

Fukushima Project

Nuclear Disaster Stress Relief

Tsuyoshi Akiyama

NTT Medical Center Tokyo

第4回市民科学者国際会議

National Olympics Memorial Youth Center

24 November, 2014 Tokyo

Nuclear Disaster

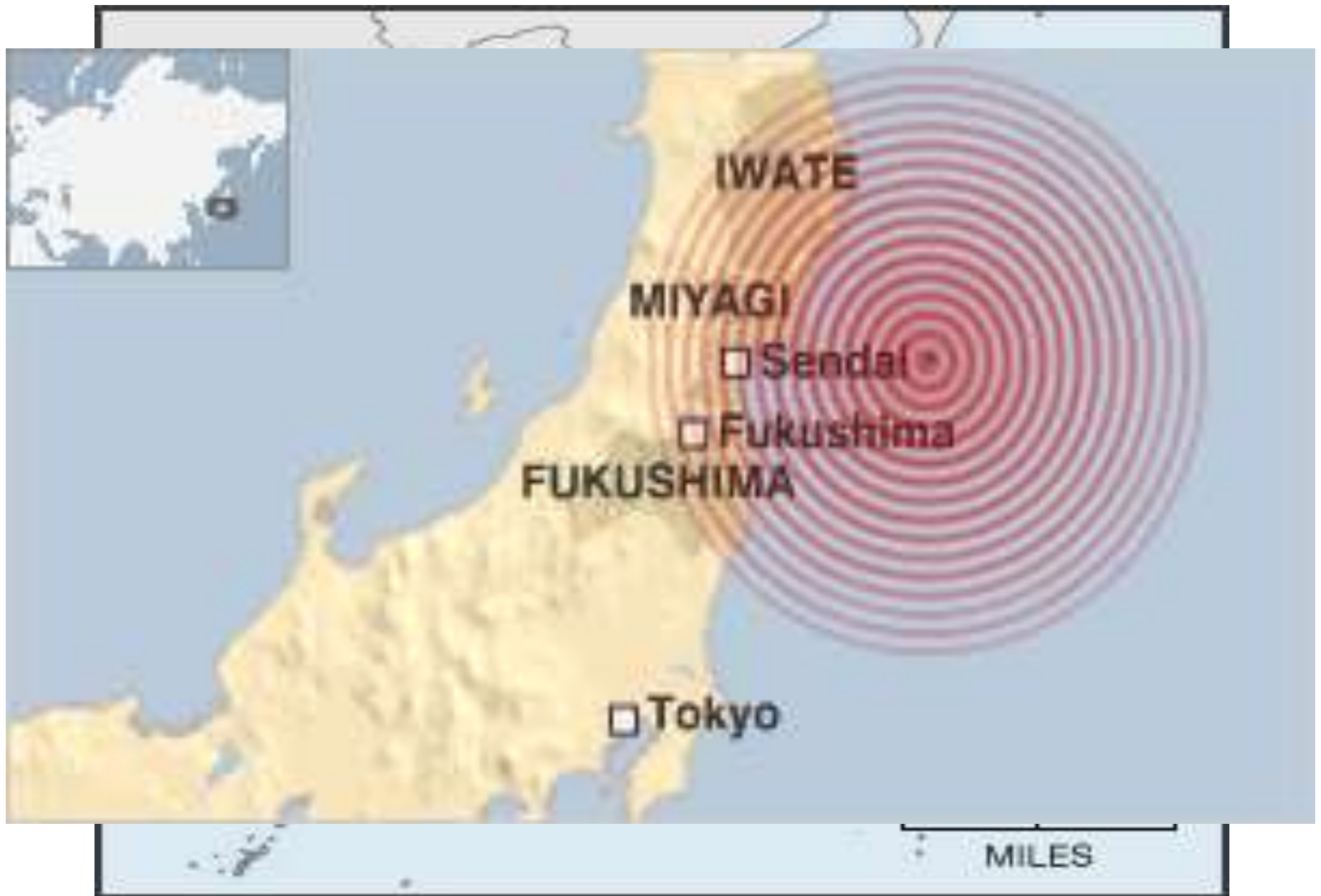
Past Nuclear Disaster Study

Fukushima Project

East Japan Great Earthquake by Kim

- * March 11, 2011 14:46
- * Magnitude of 9.0
- * Tsunami
8-15 meter
- * Death 15,880
- * Missing 2,700
(as of Jan 30, 2013)





By Yoshiharu Kim

Fukushima Daiichi Nuclear Plant

Loss of Electricity Supply

Emergency Generator

**Generator in the basement
disabled by 15m tsunami
at 15:47, 11 March!!**

Station Blackout!!



