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The 2nd International Symposium of the Radiation Medical Science Center  
for the Fukushima Health Management Survey

Build Back Better, Together.

Fukushima Health Management Survey updated,  
focusing on thyroid and mental health

# Report

Nanko Park (Shirakawa City)

**February 2(SUN) - 3(MON), 2020**

VENUE The Celecton Fukushima 3F "Adatara"

**Organizer**

Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

**Nominal Support**

Fukushima Prefecture, Hiroshima University, Nagasaki University, Fukushima University, The University of Aizu

- The content of this report is current as of the time of the symposium (February 2-3, 2020).
- † Terms with this symbol are explained on P. 74.

## On the Occasion of Publishing the Report of our International Symposium



KAMIYA Kenji, MD, PhD  
Executive Director, Radiation Medical Science Center  
for the Fukushima Health Management Survey  
Fukushima Medical University

We would like to extend sincere thanks for your understanding of and cooperation with the activities of the Radiation Medical Center for the Fukushima Health Management Survey, headquartered at Fukushima Medical University.

In response to radiation from radioactive materials released by the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant accident following the Great East Japan Earthquake, this center has been conducting the Fukushima Health Management Survey since June 2011, as commissioned by Fukushima Prefecture.

The objectives of this survey are to follow the physical and mental health of prefectural residents over a long term, and to maintain and improve their health into the future. This survey consists of a Basic Survey for estimating individual residents' external radiation doses during the period when air radiation dose rate was high, and a set of four Detailed Surveys (Thyroid Ultrasound Examination, Comprehensive Health Check, Mental Health and Lifestyle Survey, and Pregnancy and Birth Survey). We report findings to independent experts comprising the Prefectural Oversight Committee for the Fukushima Health Management Survey, and work together with Fukushima Prefecture while receiving their guidance and advice.

Each "International Symposium of the Radiation Medical Science Center for the Fukushima Health Management Survey" is organized by this center as a part of its activities, aiming to disseminate the latest information on the Fukushima Health Management Survey both domestically and internationally, to advance scientific findings of the survey through discussions with prominent researchers from all over the world and participating specialists, and to apply the results to help maintain and improve the health of Fukushima residents.

Following the first symposium last year, our second one convened February 2-3 (Sun.-Mon.), 2020 at the Celeceton Hotel in Fukushima, with "Build Back Better, Together" as our theme. At the opening of the symposium, Dr. TAKENOSHITA Seiichi, the President of Fukushima Medical University, welcomed everyone on FMU's behalf, and encouraging words from Fukushima Governor UCHIBORI Masao were delivered by Vice Governor IDE Takatoshi.

Approximately 300 people in total participated over the two days, and about 20 researchers and health/medical professionals from Japan and abroad presented and discussed thyroid and mental health topics. Forthright discussions addressed questions from the audience. Although the symposium ended well, our ultimate success will depend on reaching a broader audience.

Accordingly, we have compiled this report (in Japanese and English) as a record of the symposium, hoping to widely promulgate the latest results and interpretations of the Fukushima Health Management Survey.

We humbly request your ongoing support to make this survey more useful in maintaining and improving the health of Fukushima's people well into the future.

# Opening Remarks

This statement is current as of the time of the International Symposium (February 2, 2020).



TAKENOSHITA Seiichi, MD, PhD  
President of Fukushima Medical University

Thank you for the kind introduction. I am TAKENOSHITA Seiichi, President of Fukushima Medical University. Today, we are so happy to welcome you to Fukushima on such a beautiful day.

Let me say a few words to welcome everyone to this 2nd International Symposium of the Radiation Medical Science Center for the Fukushima Health Management Survey.

It is a great pleasure that we can hold this symposium again. On behalf of Fukushima Medical University, I would like to thank you all for coming from within Fukushima prefecture, from other places in Japan, and from countries far away.

It will not be long until the 10th anniversary of the Great East Japan Earthquake and the nuclear disaster that followed. During this time, evacuation orders have been lifted with measured progress, and good news about restoration of businesses and the introduction of new industries has been reported. However, many issues remain, such as the persistence of malicious rumors and health concerns among our residents. These stand in the way of a true and enduring recovery for Fukushima. To address these problems requires our fullest commitment.

Under such circumstances, through the Fukushima Health Management Survey that has been entrusted to us by Fukushima Prefecture, our university has been striving to accurately grasp changes in the health status of each citizen, to provide care tailored to individual needs, and to promote the overall health of Fukushima. It is our historical mission to continue watching over the health of our citizens.

In addition, we think it is our responsibility to promulgate meaningful, scientifically sound results of the Fukushima Health Management Survey widely within and outside Fukushima and to share our knowledge and experience with the world.

Mindful of this, the main theme of our international symposium was decided to be, "Build Back Better, Together." This symposium provides a valuable and important opportunity to share knowledge and lessons learned through the survey as a legacy for the wide world that we share.

This international symposium focuses on thyroid examinations and mental health, which are of great interest to many. Over the next two days, internationally recognized experts from each field will talk about advanced initiatives from around the world. Physicians and researchers based in Fukushima will concisely present the findings and lessons learned from the survey.

I hope that this symposium will give as many people as possible a deeper understanding of the Fukushima Health Management Survey, and I sincerely hope that it will be an opportunity to think about how to "Build Back Better, Together" in Fukushima.

## Invited Remarks

UCHIBORI Masao  
Governor of Fukushima Prefecture  
(delivered by Vice Governor IDE Takatoshi)

This statement is current as of the time of  
the International Symposium (February 2, 2020).



It is my pleasure that the Radiation Medical Science Center for the Fukushima Health Management Survey is holding its 2nd International Symposium.

Also, I appreciate everyone from Japan and abroad for coming to Fukushima. We extend a heartfelt welcome. Let me express my deepest respect for your research activities and thank you again for your special understanding and support for the reconstruction of Fukushima.

Following the accident at the Fukushima Daiichi Nuclear Power Plant, Fukushima Prefecture began carrying out a health survey of our citizens with the cooperation of Fukushima Medical University, with the aim of maintaining and promoting the health of Fukushima citizens into the future.

Nearly nine years have passed since the nuclear accident and we are approaching the tenth year. Although citizens' understanding of the health effects of radiation has improved, potential anxiety still remains, and I think it is very important that we continue dispatching accurate information.

Under such circumstances, it is truly significant that scientific knowledge is shared through presentations and discussions in this second symposium, which focuses on thyroid and mental health within the framework of the Fukushima Health Management Survey. We expect that this will lead to further progress toward the recovery of Fukushima.

The prefecture will continue to work closely with Fukushima Medical University to resolve the anxieties of Fukushima citizens and to ensure their safety and security. We appreciate your continued support.

Also, in July this year, the Tokyo Olympics, regarded as the revival Olympics, will finally begin. Fukushima will host Olympic baseball and softball games, an opportunity for us to express to many people in Japan and overseas our gratitude for their support, and showcase the robust recovery of Fukushima, along with its natural beauty.

I would like to conclude my remarks by wishing for the symposium's success and for every participant's further wellbeing.



## Summary of the 2nd International Symposium of the Radiation Medical Science Center

Fukushima Medical University  
Executive Director, Radiation Medical Science Center  
for the Fukushima Health Management Survey  
KAMIYA Kenji, MD, PhD

On this occasion, we have compiled a report of discussions and presentations of the symposium as a record to widely promulgate the Fukushima Health Management Survey results to people in Japan and abroad. We hope this report will be widely recognized to further promote understanding of the Fukushima Health Management Survey.

Let me take this opportunity to express sincere gratitude to those who supported the compilation of this report.

What follows is a summary of presentations and discussions at the symposium.

From the first day through the morning of the second day, sessions concerning thyroid examinations were held. In particular, with regard to the First Full-Scale Thyroid Survey (Second-Round Examination), the Prefectural Oversight Committee for the Fukushima Health Management Survey (hereinafter “Oversight Committee”)<sup>1</sup>, when it met last July, approved the report by the Thyroid Examination Evaluation Subcommittee<sup>2</sup>, which had concluded that “no causal relationship is identified between radiation exposure and incidence rate of thyroid cancer among Fukushima children at present.” This international symposium gave thyroid experts from Japan and overseas further opportunity to present and discuss matters pertinent to the survey’s analytic methods, evaluation of the data, etc.



Part 1 Current status of thyroid examination and thyroid treatment

An overview is as follows: It was pointed out that the methods of regional (geographic) correlation adopted in the analysis of Preliminary Baseline Survey (the First-Round Examination) results could not fully adjust for biases and confounding factors<sup>†</sup> arising from conducting examinations in different regions from one year to the next, making such analyses vulnerable to ecological fallacy<sup>†</sup>. For this reason, analysis of the First Full-Scale Thyroid Survey (Second-Round Examination) focused on the relationship between estimated thyroid radiation dose and thyroid

<sup>1</sup> Prefectural Oversight Committee for the Fukushima Health Management Survey: A committee set up by Fukushima Prefecture, comprising experts who provide advice and suggestions on the Fukushima Health Management Survey (FHMS) based on their specialized knowledge. The committee has the power to create subcommittees to discuss more specialized and technical topics.

<sup>2</sup> Thyroid Examination Evaluation Subcommittee: A subcommittee under the Oversight Committee, which was set up to discuss and evaluate the thyroid examination program in FHMS from the perspective of experts in pathology, clinical medicine, epidemiology, and so forth.

<sup>†</sup> Terms with this symbol are explained on P. 74.

cancer risk instead of previous analytic methods, and provisionally used the thyroid absorbed dose data from the 2013 UNSCEAR<sup>†</sup> Report. The analysis showed that after adjusting for confounders, there was no positive dose-effect relationship to correlate thyroid cancer with increasing absorbed dose. Therefore, the above conclusion was drawn. It was also pointed out that future evaluations would require more detailed methods for estimation of thyroid absorbed dose and related information accumulated over time.

