「平成24年度保物セミナー」基調講演 2013年2月1日大阪科学技術センター8階大ホール

放射線被ばくと甲状腺がんについて ~これまでの知見を踏まえて~

> 長瀧重信 放射線影響協会理事長 放射線影響研究所元理事長

保物セミナー2006 2006年10月19-20日 エルイン京都1階会議室

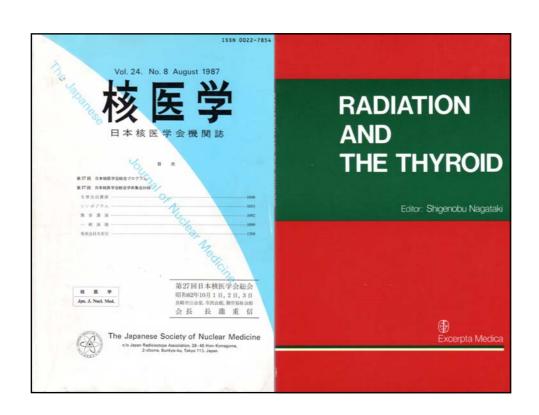
特別講演

チェルノブイリ20年 その影響は今

> 長瀧重信 日本アイソトープ協会

放射線と甲状腺

- 1) チェルノブイリ事故前の知識
- 2) チェルノブイリ事故の調査 (経時的に具体的に)
- 2 ') チェルノブイリ事故の最近の調査結果
- 3)福島原発事故と甲状腺
 - ヨウ素 131プルームの動き
 - ●甲状腺のヨウ素131摂取量 (推定と実測値)
 - ●甲状腺超音波検査の結果
 - ●今後の問題









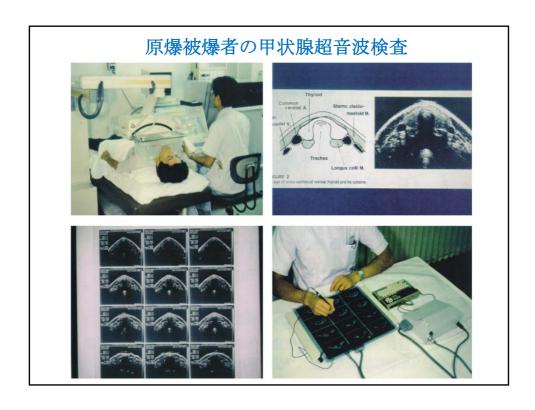


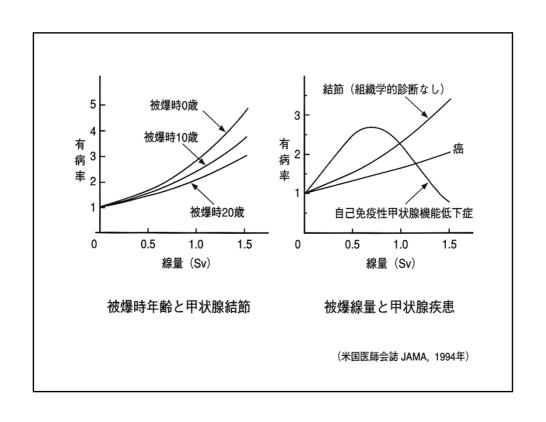


御進講

チェルノブイリ原子力発電所事故による 放射線被曝者の現状と医療支援

> 平成7年12月22日 長崎大学医学部長 長瀧重信



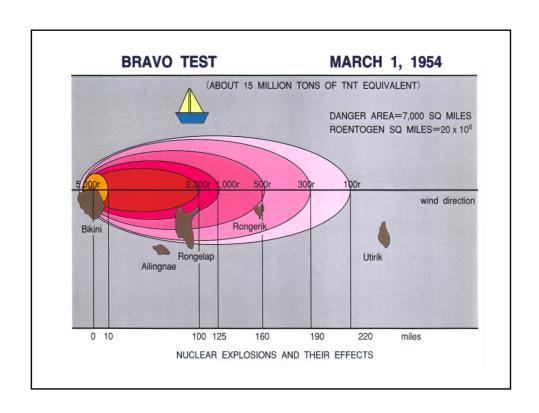


医学的放射線照射による甲状腺癌の発症

研 究	被曝年齢 (才)	人 数	観察年数	平均線量 (Gy)	観察数/ 期待数
胸腺肥大 (Shore)	0~ 1	2,650	36	1.4	37/1.52
頭部白癬 (Ron)	0 ~ 15	10,834	30	0.1	43/10.7
頭部白癬 (Shore)	0~18	2,227	35	0.06	2/1.3
皮膚血管腫 (Furst)	0~1	14,000	34	0.08	13/7.0
皮膚血管腫 (Lundell)	0~1	14,351	39	0.26	17/2.28
癌治療 (Tucker)	0~18	9,110	8	12.5	23/0.43