Late Mr. Masao Yoshida
Superintendent (then)
By Jun Shigemura



**Explosion at Fukushima
Daiichi Nuclear Plant
15:36 12 March 2011**



**Escaping Traffic
Jam 12 March**



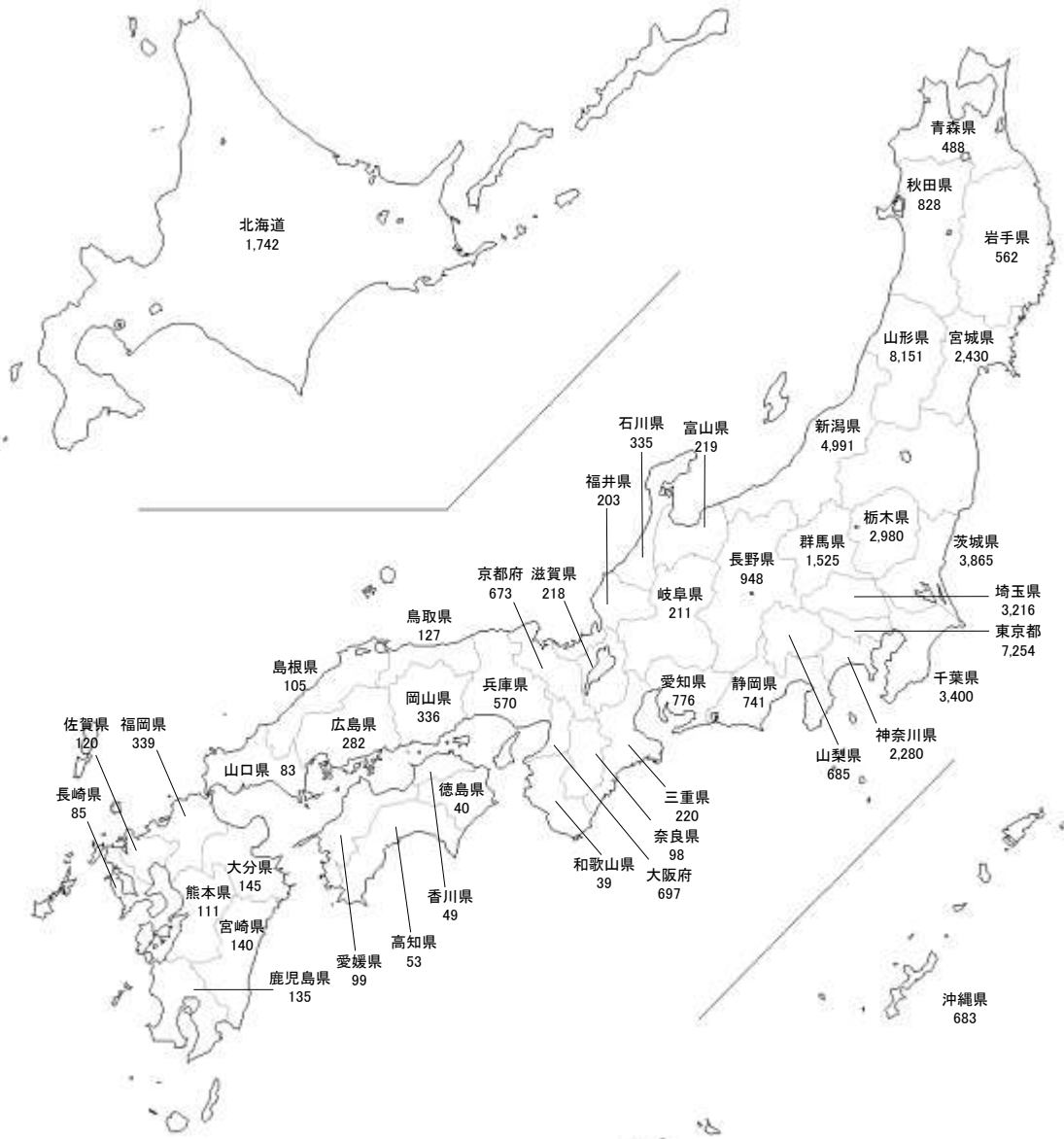
**Evacuation by bus
13 March**

By Masaharu Maeda

Evacuation 4 July 2013

福島県外への避難状況一覧 (単位 人)

北海道	1,742	滋賀県	218
青森県	488	京都府	673
岩手県	562	大阪府	697
宮城県	2,430	兵庫県	570
秋田県	828	奈良県	98
山形県	8,151	和歌山県	39
茨城県	3,865	鳥取県	127
栃木県	2,980	島根県	105
群馬県	1,525	岡山県	336
埼玉県	3,216	広島県	282
千葉県	3,400	山口県	83
東京都	7,254	徳島県	40
神奈川県	2,280	香川県	49
新潟県	4,991	愛媛県	99
富山県	219	高知県	53
石川県	335	福岡県	339
福井県	203	佐賀県	120
山梨県	685	長崎県	85
長野県	948	熊本県	111
岐阜県	211	大分県	145
静岡県	741	宮崎県	140
愛知県	776	鹿児島県	135
三重県	220	沖縄県	683
		計	53,277



※都道府県名に併記している数字は
各都道府県への避難者数。

Past Nuclear Disaster Study

Nagasaki

Three Mile Island

Chernobyl

Persistent distress after psychological exposure to the Nagasaki atomic bomb explosion

Yoshiharu Kim, Atsuro Tsutsumi, Takashi Izutsu, Noriyuki Kawamura, Takao Miyazaki and Takehiko Kikkawa

Background

Although there is speculation that individuals living in the vicinity of nuclear disasters have persistent mental health deterioration due to psychological stress, few attempts have been made to examine this issue.

