

Communication of Radiation Risks

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Outline

- Self-introduction
- Background (before the accident)
 - Status of local areas in Fukushima where the nuclear power plants existed
 - Status of knowledge on radioactivity and radiation risk prior to the accident and public perception of radiation risk
- Lessons learned through radiation risk communication after the accident
 - Conflicting advice from the experts on radiation risk
 - What was the effect on public perception of radiation risk
 - Mothers' concerns
- Current status of risk communication
 - Gaps between radiation risk (scientific basis) and need for decontamination
 - What is the most common reason for evacuees not wanting to return to their homes?
- Challenging issues for the future

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Background (before the accident) ①

- Status of local areas in Fukushima where nuclear power plants existed -

- Topography, demographics, infrastructure
- Urbanization – migration from local areas to population centers
- Japanese workplace – working away from home

大野駅前通りの商店街はみずぼらしい古い家が散見され、人通りも少く閑としていた。人々の生活は質素で人を招いてご馳走するといえば刺身が一番のもてなしであり、肉屋には牛肉がなく入手したければ平市か原町市へ行かねばならなかった。この地方は雨が少いので溜池が多く耕地面積が少ないので若い人は都会へ出て行き、給料取りは役場、農協、郵便局のみで福島県では檜枝岐地方と対比してこの地域を海のチベットと称していた。しかし、人々は大熊町まで相馬藩に属しており、隣接町村が天領であるのに比べて「我々は違う」という気位の高さを誇っていた。

縦の木会・東電原子力会編『福島第一原子力発電所1号機運転開始30周年記念文集』(2002年3月)より

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Background (before the accident) ②

- Status of knowledge on radioactivity and radiation risk prior to the accident (1) -

- Status of (nuclear) energy knowledge in the education system
- Status of radiation knowledge and risk in the education system
 - Traumatic memories of Hiroshima & Nagasaki
 - Lack of correct and appropriate information on radiation risk
 - Instinctive concerns



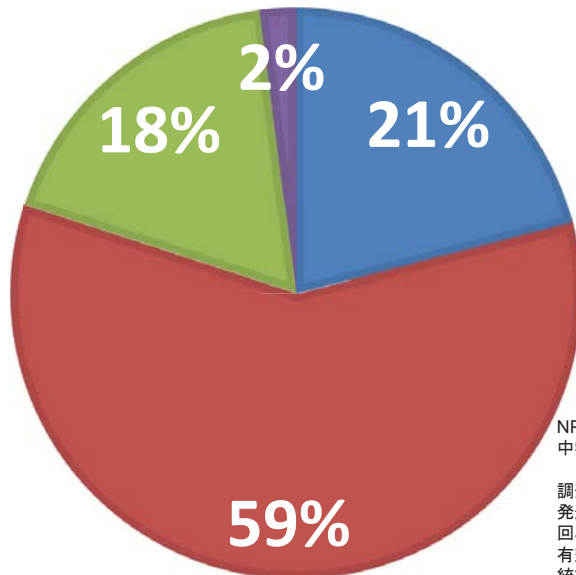
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Background (before the accident) ②

— Status of knowledge on radioactivity and radiation risk prior to the accident (2) —

Q: Better to have no additional exposure than minimum exposure?