外部被曝と甲状腺癌

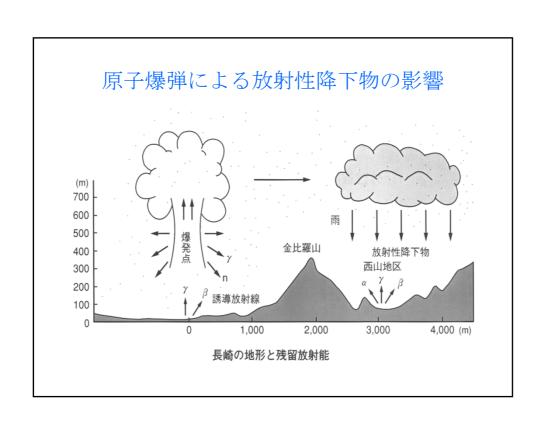
- 1. 外部被曝により甲状腺癌は発生する。
- 2. 低い線量(0.06~0.1)Gyでも可能である。
- 3. 子供は特に危険である。



E	甲狀則	泉疾患		放射性	生ヨ、	ードと	テリリ!	ウム
	1 1/ 1/1/	(I)			甲	状腺疹	取量	
被曝年齢	人 数	甲状腺結節	甲状腺癌	放射性	半減期	甲	状腺摂取量	(μCi)
Rongelap島				化合物	11	Rongelap島	Ailingnae 島	Utirik
胎 内	3	2	0	135]	6.7	1900 -	670 -	79 –
<10	21	15	1	1331	6.7	3500	1200	140
10 –18	12	3	2			3300	1200	110
>18	31	3	2	134I	0.8	670 —	430 -	1 <u>8</u> 91
<u>Sifo島</u>						1200	780	
胎 内	3	2	0	133I	20.8	1200 -	310 -	160 -
<10	7	2	0			2100	570	320
10 -18	0	_	_	122*	0.0	310 -	67 -	60 -
>18	11	3	0	132I	2.3	560	120	110
<u>Utirik島</u>				121*				
胎 内	8	0	0	131I	193.0	53 – 96	11 - 20	13 – 23
<10	56	8	1			30	20	23
10 –18	19	7	2	¹³² Te	78.0	300 -	72 –	57 -
>18	84	8	2			550	130	110
All exposed	253	51	9	131mTe	29.0	44 —	13 -	8 -
Comparison	227	0	2			81	24	17

結論 (Bravo Test)

放射性降下物により子供の甲状腺癌、 甲状腺結節は明らかに増加している。 しかし、どのような放射性物質が原因 であるかは決定できない。



PREVALENCE OF THYROID DISEASE

Diagnosis	Fallout (n = 184)	Control (n = 368)
Solid nodule *	9	3
Cyst	8	8
Hyperthyroidism	4	1
Hypothyroidism	4	10
Non - toxic diffuse goitre:		
autoantibody negative	5	14
autoantibody positive	4	15
Autoantibody positive without		
goitre de la constant	18	30

^{*} All euthyroid and 5 younger than 10 years old at time of explosion.

(英国医学誌 Lancet, 1989年)

結 論 (原爆放射性降下物)

原爆による放射性降下物により甲状腺結節は有意に 増加している。

しかし、どのような放射性物質が原因であるかは 当時の記録がないので不明である。

[†]All in remission and 1 has a history of Graves' disease before fallout.

[‡]Aspiration biopsy findings not shown.

ヒトにおける放射性ヨードからの甲状腺癌発症危険率

		ā	彡断	量					ÿ	台療	量		
研究	被曝年齢	人数	観察 年数 (平均)	平均 線量 (Gy)	観察値/ 期待値	過 剰 危険率	研究	被曝 年齢	人数	観察 年数 (平均)	平均 線量 (Gy)	観察値/ 期待値	過 剰 危険率
若年被曝	ŧ						-+ -*.		40.007		440	40/40.0	
スウェーテ	*ン0-19	2,000	20	1.6	2/1.2	0.5	スウェーテ゛ン	57	10,207	15	113	18/13.3	0.0
FDA	0-20	3,503	27	0.6	4/1.4	3.1	ミネソタ	57	1,005	15	88	3/0.8	0.0
成人被暍	ŧ						USA	48	19,186	8	88	5/2.4	0.0
スウェーテ	*ン>19	24,200	20	0.42	16/25.8	<0							
ドイツ	成人	13,896	17	1.0	80/63.6	0.3	若年者研究	0-19	602	10	88	2/0.1	0.3

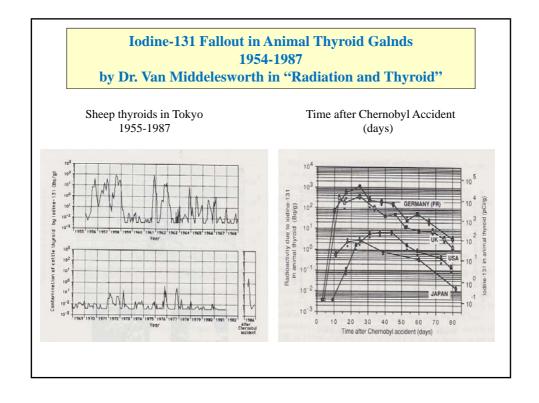
131 と甲状腺癌

今まで1311で人間に甲状腺癌が発生したとの報告はない。

内部被曝と甲状腺癌

- 1. ビキに水爆実験で甲状腺癌が増加
- 2. 原爆のFalloutで甲状腺結節が増加 しかし、両者とも放射性ヨウ素が原因とは結論できない。
- 3. 医療用のヨウ素131では、診断用でも、治療用でも癌が増えたと言う証拠はない。

2) チェルノブイリ事故の調査 (経時的に具体的に)



Report from ETA in 1987 in Nagasaki

TABLE III

EXPECTED NUMBER OF FATAL THYROID CANCERS CAUSED BY CHERNOBYL FALLOUT OF IODINE-131 IN THE NEXT 50 YEARS ACCORDING TO REGION OF EUROPE^a)

Area	Population		Dose	No
Area	ropulation	mSv	person Sv	No.
Chernoby1	135000	300	40000	2
Ukraine and Byelorussia	75000000	5	370000	18
Eastern Europe	175000000	3	520000	26
Western Europe	250000000	0.3	70000	4
Total	500000000	2	10 ⁶	50

a) the number of deaths from naturally occurring thyroid cancer is expected to be in the range 250000-500000.

