

The role of social media

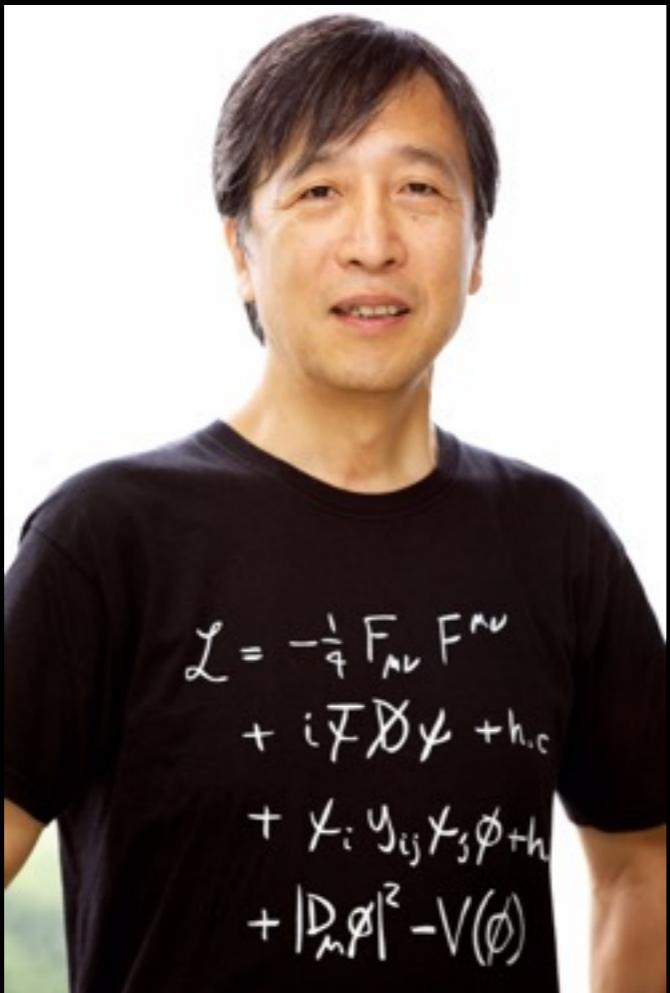
in informing population after the Fukushima disaster in Japan
work on disproving the rumours which appear in social media

Ryugo S. Hayano

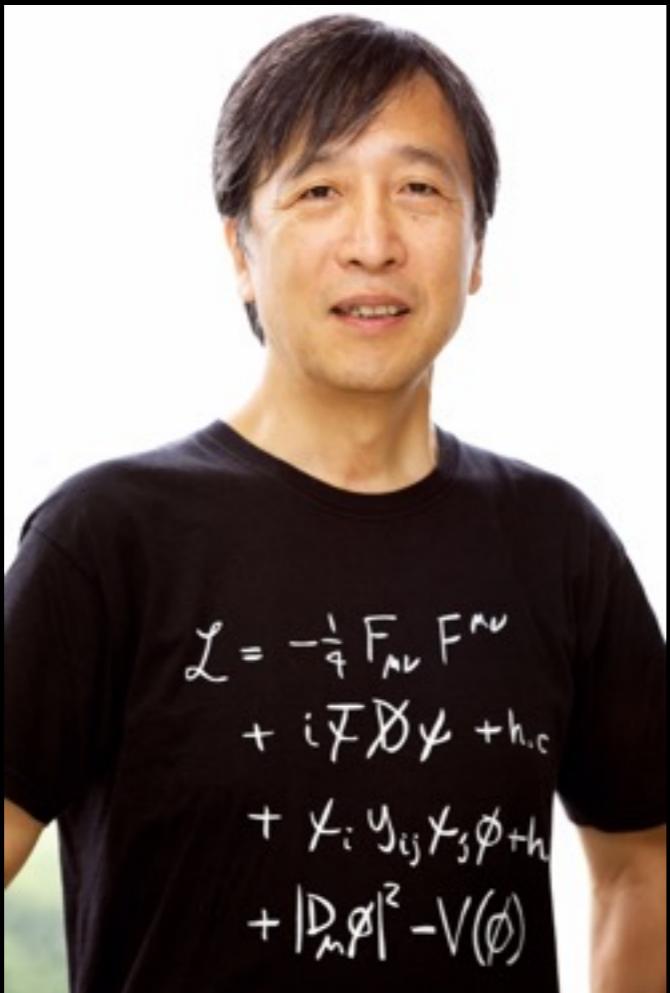
Physics department, The University of Tokyo



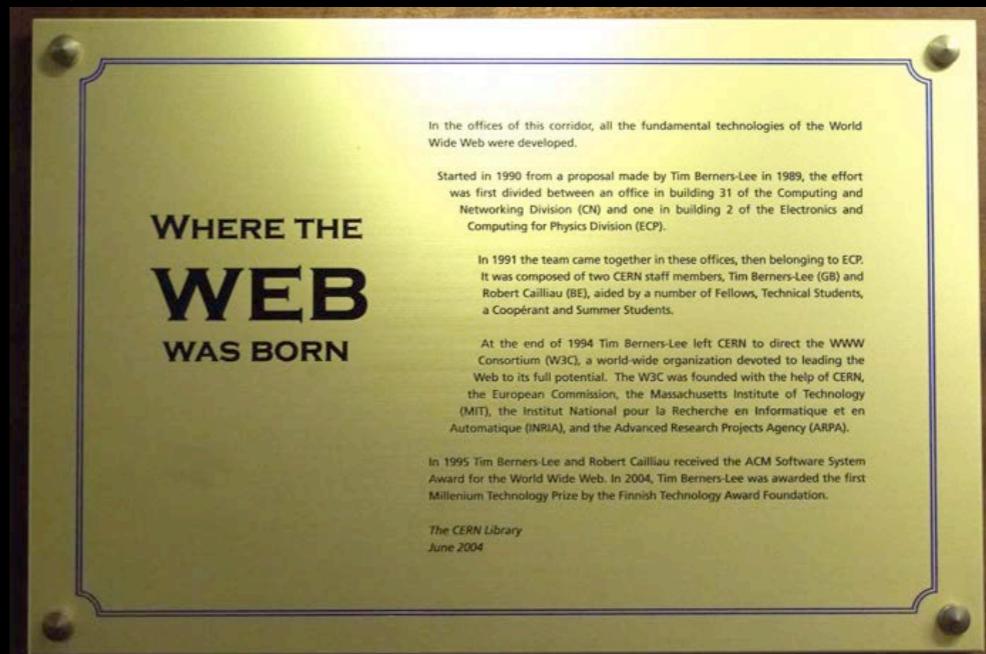
teach physics in Tokyo,
“antimatter” team leader at CERN,
Geneva since 1997



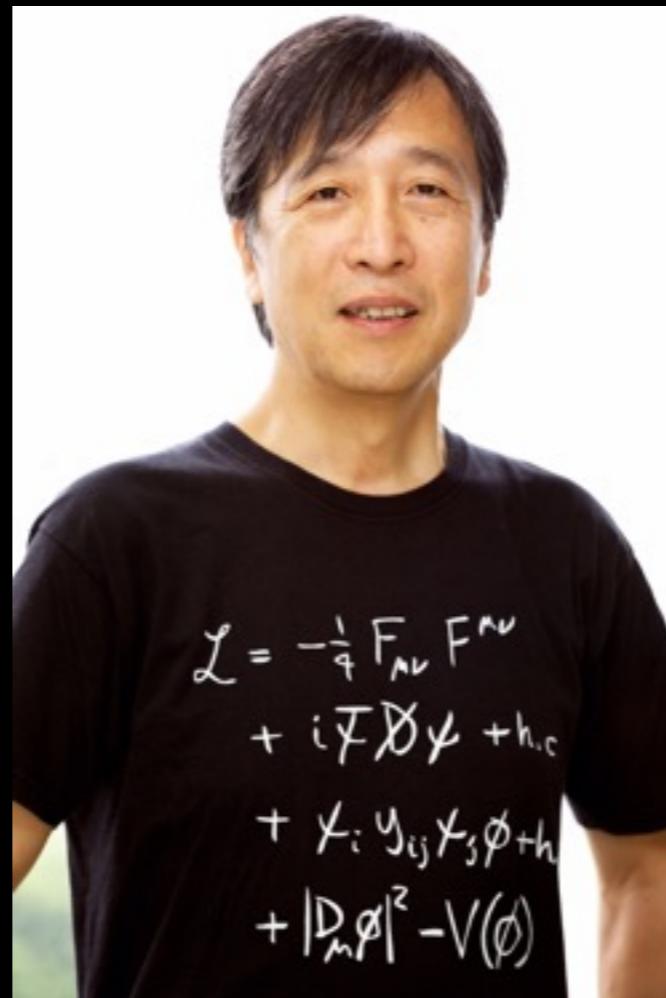
teach physics in Tokyo,
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Geneva since 1997



Just below my office
at CERN



no past experience in radiation protection
nor risk communication

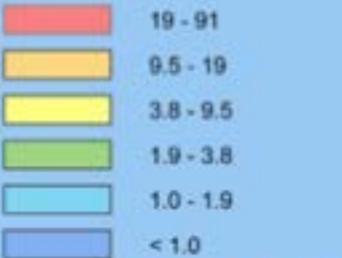


Why am I here today?

Why am I here today?