Concerning the implementation of the thyroid examination, there are both advantages and disadvantages, including psychological aspects, and the Oversight Committee discussed how the modality of informed consent for thyroid examination should proceed. As a result, it was agreed that the “Information on Thyroid Examination” distributed to prospective examinees would describe in detail advantages and disadvantages of the thyroid examination. In this symposium, our center’s doctors and researchers explained the advantages and disadvantages described in this notification more carefully, and also introduced various efforts to mitigate such disadvantages, as with the help of support teams set up to provide psychological care for examinees and their families, and by diagnosis and treatment conducted in accordance with domestic treatment guidelines. There are also new issues, such as the increasing number of examinees entering adolescence nine years after the disaster, and the need for consideration of generational issues when conducting thyroid examinations.

“Cancer” and “malignancy” are ominous words, but most thyroid cancers have a good prognosis. Rarely, cases such as undifferentiated cancers can progress rapidly and be dangerous. We believe the Oversight Committee will continue deliberating about ways to conduct thyroid examinations, while here at the center, we think it is our role to explain the advantages and disadvantages of thyroid examinations as well as the characteristics of thyroid cancer under the guidance of the Oversight Committee and Fukushima Prefecture, and to conduct examinations for those who wish to receive them after acquiring their informed consent. We hope that this and future symposiums will provide opportunities to help people in Fukushima to understand our activities better.

At this symposium, renowned experts from Japan and overseas gave lectures on the characteristics, diagnosis, and treatment of thyroid cancer among young people, and many findings were shared here in Fukushima. Specifically, it was shown that thyroid cancer cases found in Fukushima have different characteristics from ones associated with the Chernobyl accident. Dr. Peter ANGELOS presented that thyroid cancer interventions and clinical scenarios differ among countries. Dr. MIYAUCHI Akira introduced practices built around active nonsurgical follow-up (active surveillance). These and other results of the symposium will inform our thyroid examination practices and information sharing with people in Japan and overseas.

In the afternoon of the second day, a session on the theme of mental health convened.

People in Fukushima suffered from an unprecedented disaster and are working hard to rebuild their lives in hometowns or wherever they now live. To respond to their concerns, our center has been offering telephone consultations and other specific support efforts through the Mental Health and Lifestyle Survey. In this symposium, we introduced these aspects of the survey.

The main results are: 1) The prevalence of affected adults needing support declined significantly over the first four years of the survey. However, the prevalence has remained unchanged over the last 3 years and is still higher than the national average. 2) The prevalence of affected adults

deemed to need support is higher among those who evacuated outside Fukushima than among those who remained in Fukushima. In this session, based on these results, discussions pertaining to mental health aspects of Fukushima's recovery were addressed from various perspectives.

Dr. Richard BRYANT of Australia, a leading expert in trauma care research, and Dr. Douglas WALKER, who has long experience as a clinical psychologist in the United States, gave lectures. They both emphasized that it would be important for experts and communities to strengthen ties with disaster victims, and to support the proactive efforts of disaster victims themselves, which we found very suggestive for our future activities. Also, researchers in Japan



Part 2 Mental health of Fukushima people and care for them: what should we do now?

presented various results pertaining to the current situation and issues of mental health care in the disaster-affected areas, as well as mental health support for those who have evacuated outside the prefecture.

We hope that this international symposium will be an opportunity to disseminate results of the Fukushima Health Management Survey together with related knowledge to people in Japan and overseas. We are delighted that we could have this event.

We received many supportive words of appreciation for this event, encouragement for our center, as well as various suggestions and opinions. Some examples are as follows:

- Friends living abroad see Fukushima as if it were another Chernobyl, and say that it is impossible to live in Fukushima anymore. I learned about the Basic Survey today for the first time. I want you to disseminate abroad the information gained through the survey. I hope you make the most of the symposium.
- Evacuation orders have been lifted from some municipalities. While there are still many people in evacuation, I feel that municipalities are now paying less attention to evacuees. I am worried that services for evacuees might cease in the near future. In this regard, this event was very informative. I would like to utilize the information.
- I would like you to consider a mechanism to convey the results of these activities to people such as voluntary evacuees living outside the prefecture.

Currently, we are approaching the final year of a 10-year "Reconstruction and Revitalization Period," and the efforts of recovery and reconstruction of communities in Fukushima will also enter a new stage.

As the center has engaged in health and medical care, we believe it is important to analyze and evaluate the survey results in scientifically sound ways and utilize the results to maintain and enhance the health of people in Fukushima. We must also promulgate the survey results widely to people in Japan and overseas and help them understand our real situation, while we support the recovery of Fukushima from the standpoint of people's health.

Reflecting on the results of this symposium vis-à-vis the Fukushima Health Management Survey, we will continue fulfilling our mission, which is to build the foundation of recovery and reconstruction of Fukushima by earnestly watching over and supporting the people in Fukushima.

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# Presenters' biographies

Biographies are current as of the time of the symposium

## Introduction

### **KAMIYA Kenji, MD, PhD**

Vice President, Fukushima Medical University; Executive Director, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University;  
Vice President, Hiroshima University; Director, Radiation Emergency Medicine Promotion Center, Hiroshima University

Dr. Kamiya Kenji is a vice president of both Hiroshima University (HU) and Fukushima Medical University (FMU). He graduated from Hiroshima University School of Medicine in 1977 and completed a PhD in pathology in 1986. He joined HU's Research Institute for Radiation Biology and Medicine to focus on radiation biology, radiation carcinogenesis, and radiation emergency medicine. He became a professor of the Institute in 1996 and served as its director for four terms (2001-2005 and 2009-2013). Since 2004, Dr. Kamiya has directed HU's Radiation Emergency Medicine Promotion Center. After the nuclear accident in Fukushima, he was appointed as a radiation health risk management advisor to Fukushima Prefecture, and thereafter a vice president of Fukushima Medical University. In 2016, he assumed the directorship of FMU's Radiation Medical Science Center for the Fukushima Health Management Survey. He also served as president of the Japan Radiation Research Society (2008-2011) and secretary general for the 15th International Congress of Radiation Research (ICRR 2015) in Kyoto. He has been a council member of Science Council of Japan and the chair of the Radiation Council of the Nuclear Regulation Authority since 2014. His award list includes: the Asian Association for Radiation Research Award (2009), commendation for his contribution to disaster prevention from the Japanese Minister of State for Disaster Management (2009) and from the Prime Minister (2012), recognition as a "Distinguished Professor" at Hiroshima University (2013), and a distinguished research award from Radiation Effects Association (2017).

### **MATSUZUKA Takashi, MD, PhD**

Associate Professor and Director, Office of Thyroid Ultrasound Examination Administration, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

Dr. Matsuzuka Takashi is an associate professor at Fukushima Medical University. He graduated from FMU's School of Medicine in 1993 and completed a PhD in 2002. He became an associate professor of otolaryngology in 2014, and in 2018 assumed directorship of the Office of Thyroid Ultrasound Examination Administration, Radiation Medical Science Center for the Fukushima Health Management Survey.

## Part I Session 1

### **1.1 SUZUKI Satoru, MD, PhD**

Professor and Director, Office of Thyroid Ultrasound Examination Promotion, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

Dr. Suzuki Satoru is a professor at Fukushima Medical University. He graduated from Shinshu University School of Medicine in 1989 and entered a postgraduate course at Shinshu University, completing a PhD in Endocrinology in 1995. During his postgraduate course, he was working as a research associate in the Thyroid Study Unit at the University of Chicago. He mainly had studied thyroid hormone action in basic research. He started his academic career in endocrinology as a faculty member in the Department of Endocrinology and Metabolism, Shinshu University School of Medicine and Shinshu University Medical Hospital in 1995 before becoming a professor at Fukushima Medical University in 2013. He was awarded a Shichijō prize for contributions to thyrology by the Japan Thyroid Association in 2007. In 2013, he accepted membership in the Radiation Medical Science Center for the Fukushima Health Management Survey at Fukushima Medical University. He has been a chief director in the Department of Thyroid and Endocrinology, Section of Internal Medicine at Fukushima Medical University Hospital since 2015. He became a vice-director for Long-Term Follow-Up Center for AYA<sup>†</sup> and Childhood Cancer in 2019.

### **1.2 SUZUKI Gen, MD, PhD**

Director and Professor, International University of Health and Welfare Clinic

Specialties: radiation pathology, radiation epidemiology

Employment: I graduated from the University of Tokyo, Faculty of Medicine in 1975. From 1985 to 1999, I worked at the National Institute of Radiological Sciences (NIRS), Chiba, and experienced the JCO criticality accident as a radio-pathologist on the team of physicians responsible for treating two heavily exposed subjects. From 2000 to 2005, I worked at the Radiation Effects Research Foundation (RERF), Hiroshima, as a Department Chief of Clinical Studies, and as a Chief Scientist in 2004. From 2005 to 2009, I worked at the National Institute of Public Health as a Department Chief of Environmental Health. Since 2009, I have been working at the IUHW Clinic as a physician.

Adjunct appointments: From 2000 to 2011, a member of Emergency Response Investigation Committee, Radiation Safety Commission. From 2012, a member of Emergency Response Committee, Nuclear Regulatory Commission  
Award: Commendation from the Japanese Minister of State for Disaster Management (2006)

**1.3 SETOU Noriko, PhD**

Associate Professor, Department of Disaster Psychiatry and Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

Certified psychologist specializing in care for loss and grief, support for children with intractable diseases and their families, and stresses of support workers. After graduating from the Faculty of Education and the College of Medical Science at Kobe University, I obtained a Master of Psychology in clinical psychology at the Graduate School of Kobe Shinwa Women's University and a Doctor of Health Science from Kobe University Graduate School of Health Sciences. I worked in hospital pediatrics and became a lecturer at the Faculty of Nursing and Rehabilitation at Konan Women's University in 2006 and an associate professor in 2009. In 2018, I joined the Department of Disaster Psychiatry, Fukushima Medical University (FMU), and in June of the same year, was co-appointed in the Office of Thyroid Ultrasound Examination (TUE) at FMU's Radiation Medical Science Center for the Fukushima Health Management Survey. Currently, I lead the "Thyroid Support Team" that provides psychosocial support to participants and their families in the secondary confirmatory examination in TUE.