■ Incorrect ■ Correct ■ Don't know ■ No answer

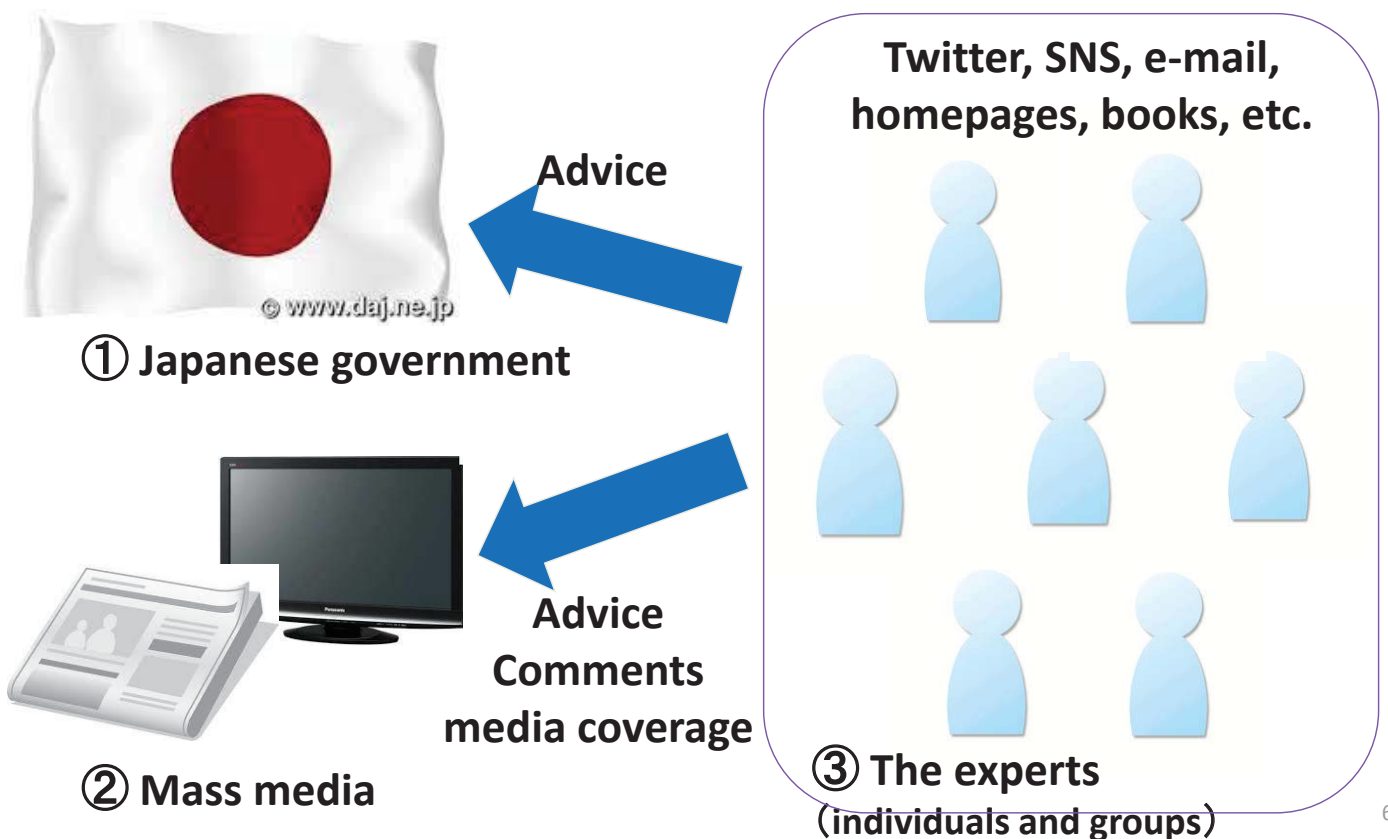


NPO法人放射線教育フォーラムによる
中学校教員を対象にした放射線に関するアンケート

調査時期 2008.11
 発送数 5001通 (実発送可能実数 4993通 発送不可能数 8通)
 回収数 1151通 (有効回収数 1149通 不備回答を含む数 2通)
 有効回収率 23.0% (発送実数に対する有効回答数の割合)
 統計に使用した数 1097通 (2008.12末日までに受領したアンケート)5

Lessons learned through radiation risk communication after the accident ①

-Conflicting advice from the experts on radiation risk-



Lessons learned through radiation risk communication after the accident ①

— Who are the “experts”? —

- Problem 1 : Comments beyond their expertise which have been subdivided into specific study fields



“No comments” are allowed?

炉物理	核融合工学	燃料	バックエンド	熱流動	放射線工学	ヒューマン・マシン・システム研究	加速器・ビーム	社会・環境	保健物理・環境科学	核データ	材料	原子力発電	再処理・リサイクル	計算科学技術	水化学	原子力安全	新型炉
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ex. divisions within AESJ

- Problem 2 : Gaps in knowledge and perception of radiation risk on the part of experts from different areas of expertise
 - Physical science
 - Nuclear engineering and science
 - Medical – biological sciences

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Lessons learned through radiation risk communication after the accident ②

— What was the effect on public perception of radiation risk —

- Political statements made to the public on radiation risk
- Political approach to radiation risk and its effect on public trust and confidence
- Conflicting advice from the experts on radiation risk, some supportive of the government position
 - Effect of this on public perception

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How did you perceive the situation ?



**There is no
immediate impact**

http://www.google.co.jp/imgres?q=%E6%9E%9D%E9%87%BE%E3%80%80%E5%86%99%E7%9C%9F&hl=ja&sa=X&rtz=1T4ADFA_jaJP492JP493&biw=1018&bih=569&tbm=isch&prmd=imvns&tbid=2zAvN25mbnH1EM:&imgrefurl=http://japanese.joins.com/article/418/138418.html&docid=-mfFxf-wZUAMUM&imgurl=http://japanese.joins.com/upload/images/2011/03/20110323101730-1.jpg&w=250&h=250&ei=CnUGUP2EleajAf224GIBA&zoom=1&iact=hc&vpx=232&vpy=228&dur=1570&hovh=200&hovw=200&tx=138&ty=197&sig=114973258337567351157&page=2&tbid=166&tbid=166&start=21&ndsp=15&ved=1t:429,r:11,s:21,1:174,yJ

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How did you perceive the situation?