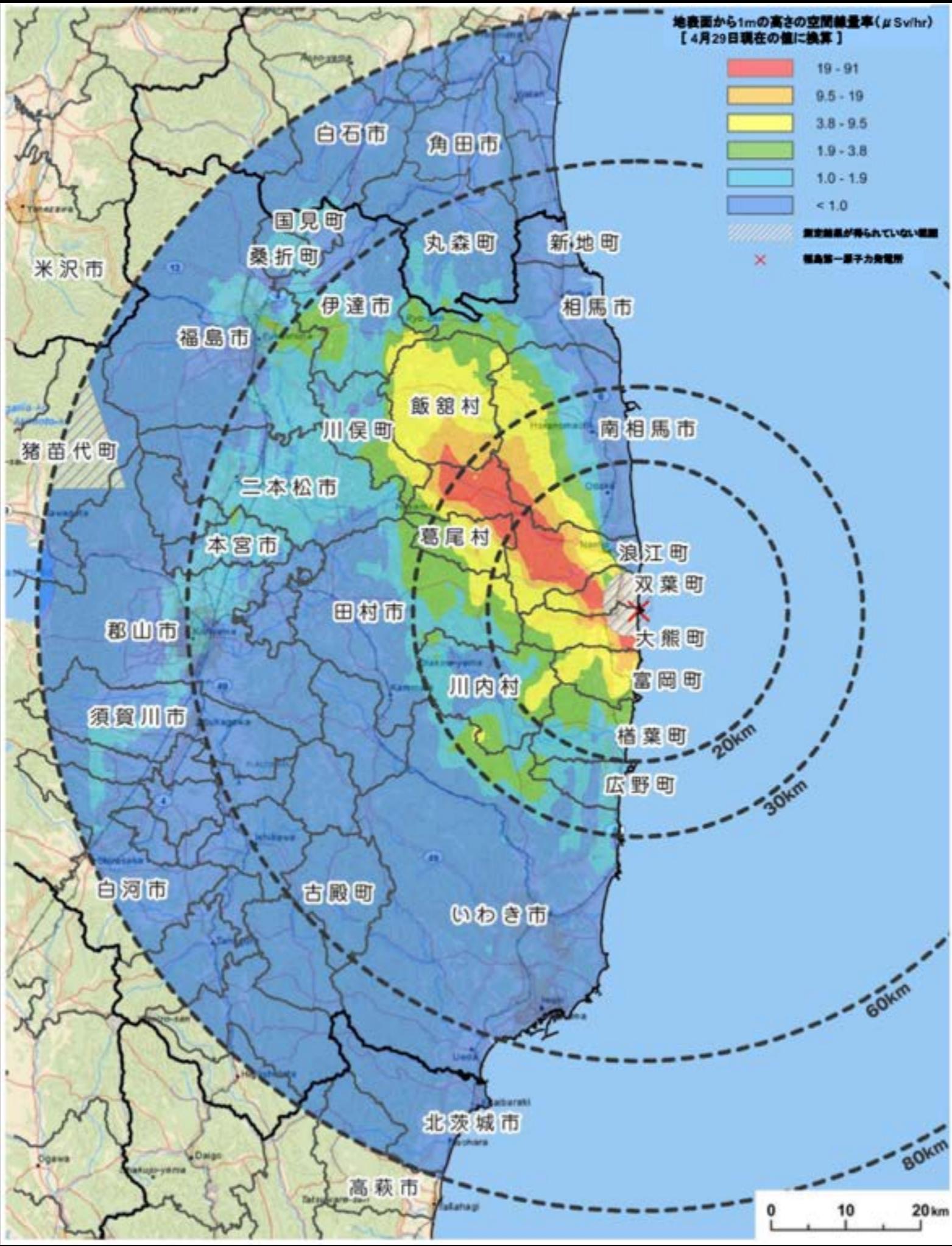
twitter  @hayano

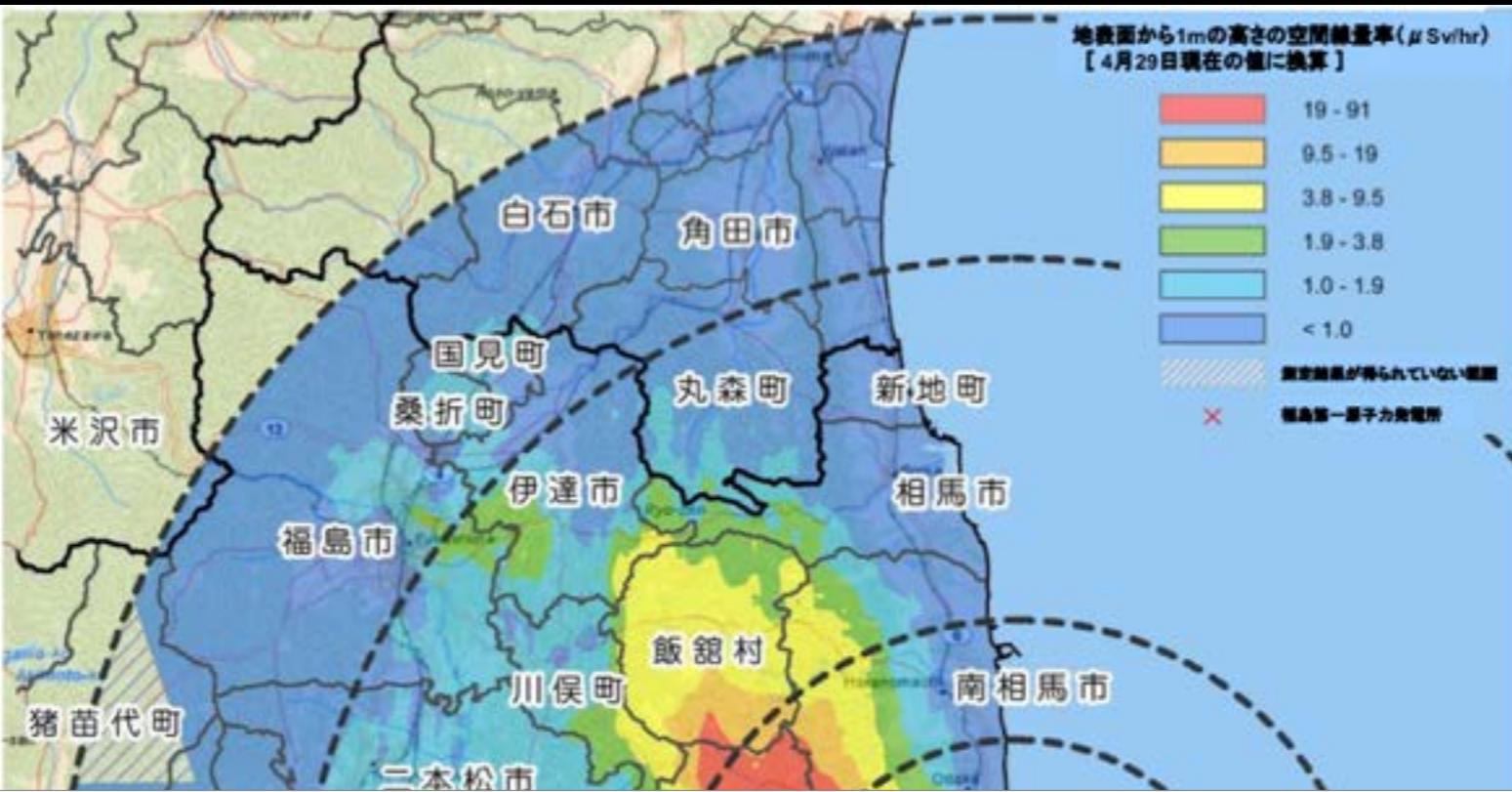
地表面から1mの高さの空間線量率(μSv/hr)
[4月29日現在の値に換算]



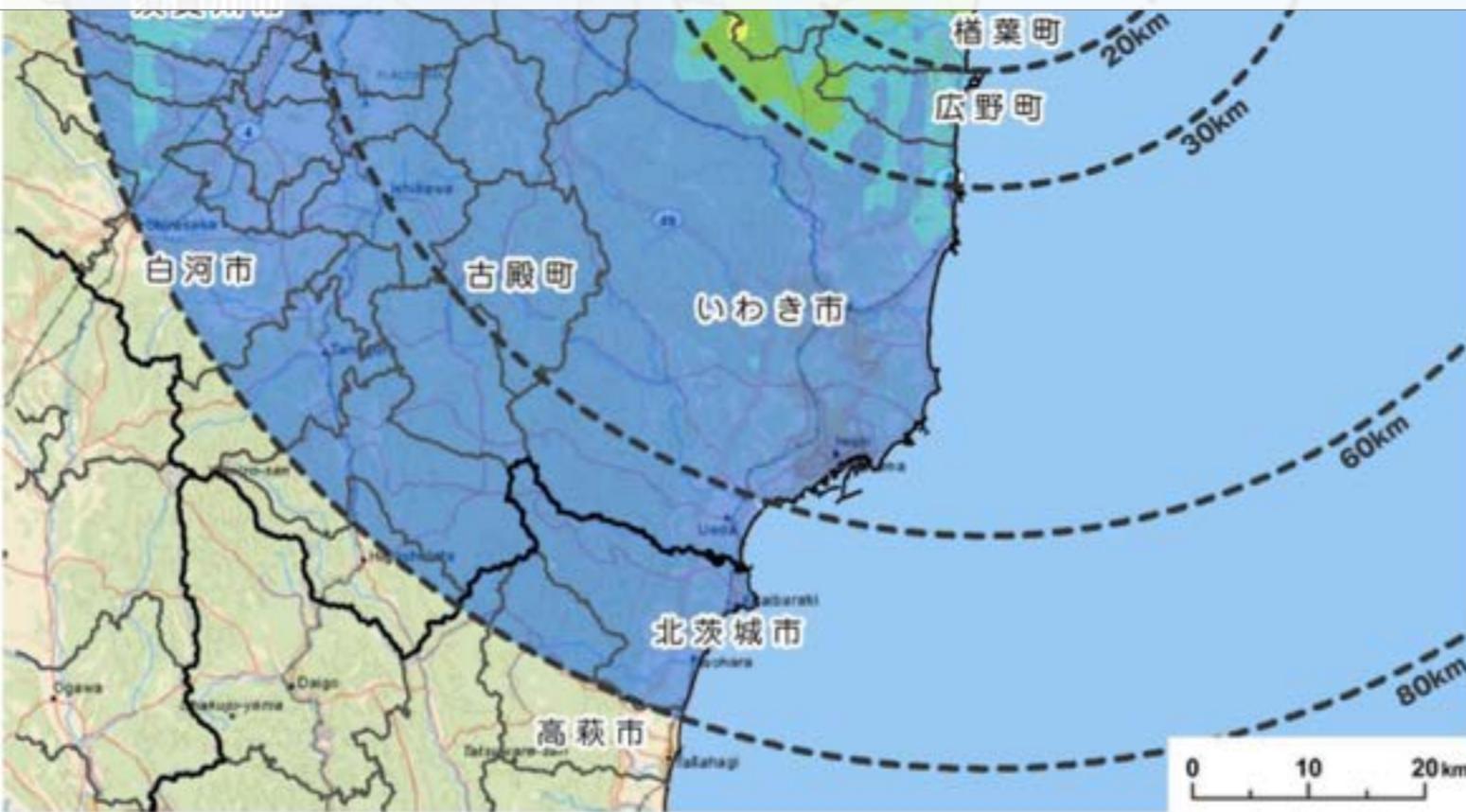
測定結果が得られていない範囲

福島第一原子力発電所





The first nuclear accident in the internet era



My first Fukushima Tweet: Mar 12, 2011, 14:22

89 characters

Cs137が出す662 keVのガンマ線を確認したという意味か。福島第一原子力発電所。Cs137は天然には存在せず、Sr90とともにウランの核分裂で生じる代表的な放射性同位元素。

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Does it mean that the 662 keV gamma ray from Cs137 decay was detected at Fukushima Dai-ichi? Cs137 does not exist in nature, and together with Sr90, typical fission product isotope.