**1.4 KITAOKA Masafumi, MD, PhD**

Director, Endocrine and Metabolism Center, IMS Miyoshi General Hospital

Having graduated from Hirosaki University School of Medicine in 1975 and completed the doctoral course in 1979, Dr. Kitaoka became a research associate of the Department of Internal Medicine at Hirosaki University Hospital in 1982, and then at the University of Tokyo Hospital in 1987. In 1989, he assumed the position of chief physician of the Department of Endocrine and Metabolism at Showa General Hospital and also taught at the University of Tokyo School of Medicine as a part-time lecturer from 1993 to 2015. Dr. Kitaoka was appointed as director of the Outpatient Department at Showa General Hospital in 1995, and an assistant to the director of the same hospital in 2009 (with a concurrent appointment as the head of the Inpatient Clinical Department and the head of Endocrine and Metabolism Department). Since 2015, he has been a member of the Expert Committee for Thyroid Examination (for the Fukushima Health Management Survey) and chairman of the Fukushima Prefecture Joint Support Committee for Thyroid Examination (concurrently, the chairman of the Project Review Committee, the chairman of the Certification Committee, and a member of Examination Questions Committee). Dr. Kitaoka was appointed as director of the Endocrine and Metabolism Center of IMS Miyoshi General Hospital in 2016. He was the president of the 87th Annual Scientific Meeting of the Japan Society of Ultrasonics in Medicine (May 2014), and received the 20th Special Society Award from the Japan Society of Ultrasonics in Medicine in 2018.

**Session 2****2.1 KATOH Ryohei, MD, PhD**

Director and Scientific Advisor, Surgical Pathology Department, Ito Hospital  
Professor Emeritus, University of Yamanashi

Dr. Katoh earned an MD from Iwate Medical University School of Medicine in 1978 and completed a PhD at the same university in 1983. He was appointed as a lecturer at the university in 1984. From 1988 to 1989, he was a visiting researcher in the Department of Pathology, Wales University, UK. Returning to Japan, in 1990 he became an assistant professor in the Second Laboratory of the Department of Pathology, Yamanashi Medical University School of Medicine. In 1996, he studied in the Department of Pathology, Addenbrook's Hospital, University of Cambridge, UK. In 2000, he became a professor of the Department of Medicine of Yamanashi Medical University (Second Laboratory, Department of Pathology). After Yamanashi University and Yamanashi Medical University combined to form the University of Yamanashi in 2003, he became a professor of its Faculty of Medicine (Department of Human Pathology), director of the Department of Pathology at the University of Yamanashi Hospital, and head of the Department of Diagnostic Pathology. Dr. Katoh retired from the University of Yamanashi in 2018 (Professor Emeritus) and assumed his current position at Ito Hospital. His research area is thyroid disease pathology, and he has authored many books and academic papers. He received the Japan Pathology Award (Japan Society of Pathology) in 2014, and the Takamatsu Award (Japan Society Histochemistry and Cytochemistry) in 2018. He has assumed many roles in academic societies, including a director of the Japanese Society of Pathology, President of the Japanese Division of the International Academy of Pathology, an executive director of the Japan Society of Histochemistry and Cytochemistry, President of the Japan Thyroid Pathology Society, and a director of the Japan Endocrine Pathology Society. He also served on the Thyroid Examination Evaluation Subcommittee of the Prefectural Oversight Committee for the Fukushima Health Management Survey.

**2.2 YOSHIDA Akira, MD, PhD**

Director, Department of Gynecologic and Breast Screening, Kanagawa Health Service Association  
Visiting Professor, Yokohama City University

After graduating from Yokohama City University School of Medicine in 1977, Dr. Yoshida worked as a doctor-in-training at Yokohama City University and Kawasaki Municipal Hospital from 1977 to 1979. From 1979 to 1985, he was engaged in general surgery, and breast and endocrine surgery, at the Department of Surgery of Yokohama City University and at Ito Hospital. Having earned a PhD in 1985, he worked as a lecturer in the Department of Breast and Endocrine Surgery at the University of Tsukuba from 1985 to 1989. Dr. Yoshida served as the chief physician in the Department of Breast and Thyroid Surgery, Kanagawa Cancer Center, from 1989 to 2000, and directed the Department of Mammary Endocrine Surgery, Kanagawa Cancer Center, from 2000 to 2015. He has also assumed positions such as councilor of the Japanese Society for Clinical Surgery, delegate of the Japan Endocrine Society, a director and president of the Japan Society of Thyroid Surgery, a director of the Japan Endocrine Surgery, chairman of the Expert Endocrine and Thyroid Surgeon Certification Board of the Japan Association of Endocrine Surgery and the Japanese Society of Thyroid Surgery, and chairman of the Thyroid Cancer Management Guidelines Development Committee. In April 2015, Dr. Yoshida was appointed to direct the Department of Gynecologic and Breast Screening, Kanagawa Health Service Association. He is also a visiting professor at Yokohama City University. He served as vice chairman of the Thyroid Examination Evaluation Subcommittee of the Prefectural Oversight Committee for the Fukushima Health Management Survey (2017-19) and as a member of the Oversight Committee (2019 to present).

### 2.3 SHIMURA Hiroki, MD, PhD

Professor and Chair of the Department of Laboratory Medicine and Director of the Department of Thyroid Ultrasound Examination, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

Dr. Shimura Hiroki is a professor of the Department of Laboratory Medicine and Director of the Department of Thyroid Ultrasound Examination, Radiation Medical Science Center for the Fukushima Health Management Survey. He graduated from Yamanashi Medical University, School of Medicine in 1986 and completed his PhD in endocrinology and metabolism in the Postgraduate School of Yamanashi Medical University in 1990. After joining Prof. Kohn's lab at NIH (USA) for three years, he worked in education, research and medical care of endocrine and metabolic disease at the Third Department of Internal Medicine in the University of Yamanashi. He served as a professor at the Department of Laboratory Medicine and has been involved in the Thyroid Ultrasound Examination program since 2013. From 2018, he is also serving as the director of Department of Thyroid Ultrasound Examination, Radiation Medical Science Center for the Fukushima Health Management Survey.

## Part I Keynote Lecture 1

### SUZUKI Shinichi, MD, PhD

Professor and Chair, Department of Thyroid and Endocrinology, Fukushima Medical University School of Medicine

Graduated from Fukushima Medical University School of Medicine in March 1983 and obtained PhD at Fukushima Medical University in 1990. He spent one year from March 2001 to April 2002 as visiting scientist at the Burnham Institute, CA, USA. He became Professor and Director, Division of Breast Endocrine and Thyroid Surgery, Department of Organ Regulatory Surgery, Fukushima Medical University School of Medicine in 2010. From March of 2013, he became Professor and Chairman, Department of Thyroid and Endocrinology and Director, Division of Thyroid and Endocrine Surgery. His specialties are endocrine surgery, molecular endocrinology, and ultrasonography of thyroid. He became the Medical Administrator of Disaster Medical Care Coordination, Fukushima Prefecture after the Fukushima disaster from March 2011. He became Director, Department of Thyroid Examination, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University from 2012 to 2015. He is also the President of Japan Association of Endocrine Surgeons (JAES) and the former President of Japan Association of Breast and Thyroid Sonology (JABTS) and councils of Japan Thyroid Association (ATA) and Asian Association of Endocrine Surgeons (AsAES).

## Session 3

### 3.1 OKAMOTO Takahiro, MD, MSc, PhD

Professor & Chair, Department of Breast, Endocrine and Pediatric Surgery, Tokyo Women's Medical University

Dr. Okamoto Takahiro is a professor of surgery at Tokyo Women's Medical University. He graduated from Tsukuba University School of Medicine in 1982 and completed a master's degree (MSc) in clinical epidemiology and biostatistics at McMaster University in 1996. He served as a professor in the Department of Endocrine Surgery in 2009-2015, and became a professor and chair of Department of Surgery II in 2015. The name of the department was changed to Breast, Endocrine and Pediatric Surgery in 2018. He served as a chairman of the Task Force of the Japan Associations of Endocrine Surgeons on the Guidelines for Thyroid Tumors since 2009.

### 3.2 MIYAUCHI Akira, MD, PhD

President and COO, Department of Surgery, Kuma Hospital

Dr. Miyauchi is President and COO of Kuma Hospital, Center for Excellence in Thyroid Care, Kobe, Japan. He is an endocrine surgeon, especially interested in thyroid and parathyroid diseases. He earned his MD and PhD at Osaka University Medical School in 1970 and 1978, respectively. He was Associate Professor, Department of Surgery, Kagawa Medical University until he was appointed to Vice President of Kuma Hospital in 1998. Since 2001, he is at his present position. About 2,000 operations, including about 1,300 thyroid cancer cases, are done every year at Kuma Hospital. He is a Visiting Professor of Surgery, Nippon Medical School, Tokyo, Japan and Belgrade University, Belgrade, Serbia. Since 2012, he has been serving as Chairman of the Asian Association of Endocrine Surgeons. In 2018, he became President of the International Association of Endocrine Surgeons.

Prizes: Shichijo Prize, Japan Thyroid Association in 1985.

Miyake Prize, Japan Thyroid Association in 2007.

Best Endocrine Surgeon of the Year Prize, Japan Endocrine Society in 2008.

Asia Oceania Thyroid Association Prize (Nagasaki-FUJI FILM Prize) in 2015.

Light of Life Honor at Memorial Sloan Kettering Cancer Center in 2017.

Publications: 597 papers in English and 524 papers in Japanese (as of June 15, 2019).

### 3.3 Peter ANGELOS, MD, PhD, FACS

Linda Kohler Anderson Professor of Surgery, Vice Chairman for Ethics, Professional Development, and Wellness, Chief of Endocrine Surgery, Department of Surgery, The University of Chicago

Dr. Angelos completed his undergraduate degree, medical school, and a PhD in Philosophy at Boston University. He completed a residency in General Surgery at Northwestern University and went on to complete fellowships in Clinical Medical Ethics at the University of Chicago and in Endocrine Surgery at the University of Michigan. Dr. Angelos is a busy endocrine surgeon who has written widely on improving outcomes of thyroid and parathyroid surgery, minimally invasive endocrine surgery, and ethical aspects in the care of surgical patients. Dr. Angelos has written over 200 peer-reviewed publications and has authored or co-authored 52 book chapters. He edited two editions of the book, *Ethical Issues in Cancer Patient Care*, and he is co-editor of the American College of Surgeons textbook, *Ethical Issues in Surgical Care*. Dr. Angelos is a Governor of the American College of Surgeons, past President of the American Association of Endocrine Surgeons, and a Councilor of the American Board of Surgery.