事故によって降下した I-131の被曝により、ヨーロッパ全体で50人の甲状腺癌が増加する。

しかし、その増加はいかなる疫学的方法によっても証明されないであろう。

1990-1991年の日本の報道(事故は1986年)

世界最大の原発事故、数日間にわたって燃え続け、大気中に原爆の何千倍もの放射性物質を放出した。

放出された放射線物質は現地のみならず北半球全体に撒き散らされた。

原発内には巨大な放射線物質の塊が残され、周囲は石棺と 呼ばれるコンクリートで固められているが、その外から でも強い放射線が測定される。

事故によって原発内で数千人の人が亡くなり、放出された放射性物質により、周辺の数万人が亡くなった。



チェルノブイリ・プロジェクト

1990年8月から1991年4月までに準備完了

対象:

事故当時10歳以下の小児 10万人 (男女5万人づつ)

被曝地を巡回してできるだけ多くの子供の健診

方法:

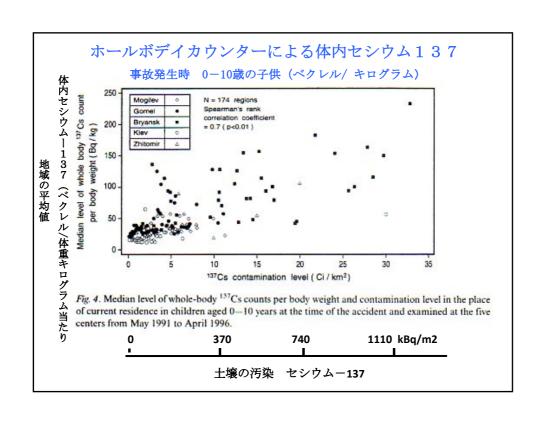
A. 甲状腺疾患 長崎原爆被曝者の調査方法 世界の批判に耐える(超音波診断)

- B. 血液疾患 原爆被曝者の調査方法
- C. 被曝線量測定 対象者すべての体内セシウム137測定



ソ連邦科学アカデミーにおける討議





$\label{thm:continuous} \textbf{Project supported by Ministry of Foreign Affairs of Japan}$

The First Report on the Increase of Childhood Thyroid Cancer

(1991 in Nagasaki University)



症例の報告-問題提起 1992年9月

ベラルーシ共和国から小児甲状腺癌 増加の報告

発表者は 厚生大臣

甲状腺腫瘍研究所長 放射線医学研究所長

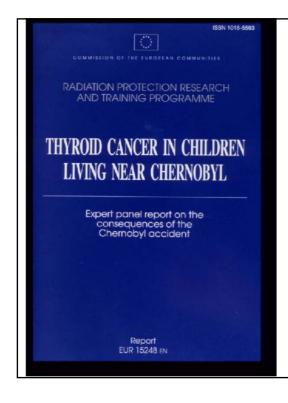
支持者は ヨーロッパWHO

英国 ケンブリッジ大学教授 イタリア ピサ大学教授

しかしながら 日本、米国、オックス フォード大学から反論

								SCIE	NTIFIC	CORRESPO	NDENCE
Thyroid	cai	ncer	r af	ter	Ch	erno	byl		operations	nined 11 children for thyroid cu	reinoma and
Six — We would li						is placing			were now	hospitalized for p nt or evaluation	ost-operative
increase in the fo	CONCOL	w of the	roid	become to	s, and	n pracing	of our	new	disease W	le were shown	he riunches
cancer in children	in B	clarus, w	thich :	country.	It also	provides as	подрог	tunity.	records for	these patients,	including X
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seen that the overall an average of just				paring d of the p	etailed	reports of v	tarious a	ospects	region. Th	e age at diagnored five males wa	is of the sit
from 1986 to 1989	inclusi	ive, to 5	5 in	We I	ecieve.	that the	only re	alistic	and 13 yes	ars of age; the y	roungest war
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Region of		DOCUME OF T	injusto c	Years	Cimp er				We have	studied the hister	ogical slides
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(EUのミッションの報告書) チェルノブイリ近辺に住む 子供たちの甲状腺癌

EUのミッションは、破壊された 原子炉から放出された放射性ヨウ素が、ベラルーシ、ウクライナで発見された小児甲状腺癌の 増加の原因になっている可能性 が大きいと考える。