181 characters

My first Fukushima Tweet: Mar 12, 2011, 14:22

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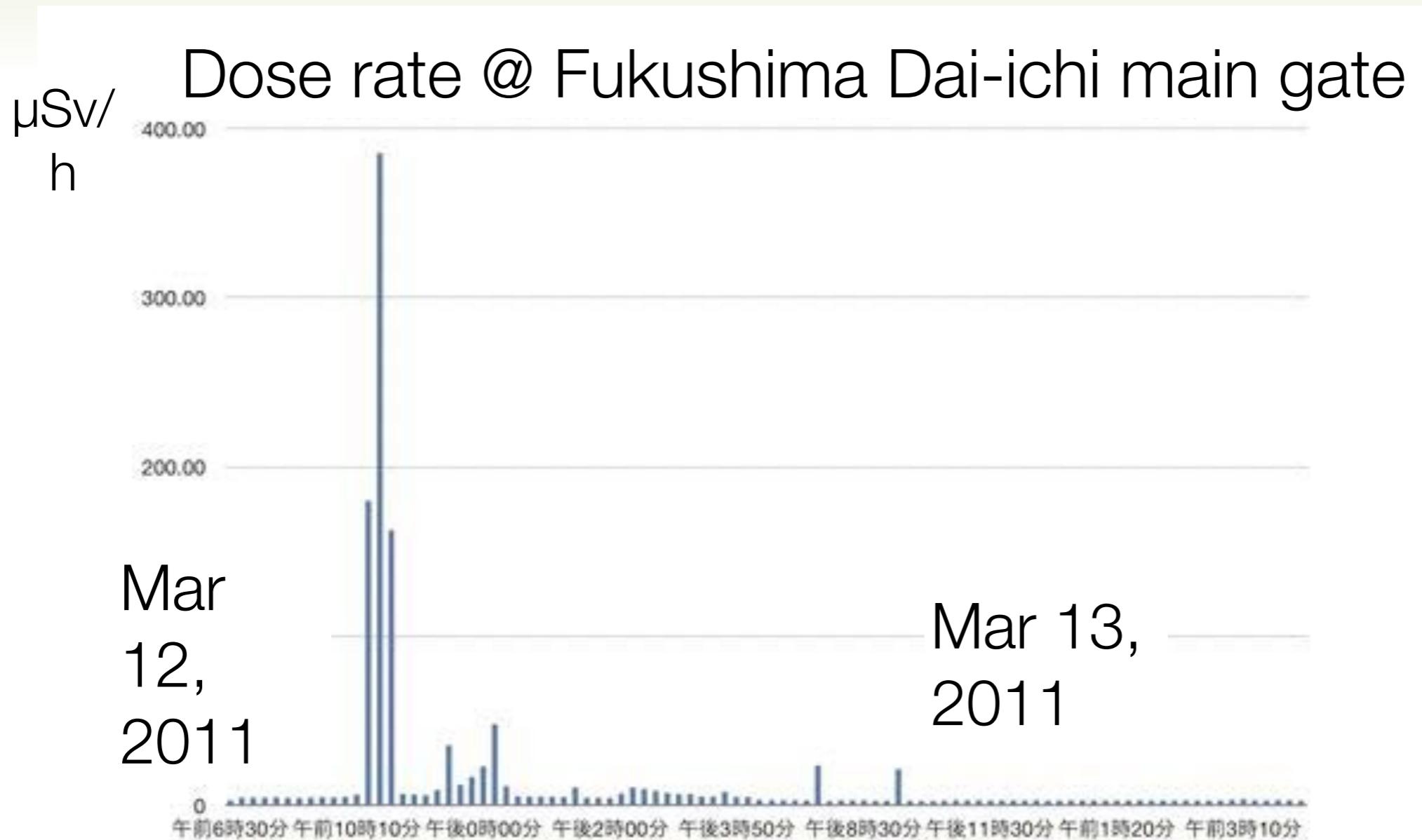
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Japanese tweets can contain
more info

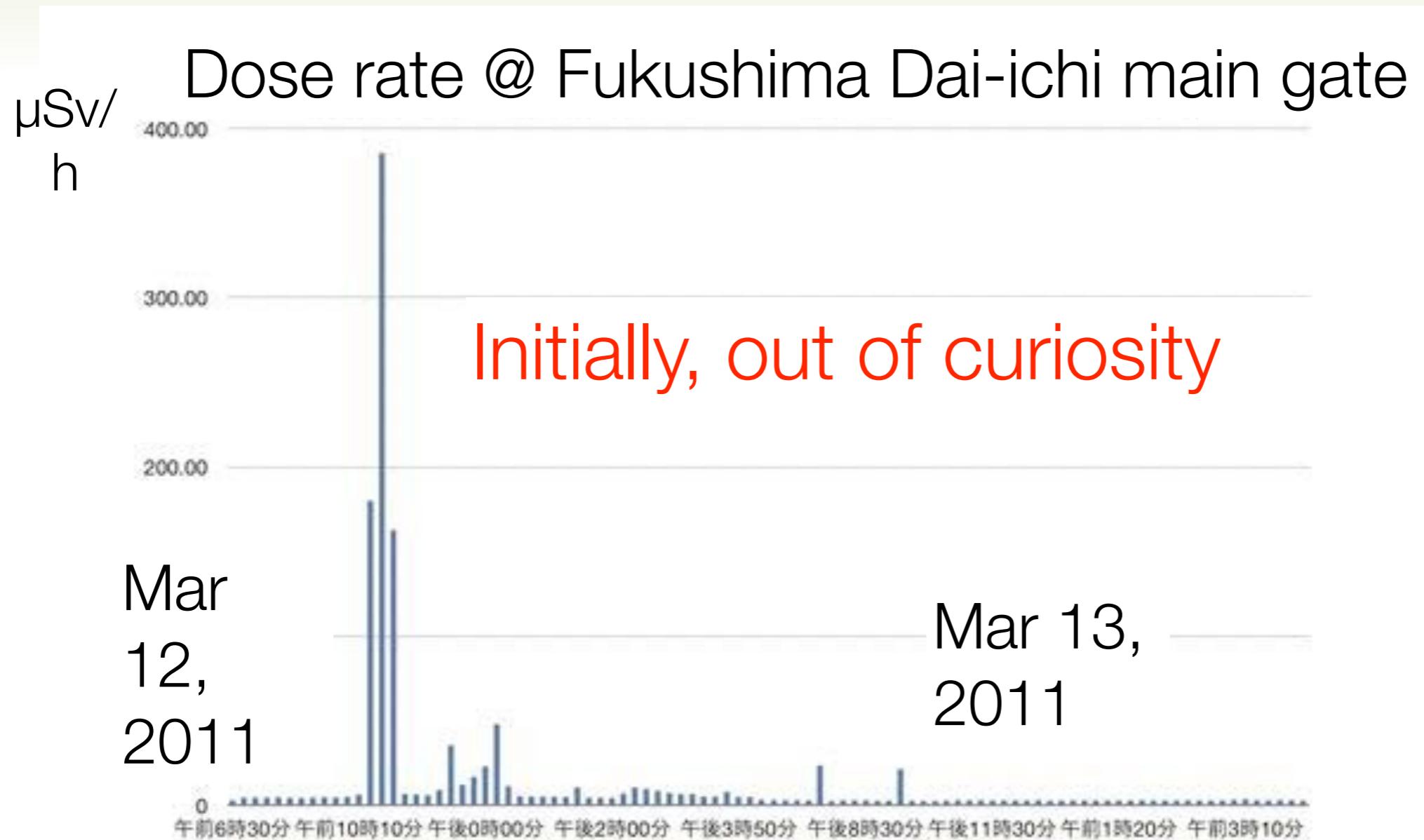
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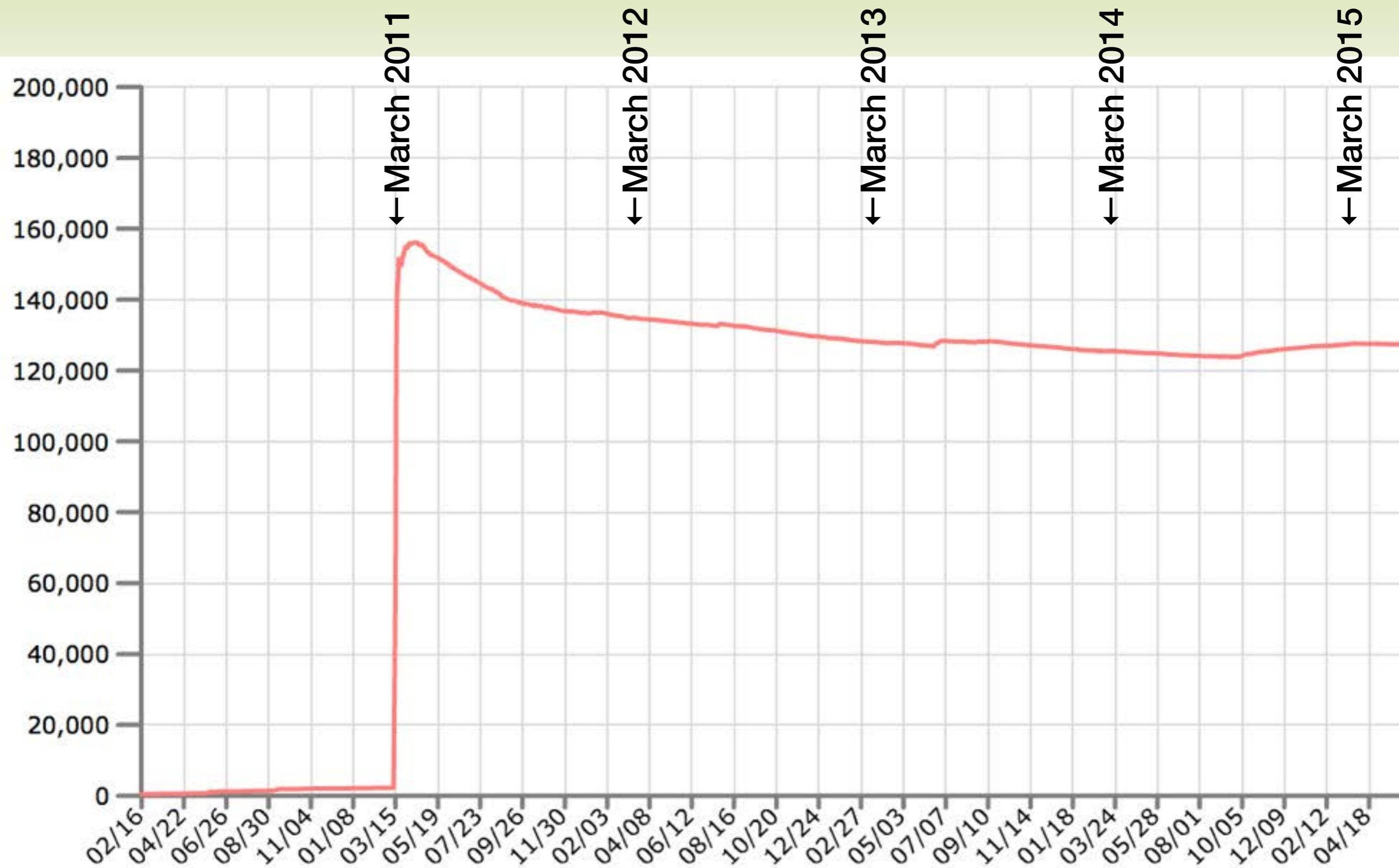
My first **graph**: Mar 13, 2011, 07:49



My first **graph**: Mar 13, 2011, 07:49



The number of my followers



Ranked 7th among the most influential twitter accounts

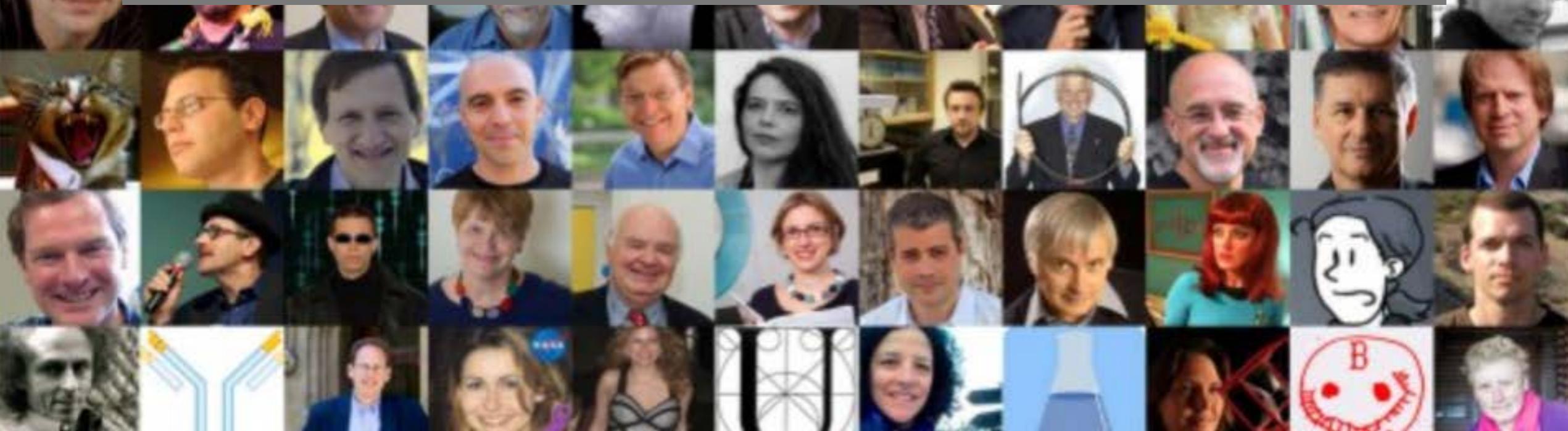
順位	ユーザ	被RT回数
1	@NHK_PR	630459
2	@nhk_seikatsu	304824
3	@Asahi_Shakai	279259
4	@nhk_news	209515
5	@nhk_HORIJUN	173995
6	@tsuda	165434
7	 @hayano	145436
8	@nhk_kabun	127916
9	@earthquake_jp	114806
10	@touhokujishin	112592