**Effects of low dose
exposure are not known**

http://www.google.co.jp/imgres?q=%E6%9E%9D%E9%87%BE%E3%80%80%E5%86%99%E7%9C%9F&hl=ja&sa=X&rtz=1T4ADFA_jaJP492JP493&biw=1018&bih=569&tbm=isch&prmd=imvns&tbid=2zAvN25mbnH1EM:&imgrefurl=http://japanese.joins.com/article/418/138418.html&docid=-mfFxf-wZUAMUM&imgurl=http://japanese.joins.com/upload/images/2011/03/20110323101730-1.jpg&w=250&h=250&ei=CnUGUP2EleajAf224GIBA&zoom=1&iact=hc&vpx=232&vpy=228&dur=1570&hovh=200&hovw=200&tx=138&ty=197&sig=114973258337567351157&page=2&tbid=166&tbid=166&start=21&ndsp=15&ved=1t:429,r:11,s:21,1:174,yJ

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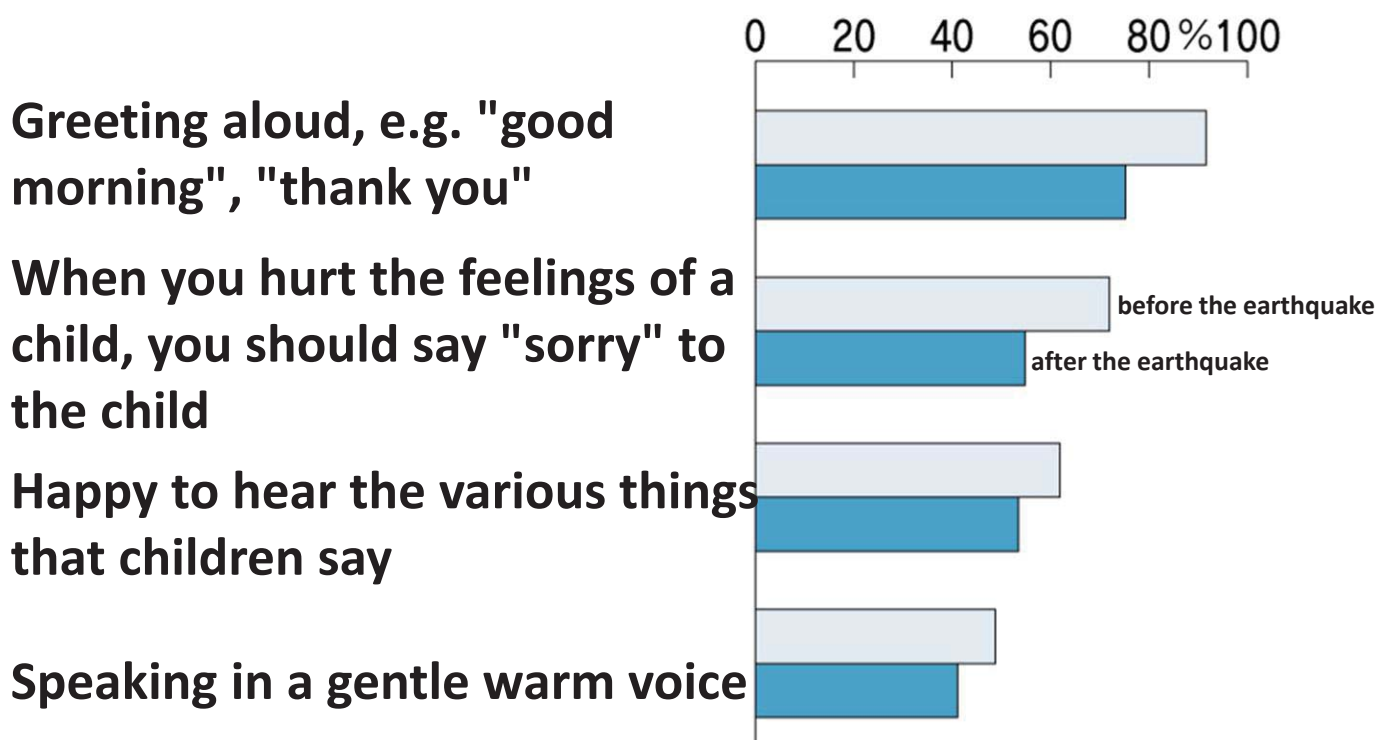
Lessons learned through radiation risk communication
after the accident ③
- Mothers' concerns -

Wish to protect children in any way

However, some actions were observed that were based on views that differed from the scientific understanding of radiation

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After the earthquake, tolerance of mothers has decreased



