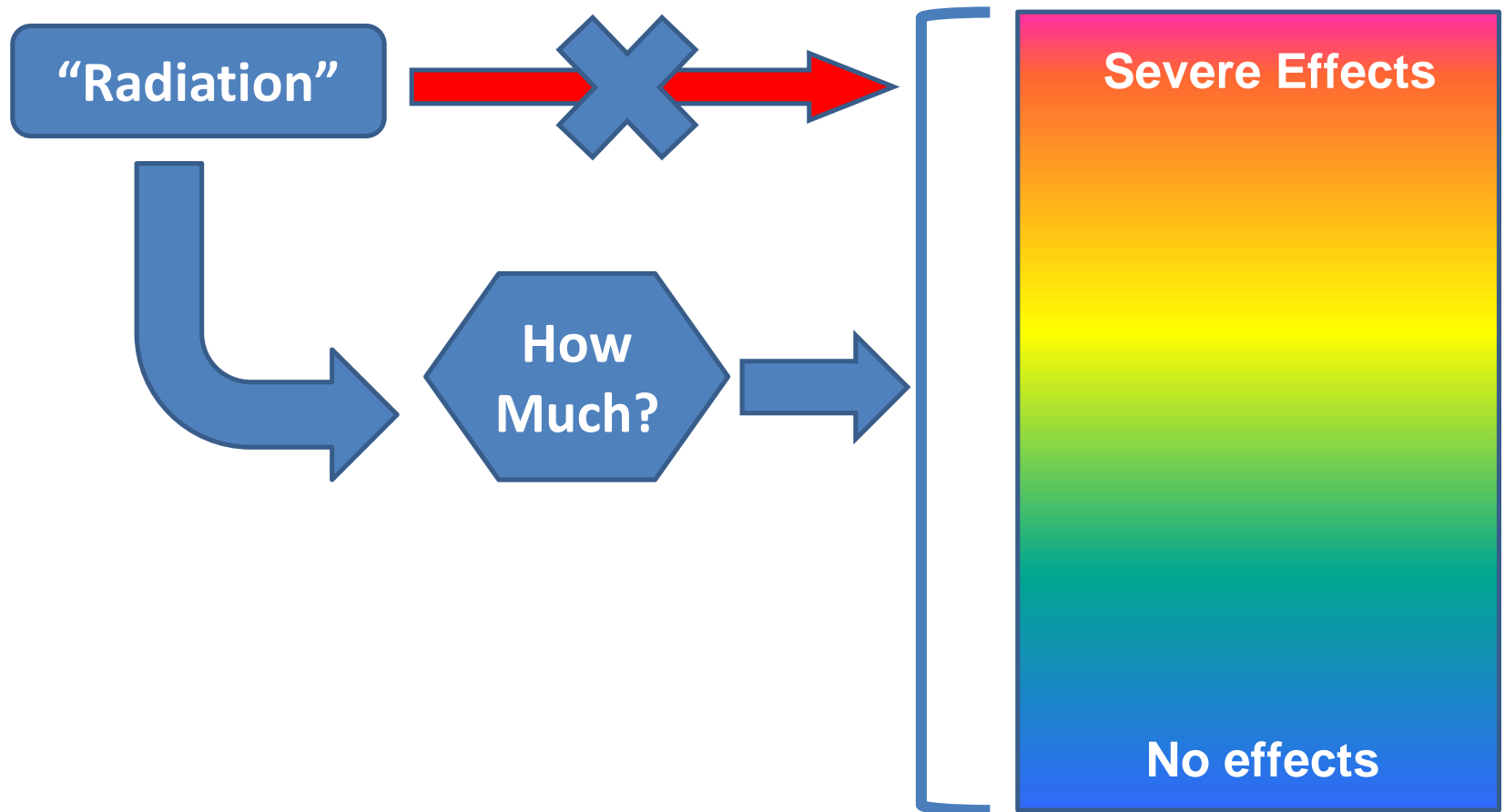
(Publication 84)

Perception of Radiation among General Public

Direct connection between “Radiation”
and “Severe Effects, Cancer, Death”