Aims

To determine whether having been in the vicinity of the Nagasaki atomic bomb explosion in the absence of substantial exposure to radiation affected the mental health of local inhabitants more than half a century later.

Method

Participants were randomly recruited from individuals who lived in the vicinity of the atomic bomb explosion in uncontaminated suburbs of Nagasaki. This sample ($n=347$) was stratified by gender, age, perception of the explosion and current district of residence. Controls ($n=288$) were recruited from among individuals who had moved into the area from outside Nagasaki 5–15 years after the bombing, matched for gender, age and district of residence. The primary outcome measure was the proportion of those at high risk of mental disorder based on the 28-item version of the General Health Questionnaire, with a cut-off point of 5/6. Other parameters related to individual perception of the

explosion, health status, life events and habits were also assessed.

Results

Having been in the vicinity of the explosion was the most significant factor (OR=5.26, 95% CI 2.56–11.11) contributing to poorer mental health; erroneous knowledge of radiological hazard showed a mild association. In the sample group, anxiety after learning of the potential radiological hazard was significantly correlated with poor mental health ($P<0.05$), whereas anxiety about the explosion, or the degree of perception of it, was not; 74.5% of the sample group believed erroneously that the flash of the explosion was synonymous with radiation.

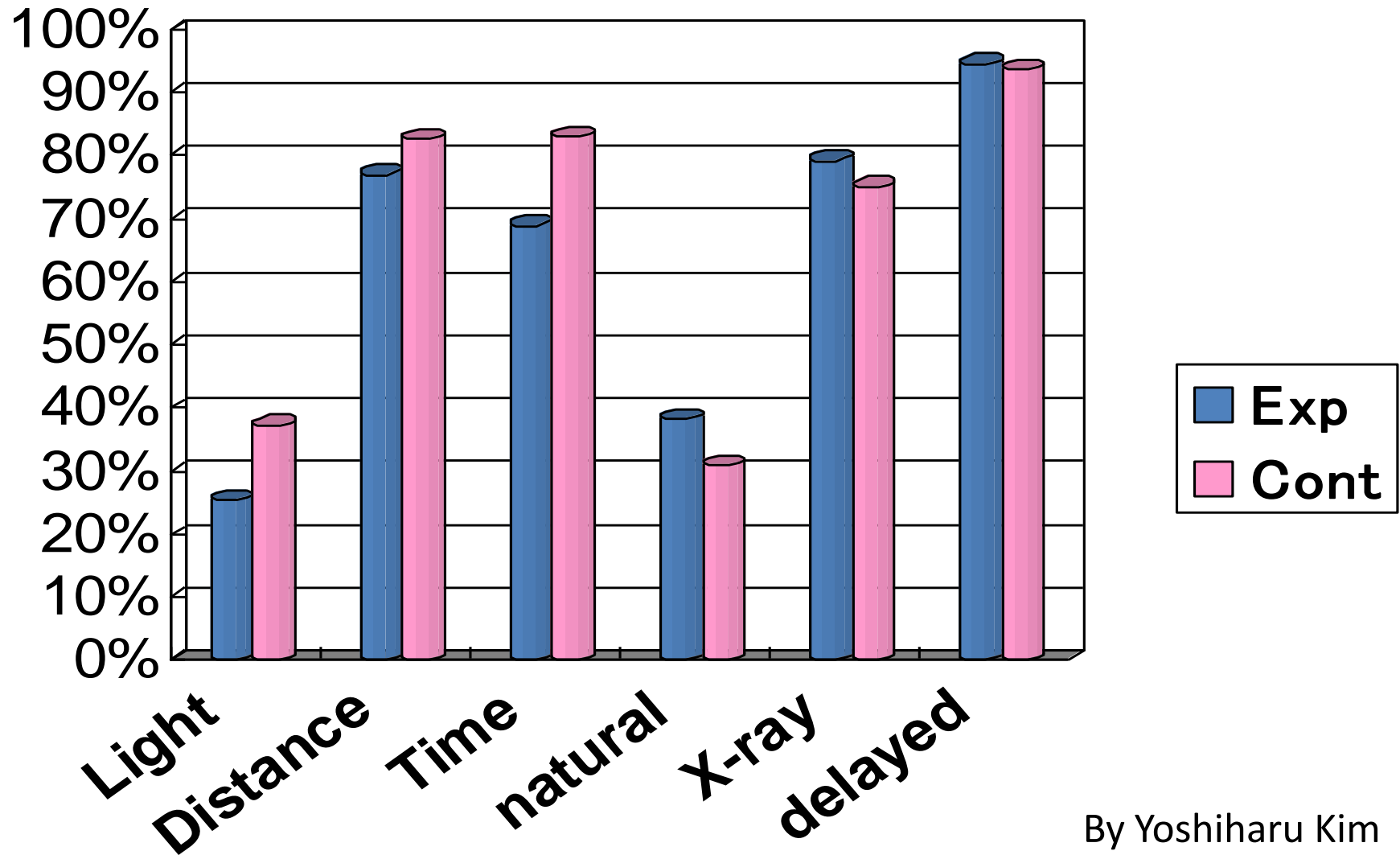
Conclusions

Having been in the vicinity of the atomic bomb explosion without radiological exposure continued to be associated with poorer mental health more than half a century after the event. Fear on learning about the potential radiological hazard and lack of knowledge about radiological risk are responsible for this association.

Declaration of interest

None.

Rate of correct knowledge on atomic bomb/radiation



By Yoshiharu Kim
modified

Table 2. Contribution of variables to poorer mental health

By Yoshiharu Kim
modified

	Adjusted odds ratio	95% CI		<i>p</i>
Sample group ^b	5.26	2.56	11.11	<0.001
Age	0.98	0.93	1.04	N.S.
# of family members living with	0.91	0.76	1.10	N.S.
Years of education	1.06	0.90	1.24	N.S.
Job history of farmer/ fishery	2.11	0.95	4.66	N.S.
Loss of spouse/ relative within 3 ^o due to atomic bomb	1.75	0.89	3.44	N.S.
Presence of physical disease within 6 mo. ^b	1.77	0.82	3.80	N.S.
# of non-atomic traumatic events	1.18	0.99	1.41	N.S.
Erroneous knowledge on radiation ^c				
Radioactivity is different from lightening	2.14	1.05	4.33	<0.05
Radioactivity decreases over time	1.94	0.85	4.41	N.S.
Natural exposure to radiation occurs	2.37	1.16	4.84	<0.05

Psychological Aftermaths of Nuclear Power Plant Accidents

**Evelyn J. Bromet
Stony Brook University**

**April 2014
modified**

Three Mile Island (TMI; 1979)