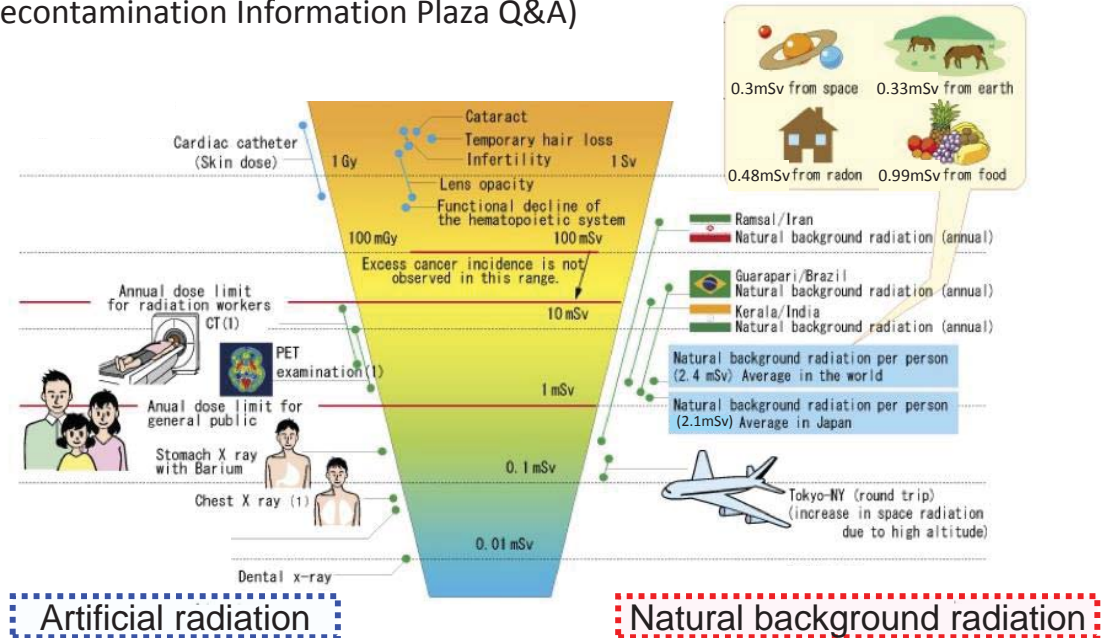
Survey of mothers with a child under two years of age in metropolitan areas
November 2006: before the earthquake
Late May 2011: after the earthquake
Benesse Institute for the Development of the Next Generation

4th July, 2011
by the Nikkei Shimbun (evening paper)

Current status of risk communication ①

- Gaps between radiation risk (scientific basis) and needs for decontamination -

Although a target value for dose reduction through decontamination is not specified, it is necessary for radiological protection to implement measures to reduce individual exposure dose to meet the long-term objectives of radiation protection, such as additional dose to be less than 1 mSv/y (from Decontamination Information Plaza Q&A)



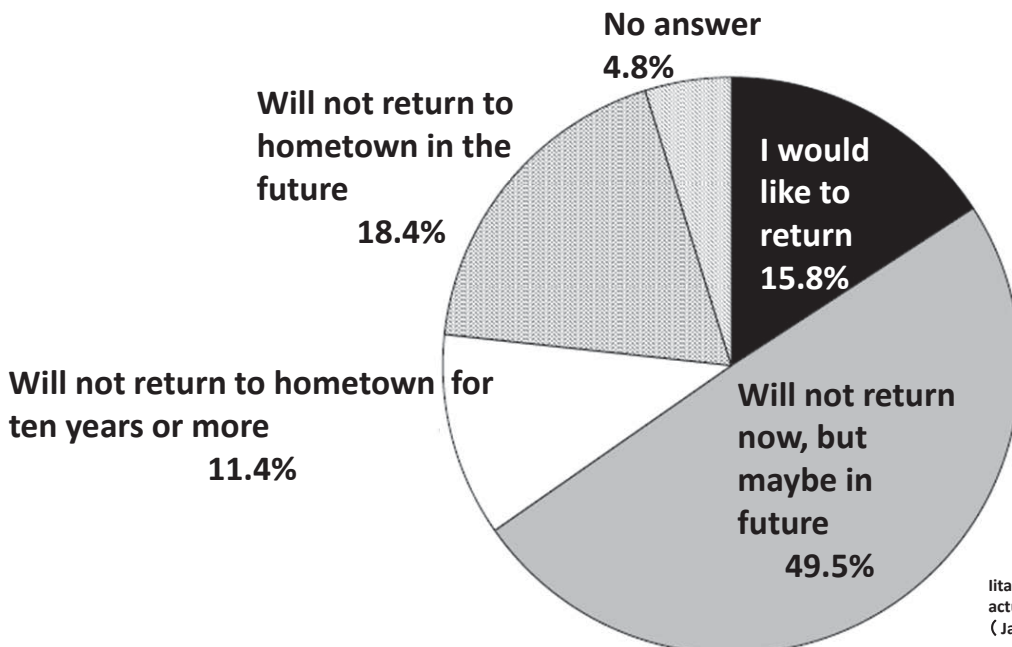
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Current status of risk communication ②

- What is the most common reason for evacuees not wanting to return to their homes? (1) -

◆ Intention to return to hometown after clearance to return being given at the time which has been agreed with the country (n=1,366 s)

【Q3】 If clearance to return is given 3 - 6 years after the occurrence of the accident, would you return to your hometown and live there?