## Part II Keynote Lecture 2

### **Richard A. BRYANT, PhD**

Scientia Professor, School of Psychology, University of New South Wales

Richard A. Bryant is a Scientia Professor of Psychology at the University of New South Wales, Sydney. Professor Bryant has worked on posttraumatic stress disorder and other disaster-related conditions for over 20 years. His work has identified key genetic, neural, and psychological factors underpinning PTSD<sup>†</sup>, and he has developed many of the programs currently used to manage disaster-related conditions. He has consulted to governments after many disasters, including the 2004 tsunami, Hurricane Katrina, and the 9/11 terrorist attacks. His major assessment and treatment tools have been translated into over 15 languages and used in many countries. Professor Bryant has written 5 books, 75 book chapters, and 580 journal articles. He has served on major international committees to define PTSD, including ICD-11 and DSM-5. In recognition of his services to management of traumatic stress, he has received Australia's highest award: the Companion of the Order of Australia.

## Session 4

### **4.1 MAEDA Masaharu, MD, PhD**

Professor and Chair, Department of Disaster Psychiatry, School of Medicine, Fukushima Medical University; Director of the Department of Health Survey Personal Support and Director of the Office of Mental Health and Lifestyle Survey and Care, Radiation Medical Science Center for the Fukushima Health Management Survey

Professor Maeda is Professor and Chair of the Department of Disaster Psychiatry, School of Medicine, Fukushima Medical University in Fukushima, Japan.

Professor Maeda received his medical degree at Kurume University School of Medicine, Fukuoka, Japan, and completed his residency training in psychiatry at Kurume University Hospital. He later returned to his alma mater in 1996 as Associate Professor, before assuming his current roles.

Professor Maeda served as the President of Japanese Society of Traumatic Stress Studies from 2009 to 2013. He has been actively involved in providing psychiatric examinations and organizing psychiatric intervention teams for survivors of several major disasters that have occurred in Japan, particularly transportation disasters.

Professor Maeda's current clinical and research interests lie in the widespread psychosocial effects resulting from the Fukushima nuclear accident. As Vice Director of the Fukushima Center for Disaster Mental Health, he also leads the Mental Health and Life Style Survey to facilitate adequate care of residents who are at risk of developing mental health problems following the complicated nuclear accident.

### **4.2 Douglas W. WALKER, PhD**

Chief Programs Director, Mercy Family Center

Doug Walker is the Chief Programs Director at Mercy Family Center in New Orleans. He has practiced as a Clinical Psychologist for the past twenty-two years, and is celebrating his 21st year with Mercy this year. He received his doctorate from the University of North Texas where he participated in the emerging field of psychoneuroimmunology, studying the impact of stress upon the human immune system.

In response to Hurricane Katrina, Dr. Walker created Project Fleur-de-lis, New Orleans's largest school-based mental health program devoted to students struggling emotionally and academically in the years following the storm and destruction. Since having created Project Fleur-de-lis, his expertise in responding to the mental health needs of large-scale natural and man-made disasters has been utilized to create culture-specific, trauma-informed mental health programming across the United States and abroad.

Dr. Walker has served as technical advisor to the US State Department's Office of Overseas Schools in Central America and Africa. He currently serves as a consultant to the Council of International Schools and the International Centre for Missing and Exploited Children. Dr. Walker completed a Fulbright Specialist Scholarship in Fukushima City, Japan, where he was hosted by Fukushima University. While in Fukushima he conducted lectures in disaster mental health, and collaborative research into peer-to-peer support post 2011 Tōhoku earthquake, tsunami and level 7 meltdown at the Fukushima Daiichi Nuclear Power Plant. He is very excited to return to Fukushima and once again work alongside his Japanese friends and colleagues.

### **4.3 UCHIYAMA Tokio, MD, PhD**

Professor, Department of Clinical Psychology, Faculty of Psychology and Sociology, Taisho University  
Director, Yokohama Psycho-Developmental Clinic  
Specially Appointed Professor, Aizu Medical Center, Fukushima Medical University  
Specially Appointed Professor, Child Mental Health Care Center, Fukushima University

After graduating from Juntendo University's School of Medicine in March 1983, Dr. Uchiyama pursued specialty training in Juntendo's Department of Psychiatry. From 1987, he worked at the Juntendo Koshigaya Psychiatric Institute Hospital and the Metropolitan Umegaoka Hospital's Psychiatry Department. In 1994, he was invited to study at the Department of Psychiatry in the University of North Carolina's School of Medicine. After retiring from the Metropolitan Umegaoka Hospital, he worked at the Nakamachidai Clinic for Developmental Disorders, and then studied at the Centre for Social Communication Disorders (currently Lorna Wing Centre) attached to UK's National Autistic Society to learn about DISCO (Diagnostic Interview for Social and Communication Disorders) and diagnostic considerations related to Asperger's syndrome. After returning to Japan, Dr. Uchiyama worked at Otsuma Women's University and established the Yokohama Psycho-Developmental Clinic in 2000 to provide medical care for patients with developmental disorders, to promote awareness of such disorders, and to train professionals. After resigning from Otsuma Women's University in 2009, he accepted a professorship in the Faculty of Human Development and Culture at Fukushima University, serving there until 2016. In 2010, he was a plenary lecturer at the Third World Autism Congress in Mexico. Immediately after the Great East Japan Earthquake, he continued support and research activities for children with developmental disabilities, and became a Specially Appointed Professor at Fukushima Medical University's Aizu Medical Center, with co-appointments as Professor at the Child Mental Health Care Center of Fukushima University, and advisor to the Fukushima Center for Disaster Mental Health. Since 2016, Dr. Uchiyama has been a professor in the Department of Clinical Psychology, Faculty of Psychology and Sociology, Taisho University, and an Honorary Research Fellow (Non-Clinical) at the Center for Applied Autism Research (CAAR), Department of Psychology, Bath University.

### **4.4 WATABE Ikuko**

Manager, Operations Department, Fukushima Center for Disaster Mental Health, Fukushima Association for Mental Health and Welfare

After graduating from Saitama Prefectural Health Junior College in 1976, Ms. Watabe became a public health nurse in the former Ogoe Town, Fukushima Prefecture. After five municipalities including Ogoe Town merged to become Tamura City in March 2005, she served as a public health nurse of Tamura City (2005-2013). She joined the Kenchu-Kennan Regional Center of the Fukushima Center for Disaster Mental Health in April 2013 as chief of its Operations Section. In April 2015, she became manager of the Operations Promotion Department at the Core Center of the Fukushima Center for Disaster Mental Health and was additionally appointed as manager of the Core Center's Planning Department in June 2015. She assumed the position of manager for the Operations Department (2017-present).

### **4.5 NAKAJIMA Satomi, MD, PhD**

Professor, Faculty of Human Sciences, Graduate School of Human and Social Sciences, Musashino University  
Director, Musashino University Cognitive Behavioral Therapy and Research Institute

Dr. Nakajima Satomi has been a professor at the Faculty of Human Sciences at Musashino University since 2018 and became a director of the Cognitive Behavioral Therapy and Research Institute in 2019. She graduated from the School of Medicine at the University of Tsukuba in 1989 and completed a PhD in medicine in 1993. Dr. Nakajima served as the director of the Kitanomaru Clinic from 1993 to 1996. She worked as an assistant professor of Tokiwa University from 1996 to 2001 and an associate professor from 2001 to 2003. Dr. Nakajima served as a section chief in the Department of Adult Mental Health, National Institute of Mental Health, National Center of Neurology and Psychiatry from 2003 to 2016. During this period, she researched crime victims' mental health and cognitive behavioral therapy for complicated grief. She served as a program associate professor of the Radiation Medical Science Center for the Fukushima Health Management Survey at Fukushima Medical University from 2016 to 2018. Dr. Nakajima is currently serving as a member of one of the Center's Expert Committees. She is on the board of the Japanese Society of Traumatic Stress Studies and the Japanese Association of Victimology. Dr. Nakajima has been a member of the Science Council of Japan since 2012 and is also a member of the Council for the Promotion of Policies for Crime Victims in the Cabinet Office.

## Introduction

# Overview of the Fukushima Health Management Survey (FHMS)

Chair: OHTO Hitoshi, MD, PhD

General Vice President, Fukushima Medical University

General Vice Director, Radiation Medical Science Center for the Fukushima Health Management Survey



Professor Emeritus Ohto is General Vice President of Fukushima Medical University(FMU). He graduated from FMU (MD) in 1977 and finished a PhD thesis of medicine in 1984 at the University of Tokyo. His research focuses chiefly on fetomaternal micro-transfusion and its consequences to mother and child, including transmission of pathogens and alloimmune responses. He has studied mother-to-infant transmission of hepatitis viruses, and infantile and maternal microchimerism during and after pregnancy.

He has contributed to worldwide transfusion safety initiatives, especially the prevention of transfusion-associated graft-versus-host disease, which is uniformly fatal, by introducing universal irradiation of cellular transfusion components at FMU in 1989, first in the world. He guest edited a collection of articles with the theme “Disasters and Transfusion” in an international journal. He has published more than 200 peer-reviewed scientific papers in international top journals. He is currently serving in the Fukushima Health Management Survey as General Vice Director.

### **Current status of the Fukushima Health Management Survey**

KAMIYA Kenji (Fukushima Medical University)

### **Additional Remarks: Advantages and disadvantages of thyroid ultrasound examination in the Fukushima Health Management Survey**

MATSUZUKA Takashi (Fukushima Medical University)

Notes on the contents of this report

- The latest data from the Fukushima Health Management Survey are available on the website of the Radiation Medical Science Center for the Fukushima Health Management Survey.  
<http://kenko-kanri.jp/en/>
- Slide images contained in this report may have been slightly modified from the original versions in consideration of readability.
- † Terms with this symbol are explained on PP. 74-75.