Central Pennsylvania

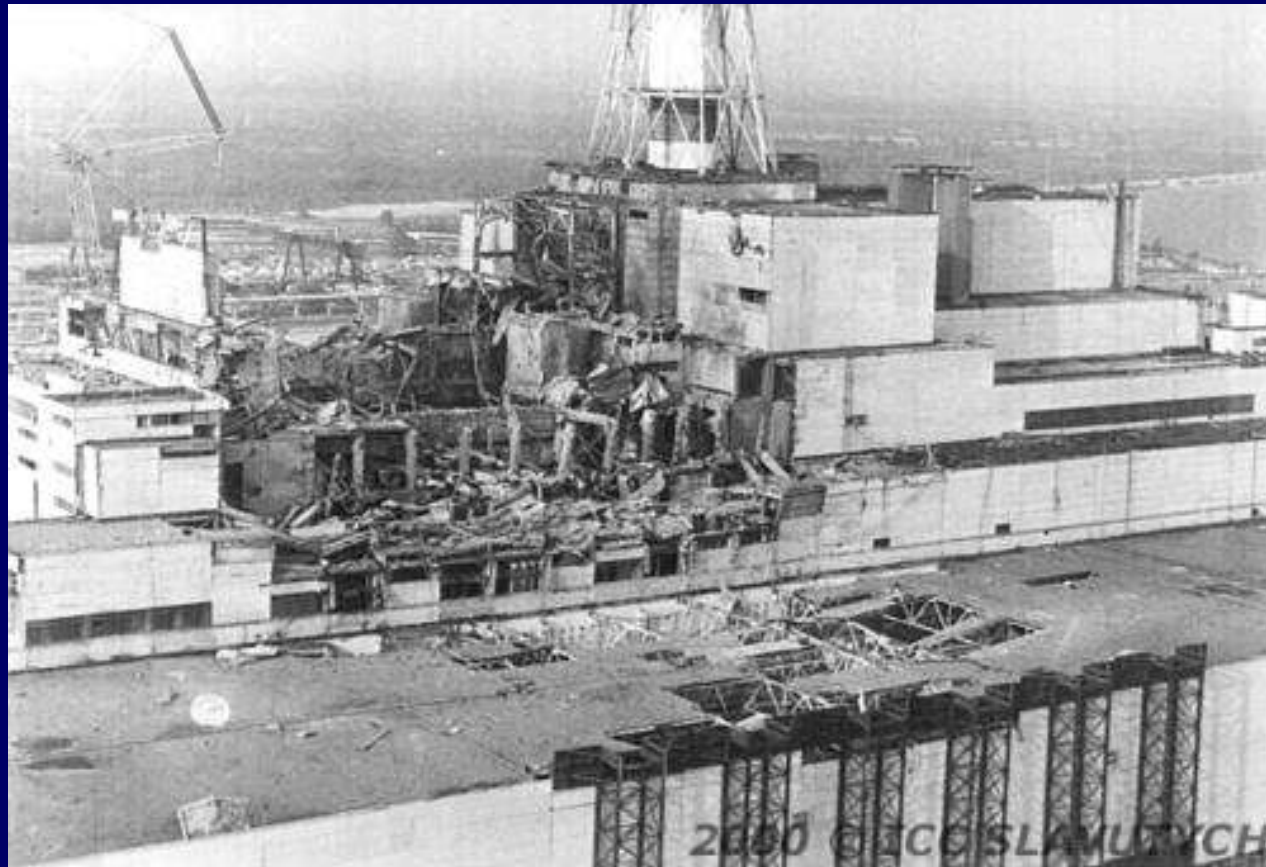


Three Mile Island Study

- Pre-school and 11-year old children no differences
- Mothers continued to worry (10 years later)
- 42%: their health affected
- 68%: children's health affected
- Risk perception: distress & poor self-rated health

Apr 26, 1986

Chornobyl explosion



Chernobyl Survey

- **11 and 19 years after Disaster**
- **300 evacuee children and 300 gender-matched classmate controls**
- **Medical exams and blood tests**

Health of children

- **No differences**

Mental health

Physical examination

Blood tests

Grades at school

Mothers (11y)

- Children's health 'bad' or 'very bad'
 - 37% (evacuee)
 - 14% (controls)