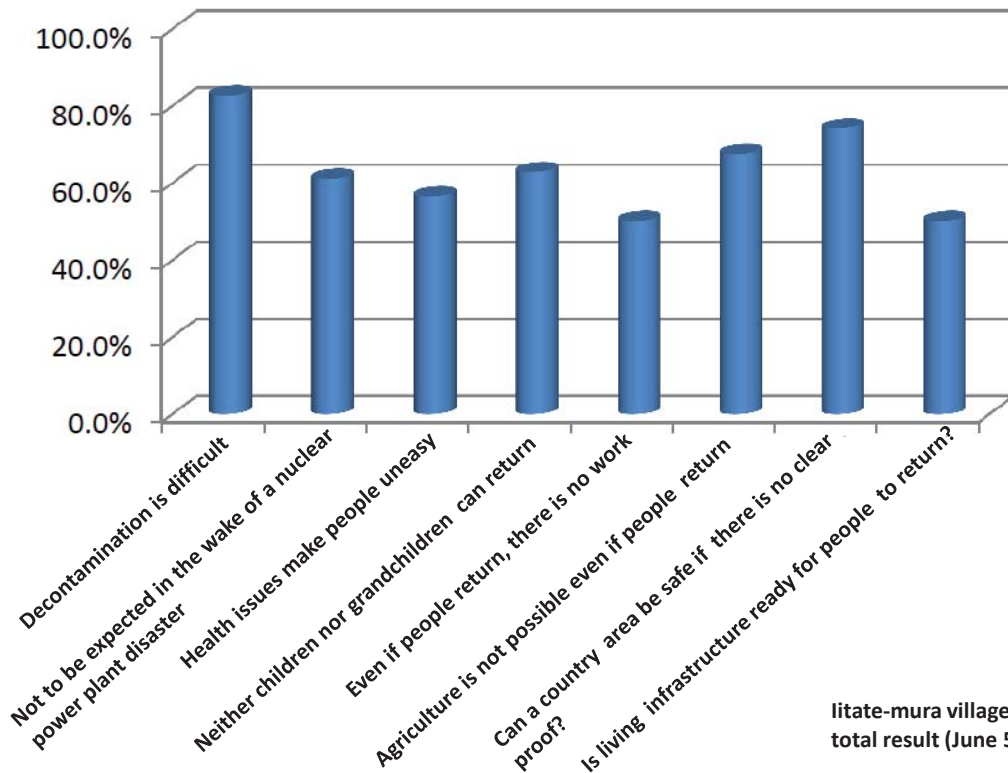


litaate-mura adult questionnaire result about the actual condition of litaate-mura, and revival (January, 2013)

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Current status of risk communication ②

- What is the most common reason for evacuees not wanting to return to their homes? (2) -

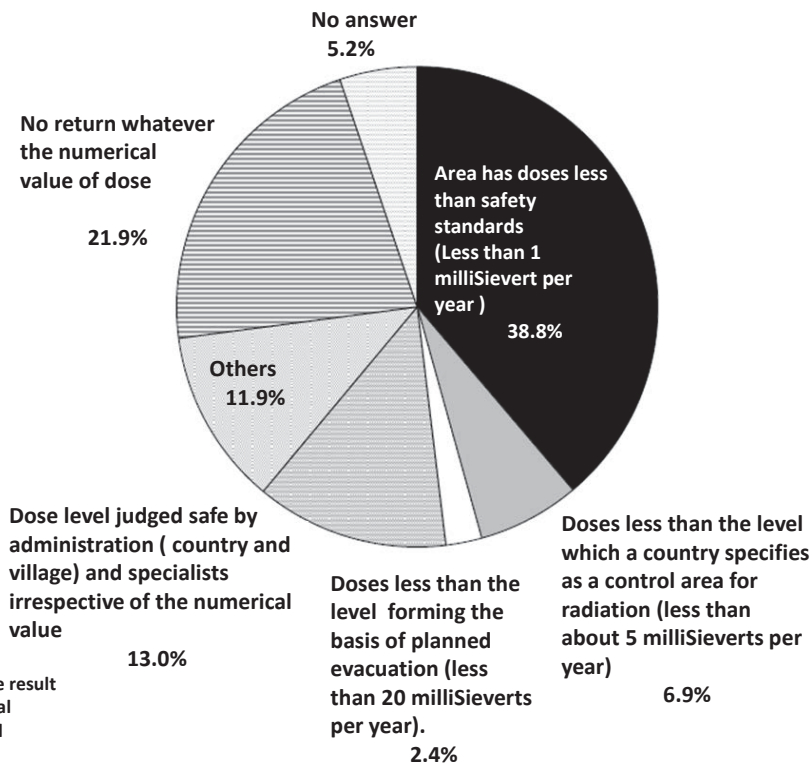


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Current status of risk communication ②

- What is the most common reason for evacuees not wanting to return to their homes? (3) -

【Q1】 Can you return and live in a village after decontamination?