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## Current status of the Fukushima Health Management Survey

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### **KAMIYA Kenji, MD, PhD**

Vice President, Fukushima Medical University;  
Executive Director, Radiation Medical Science  
Center for the Fukushima Health Management  
Survey, Fukushima Medical University;  
Vice President, Hiroshima University;  
Director, Radiation Emergency Medicine  
Promotion Center, Hiroshima University

In response to the Fukushima nuclear accident, Fukushima Prefecture commissioned the Fukushima Health Management Survey to Fukushima Medical University, with aims to understand the exposure doses and health conditions of residents, and to prevent, promptly detect, and treat diseases in order to maintain and improve their long-term health.

This survey is two-fold, with a Basic Survey aiming to estimate individual radiation doses of residents during their first four months after the accident, and a set of four Detailed Surveys to assess specific health conditions: 1) Thyroid Ultrasound Examination, 2) Comprehensive Health Check, 3) Mental Health and Lifestyle Survey, and 4) Pregnancy and Birth Survey (Slide 1).

Survey results since last year's symposium can facilitate a better understanding of the current situation in Fukushima.

The Basic Survey has grown to cover 466,000 residents, showing results similar to the previous ones, with external doses of less than 5 mSv for 99.8% of residents and less than 2 mSv for 93.8% (Slide 2).

The second round of full-scale thyroid examinations has finished and the third round is now in its final stage. Results of three rounds (a preliminary baseline screening and two full-scale examination rounds) have been finalized, and the number of children diagnosed with or suspected as having thyroid cancer in each round was 116, 71, and 29, respectively (Slide 3).

The Prefectural Oversight Committee for the

Fukushima Health Management Survey accepted the conclusion about the first full-scale thyroid examination (second round) made by the Thyroid Examination Evaluation Subcommittee, that no causal relationship could be established between radiation exposure and prevalence of thyroid cancer among Fukushima children (for details, please refer to the article P.24 by Dr. Suzuki Gen). The Oversight Committee has also recognized and discussed risk/benefit issues related to thyroid examinations and other ethical issues, and a draft revision is now being finalized to include a more detailed explanation ("Information on Thyroid Examination") of potential benefits and risks associated with the examination program in notifications that will be sent to all residents eligible for the examination. These contents were reported as additional remarks to my presentation.

The Comprehensive Health Check has identified more evacuees with obesity, hypertension, diabetes, dyslipidemia (low HDL cholesterol), chronic kidney disease, liver dysfunction, and polycythemia (Slide 4). As obesity, hypertension, diabetes and dyslipidemia are also risk factors for cardiovascular diseases, health management with these factors taken into consideration is important.

The Mental Health and Lifestyle Survey shows that the possibility of mood disorders, including depression, and anxiety disorders in people of age 16 or over, and the percentage of children in need of support for problematic behavior, were high just after the accident, but have decreased over time (Slide 5). However, these data for FY2017 were higher compared with those of the general population in Japan. With regard to lifestyle, sleep satisfaction and exercise frequency have increased over time, and the percentage of smokers and that of problem drinkers have decreased over time for both genders. The Pregnancy and Birth Survey reveals that the preterm birth rate, low birth weight birth rate, and the rate of congenital malformations and birth defects have not been different from nationwide vital statistics since 2011 (Slide 6).

In the Fukushima Health Management Survey, activities are also being implemented to utilize the obtained results to maintain and improve the health of prefectural residents. It is necessary to carry out this Survey for a long period of time to clarify the health effects of the nuclear accident and to link the results to appropriate health and medical care.

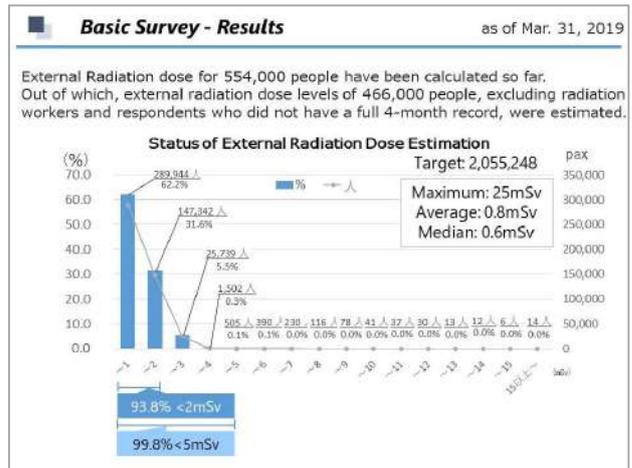
Slide 1

### Outline of Fukushima Health Management Survey

■ Type of survey (Basic survey to estimate individual external exposure dose for four months after the accident and detailed survey to understand individual health condition)

Type	Participants	Number	Method of survey / response
Basic survey	Residents / visitors of Fukushima Prefecture during the disaster	Approx. 2.05 million	Fill in survey form → post
Detailed survey	Preliminary baseline : All residents of age 16 or less at the time of the disaster	Approx. 368,000	Consult at school / medical institution / public facility
	Full-scale : In addition to those mentioned above, people who were born from April 2, 2011 to April 1, 2012	Approx. 381,000	
Thyroid examination	Residents of 13 municipalities in evacuation zones (Implemented as prefectural project except for above)	Approx. 210,000	Consult at medical institution / municipal health examination venue etc.
Comprehensive health check	Residents of 13 municipalities in evacuation zones	Approx. 210,000	Fill in survey form → post or Web response
Mental health lifestyle survey	Those who received a Maternal and Child Handbook in Fukushima, Those who delivered in Fukushima	14,500 - 16,000 / each year	Fill in survey form → post or Web response
Pregnancy and birth survey			

Slide 2



Slide 3

### Thyroid Examination - Results

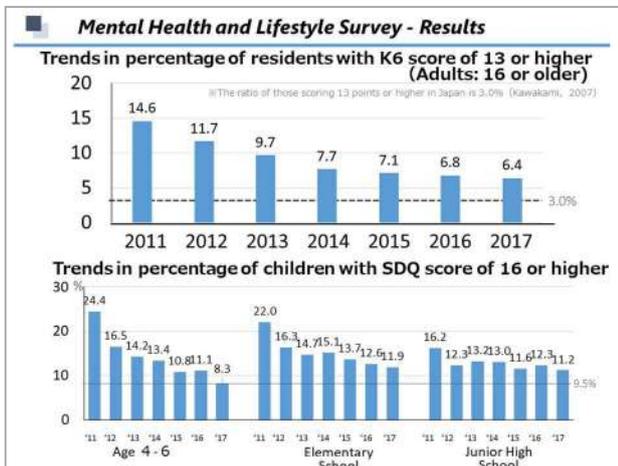
As of Jun. 30, 2019

	Preliminary Baseline (1 <sup>st</sup> Exam)	Full-scale Screening (2 <sup>nd</sup> Exam)	Full-scale Screening (3 <sup>rd</sup> Exam)	Full-scale Screening (4 <sup>th</sup> Exam)
Fiscal Year	2011-2013	2014-2015	2016-2017	2018-2019
NO. of target population	367,637	381,244	336,669	294,158
Participation rate of primary exam	81.7%	71.0%	64.7%	40.1%
Target population of confirmatory exam	2,293	2,227	1,499	655
Participation rate of confirmatory exam	92.9%	84.1%	72.7%	59.8%
Malignant or suspicious for malignancy (FNAC)	116	71	29	13
No. of people received surgery	102	52	19	1
Pathological Diagnosis	Papillary Cancer	100	51	19
	Low-differentiated cancer	1		
	Others	1	1	

Slide 4

- ### Comprehensive Health Check - Results
- Diseases that are considered as being attributable to evacuation due to the Great East Japan Earthquake
- Obesity
  - Hypertension
  - Diabetes
  - Dyslipidemia (HDL-C)
  - Chronic Kidney Diseases
  - Liver Functional Impairment
  - Polycythemia
- Diseases that increased after the earthquake
- Atrial Fibrillation
- Diseases that increased after the earthquake but reduced after 2013
- Hepatobiliary enzyme abnormality (liver functional impairment): Daily exercise and breakfast are the key factors.

Slide 5



Slide 6

### Pregnancy and Birth Survey - Results

(%)

	Rate of preterm deliveries		Rate of low birth weight infants		Rate of congenital anomalies	
	Fukushima	National*	Fukushima	National*	Fukushima	General standard
FY 2011	4.8	5.7	8.9	9.6	2.85	3~5**
FY 2012	5.7	5.7	9.6	9.6	2.39	
FY 2013	5.4	5.8	9.9	9.6	2.35	
FY 2014	5.4	5.7	10.1	9.5	2.30	
FY 2015	5.8	5.6	9.8	9.5	2.24	
FY 2016	5.4	5.6	9.5	9.4	2.55	
FY 2017	5.4	5.7	9.4	9.4	2.38	

\* Vital Statistics (Ministry of Health, Labor and Welfare)  
\*\* Clinical Practice Guidelines for Obstetrics 2014

## Advantages and disadvantages of thyroid ultrasound examination in the Fukushima Health Management Survey



### **MATSUZUKA Takashi, MD, PhD**

Associate Professor and Director, Office of Thyroid Ultrasound Examination Administration, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

The Fukushima Prefectural Oversight Committee for the Fukushima Health Management Survey, and its Thyroid Examination Evaluation Subcommittee, deliberated the nature and contents of informed consent for the thyroid examination. After vigorous discussions, the Oversight Committee summarized the objectives and advantages and disadvantages of the thyroid examination as shown on the next page. Even though until now explanations including the disadvantages as well as the objectives of the examination and the status of efforts that have been given, and the examination has been conducted after obtaining informed consent, it was agreed that more detailed and careful explanations of the advantages and disadvantage should be offered. The objectives of the examination are as follows:

“Fukushima Prefecture and Fukushima Medical University are conducting thyroid examinations within ‘the Fukushima Health Management Survey’ with the aim of observing children’s health over the long term following TEPCO’s Fukushima Daiichi Nuclear Power Plant accident (hereinafter referred to as the nuclear accident). This examination was commenced in order to ease the growing anxieties among prefectural residents concerning the possible increase in childhood thyroid cancer due to radioactive iodine, etc., discharged after the nuclear accident.