- Mother's Health

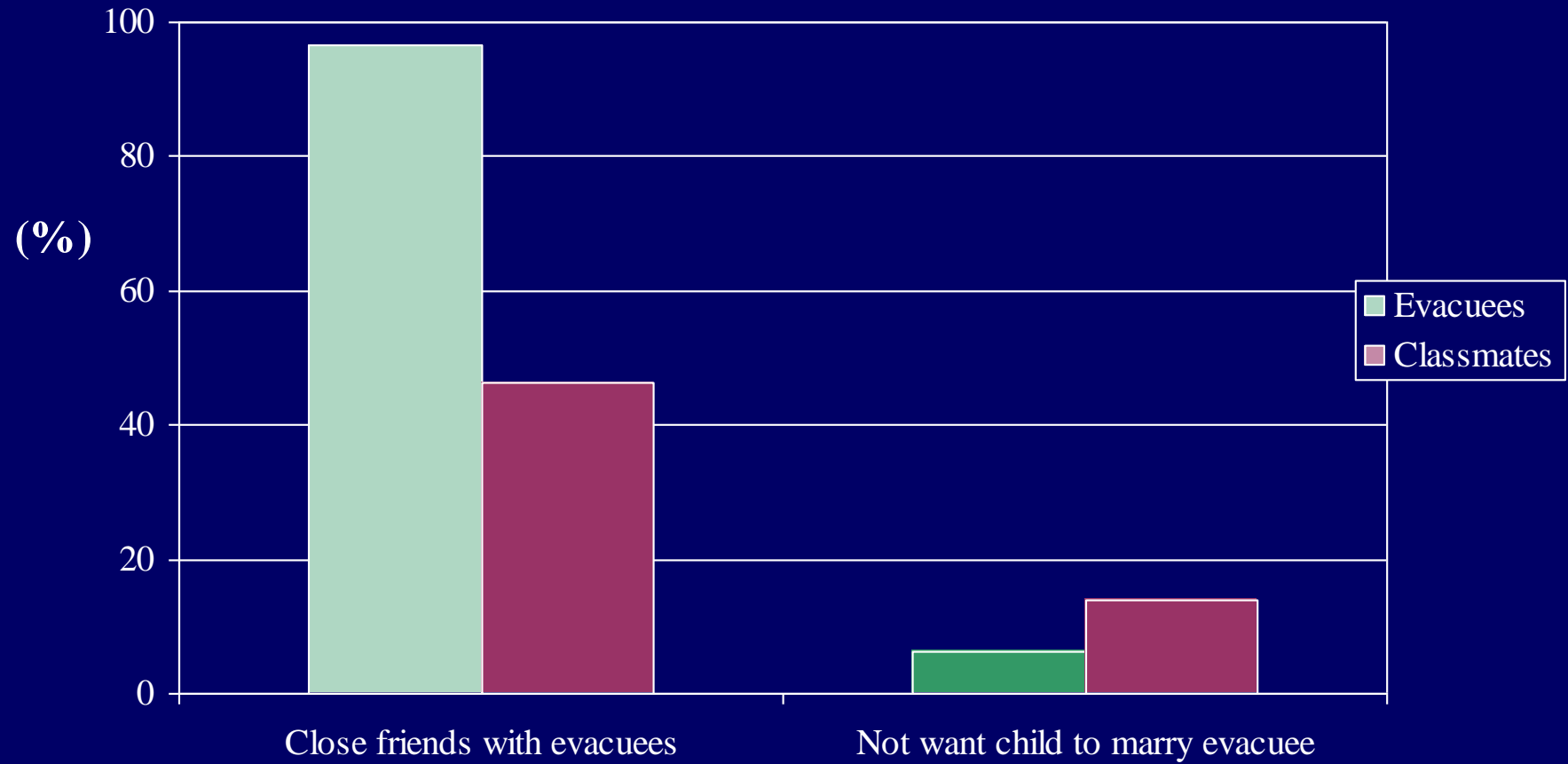
Significant differences

Mental health

Subjective health

Self-stigma

Self-stigma



Fukushima Project

Parent/child play and discussion

Focus group with community Ns

Health class and discussion

Cognitive behavioral activation

**Expressive reading and
discussion**

Support to supporters

Parent Child Play and Peer Discussion

Fukushima Association of Clinical Psychologists

Procedures

● **Staff: Pre-meeting**

● **Parent Child: Ice-break (5 minutes)**

● **Parent Child: Play (30 minutes)**

○ **Parent: Peer Discussion (60 minutes)**

○ **Child: Nursery**

● **Parent Child: Cool-down (5 minutes)**