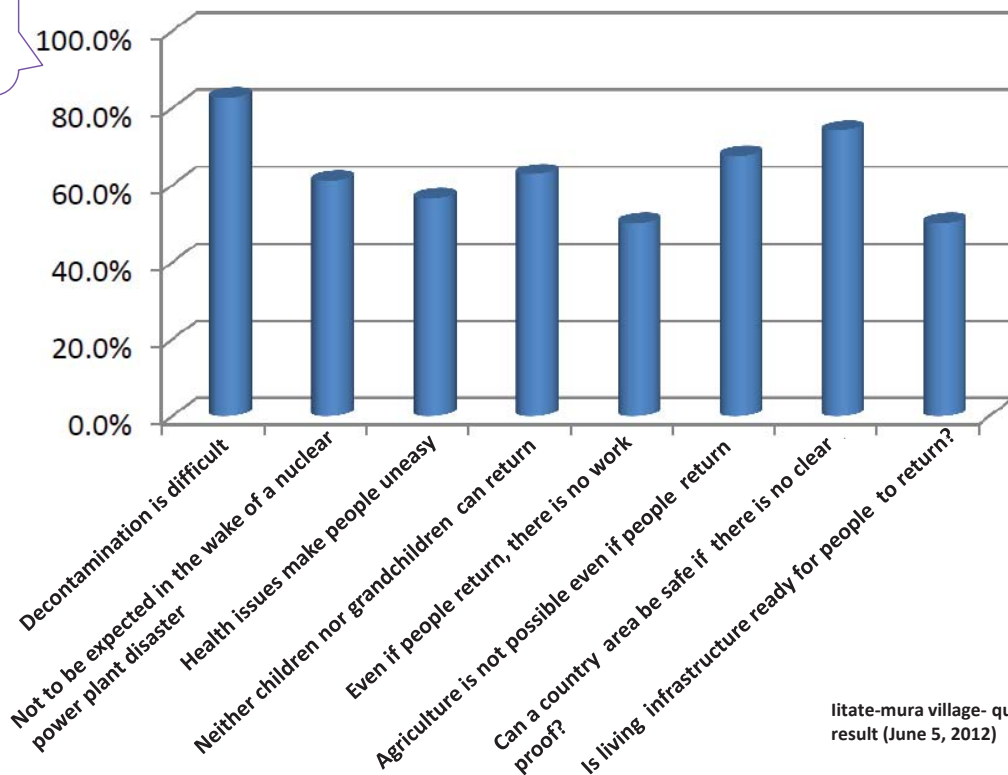
The litate-mura adult questionnaire result news flash about the refuge life actual condition of litate-mura, and revival (January, 2013)

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Current status of risk perception communication ②

- What is the most common reason for evacuees not wanting to return to their homes? (2a) -

Reasons both real and official



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Current status of risk communication ②

- What is the most common reason for evacuees not wanting to return to their homes? (4) Yamakoshi village -

Kansei Gakuin University emergency restoration institutional approach center newsletter FUKKOU 2007 vol.3

The house was lost	52.2%
Host town life convenient	29.9%
The workshop was lost	19.4%
House reconstruction is economically difficult	17.9%
Uneasy in a disaster prevention area	17.9%
Shopping is inconvenient	16.4%
(Comparing Yamakoshi with Nagaoka refuge)	
New workplace is too far	10.4%
Problem of children's schools	6.0%

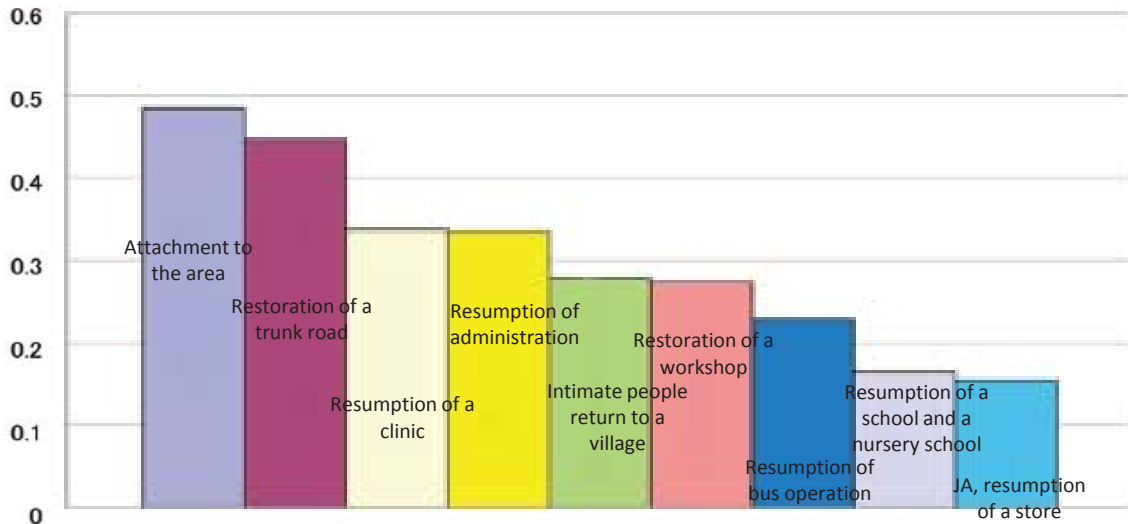
Notes : There were many elderly people among respondents