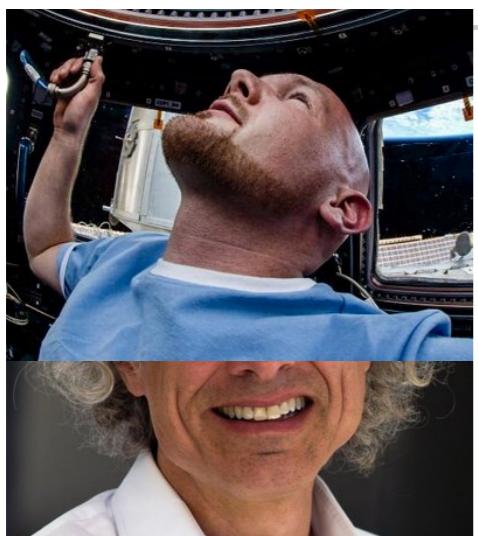


Science Magazine Blog

top 100 scientists on twitter

October 2014





20. Steven Pinker, *Cognitive scientist*

145,000 followers [@sapinker](http://twitter.com/@sapinker) (<http://twitter.com/@sapinker>)

Citations: 49,933 K-index: 105

Total number of tweets: 1,674

Harvard University, United States



21. Richard Wiseman, *Psychologist*

135,000 followers [@RichardWiseman](http://twitter.com/@RichardWiseman) (<http://twitter.com/@RichardWiseman>)

Citations: 4,687 K-index: 209

Total number of tweets: 22,600

University of Hertfordshire, United Kingdom



22. Ryugo Hayano, *Nuclear physicist*

124,000 followers [@hayano](http://twitter.com/@hayano) (<http://twitter.com/@hayano>)

Citations: 956 K-index: 319

Total number of tweets: 56,500

University of Tokyo, Japan

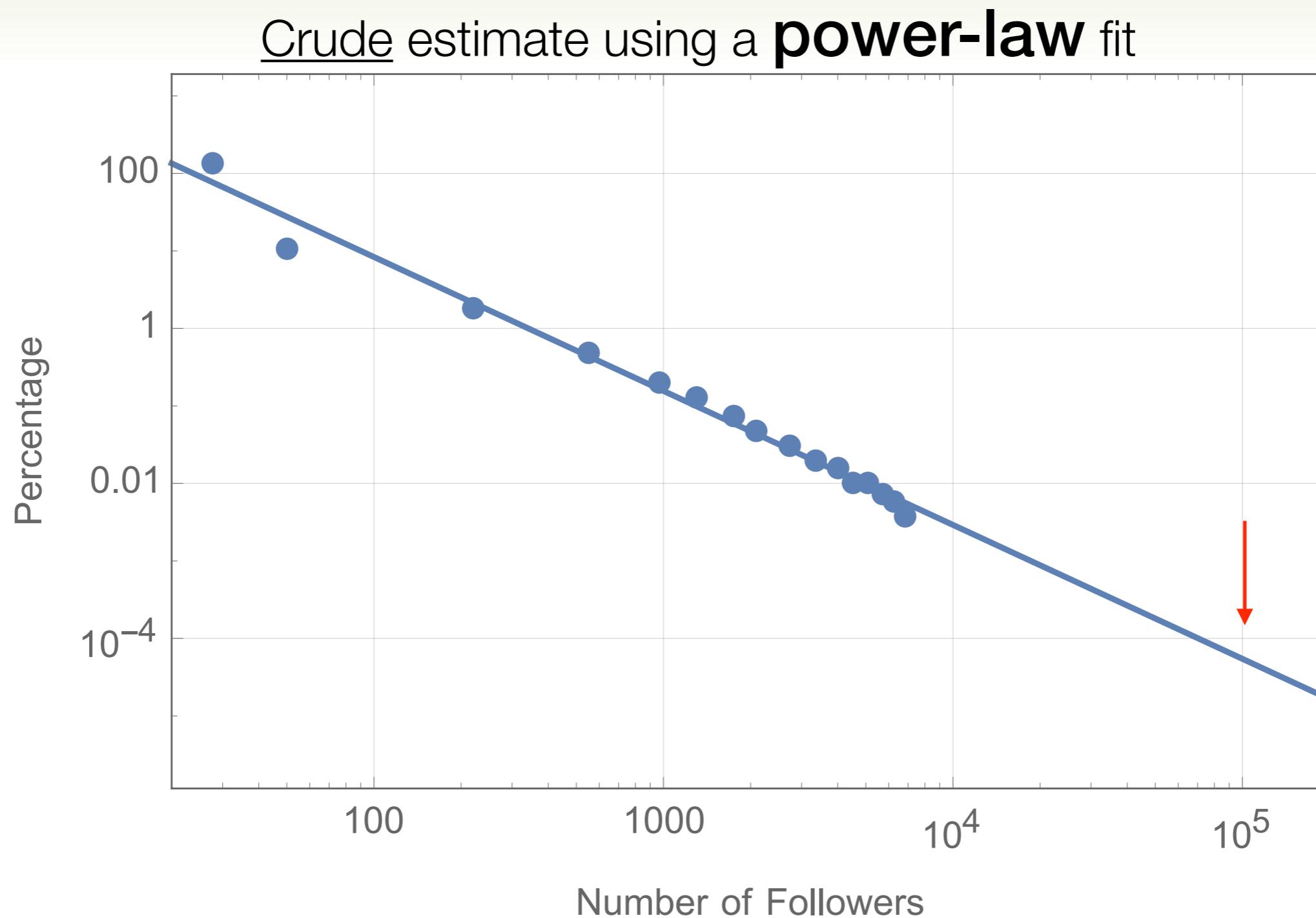


Part 1

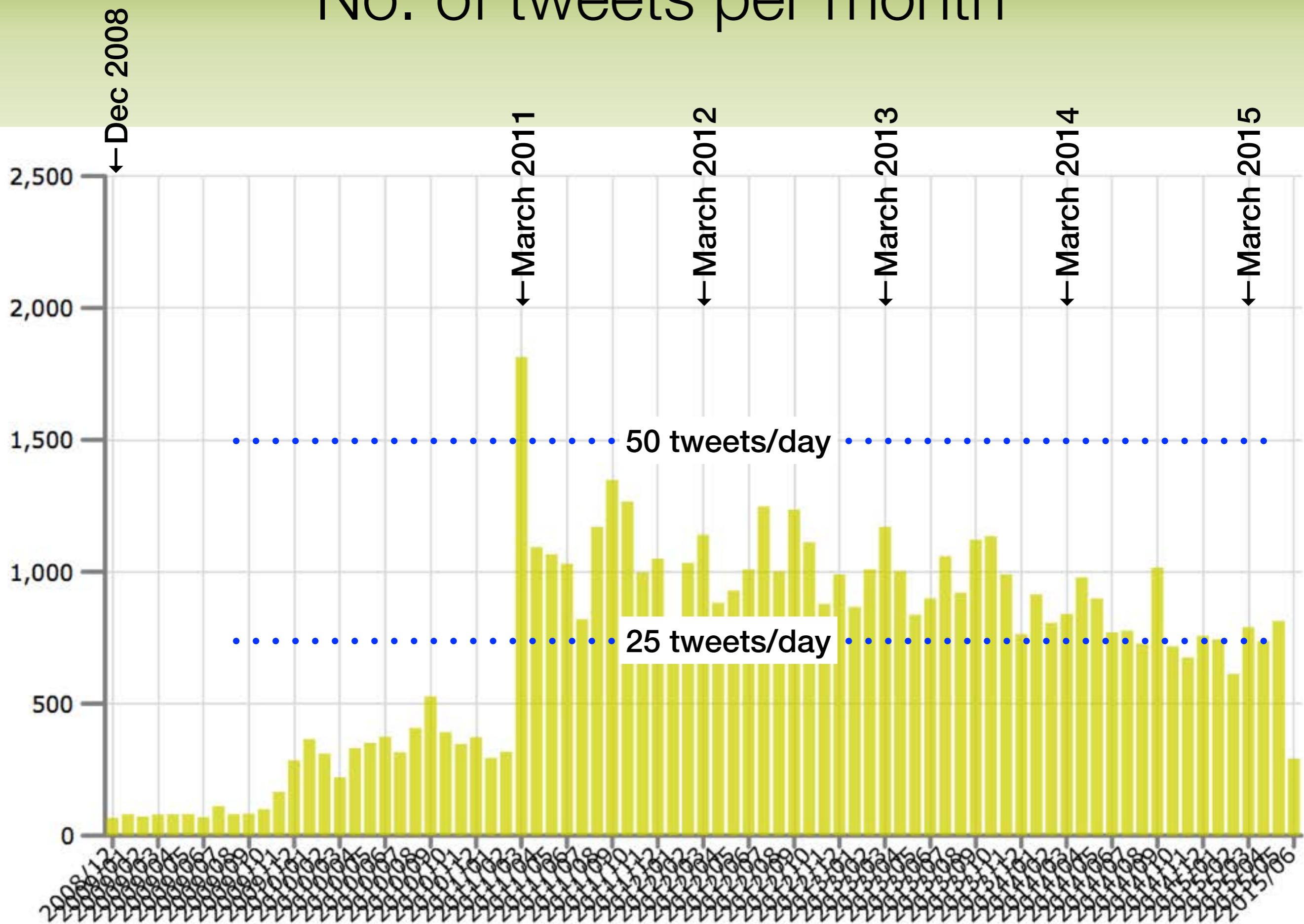
My experience

“your mileage may vary”