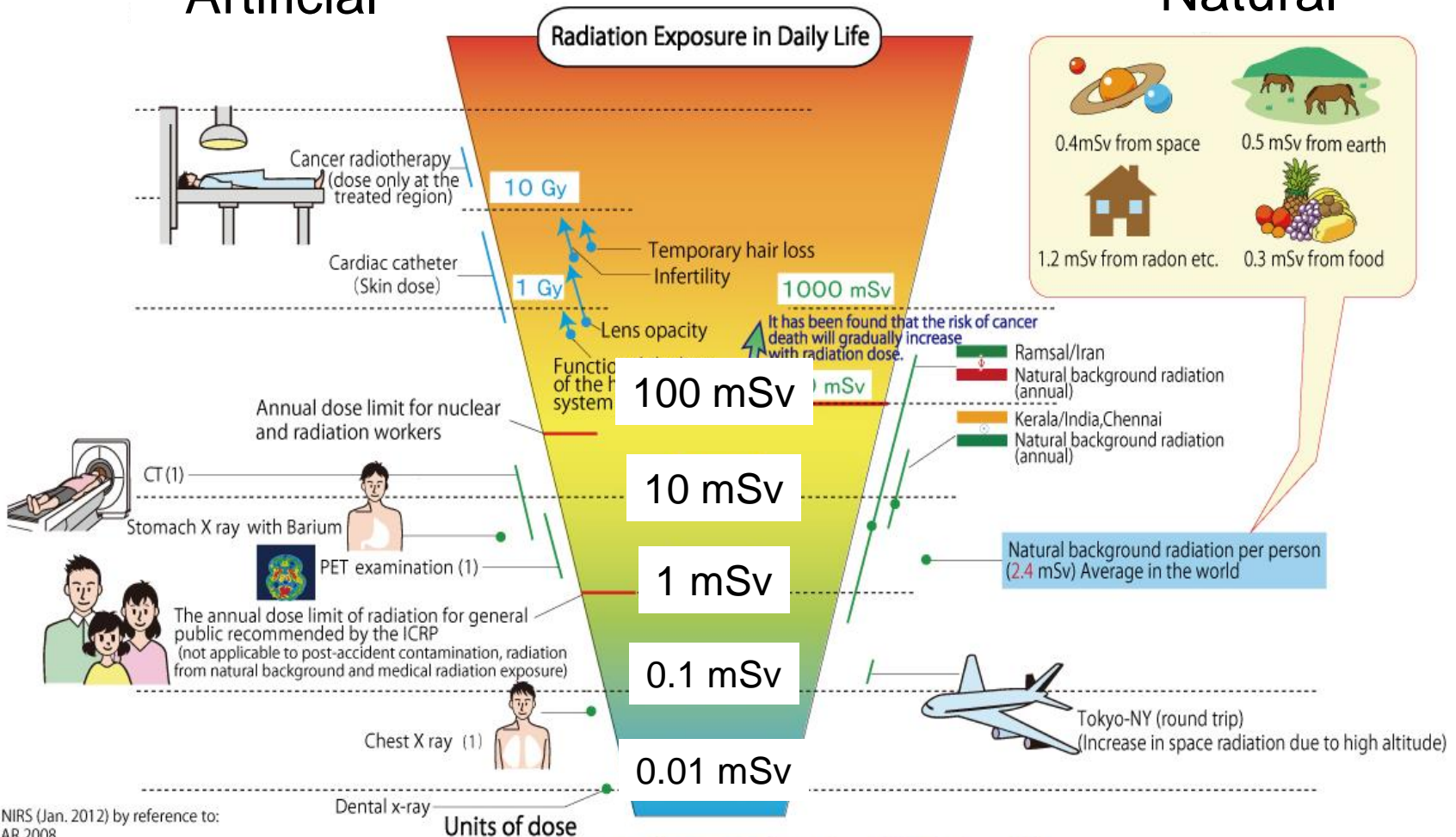
Shift of Thinking: Need for the Concept of “Dose-Effect Relationship”