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Current status of risk communication ②

— What is the most common reason for evacuees not wanting to return to their homes? (5) Yamakoshi village —

Kansei Gakuin University emergency restoration institutional approach center newsletter FUKKOU 2007 vol.3



Conclusive factors for return to a village (multiple answers allowed)

✂ Rate of return to Yamakoshi village: about 70%

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Challenging issues for the future

— Supposing 3.11 happens again, what do we do (1)? —

The impact on the human body due to radiation : What is known

- Atomic bomb : Hiroshima • Nagasaki

Survivors of the atomic bombs long-term follow-up survey

Life investigation (1950~) 120,000 persons

Adult health study (1958~) 20,000 persons

✂consults once per year

Contamination in the womb (1950~)

3,300persons

Secondary contamination (1946~)

88,000persons

- Nuclear bomb experiments: Marshall archipelago (Bikini Atoll), Nevada (USA), Semipalatinsk (Soviet Union), UK, France, China, India, Pakistan
- Accident during atomic bomb manufacture: Hanford (USA), South Urals (Soviet Union)
- Nuclear power plant disaster: Three Mile Island (USA), Chernobyl (Soviet Union), JCO (Japan, Tokai village)
- Occupational contamination: Uranium mine, fluorescent paint contractor, nuclear power plant staff
- Medical contamination: Diagnosis, medical treatment
- Medical accident: Every corner of the earth (IAEA, reports to WHO)
- Residents in high natural radiation areas: Brazil, China, etc.

International organizations on radiological protection referred to
 UNSCEAR
 ICRP
 IAEA
 WHO

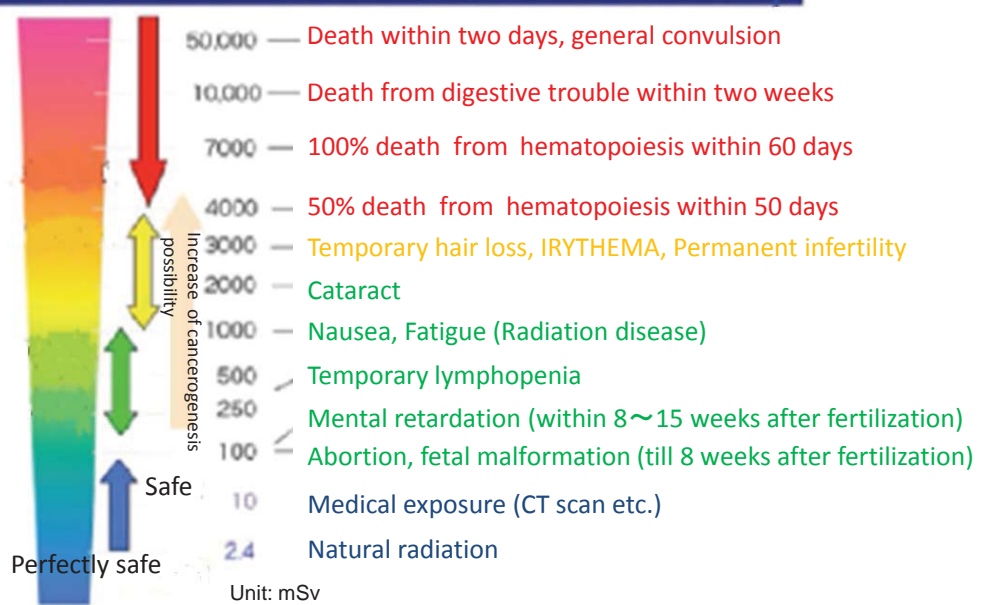
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Challenging issues for the future

— Supposing it returns to 3.11 once again, what does it do (2)? —

The degree and the cause of carcinogenic of carcinogenic probability
: It dies, living