“In this examination, ultrasonic diagnostic equipment is used to check the thyroid status of each examinee, but the impact of the radiation exposure

on individuals cannot be clarified.”

(Excerpted from the 36<sup>th</sup> meeting of the Prefectural Oversight Committee for the Fukushima Health Management Survey held on Oct. 7, 2019.)

The advantages and disadvantages of the examination are shown in Table 1. The following measures are taken to address these disadvantages. In response to the possibility of detecting even harmless thyroid cancer that otherwise would not show any symptom or affect quality and duration of life, measures are taken to minimize the diagnosis of lesions that do not require treatment, such as excluding nodules<sup>†</sup> less than or equal to 5.0 mm from requiring the confirmatory examination or, when nodules greater or equal to 5.1 mm are found, judging the necessity of cytology based on the ultrasound images according the guidelines of an academic society (Slide 1).

In response to psychological burdens, mental care support teams are in place at Fukushima Medical University and other institutions to respond to anxieties. Telephone counseling and explanatory meetings are performed to answer medical questions related to thyroid examination results or the disease, and mental problems.

In response to social and economic disadvantages, Fukushima Prefecture supports the medical expenses necessary for medical treatment after thyroid examination, through the Prefectural Health Survey Thyroid Examination Support Project.

The notification “Information on Thyroid Examination” was revised with these issues taken into account and a special focus on the advantages and the disadvantages of the examination (Slide 2). Results of the examination so far are also included. In addition, with the participation of schoolteachers, students, and children, easy-to-understand leaflets are also created for elementary school pupils and junior high school students (Slides 3, 4).

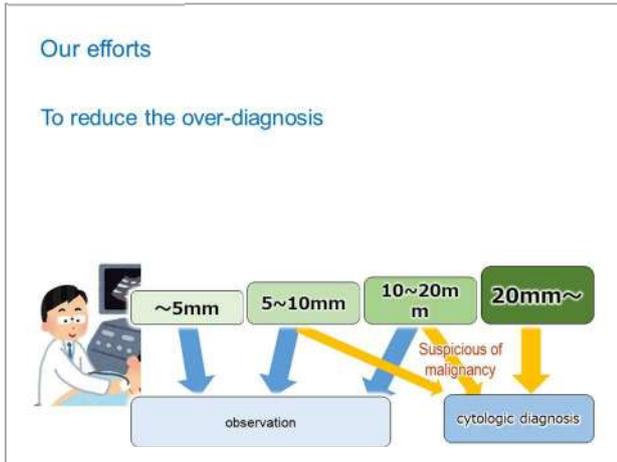
The revision of this “Information on Thyroid Examination” was deliberated by the Thyroid Examination Evaluation Subcommittee and the Oversight Committee for the Fukushima Health Management Survey and approved by the Ethics Committee of Fukushima Medical University, which is guided by local policy, national law, and the World Medical Association Declaration of Helsinki. From fiscal 2020, the examination will be conducted for those who give informed consent based on the new notification.

Table 1

<p>[Advantages]</p> <ol style="list-style-type: none"> <li>1) If the examination shows no abnormalities in the thyroid gland, it will help the examinee and his/her family, who may be concerned about the health effects of radiation, feel relieved and improve their quality of life.</li> <li>2) Early diagnosis and early treatment may reduce the risk of surgical complications, side effects associated with treatment, and the risk of recurrence.</li> <li>3) Analysis of thyroid examination results can inform not only the examinee and his/her family but also people living in and outside the prefecture about the presence or absence of radiation effects.</li> </ol> <p>[Disadvantages]</p> <ol style="list-style-type: none"> <li>1) Diagnosis may lead to treatment of cancers that otherwise would not show any symptom or affect quality and duration of life.</li> <li>2) If a cancer or a suspected cancer is diagnosed early, the treatment and follow-up period can be prolonged and may increase psychological burdens or cause social and economic disadvantages.</li> <li>3) Nodules (lumps) or cysts<sup>†</sup> which do not require treatment may be found, and secondary examination or cytology may be recommended even in case of benign nodules. This may impose physical burdens and anxieties to the examinee and his/her family.</li> </ol>
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(Excerpted from the 36<sup>th</sup> meeting of the Prefectural Oversight Committee for the Fukushima Health Management Survey held on Oct. 7, 2019.)

Slide 1



Slide 2

### Revision of Explanation

- The purpose
- Advantages and disadvantages
- Consent of examinee/patient and guardian

Slide 3

### Leaflets

Slide 4

### Leaflets for elementary and junior high school students



**Part I**  
**Current status of thyroid examination  
and thyroid treatment**

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**Session 1**  
**Current status and evaluation of  
thyroid ultrasound examination**

Chair: MIYAUCHI Akira (Kuma Hospital)  
KATO H Ryohei (Ito Hospital)

**1.1 Evaluation of the results from the Full-Scale Survey (FSS) (Second Examination) of TUE**  
SUZUKI Satoru (Fukushima Medical University)

**1.2 First Full-scale Survey (1st FSS) of Thyroid Ultrasound Examination (second round survey)**  
SUZUKI Gen (International University of Health and Welfare Clinic)

**1.3 Psychological support for participants and their families in the secondary confirmatory examination in TUE**  
SETOU Noriko (Fukushima Medical University)

**1.4 Training and education for thyroid examiners in Fukushima**  
KITAOKA Masafumi (IMS Miyoshi General Hospital)

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## 1.1 Evaluation of the results from the Full-Scale Survey (FSS) (Second Examination) of TUE

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### **SUZUKI Satoru, MD, PhD**

Professor and Director, Office of Thyroid  
Ultrasound Examination Promotion, Radiation  
Medical Science Center for the Fukushima  
Health Management Survey, Fukushima  
Medical University

The first round of thyroid ultrasound examinations, namely the Preliminary Baseline Survey (PBLs), was conducted over 3 years from October 9, 2011 within the Fukushima Health Management Survey. A Full-Scale Thyroid Screening Program (2nd examination) was implemented following the PBLs to assess the condition of examinees' thyroid glands. Full-Scale Screening started April 2, 2014 and proceeded for two years.

Of 381,244 people aged 18 years or younger, including babies in utero as of April 1, 2011, in Fukushima Prefecture at the time of the accident, 270,540 (71.0%) underwent thyroid ultrasound examination (Slides 1, 2). Among the screened subjects, 2,219 had nodules<sup>†</sup> of 5.1 mm or larger, 6 had cysts<sup>†</sup> of 20.1 mm or larger, and 2,225 in total were recommended for confirmatory examinations. Of these, 1,874 subjects received confirmatory examinations and 1,826 underwent a detailed ultrasound examination. Among them, 1,398 were found to have nodules of 5.1 mm or larger or cysts of 20.1 mm or larger. Of these, 207 received fine needle aspiration cytology (FNAC)<sup>†</sup> and 71 were diagnosed with malignancy or suspected malignancy (32 males and 39 females).

108,718 who did not have to receive confirmatory examinations (40.2% of the screened subjects) were diagnosed as A1, or having no nodules or cysts. The remaining 159,584 (59% of the screened subjects) were diagnosed as A2, or having nodules of 5.0 mm or smaller or cysts of 20.0 mm or smaller.

Of those who underwent the confirmatory examinations, 418 received detailed ultrasound examinations, but nodules of 5.1 mm or larger or cysts of 20.1 mm or larger were not confirmed. They were regarded as having concluded the 2nd examination as in the case of A1 and A2 in PBLs. Along with 136 FNAC recipients who were not diagnosed as malignant or suspicious for malignancy, there were 1,191 who did not fulfill the criteria for receiving FNAC. These 1,327 were regarded as having completed the 2nd examination or proceeded to regular insured medical care (Slides 1, 2).

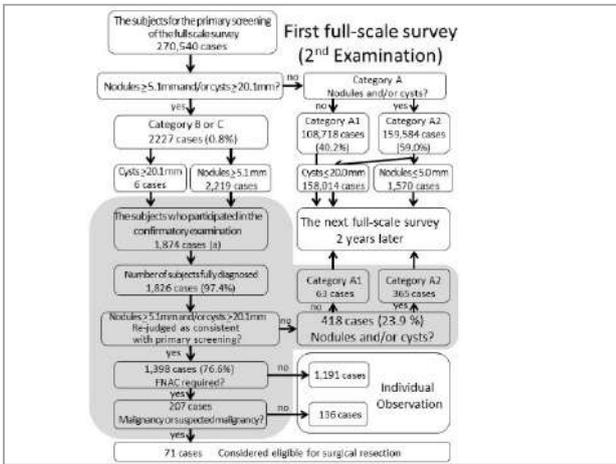
No significant differences were found in the proportions of A1, A2 and B in the PBLs and that in the 2nd examination. The average age of diagnosis of malignancy or suspected malignancy is 16.9 years old at the time of diagnosis, or 12.6 at the time of disaster. The average tumor size is 11.1 mm (Slide 3).

The age-gender distribution shows an age-dependent increase in cancer incidence after age 5, and no significant change from the PBLs even after adjusting frequency of occurrence for each age (Slide 4, 5).

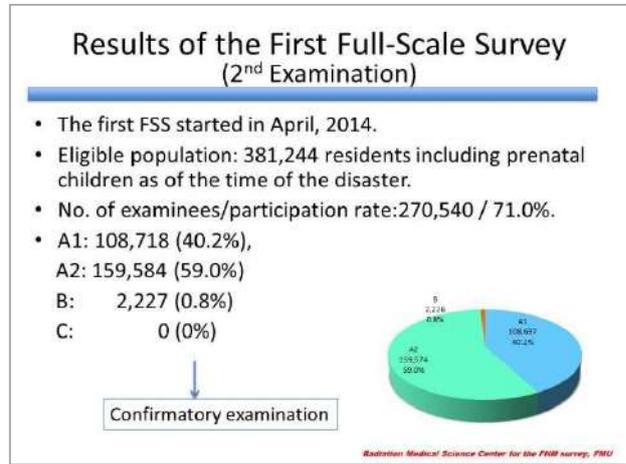
Of 71 subjects who were diagnosed as malignant or suspicious for malignancy, 36 agreed to submit records of their behavior following the earthquake, from which the highest maximum exposure was estimated to be 2.1 mSv (Slide 6).