しかし、ロシア、アメリカ、日本のメンバーは、結論はまだ早すぎる、疫学的事実を明らかにしてから結論を発表すべきであると主張した。

小児甲状腺癌増加の確認の時代 1992年~1994年

WHO, ヨーロッパ共同体, IAEAシンポジウム

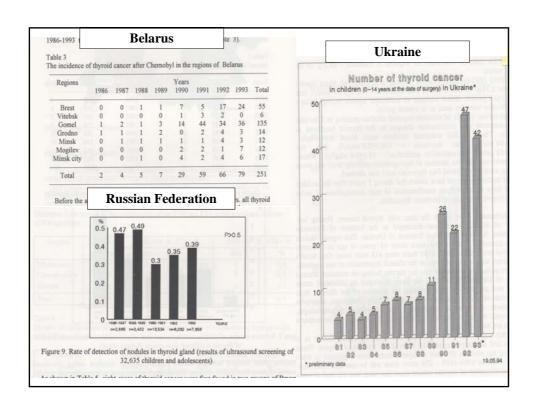
1992年WHOベラルーシ・ミンスク1993年WHOウクライナ・キエフ1994年WHOスイス・ジュネーブ1994年ヨーロッパ共同体オーストリア・ウィーン1994年IAEAオーストリア・ウィーン

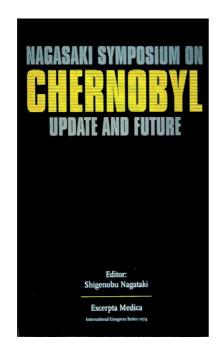
長崎市におけるシンポジウム

1993年長崎大学長崎市1994年文部省長崎市

日本内分泌学会

長崎大学





1994 (8年目) 討論のまとめ Summary of Discussion

1. ベラルーシ、ウクライナで事故後 小児甲状腺癌が増加。しかしロシア 共和国ではそのような事実はない。

After the accident, an increase of childhood thyroid cancer has been observed in Belarus and Ukraine, but no increase has been observed in Russia.

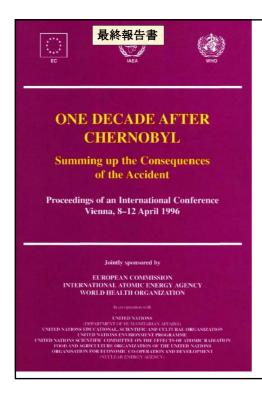
2. 小児甲状腺癌の原因はチェルノブイ リ原発事故による可能性が大きい。 しかし他の原因も調べる必要がある。

It is highly likely that childhood thyroid cancer has been caused by the Chernobyl nuclear power plant accident. However, other causes should also be sought.



チェルノブイリ事故10周年国際会議 IAEA WHO EC ウィーン オーストリア 1996年4月8~12日





(10年目の報告)

- 子供の甲状腺がんは、ロシア、ベラルーシ、ウクライナで症例が増加している。
- 原因はチェルノブイリ事故により 放出された放射性ヨウ素と考える。
- 理由は、時間的(1990年頃から)、 地域的(被災した地域)な客観的 状況証拠よる。

Strong circumstantial evidence (chronological and geographical)

- 線量相関関係は不明
- 早期に遠隔転移するのは、被 ばくの為ではなく、年齢の為 である。

Childhood Thyroid Cancer: Comparison of Japan and Belarus

YUTAKA SHIRAHIGE, MASAHIRO ITO*, KIYOTO ASHIZAWA, TOMOKO MOTOMURA, NAOKATA YOKOYAMA, HIROYUKI NAMBA**, SHUJI FUKATA***, TAMOTSU YOKOZAWA***, NAOFUMI ISHIKAWA*, TAKASHI MIMURA*, SHUNICHI YAMASHITA**, ICHIRO SEKINE*, KANJI KUMA***, KUNIHIKO ITO*, AND SHIGENOBU NAGATAKI

 $First\ Department\ of\ Internal\ Medicine,\ Departments\ of\ *Molecular\ Pathology\ and$

- **Nature Medicine, Atomic Bomb Disease Institute, Nagasaki University School of Medicine, Nagasaki 852-8501,
- ***Kuma Hospital, Kobe 650-0011, and *Ito Hospital, Tokyo 150-0001, Japan
- ベラルーシで、我々は25000人を検査し、26人の甲状腺がんの患者を 発見した。この患者と日本の1962-1995に発見された37人の患者を比 較した。
- 子供の甲状腺がんは乳頭がんであっても、リンパ節転移は (73% べ:74%日)、肺転移は(4%べ:19%日)と両国ともに多く、優位の差は認められなかった。
- 優位な違いは、手術時のがんの大きさ(1.4cmべ:4.1cm日)で 認められただけである。

moiecular epidemiology are needed in belarussian cases.