Radiation Exposure/Effects at a Glance

Artificial

Natural



Made by NIRS (Jan. 2012) by reference to:
 • UNSCEAR 2008
 • ICRP 2007 Recommendations, and
 • The Guidelines for Medical Exposure by Japan Association of Radiological Technologists

[Note]

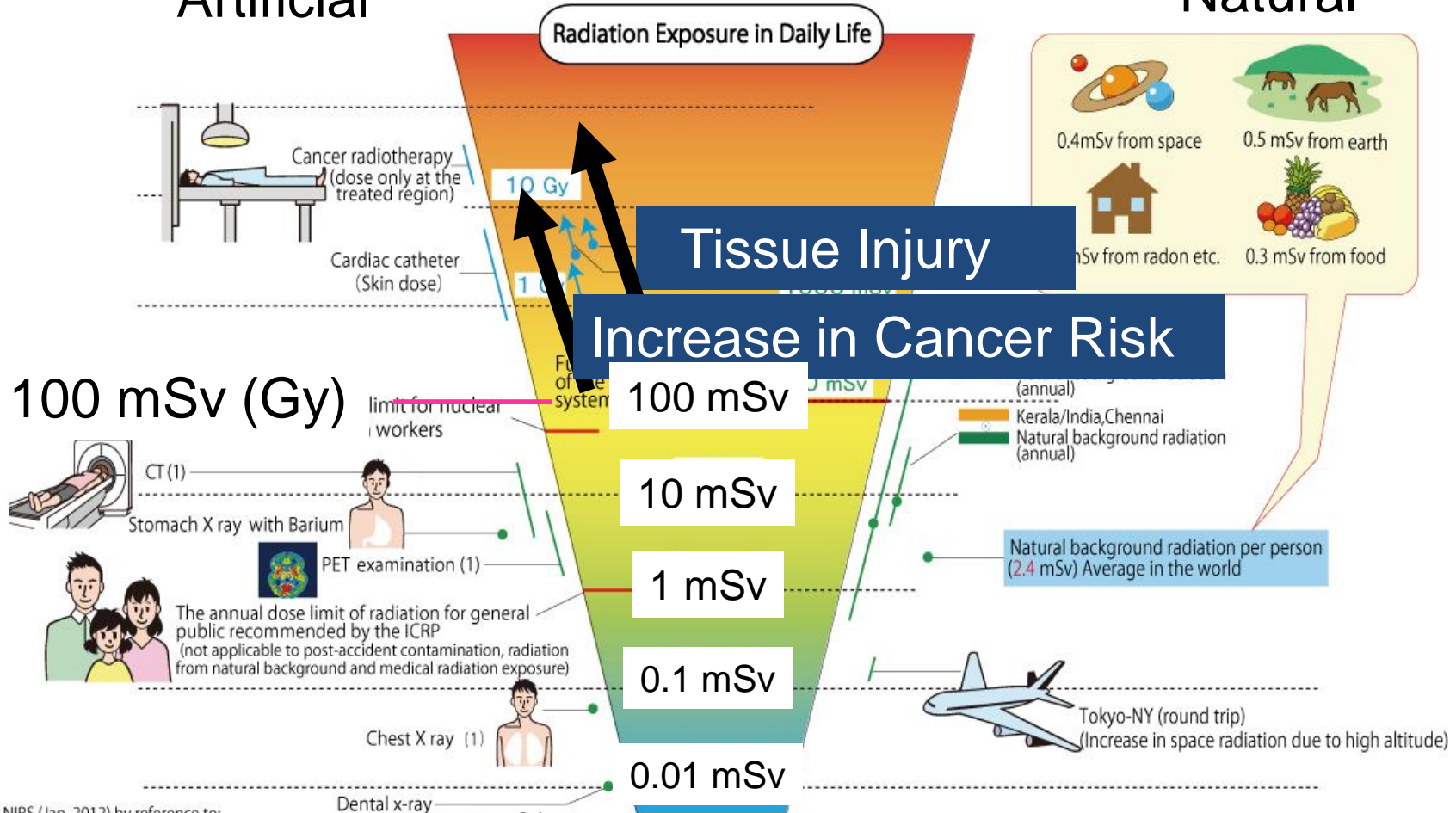
1. The numerical values are approximate figures based on significant digits
2. The scales shown by the dotted lines are a logarithmic display.
3. This chart is...