The threshold of the sudden sexual disorder by radiation



小林泰彦氏
食のコミュニケーション円卓会議2011.5.30資料

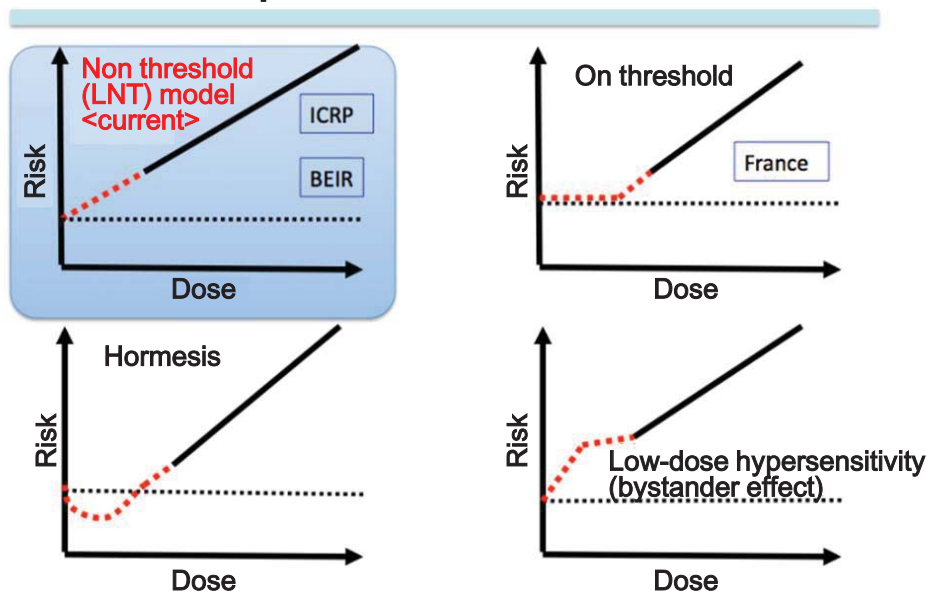
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Challenging issues for the future

— Supposing 3.11 happens again, what do we do (3)? —

What is agreed about exposure under 100 mSv?

Concept of risk of low radiation



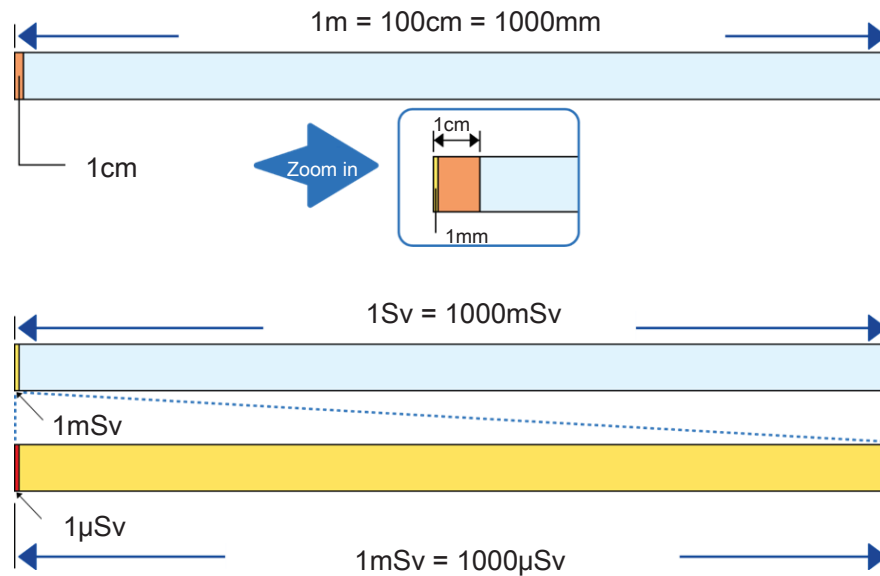
Reference: discourse document by Prof. Y. Matsumoto at Tokyo Institute of Technology

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Challenging issues for the future

— Supposing 3.11 happens again, what do we do (4)? —

Description of the magnitude of the numbers :
What is milli and micro ??



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Challenging issues for the future

Do experts take steps to communicate?

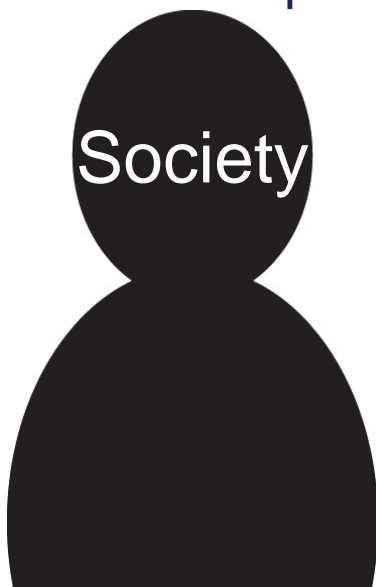
Step:1 Understand the background
(other side + its purpose)

Step:2 Convey

- feelings
 - situation
 - knowledge and background
- } → purpose



(purpose)
scientific data



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