Key words: Chernobyl, Japan, Radiation, Thyroid neoplasms, Children

(Endocrine Journal 45: 203-209, 1998)

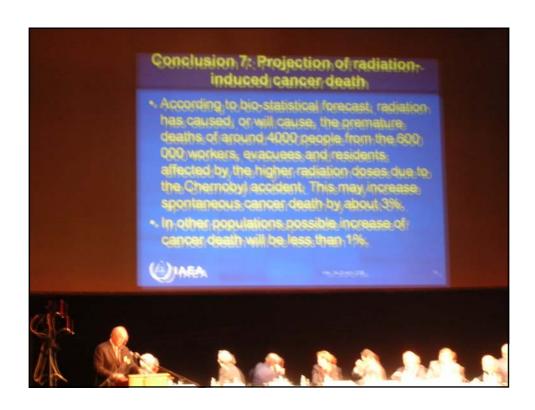
20周年記念行事2006年4月24日 国立オペラ劇場



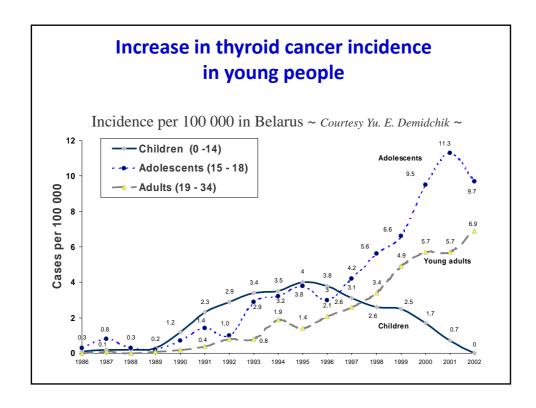












Psychological, mental and nervous system effects 精神的、心理的、神経的影響 20年目の報告

- Issues
 - ? In-utero mental retardation
 - ? Direct effects on the brain among highly exposed
 - Psychological consequences
- Consensus
 - Psychological effects are the largest public health impact from the accident
 - May not be possible to disentangle accident effects from other stressors
 - High levels of anxiety and unexplained medical complaints continue up to the present

精神的影響は事故による最大の健康影響である。 高度の不安と説明できない医学的訴えは現在も続いている

チェルノブイリ原発事故の人体に対する影響のまとめ 2011年2月の(25年目)国連科学委員会(UNSCEAR)の報告書

急性影響 (原発内)

134人の職員ならびに消防夫は急性放射線障害を起こした。

- このうち28人は高線量の被曝により死亡した。
- このうちさらに19人が2006年までに死亡したが、死因は被曝との関係は認められてはいない。

晩発影響-1 (原発周辺で作業した人たち)

数十万人が汚染除去作業に従事した。

● 高線量被曝者に白血病、白内障が増加しているようにも見えるが、放射線に起因する健康影響のエビデンスはない。

晩発影響-2 (原発外の周辺住民)

- 汚染されたミルクを規制なしに飲んでいた被曝当時子供だった人たちの中から6000人以上という相当な数の甲状腺癌患者が発見されている。 (2006年までの死亡者は15人)
- 現在まで一般公衆に放射線に起因する健康影響のエビデンスはない。

精神的影響は、放射線の影響ではないと25年目の報告書からは削除

チェルノブイリ事故による甲状腺がん 最近の発表

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www.bjcancer.com

Thyroid cancer risk in Belarus among children and adolescents exposed to radioiodine after the Chornobyl accident

LB Zablotska*,¹, E Ron², AV Rozhko³, M Hatch², ON Polyanskaya³, AV Brenner², J Lubin², GN Romanov³, RJ McConnell⁴, P O'Kane⁵, VV Evseenko³, VV Drozdovitch², N Luckyanov², VF Minenko⁶, A Bouville² and VB Masyakin³

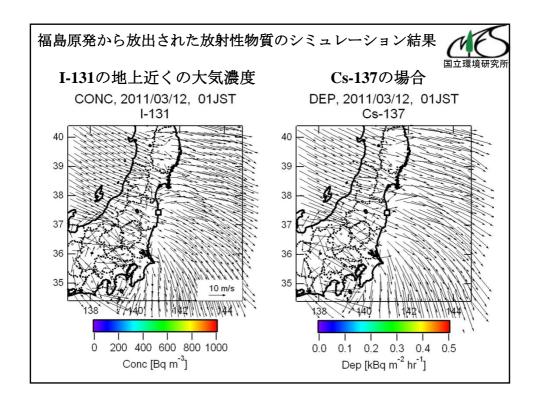
¹Department of Epidemiology and Biostatistics, University of California San Francisco, 3333 California Street, Suite 280, San Francisco, CA 94118, USA;
²Division of Cancer Epidemiology and Genetics, NCI/NIH-IID-HI-IS, Bethesda, MD 20892, USA;
³The Republican Research Center for Radiation Medicine and Human Ecology, Gomel 246040, Belarus;
⁴The Thyroid Center, Columbia University, New York, NY 10032, USA;
⁵Radiology Department, Thomas Jefferson University Hospital, Philadelphia, PA 19107, USA;
⁶Belarusian Medical Academy of Post-Graduate Education, Minsk 220714, Belarus

Table I Descriptive characteristics of prevalent thyroid cases and non-cases

		c	ases	Non-	cases			
Variable	Value	N	%	N	%	Odds ratio ^a	95% CI	P-value ^b
Gender	Men	37	42.53	5602	48.61	1		0.12
	Women	50	57.47	5922	51.40	1.40	0.91-2.15	
Age at screening, years	10-14	13	14.90	1379	12.00	1		0.19
0,	15-17	14	16.10	2161	18.80	0.89	0.41 - 1.91	
	18-20	12	13.80	2010	17.40	1.03	0.46 - 2.32	
	21-23	8	9.20	1891	16.40	0.71	0.29-1.75	
	24-26	19	21.80	1840	16.00	1.75	0.83 - 3.67	
	27-29	15	17.20	1533	13.30	1.73	0.79 - 3.79	
	30-34	6	6.90	708	6.10	1.61	0.59 - 4.43	