Although the possibility of the radiation-induced thyroid cancer is thought to be low, the surveys should be continued and their results should be analyzed carefully and then be examined comprehensively along with the results of past surveys. We are proceeding in the context of providing sufficient explanation on the advantages and disadvantages of receiving thyroid ultrasound examination.

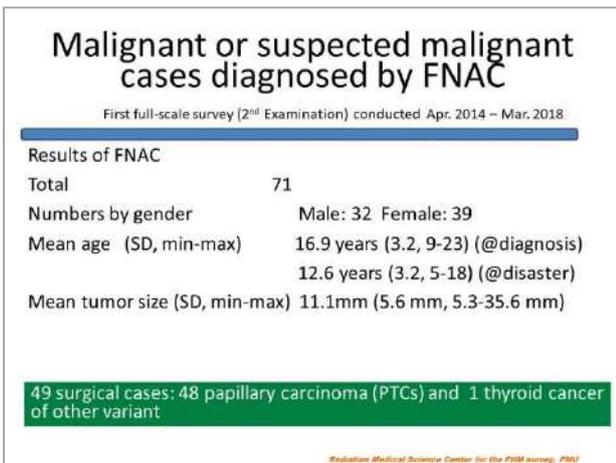
Slide 1



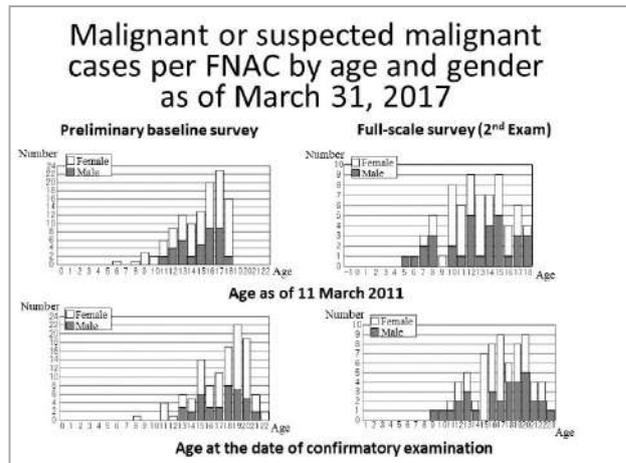
Slide 2



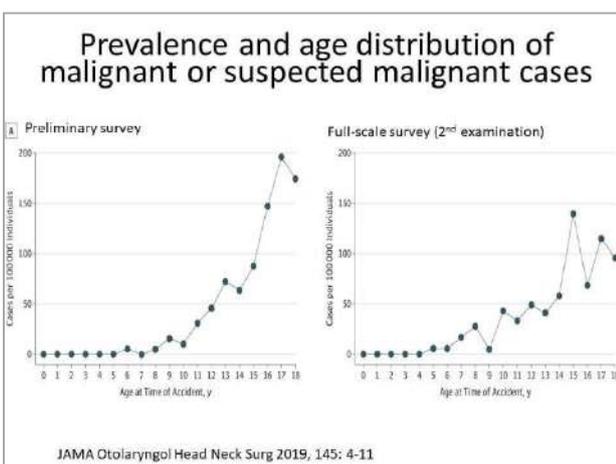
Slide 3



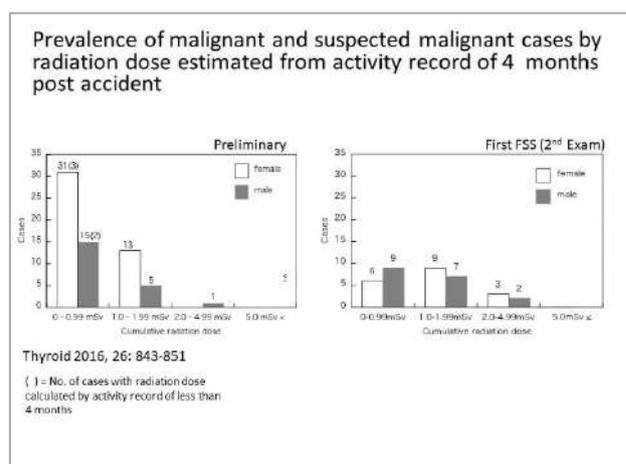
Slide 4



Slide 5



Slide 6



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## 1.2 First Full-scale Survey (1st FSS) of Thyroid Ultrasound Examination (second round survey)

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**SUZUKI Gen, MD, PhD**

Director and Professor, International University of Health and Welfare Clinic

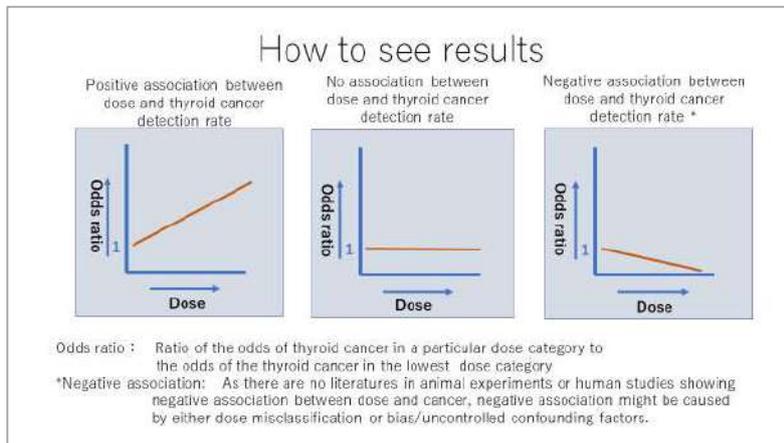
The Subcommittee on the Evaluation of Fukushima Thyroid Examination (FTE) analyzed the association between radiation and 71 thyroid cancer cases detected in the second-round FTE. First, possible bias or confounding factors<sup>†</sup> were investigated, such as gender, age, and the fact that thyroid examinations proceeded in different parts of the prefecture from one fiscal year (FY) to the next. B-grade judgements and biopsy rates tended to decrease year by year, which might affect the cancer detection rate. In addition, the period between the 1st and 2nd FTEs differed among areas and the longer it was, the higher the cancer detection rate was (Slide 1). An observational study like FTE must be analyzed after adjusting for bias or confounding factors in order to get a scientifically sound conclusion. The Subcommittee decided not to adopt an ecological study design that compares cancer prevalence or incidence rates among 4 areas and was utilized in the Interim Assessment, because it might result in ecological fallacy<sup>†</sup> due to uncontrollable bias or confounders. Since thyroid doses differed among subjects even in the same area, depending on the date and destination of evacuation, the Subcommittee decided to use thyroid dose as an explanatory variable. Although individual dose estimates were preferable, age-category-specific and municipality-specific thyroid absorbed doses used in the UNSCEAR<sup>†</sup> 2013 Report were adopted. In logistic regression analyses to test possible associations between thyroid cancer and dose, gender, age at the time of 2nd exam, FY of exam, and elapsed time were included as confounding factors (Slide 2).

In the UNSCEAR 2013 Report, dose estimates are stratified by three age categories (less than 5 y, 6-14 y, more than 15 y), and the age-category-specific ingestion doses are allocated to all Fukushima residents. Thus, dose differences among municipalities are mainly based on inhalation doses. If one conducts a logistic regression analysis after age-category stratification, one can analyze an association between inhalation dose and thyroid cancer incidence. Two dose estimates are allocated for some municipalities depending on two evacuation scenarios in the UNSCEAR Report. In the present analyses, lower dose estimates and higher dose estimates were utilized separately. As shown in Slide 3, there were no dose effects in the logistic regression analyses of thyroid cancers detected among those 6-14 years old at the time of accident, who account for about 2/3 of all cancers detected in the 2nd round FTE. In the analyses of thyroid cancers in the age category of over 15 y, results varied, and a “negative association” between dose and cancer incidence emerged in some combinations of confounding factors (Slide 4). Since “negative dose response” indicates the protection from cancer induction by radiation exposure, it is biologically unlikely. Moreover, there are no reports in the literature that demonstrate protective effects of radiation on cancer induction. Thus, we believe that any observed “negative dose response” might be due to misclassification of dose, uncontrolled confounding factors, or over-adjustment. On the other hand, there is no “positive dose response” in the present analyses after adjusting for confounding factors and thus we have concluded that, “At present, there are no indications of radiation effect on thyroid cancers found in the 2nd round FTE.”