“your mileage may vary”
it is **VERY** rare to have $>100k$ followers



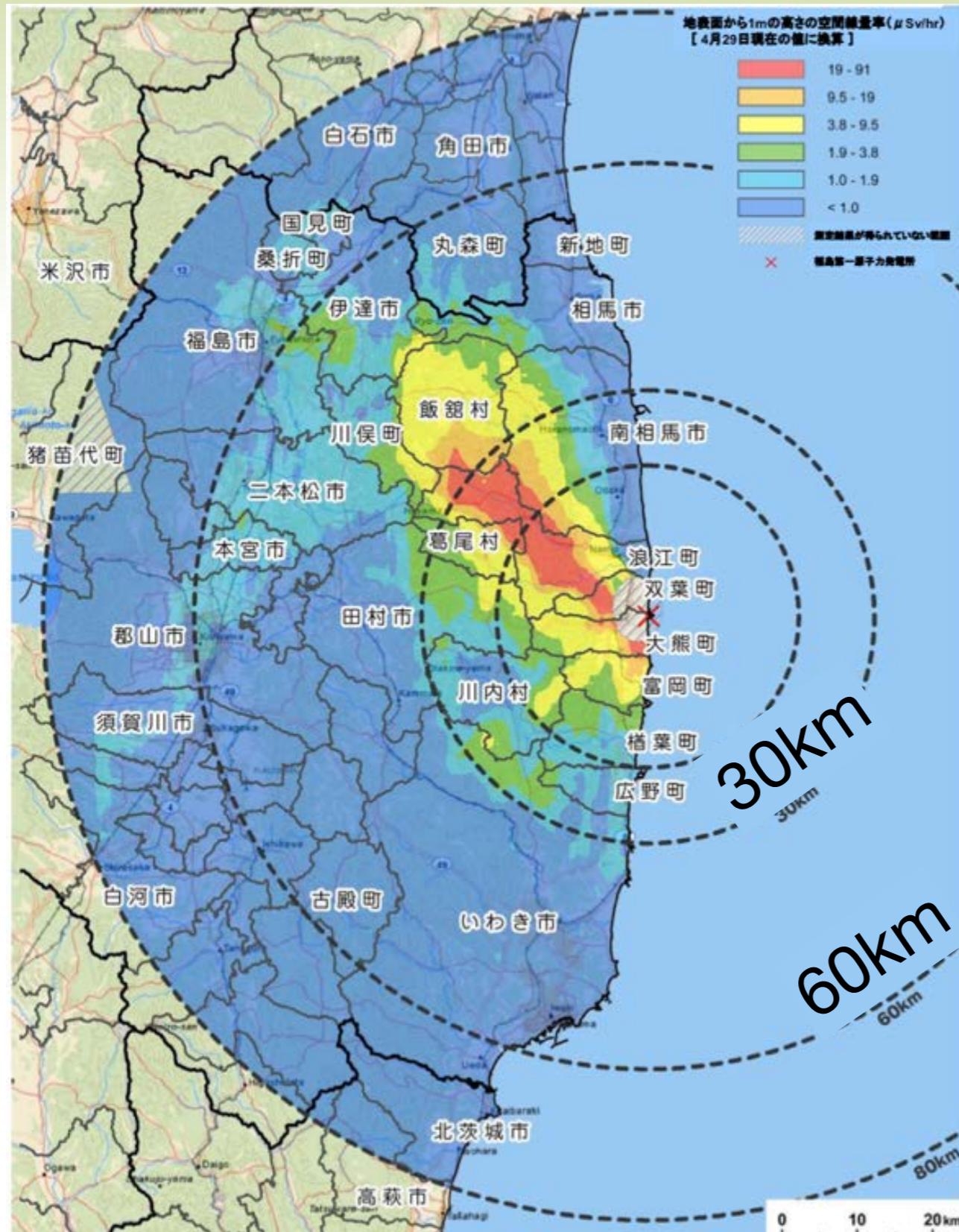
No. of tweets per month



read other people's tweets

("know your public")

summer, 2011



contamination maps &
various monitoring results
became available -

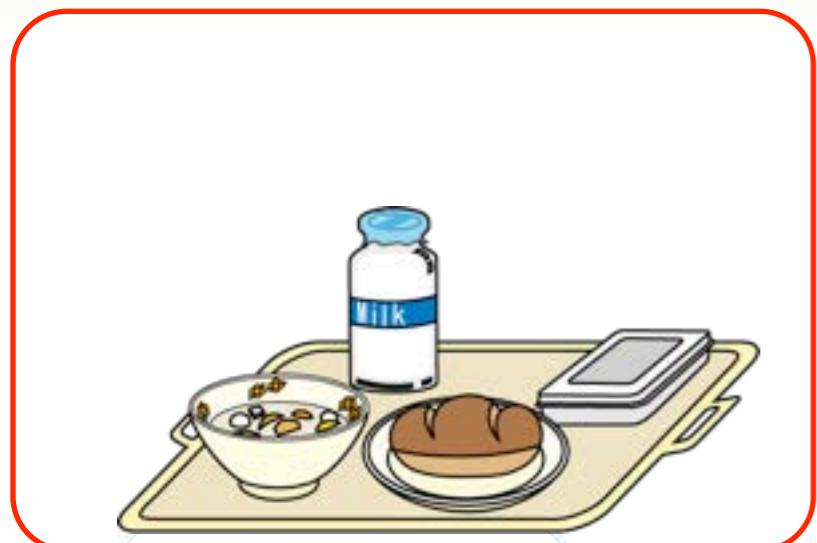
but

increasing number of
tweets by worried
mothers:

what about food safety?

Airborne Monitoring Survey, April 2011

I proposed to measure school lunch but MEXT said **NO!**



MEXT:

- ▶ What if caesium is really detected?
- ▶ People will PANIC!
- ▶ therefore MEXT does not want to do it



Using twitter, I asked parents (7000 replies in 2 days)

給食まるごとセシウム検査 WEB アンケート (東京大学理学部物理 教授 早野龍五)

「給食まるごとセシウム検査」とは、調理済み給食を一食分まるごとミキサーにかけて放射性物質検査をして、結果を公開することにより、子供たちの内部被ばくの実態を知り、対策に役立てようという提案です。



Q: 具体的方法は?

A: 給食まるごと

Q: メリットは?

A: 実際に子供が

>90% supported the proposal

品の汚染の実態

を推測する指標となります。

Q: 調理前食材のサンプル調査は行わないということか?

A: 食材のサンプル調査は行った上で、調理済み給食検査も行うという提案です。

Q: 食べた後で汚染が分かっても手遅れというデメリットがあるのではないか?

A: 給食は材料が保存されているので原因を追求し、対策できます。長い目で見れば必ず内部被ばく予防につながります。

この提案に関する皆様の意見分布を是非知りたいので、以下の簡単なアンケートにご協力下さい。結果は官邸及び文科省に伝えます。

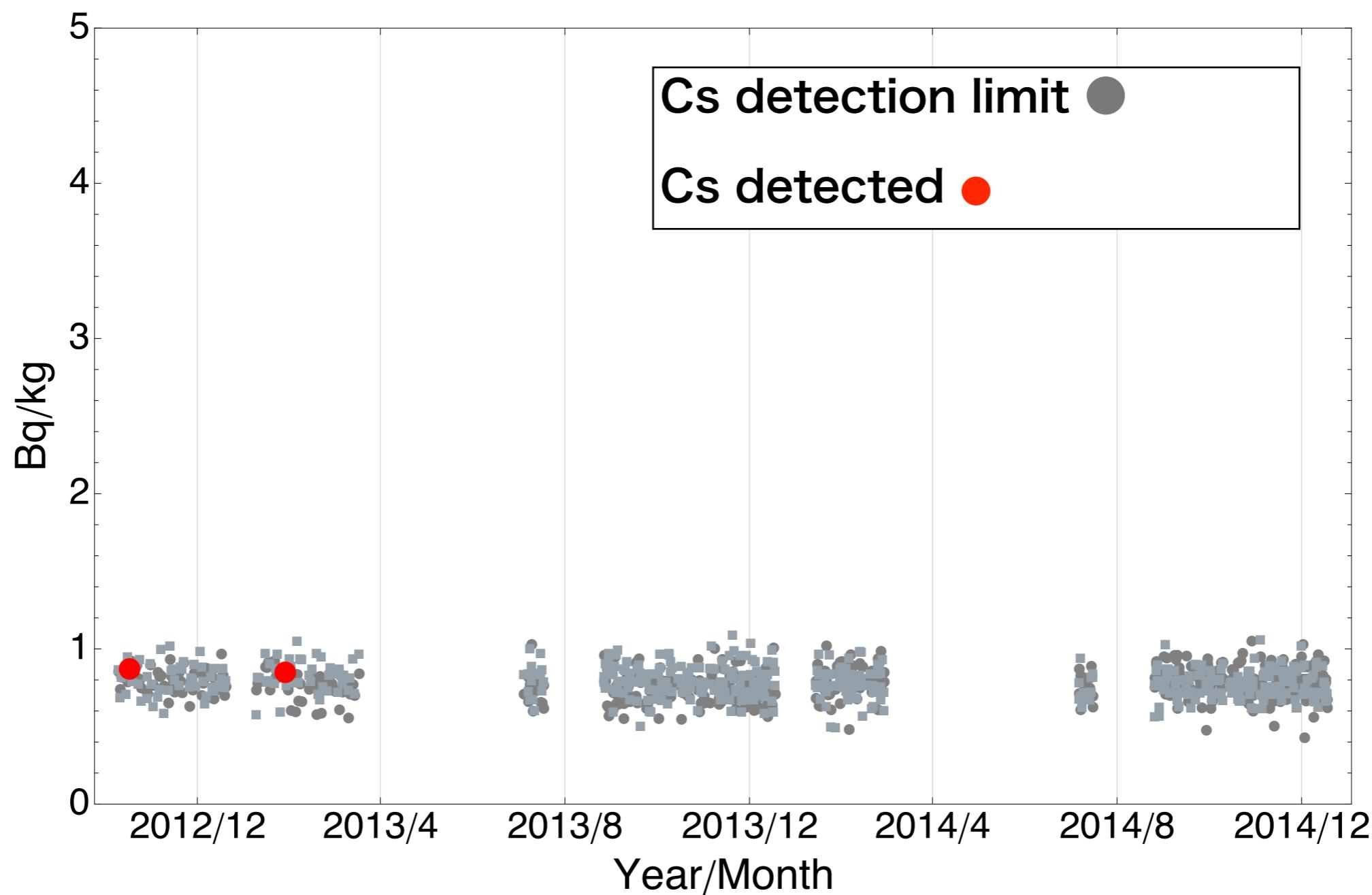
問1:

上記のような給食検査実施に賛成されますか? *

- 賛成
- 食べた後でセシウム入ってましたと知るのでは無意味
- 絶対に反対
- 判断できない

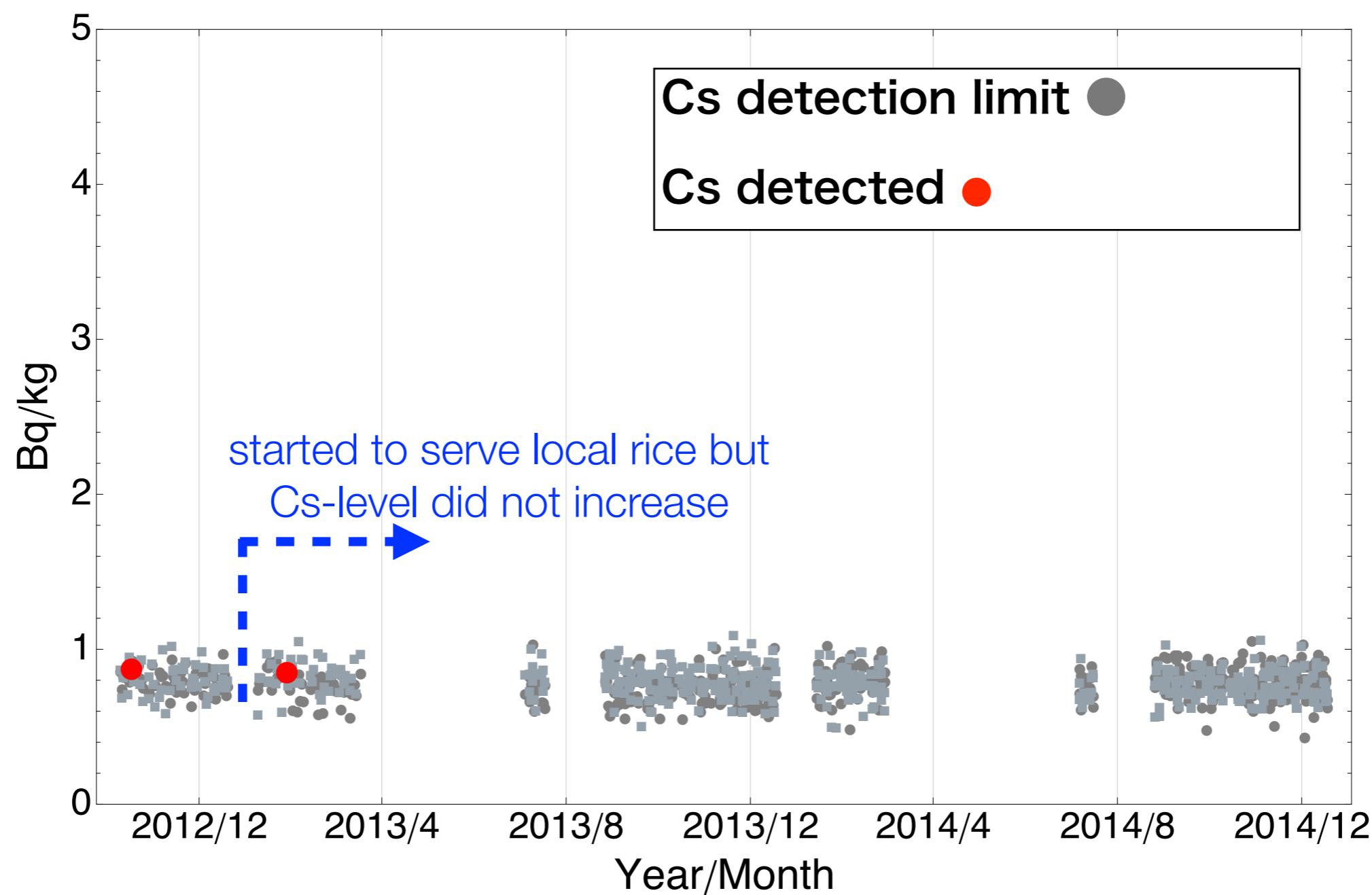
I brought the web poll result to MEXT vice minister,
and the project got funded