福島原発事故と甲状腺癌

- (1) ヨウ素131プルームの動き(避難、食品制限などの対策)
- (2) 甲状腺のヨウ素131摂取量 (推定値と個人の実測値)
- (3) 甲状腺超音波検査の結果
- (4) 今後の問題



福島原発事故に対する緊急の対策 Countermeasures

Evacuation and Sheltering (避難と屋内退避)

Da	ate	Evacuation	Sheltering
3月11日	21:23	3km	3-10km
3月12日	5:44	10km	
3月12日	18:25	20km	
3月15日	11:00		20-30km

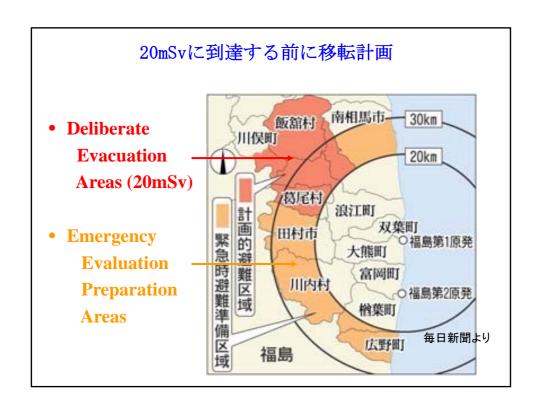
Food Control (食品の規制)

3月17日 放射性ヨウ素、放射線セシウムの規制

Accumulated Dose at reading points (積算被曝線量の測定)

3月 17日 から定期測定開始 20mSv 以上を計画的避難区域





住民の個人の被ばく線量 「外部被ばく」(2012年3月)

行動調査(福島県民健康管理調査)

先行調査 事故4か月の累積外部被ばく線量 川俣町、浪江町、飯館村 9,747名

1ミリシーベルト以下5,636名57.8%10ミリシーベルト以下9,676名99.3%10-23ミリシーベルト71名0.7&

個人線量計(福島市の調査)

福島市 子供と妊婦 9-11月の積算線量 36,767名

1ミリシーベルト以下 36,657名 99.7%・ 最大値は2.7ミリシーベルト

福島市、二本松市、田村市、郡山市など、年間3mSv以下が95%以上

男女別・線量別 内訳 【放射線業務従事者を除く】

H24.12.5現在

						112 1.12.0 90 д
実効線量		男女別				左の線量別
(mSv)	男性	左の線量別 割合(%)	女性	左の線量別 割合(%)	計	割合(%)
~1未満	102,054	64.6	132,875	67.5	234,929	66.2
~2未満	46,116	29.2	55,622	28.3	101,738	28.7
~3未満	8,234	5.2	7,230	3.7	15,464	4.4
~4未満	673	0.4	449	0.2	1,122	0.3
~5未満	282	0.2	245	0.1	527	0.1
~6未満	200	0.1	193	0.1	393	0.1
~7未満	125	0.1	95	0.0	220	0.1
~8未満	60	0.0	50	0.0	110	0.0
~9未満	40	0.0	36	0.0	76	0.0
~10未満	24	0.0	15	0.0	39	0.0
~11未満	28	0.0	12	0.0	40	0.0
~12未満	17	0.0	12	0.0	29	0.0
~13未満	8	0.0	8	0.0	16	0.0
~14未満	8	0.0	3	0.0	11	0.0
~15未満	6	0.0	4	0.0	10	0.0
15以上~	10	0.0	2	0.0	12	0.0
8†	157,885	100.0	196,851	100.0	354,736	100.0

※割合(%)は線量別に端数処理を行っている

住民の個人の被ばく線量

「内部被ばく(セシウム134と137)」

ホールボデイカウンター (WBC) いくつかの報告を総合して

対象者:計画的避難区域や双葉郡の町村等の住民を中心に実施 川俣町山木屋地区、浪江町、飯舘村、広野町、楢葉町、富岡町、川内村、大熊町、双葉町、葛尾村、相馬市、南相馬市、伊達市及び田村市

測定場所: (独) 放射線医学総合研究所、(独) 日本 究開発機構,南相馬市立総合病院、新潟県 11,816名 (独) 日本原子力研

測定期間:6月27日-12月31日

測定結果: (預託実効線量) (12月31日時点)

1 mSv未満 11,792名 99.8% 1-2mSv12名 0.1% 2-3mSv10名 0.1% 3mSv2名

住民の個人の被ばく線量 「子供の甲状腺の被ばく線量」

小児甲状腺被ばく線量スクリーニング (災害対策本部)

いわき市 川俣町 飯館村 1,080名 3月24日-30日

598名 0.01uSv/h 以下 55, 4% 1,069名 0.05uSv/h 以下 98.9% 0.05-0.1uSv/h 11名 1.1%

0. 1uSv/h (介入レベル 0. 2uSv/h)