● **Staff: Post-meeting**

By Kanae Narui

Play
Reactivation of Contacts
Peer Discussion
Peer Support, Self-affirmation, Activation

Ice-break



Mother Child Play: running together



Parent: Peer Discussion



Cool-down: Furoshiki Balloon

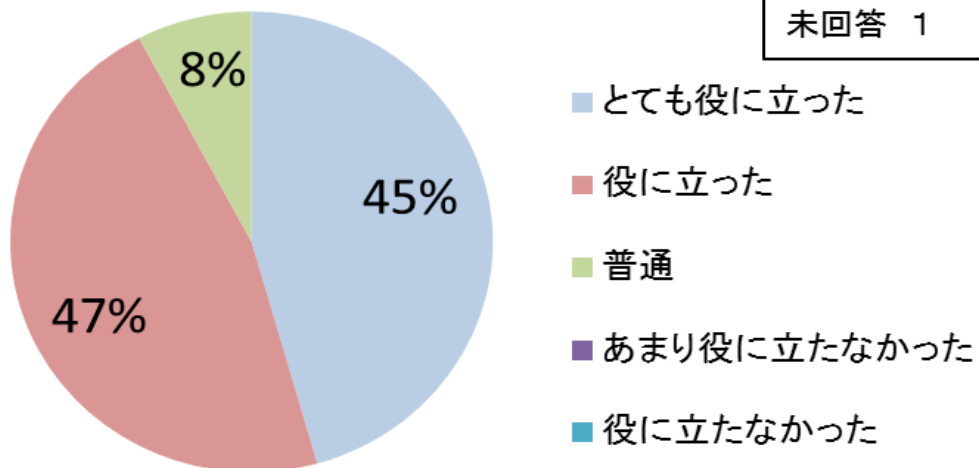


By
Kanae
Narui

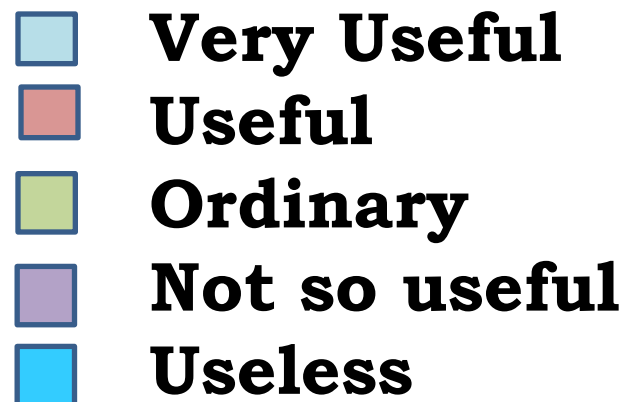
Session Record

- **Period:** June 2011 – May 2013
- **Sessions:** 301
- **Area:** 34 places
(in 25 city/town/village in Fukushima)
- **Parents:** 3,000
- **Child:** 3,100 (3 months – 6 years)
- **Staff:** 1,872
- **Discipline:** NT 673 CN 600 CP 599
Midwife, Dietician, Child rearing supporter,
other staff