Fukushima school lunches are practically free of radiocaesium
(results of other municipalities are similar)



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Fukushima school lunches are practically free of radiocaesium
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social media connect people

I got connected to

- ▶ medical doctors in Fukushima
- ▶ ICRP & other experts
- ▶ TV and newspaper reporters
- ▶ school teachers/students
- ▶ government officials/offices

(in most cases, they found me)

With medical doctors in Minamisoma City Hospital (2011)



My first “medical” paper

- (conventional) media coverage
- discussion on social media (+ & -)

No. 4]

Proc. Jpn. Acad., Ser. B **89** (2013)

157

Internal radiocesium contamination of adults and children in Fukushima 7 to 20 months after the Fukushima NPP accident as measured by extensive whole-body-counter surveys

By Ryugo S. HAYANO,^{*1,†} Masaharu TSUBOKURA,^{*2} Makoto MIYAZAKI,^{*3}
Hideo SATOU,^{*4} Katsumi SATO,^{*4} Shin MASAKI^{*4} and Yu SAKUMA^{*4}

UNSCEAR 2013, Ref [H5]

- Internal exposure of Fukushima people surprisingly low
 - children 100% below detection limit in 2012
 - much lower than in 1960s (global fallout)
 - supported by other recent studies

So, no problem whatsoever?

So, no problem whatsoever?

No.

So, no problem whatsoever?

No.

(a significant fraction of) people still live with doubts&fear in
Fukushima, indicating the failure of risk communication

So, no problem whatsoever?

No.

(a significant fraction of) people still live with doubts&fear in Fukushima, indicating the failure of risk communication

Mothers, in particular, are really worried about their children.

OPEN ACCESS**IOP Publishing | Society for Radiological Protection**

J. Radiol. Prot. 34 (2014) 645–653

Journal of Radiological Protection

doi:10.1088/0952-4746/34/3/645

BABYSCAN: a whole body counter for small children in Fukushima

Ryugo S Hayano¹, Shunji Yamanaka², Frazier L Bronson³,
Babatunde Oginni³ and Isamu Muramatsu⁴

- So, we made this in 2013
 - deployed 3 units by the summer of 2014
 - measured >2,000 babies in 2014
 - no baby had detectable level of radiocaesium (<3 Bq/kg)
 - this is a “communication device”



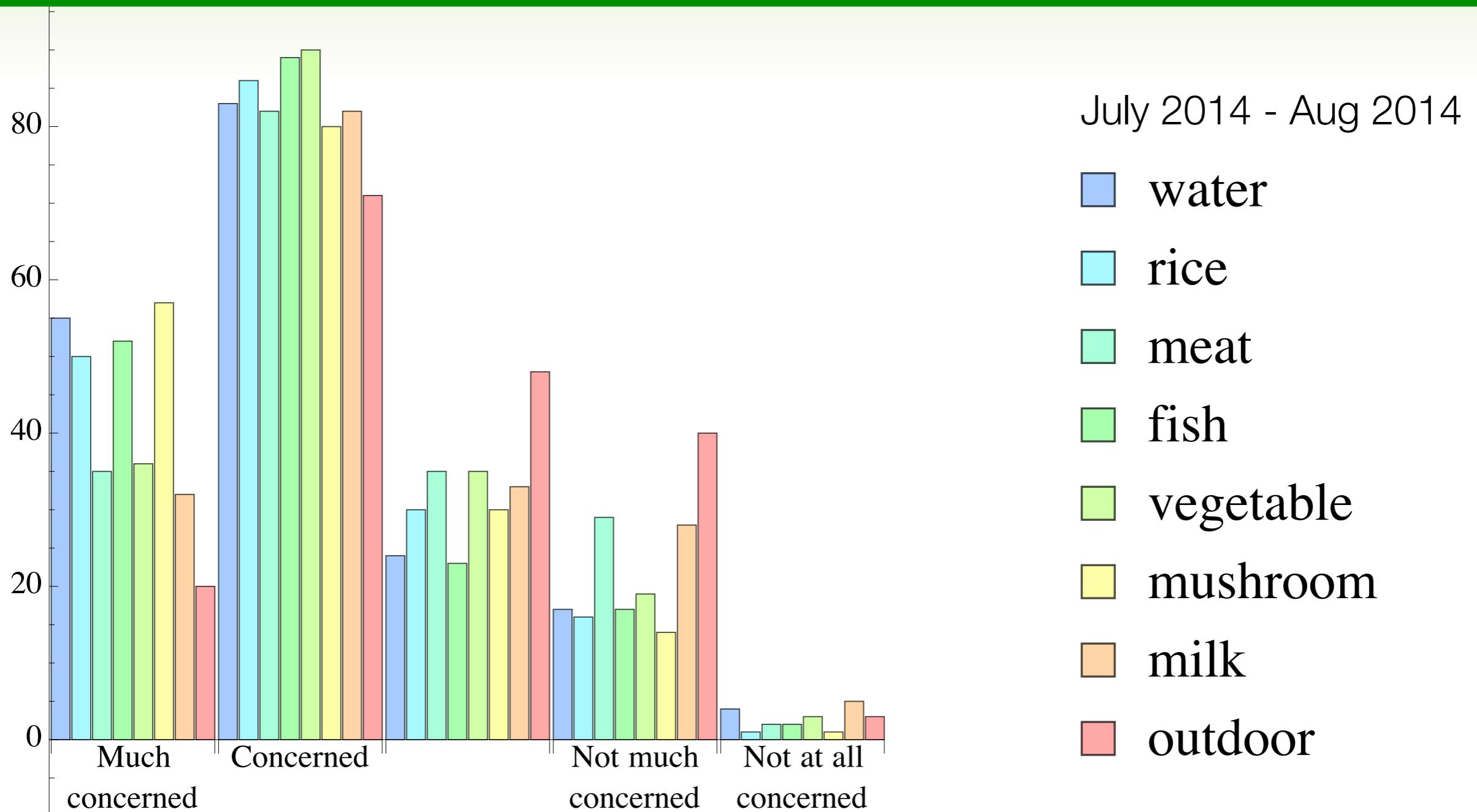
Communication is the key



Dr. Masaharu Tsubokura, Minamisoma

questionnaire sheets reveal...

There still is a large gap between what we know from measurements, and the perception of parents



Part 2

internet & nuclear disaster

- grass-roots efforts

Portal site setup in March 2011 by a volunteer (Dr. R. Ichimiya, KEK)

radmonitor311

放射線量モニターデータまとめページ

A summary page of radiation monitoring data and graphs
related to the nuclear power plant accident in Fukushima, Japan

このサイトを検索

[トップページ](#)

[Top \(in English\)](#)

当サイトに寄せられた最新の情報

更新履歴

[このサイトの使い方](#)

- ある地域の放射線量が知りたい
→ 1.1 放射線量観測データ（可視化済み）

- 放射能や原子炉について知りたい
→ 2. 放射線・放射能についての基礎知識

- 自分でもグラフを作成みたい
→ 0. 機械可読の観測データ
→ プロット・解析ツール(専門家向け)

- 情報を投稿したい
→ ichimiya(at)gmail.comへコンタクト

当サイトでは、各種データの「発信者」に基づいた整理を優先しているため、「地域」別のまとめは設けておりません。地域別を一覧出来るサイトとしては <http://atmc.jp/> や <http://rdtn.org/> がありますのでご利用下さい。

[サイトマップ](#)

- 0. 機械可読の観測データ (CSV, TSV, API)

Top (in English)

2011/03/22 21:40 に Ryo Ichimiya が投稿 [2013/02/25 3:30 に Kiyoshi Tanida さんが更新しました]

For First Visitors and non-experts:

This site provides aggregated information on radiation monitoring in forms of plots and machine readable data, related to the nuclear power plant accident in Fukushima prefecture, Japan.

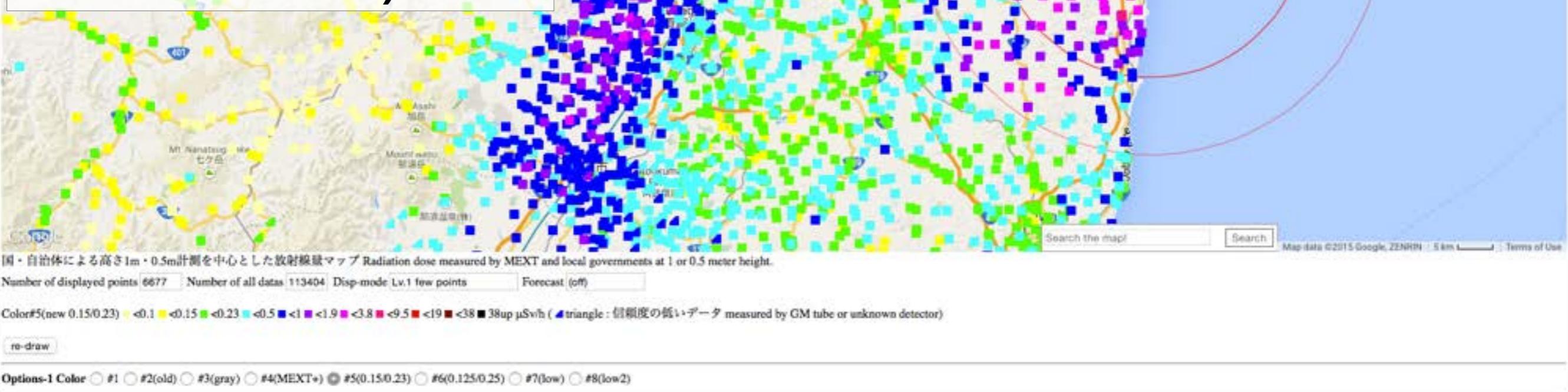
In order to summarise radiation monitor data from many sources, this site has been created by an experimental physicist who specializes in high energy physics and radiation measurement. Keeping neutral and scientific manner, about 70 collaborators (in June 1st) are working on this activity with sharing information at a working mailing list.