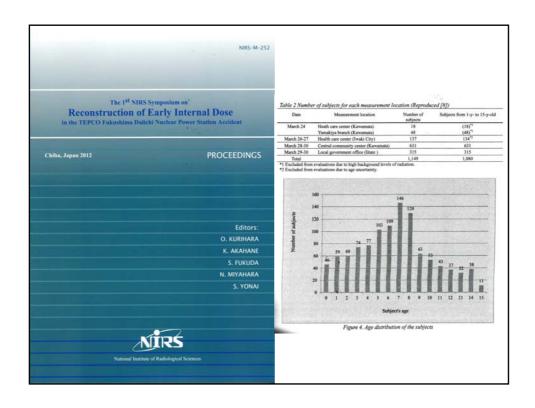
甲状腺被ばく線量測定 (弘前大学) (Scientific Report)

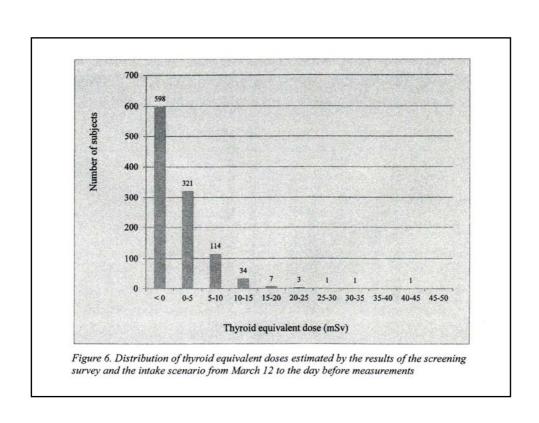
浪江町 (17名) 福島市に避難 (48名) 4月11日-16日

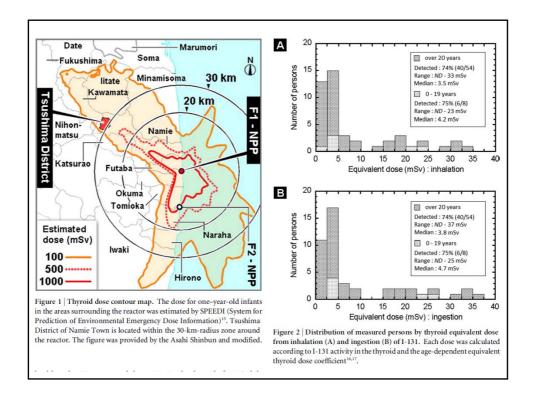
子供(0-9才5名、10-16才3名) 大人 Median Value 4.2mSv 3.5mSv Maximum 23mSv 33mSv