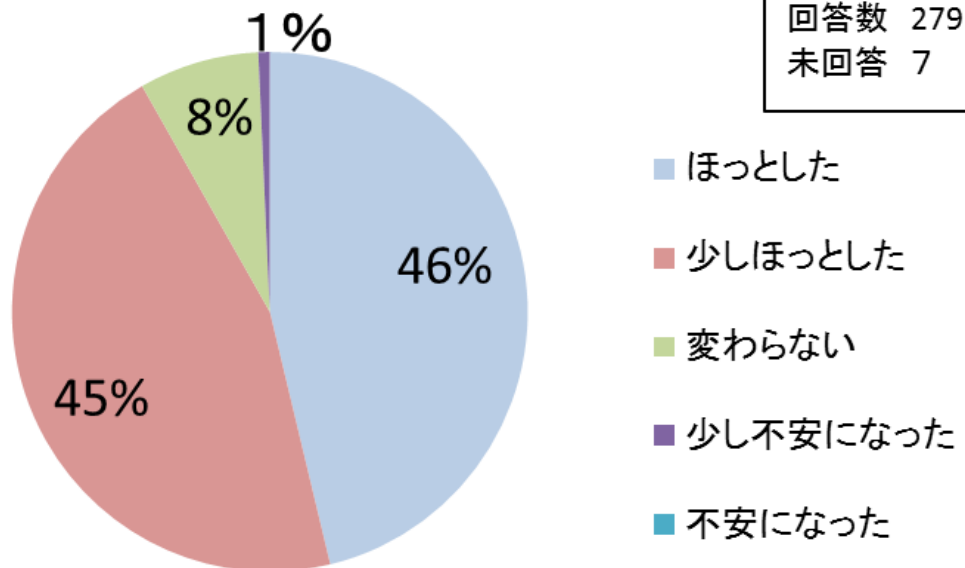
質問3. 活動内容はどの程度役に立ったか



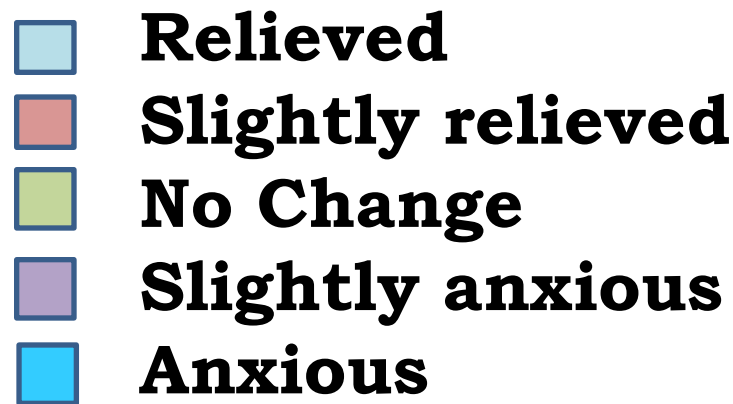
Q3: How useful was the session?



質問4. プログラムに参加する前後での気持ちの変化 気持ちがほっとしたかどうか



Q4: How feelings changed: pre - post



Survey with Parents (2012) #2

Free Answer

- **Effect to speak in group (including worry about radiation and food)**
- **Awareness of feeling and stress of parents themselves**
- **Awareness of change in child, through play**
- **Effect of play program**
- **Request for more and regular sessions**
- **Discussion had better be longer**
- **Request of individual session with CP**

Focus Group with Community Nurse

3 Cities 32 Community Nurses (CN)

2 hours

- **Immediate Difficulty after the Disaster**
- **Contradicting Radiation Information**
- **Exploration of Support to Residents**
- **Continuing Tasks**

Contradicting Radiation Information

- **Residents: Anxiety and Anger: Leave**
- **City employees can not leave
Duties Prioritized**
- **Targeted for Question and Complaint**
- **Uncertainty and Distrust**