Effective dose: mSv
 The dose of radiation to the entire human body totaling the dose received at each organ or tissue and weighted for its sensitivity to cancer and hereditary effects. This is a term in use for radiation protection. If the entire human body is evenly exposed to gamma rays at an absorbed dose of 1 Gy, the effective dose will be 1000mSv.

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- 1.The numerical values are approximate figures based on significant digits
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Each step is 10 times the previous one.
- 3.This chart is based on the data from the International Commission on Radiological Protection (ICRP).

Units of dose

• **Absorbed dose at each organ or tissue: Gy**
 The unit to show energy received per unit weight (J/kg) at each organ or tissue exposed to radiation.

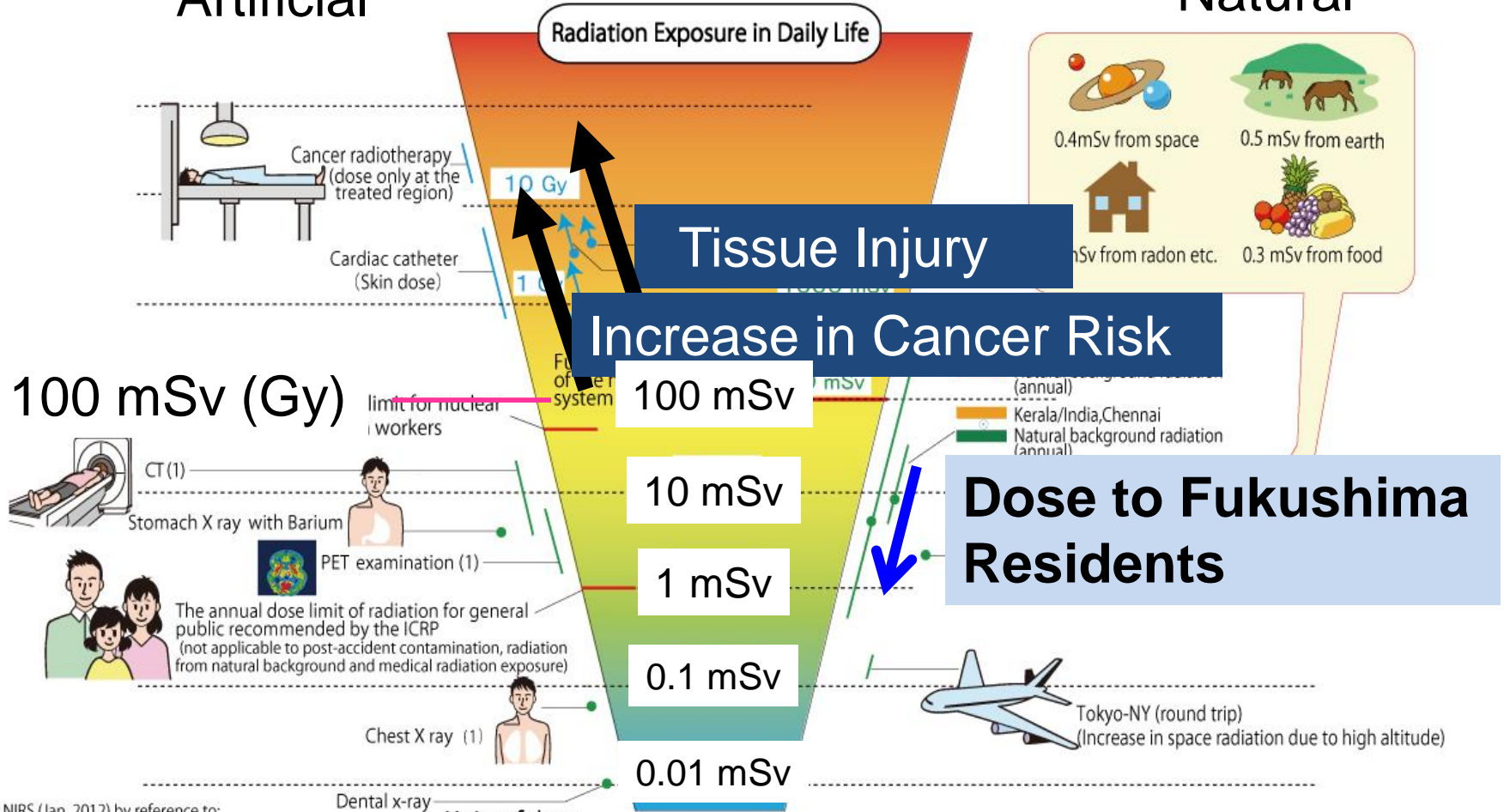
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- 1.The numerical values are approximate figures based on significant digits
- 2.The scales shown by the dotted lines are a logarithmic display.
Each step is 10 times the previous one.
- 3.This chart is based on the data from the Fukushima Daiichi Nuclear Power Plant accident.