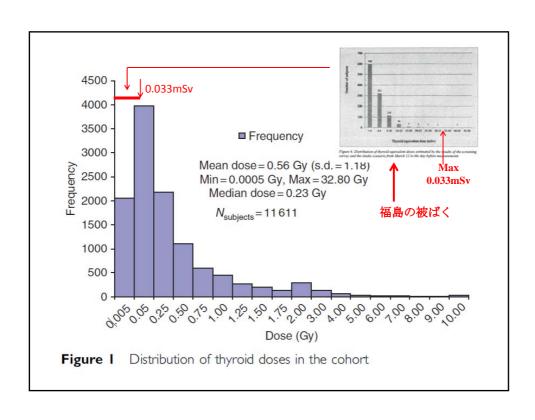
長崎大学 WBCによる測定、甲状腺被ばく線量は50mSv以下

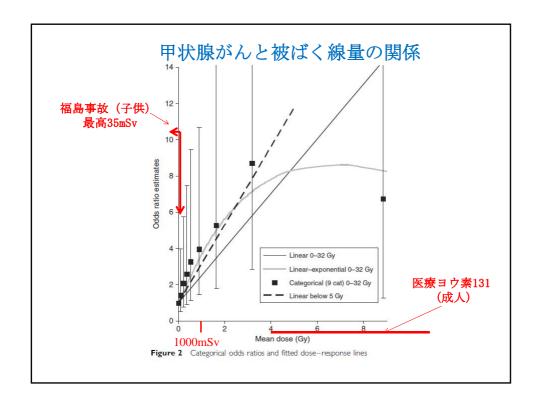
「介入線量以上の被曝は、今までのすべての報告でいない」











甲状腺超音波検査の結果と 今後の課題

介入線量以下の被ばくなのに 何故30万人の子供の超音波検査が必要か 正当化できるか

	10	No.		H2	23年度		H2	4年度
	検査実施総	数		38	,114人		57,	840人
wichet EB	Wile	ach size		H	23年度		H2	24年度
判定結果	TUT	2内容		人数	8	合	人数	割合
A (A1)	結節や嚢胞を認めなかった	たもの		24,469人	64.2%		33,158人	57.3%
判 定 (A2)	5.0㎜以下の結節や20.0	mm以下の嚢胞を認	めたもの	13,459人	35.3%	99.5%	24,367人	99.5% 42.1%
B判定	5.1㎜以上の結節や20.11	mm以上の嚢胞を認め	かたもの	186人	0.9	5%	314人	0.5%
C判定	甲状腺の状態等から判断するもの	して、直ちに二次枝	査を要	OX	0,	0%	1人	0.001%
· A1.								
B、C事※ A2の判	製定は二次検査 (二次検査 定内容であっても、甲状腺 変の検査結果については、	の状態等から二次	、二次検査 検査を要する	と判断しただ	うについて	は、B判定と		
・ B、C [‡] ※ A2の [‡] ※ H24年	別定は二次検査 (二次検査 定内容であっても、甲状腺 変の検査結果については、	の状態等から二次	、二次検査 検査を要する	と判断しただ	うについて	は、B判定と		
・ B、C [‡] ※ A2の [‡] ※ H24年	判定は二次検査(二次検査 定内容であっても、甲状腺	の状態等から二次	、二次検査I 検査を要する いる9月28	と判断しただ	うについて	は、B判定と	しています。	81
• B、C [‡] ※ A2の [‡] ※ H24年 (参考)	別定は二次検査(二次検査 定内容であっても、甲状腺 変の検査結果については、 判定結果	の状態等から二次を検査結果が確定して	、二次検査(_美 査を要する にいる9月28 H23年度	を判断したが 8日検査分まで 計	うについて	は、B判定と ています。	しています。 H24年度	0/
・ B、C [‡] ※ A2の [‡] ※ H24年	別定は二次検査(二次検査 定内容であっても、甲状腺 変の検査結果については、 判定結果	の状態等から二次を検査結果が確定して	、二次検査(検査を要する にいる9月28 H23年度 割合	を判断したが 8日検査分まで 計	でを集計し	は、B判定と ています。 人数	しています。 H24年度 割合 0.53	% 538/
• B、C [‡] ※ A2の [‡] ※ H24年 (参考)	別定は二次検査 (二次検査 定内容であっても、甲状腺 変の検査結果については、 判定結果 5.1mm以上 5.0mm以下	の状態等から二次 検査結果が確定して 人数 184人	、二次検査(検査を要する にいる9月28 H23年度 割合 0.48%	35と判断したが 3日検査分まで 8t 31 (1,0	5について でを集計し 85人 51%)	は、B判定と ています。 人数 307人	H24年度 割合 0.53 0.40	% 538 <i>)</i> % (0.93%



今後の大きな問題

甲状腺微小癌 (Microcarcinoma <1cm)

病理解剖で初めて見つかった症例

頻度:日本で408名調べたら46名に微小癌が発見された (11.3%) 年齢、性に関係なし。 (1990 Cancer)

超音波検査で頻度は増えている

器械の発展に伴い増加している。

年齢とともに増加すると言う論文が多い。

経過 (病理解剖から)

大部分は他の病気で死亡するまで診断されていない

(超音波検査から)

一部は(7%)は5年以内に3cm以上なった。

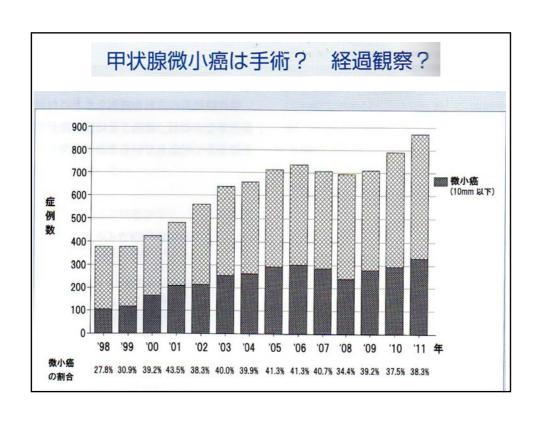
一部(1.7%)は5年以内にリンパ節転移

手術するのか (1.0cm以下でも)

現在は病院により異なる

韓国では、甲状腺がんの症例は4-8倍に増加している

福島でどうするのか



福島の甲状腺癌患者の手術

計画は、現在の調査対象の子供を生涯検査を続ける。 超音波検査で結節 5 mm以上は、B判定で2次検査が必要。

2次検査では 針生検を行えば、微小癌が発見される。 癌が見つかればどうするか。

癌なのに経過観察は、親が納得しない、手術になる。 微小癌の手術をすれば、最終的に人口の10%が手術になる。

年齢とともに微小癌は増加する。

福島で3万人になるまで、毎年甲状腺癌患者が増加する。 放射線によって癌が増加したと言う主張に対する答えは

対象の地域でも手術をすると日本中で甲状腺癌が増える。 日本で人口の10%を甲状腺癌として手術するのか

検査をすれば癌の発見が増える(乳がん、前立腺癌、肺がん、など) 専門医だけではなく日本社会全体として、癌全体の問題として考える

2013年1月12日のNHKスペシャル (補遺)

福島では牛乳摂取制限(チェルノブイリ事故との最大の違い) (放送せず)

3月25日-30日まで1000人以上の子供の甲状腺ョウ素131測定(対策本部) 弘前大学、長崎大学でも測定、介入線量以上の子供は一人もいない (放送せず)

I-131プルームのsimulation がメインの内容 (科学的に大切である。しかし、現状では、甲状腺の放射性ョウ素の摂取を予測するには誤差が多すぎると考えるのが常識)

セシウムの内部被ばくから甲状腺のヨウ素摂取量を予測する (直接甲状腺ヨウ素131を測定するのに比較すると意味はない。チェルノブイリ事 故でもセシウムからヨウ素摂取を予想することは全く行っていない)

33mSvの被ばくの影響は、国際機関の合意でも安定ヨウ素を投与するレベルではない

(50mSvでも癌が増えると根拠のない放送)

科学的な番組の形を取りながら、番組は明らかに意図的な取捨選択があり、視聴 者を惑わす番組ではないかと危惧される。 (視聴者はどう受け取ったか)