Continuing Tasks

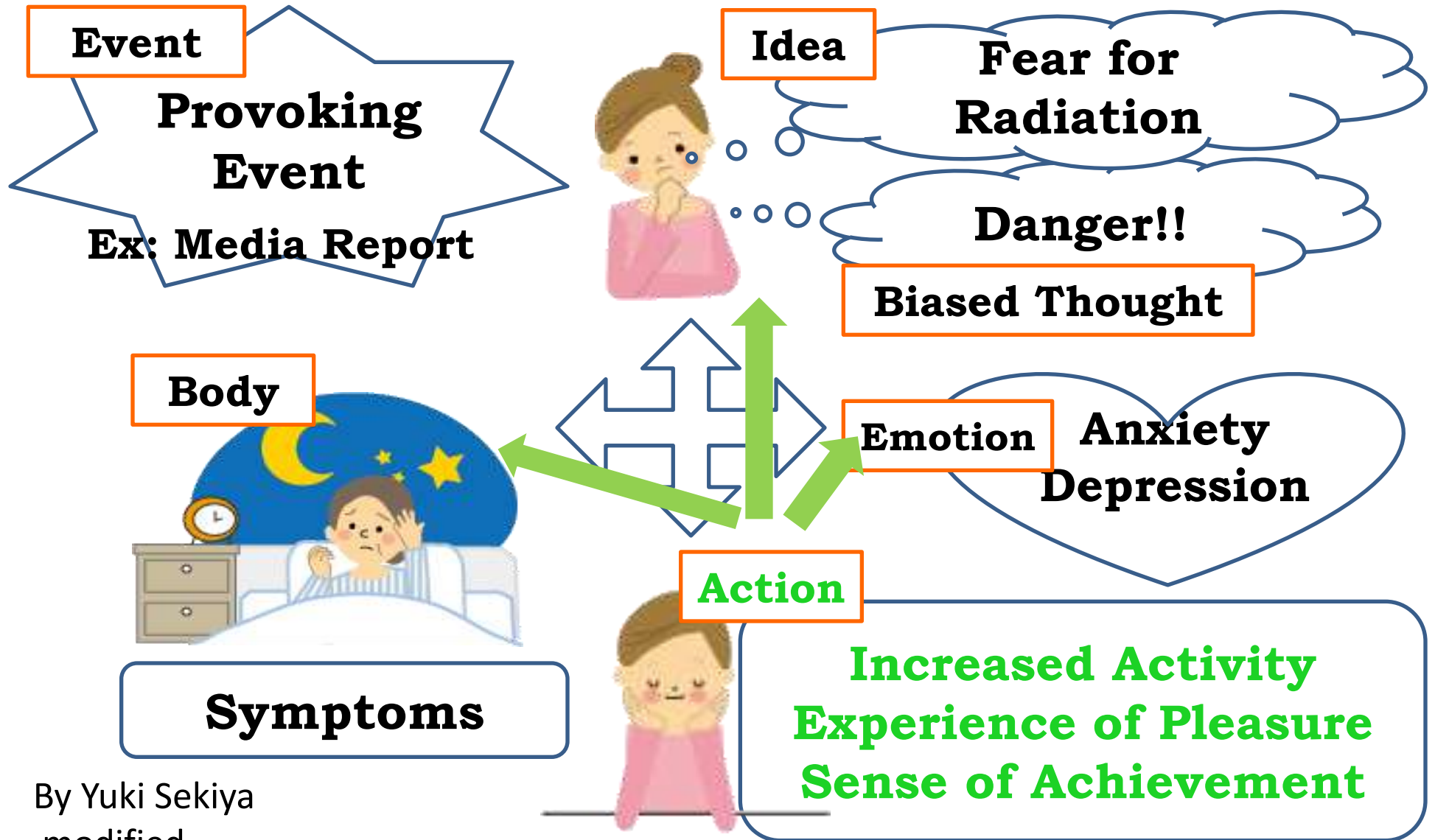
- **Conflict within Family**
- **Hurting Comments from Neighbor /
Relative to Mother**
- **Vulnerable Individuals**

Cognitive Behavior Activation

**Yuki Sekiya
Norito Kawakami**

**Department of Mental Health,
School of Public Health, the
University of Tokyo**

Cognitive Behavior Model



Intervention

- **The CBT program named “Iki-Iki (Liveliness) seminar for mothers**
 - **2 weekly sessions**
 - **90 minutes/ 1 session**
 - **Home work**
 - **Participatory program**
 - Group discussion**
 - **Behavior Activation**



By Yuki Sekiya

7 young mothers

Inactive pleasure feeling *

Subjective Mental Health

Subjective Physical Health

Satisfaction with Life

Anxiety about Child Rearing

Health Class + Discussion

**Regular Health Class followed by
Small Group Discussion**

Training for Community Nurse

**Pilot Program in Fukushima and
Iwaki City**

Training

30 September 2014, Fukushima

3 hours course

Lecture: Skill of Listening

Role-play: Good / Bad examples

Lecture: Skill of Questioning

Lecture: Skill of Consensus Building

Role-play of Session with Residents

Group Discussion

32 Community Nurses (Fukushima)

Understanding of procedures

Pre 1.91 Post 3.13 $P < 0.001$

Dealing with trouble situations

Pre 1.72 Post 3.09 $P < 0.001$

Making useful for participants

Pre 2.38 Post 3.47 $P < 0.001$

Willing to facilitate discussion

Pre 3.66 Post 3.84 NS

9 December, 2014 in Iwaki City

Expressive reading and discussion

OUTSIDE
THE WIRE

Columbia University

**An expressive reading
by professional actors
Group discussion**



Alcoholism, the Individual and the Community

The Tohoku Theater Project



Rum and Vodka

**Issues about alcoholism,
substance abuse, and
addiction**

- ◆ **This method has been widely practiced and its effect has been confirmed in the United States.**
- ◆ **First introduction in Japan**
- ◆ **Appropriate text is being chosen.**
- ◆ **Adaptability will be confirmed first with community nurses in Fukushima City on 27 November, 2014.**

Support to Supporters

Prolonged evacuation

Breakage of community

**Community nurses and
mental health care center**

Alcoholism

Suicide

Mid- to long- term support

Summary

Biased worry leads to distress and poor self-rated health.

Support to Mothers

Cognition – Activation

Cohesion Enhancement through Discussion

Support to Supporters

Council of Stakeholders

Hanamiyama (flower seeing) Park Fukushima city

We should restore peace in Fukushima.



**Thank you
for listening**