For this reason, so far, advanced information is dominant than that is easy to read. Also each page is rather "warehouse" of information, unlike a "display" of merchandise. (As updating information is our first priority.)

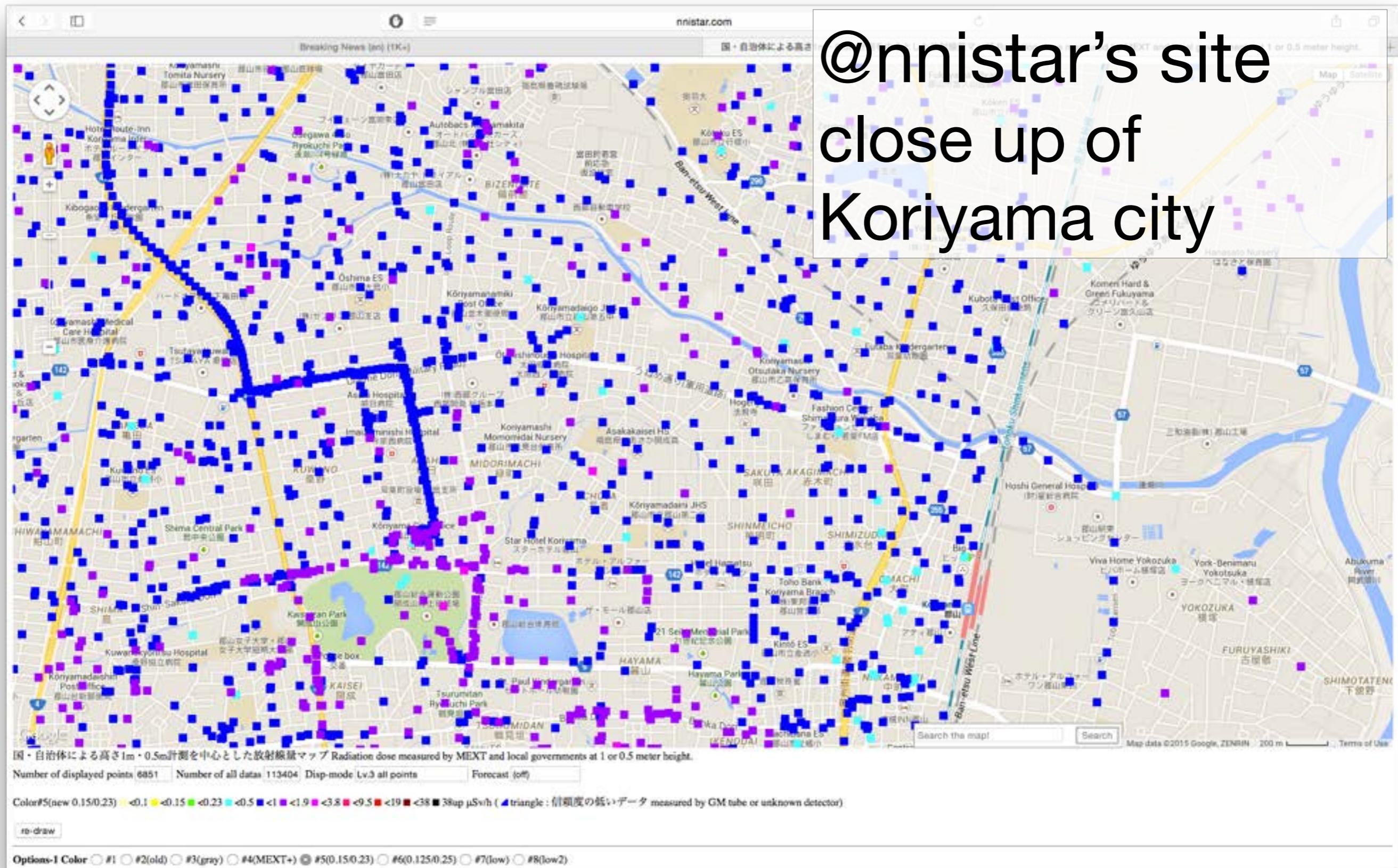
However, understanding basic facts disengages you of a vague feeling of anxiety and lets you understand risks correctly. Also, it helps survivors who are struggling at the disaster areas by not obstructing them.

We'd like to provide correct data which helps you understand correctly and introduce sources; easy to understand correct knowledge.

Anonymous
individual
@nnistar
made this site
(manually
entered >110k
dose data!)

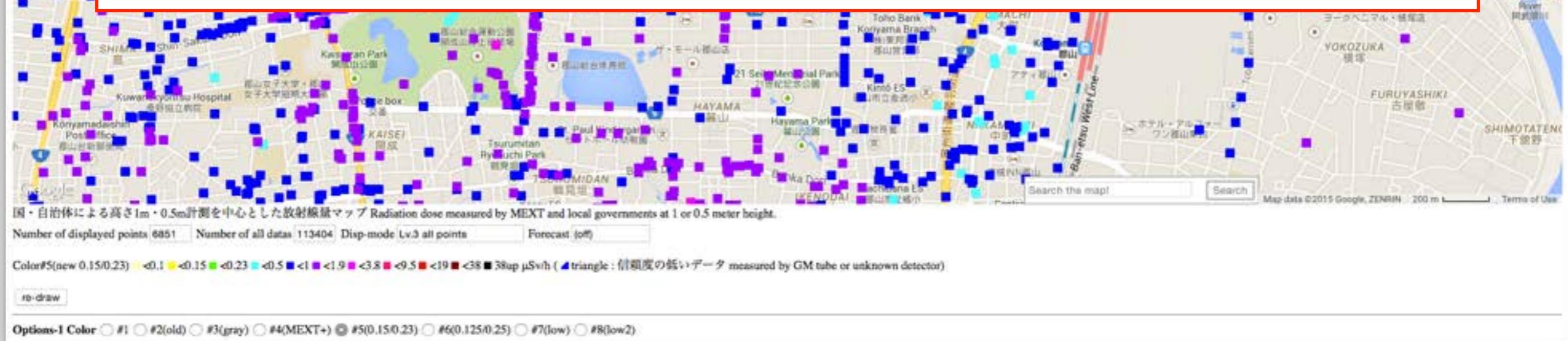


@nnistar's site close up of Koriyama city



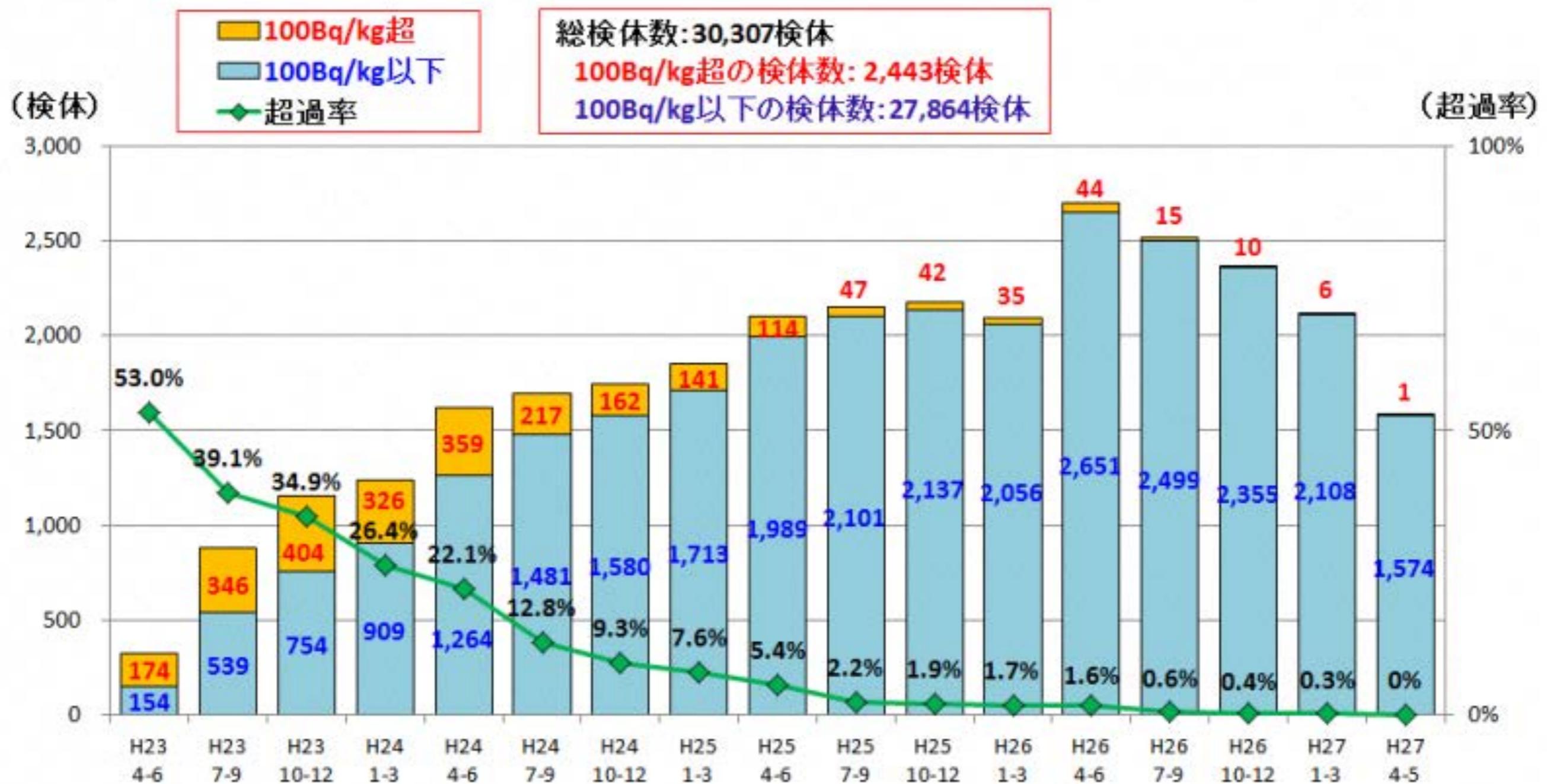
@nnistar's site
close up of
Koriyama city

Valuable cross check of government
vs NGO measurements



data dissemination by the government
- lots to be desired but getting better -

Fisheries agency (now showing graphs)