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Misunderstanding about RP Concepts (1)

- Any dose more than 1 mSv is dangerous.

... It must also be realised that neither dose and risk constraints nor reference levels represent a demarcation between 'safe' and 'dangerous' or reflect a step change in the associated health risk for individuals.
(Paragraph 228, Publication 103)

Misunderstanding about RP Concepts (2)

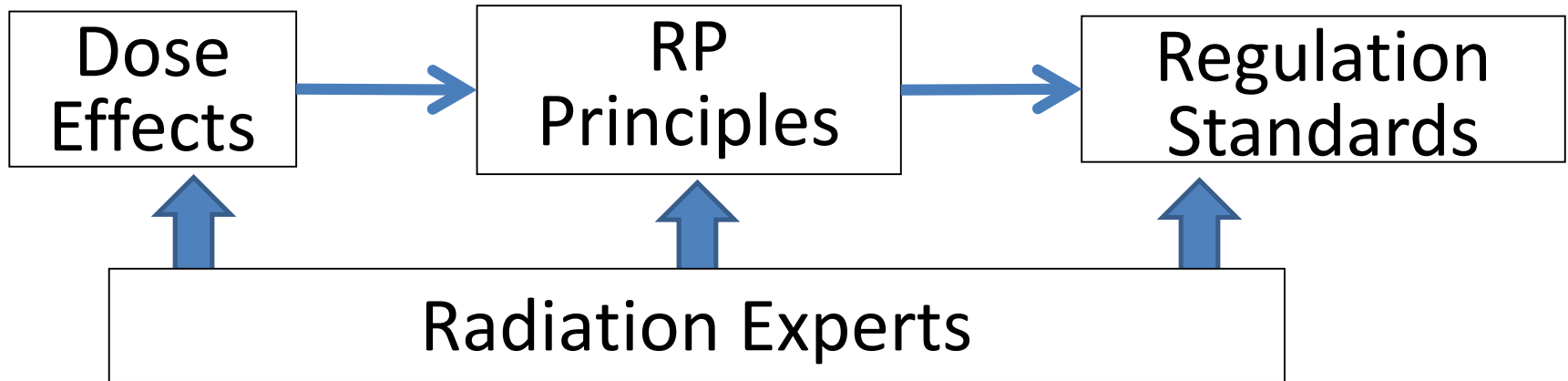
- Tens of thousands people shall die due to radiation from the accident.

...the Commission emphasises that whilst the LNT model remains a scientifically plausible element in its practical system of radiological protection....the Commission judges that it is not appropriate, for the purposes of public health planning, to calculate the hypothetical number of cases of cancer or heritable disease that might be associated with very small radiation doses received by large numbers of people over very long periods of time. (Paragraph 66, Publication 103)

Conclusion

- Residents in Fukushima, who had not been aware of radiation effects nor radiological protection, have been affected and confused by lack of information on radiation effects and misunderstanding of concepts in radiological protection system.
- Radiation experts should disseminate;
 - (i) precise information on effects of radiation,
 - (ii) plain explanation on RP concepts.

Roles of Radiation Experts



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