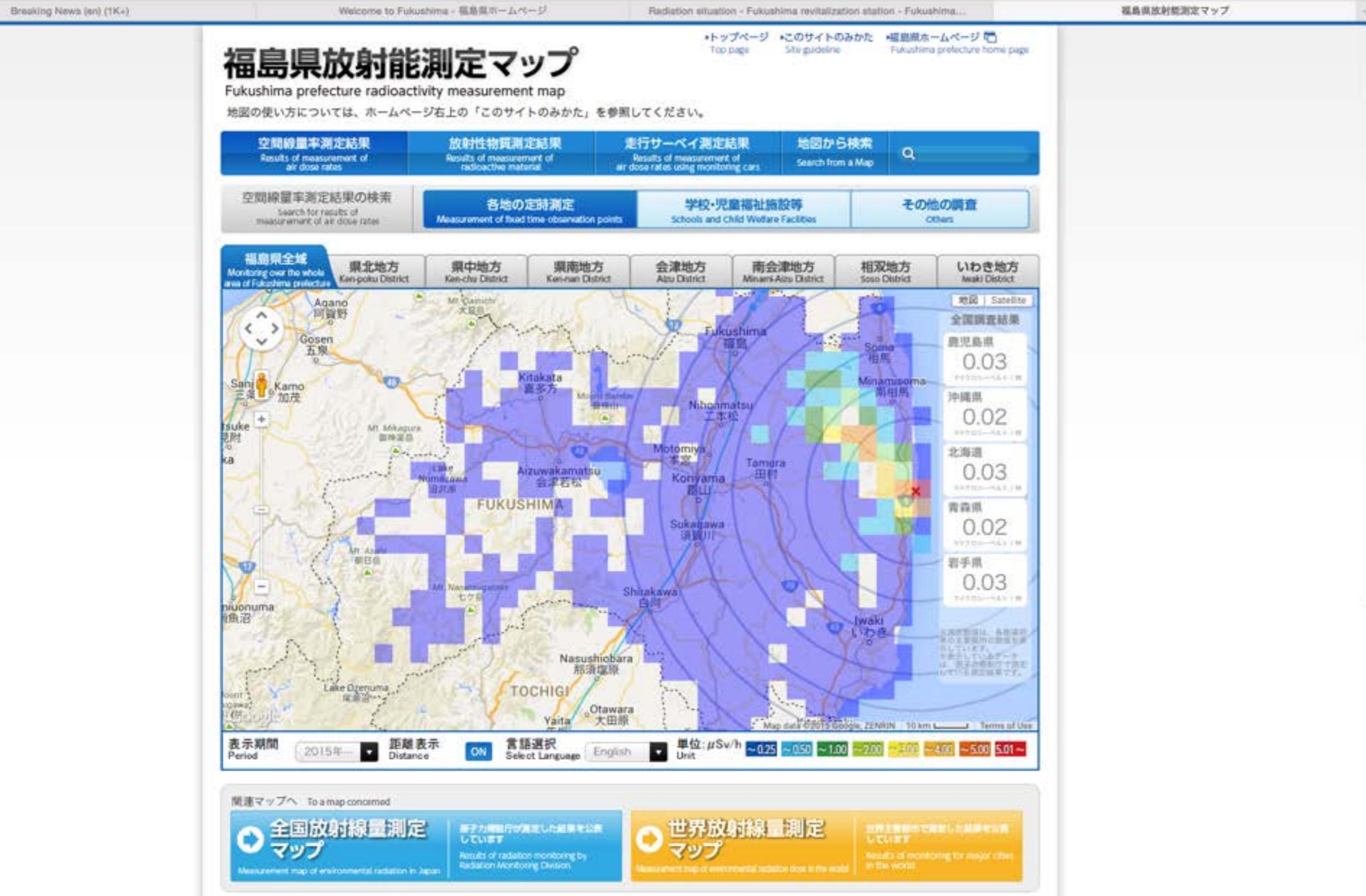


Fukushima prefecture portal is now multilingual (using machine translation)



This section contains several modules: 1. Situation of TEPCO Fukushima Daiichi NPS (image of the damaged reactor building). 2. Radiation & Decontamination (image of a small plant growing in soil). 3. Status of evacuation zones/ Support for sufferers (map of Fukushima Prefecture regions with labels like 田村市, 川内村, いわき市, 大熊町, 福島町, 富岡町, 广野町). 4. Life and health of citizens (image of a woman holding a baby). 5. Radiological inspections: Water & Food (image of vegetables like radishes and green beans). 6. Infrastructure restoration, maintenance (image of a road). On the right, there is a large video player with a yellow cartoon character. The video title is "ふくしまから はじめよう。2014" and the subtitle is "しまから はじめよう。". The video also features the text "Future From Fukushima." and a play button icon. At the bottom, there is a footer with language selection buttons: Japanese, English, and Zhongwen (简 character).

Real time and clickable radiation monitor map



searchable rice-test database with a graph (since 2012)

brown rice

Fukushima Association for Securing Safety of Agricultural Products

Radioactive Material Inspection Information

Search for 2013

Search for 2012

Brown Rice produced in the prefecture must go through "the inspection of all rice in all rice bags". The inspection confirms the radioactive material level of rice for shipment is below the reference value (100Bq/kg)for general food stipulated in the "Food Hygiene law".

Search result 2014

Area: : whole Fukushima Pref. (city)

Inspection Period : 08/21/2014~02/24/2015

items : 10,939,452 items

Summary 2014

whole Fukushima Pref. (city) items 10,939,452 items

Category	Items
1	13,000,000
2	12,000,000
3	11,000,000
4	10,000,000
5	9,000,000
6	8,000,000
7	7,000,000
8	6,000,000
9	5,000,000
10	4,000,000
11	3,000,000
12	2,000,000
13	1,000,000
14	0

Search condition 2014

Select area

>10⁷ rice bags (30 kg each) measured every year

Select date

71 exceeded the 100 Bq/kg limit in 2012

28 in 2013

Identifications 0 in 2014

Back to

rumors rapidly spread in the cyberspace

people become split - “danger” vs “safe”

... fight continues ... still continuing ...

but people live in Fukushima,
not in the cyberspace

So,

some people wisely used the internet,

and

applied the knowledge to real life situation



April 4, 2011

April 4, 2011

The International Commission on Radiological Protection (ICRP) in cooperation with Elsevier, the publishers of the Annals of the ICRP, present this special cost-free release of ICRP *Publication 111* Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency.

ICRP is a registered charity that relies on the sale of publications to help support its ongoing work. However, the cost-free release of this publication is a gesture to aid the Japanese people in recovering from the recent earthquake, tsunami, and accident at the Fukushima Daiichi nuclear power plant. Our thoughts are with those in Japan dealing with the aftermath of these tragic events, and we regret that the recommendations of ICRP *Publication 111* need to be put into active use so soon after having been published.

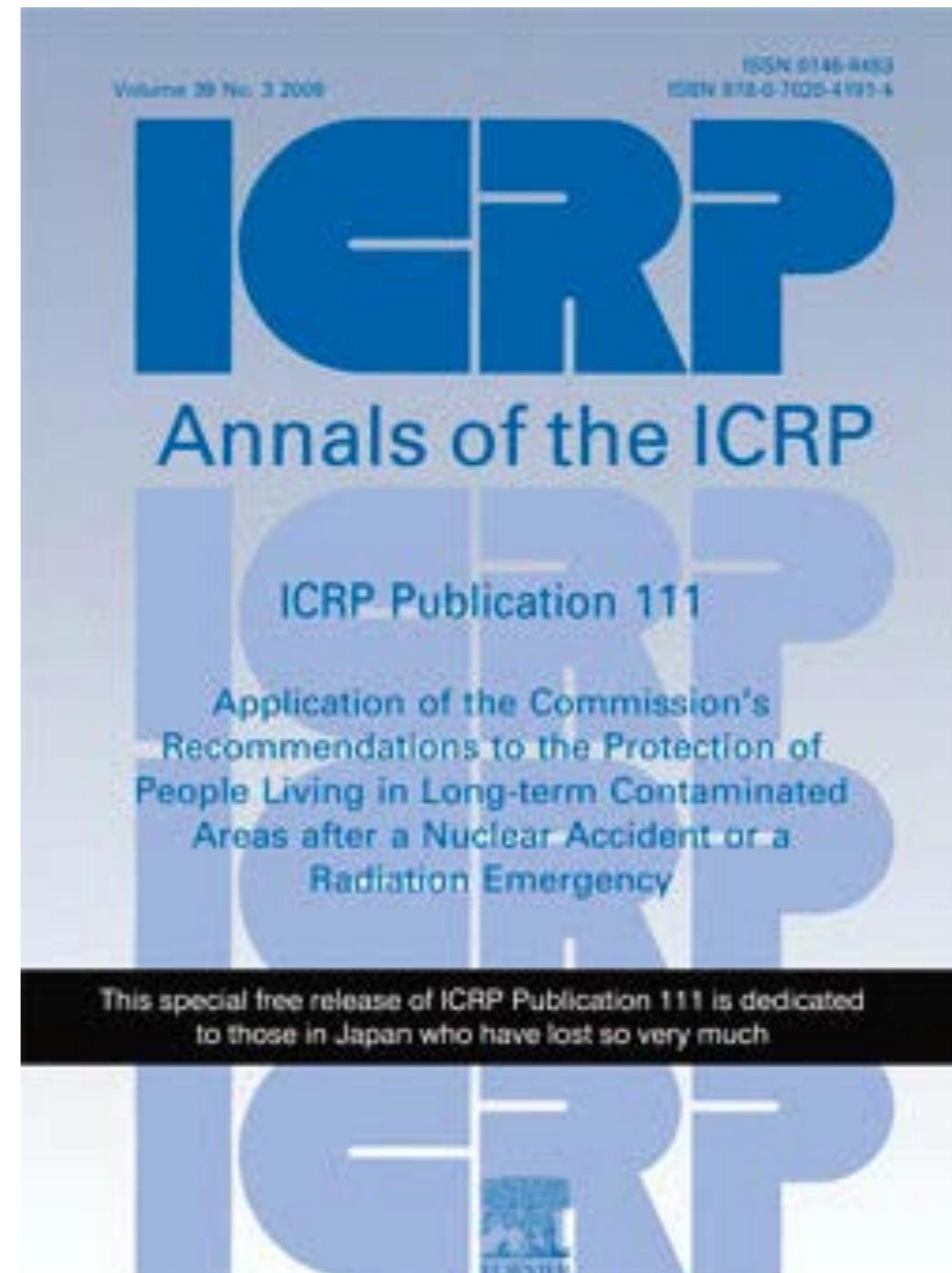
This special free release of ICRP *Publication 111* is dedicated to those in Japan who have lost so very much.

With deep sympathy, on behalf of ICRP,

Claire Cousins

Claire Cousins
ICRP Chair


Christopher Clement
ICRP Scientific Secretary



difficult to read



twitter mediated a breakthrough

ICRP111から 考えたこと

Introduction to ICRP Publ. 111

福島で「現存被曝状況」を生きる

[国際放射線防護委員会
ICRP入門講座 対話篇]

先生 生徒会長
J_Tphoto × buvery

- ◎放射線の被曝って、どこまで下げれば十分なの?
- ◎住みつけたい人で、もっとも線量の高い人から
被曝を減らすようにする、ってなに?
- ◎社会的・経済的な要素を考えに入れて、
合理的に、達成できる限り低くする、ってなに?
- ◎じゃあ、それはどうやったら可能になるの?
——オープンな議論、利害の調整、福島との連帯。
——リスクを引き受ける人が判断する。慎重に、理的に。

Made on Twitter

2012.02.09 ~ 2012.03.04

by @J_Tphoto & @buvery

“Introduction to ICRP 111”
Published (in Japanese)
on March 28, 2012
as a free ebook

and actually applied the concept in real life
to/with the people living in the affected
community



Conclusions

- Social media, useful (to some extent) to reach people

- ▶ Social media, useful (to some extent) to reach people
- ▶ don't overestimate the power of social media, but don't underestimate it's influence

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- ▶ don't overestimate the power of social media, but don't underestimate it's influence
- ▶ The real power is in learning from the society and to get people connected (“social”!)

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- ▶ don't overestimate the power of social media, but don't underestimate it's influence
- ▶ The real power is in learning from the society and to get people connected (“social”!)
- ▶ Psychosocial facets are important after the disaster: Internet technology alone cannot save people face-to-face communication is essential

知ろうとすること。

糸井重里
早野龍五

東京大学大学院
理学系研究科教授



新潮文庫

in stores, Oct 1, 2014, >100,000 copies printed so far, e-book (kindle, etc.), May 1, 2015