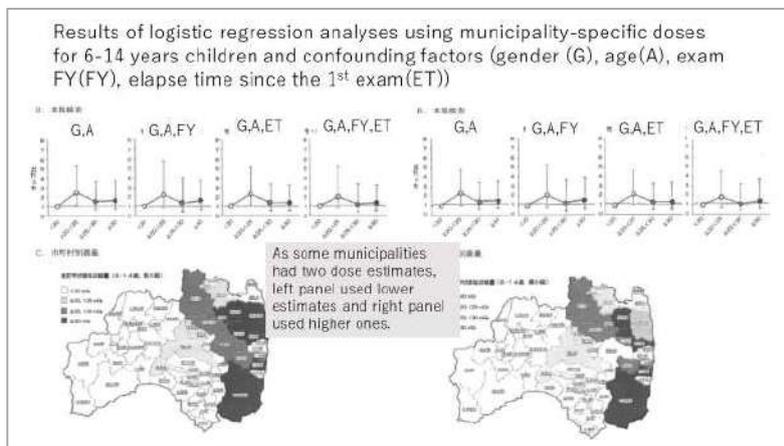
Slide 1

Factors associated with cancer detection rate in the 2 <sup>nd</sup> exam		Area	Evacuation area	Naka-Dori	Hama-Dori	Aizu area	#
		受診者数**	32,006	140,582	46,406	27,693	246,887
Age (y)	→	年齢 (歳)	11.8	11.9	12.6	12.3	12.1
B Grade rate	→	本検査二次検査対象者数 (B判定)	329	1135	379	221	2,064
		本検査B判定率 (B判定/一次検査受診者) %	1.03	0.81	0.82	0.80	0.84
B Grade rate in the previous exam among B Grade subjects in the present exam	→	本検査B判定中の先行検査B判定者数	69	391	161	110	731
		本検査B判定中の先行検査B判定者, %	21.0	34.4	42.5	49.8	35.4
		二次検査受診者数	281	920	308	166	1,475
		二次検査受診率, %	85.4	81.1	81.3	75.1	81.2
Secondary exam rate	→	編設診察施設数	38	119	24	9	190
		編設診察施設数 (先行検査B判定者)	0	10	14	4	28
Biopsy rate	→	編設診察施設率 (実施設/二次検査受診者数) %	13.5	12.9	7.8	5.4	11.3
		編設診察施設率 (先行検査B判定者のみ実施設) %	8.0	1.1	4.5	2.4	1.7
		編設診察施設率 (先行検査B判定以外者のみ実施設) %	13.5	11.8	3.2	3.0	9.7
Cancer detection rate	→	悪性ないし悪性疑い者数	17	39	10	4	70
		悪性ないし悪性疑い者/受診者 (10万人対人)	53.1	27.7	21.6	14.4	28.4
Elapse time	→	平均検査間隔 (年) ***	2.48	2.07	2.18	1.87	2.12

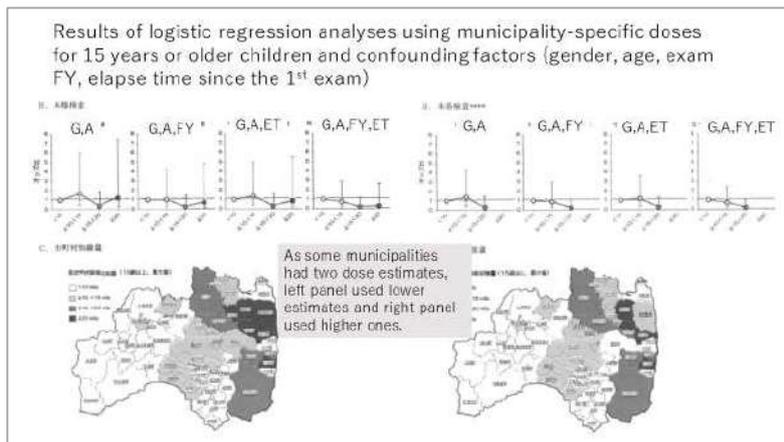
Slide 2



Slide 3



Slide 4

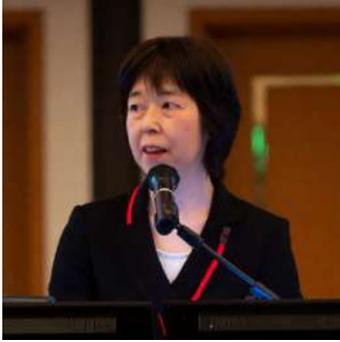


The original graphs and maps on Slides 3 and 4 are excerpted from the materials distributed at the 13th meeting of Thyroid Examination Evaluation Subcommittee held on June 3, 2019.  
 URL <https://www.pref.fukushima.lg.jp/uploaded/attachment/330129.pdf>

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## 1.3 Psychological support for participants and their families in the secondary confirmatory examination in TUE

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### SETOU Noriko, PhD

Associate Professor, Department of  
Disaster Psychiatry and Radiation Medical Science  
Center for the Fukushima Health Management  
Survey, Fukushima Medical University

Thyroid examinations, which began in October of 2011, consist of a primary and secondary examination. If a cyst<sup>†</sup> or nodule<sup>†</sup> of a certain size or larger is found in the primary examination, a more detailed secondary examination is performed. During secondary exams, patients and their families often exhibit anxiety about the onset of thyroid cancer and radiation effects. In November 2013, Fukushima Medical University formed a “Thyroid Support Team,” comprised of 4 staff members dedicated to providing psycho-social support (Slide 1).

The Thyroid Support Team (1) alleviates anxieties; (2) explains what to expect in ongoing examinations; (3) conveys appropriate information and supports examinees’ decision-making about participation in future examinations, including fine-needle aspiration cytology<sup>†</sup> (if required); (4) helps those suspected of having thyroid cancer understand and accept their situation. In addition, team members listen carefully to the thoughts and complaints of examinees and their families, with neutral data at hand to help them make proper decisions regarding their own future (Slide 2).

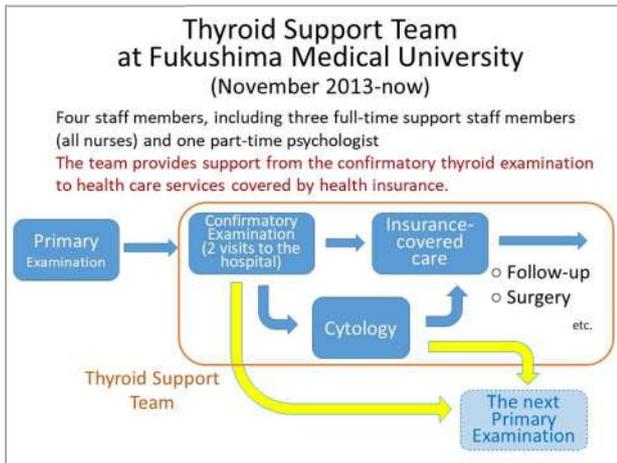
The fourth round of thyroid examinations is currently underway, during which the anxieties and pleading of examinees and their families have become more diverse compared to those of earlier rounds. In the midst of various opinions circulating about the impact of radiation on health and the examination process, the Thyroid Support Team must respond to questions from

examinees and their families who may have different degrees of information and various values, respecting those values, adding to what they know, and correcting misinformation to help them make good decisions (Slides 3, 4).

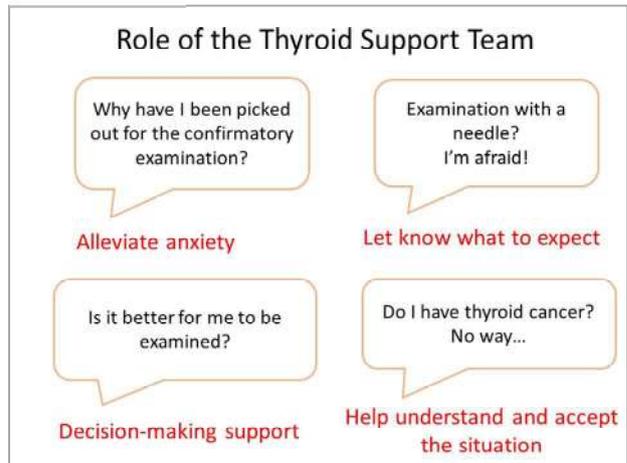
As more examinees enter the AYA generation (adolescent and young adult)<sup>†</sup>, it is important to provide support by taking into account the characteristics of this generation, such as increased interaction with peers, seeking independence from parents, and taking first steps toward their dreams. Therefore, in-depth explanations are being given to examinees at thyroid examinations as they can now sufficiently understand what these examinations are and decide for themselves whether or not to take the next examination. Furthermore, for those recommended for cytology or diagnosed with thyroid cancer, team members strive to carefully explain prospects in consideration of such life events as attending school, securing employment, getting married, and other aspirations. The support team can even mediate if opinions within a family differ. The support method is still a work in progress (Slides 5, 6).

Correct understanding of examination results, appropriate provision of information, and psychosocial support are important to reduce anxiety among examinees and their families. It is also reported that societal stigmas after the nuclear disaster are still persistent today, and what should especially be noted is that there is a large disparity in the amount of information available in and out of Fukushima. Many young people in Fukushima Prefecture leave the prefecture for higher education or employment. Support for this generation is increasingly important to help them pursue their dreams and live fulfilling lives.

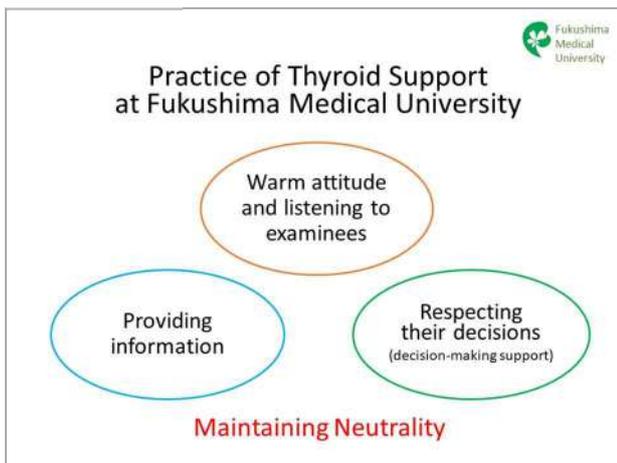
Slide 1



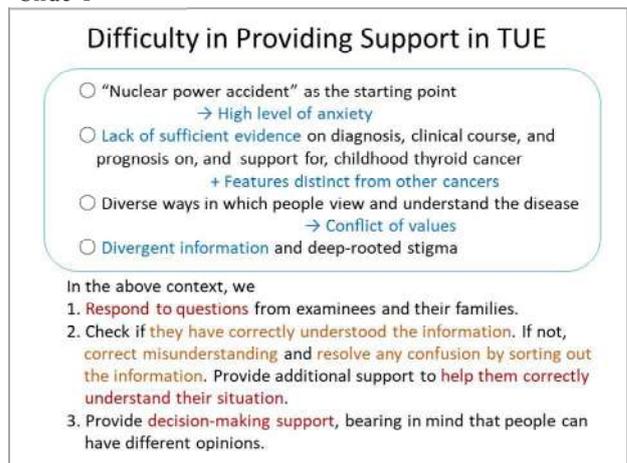
Slide 2



Slide 3



Slide 4



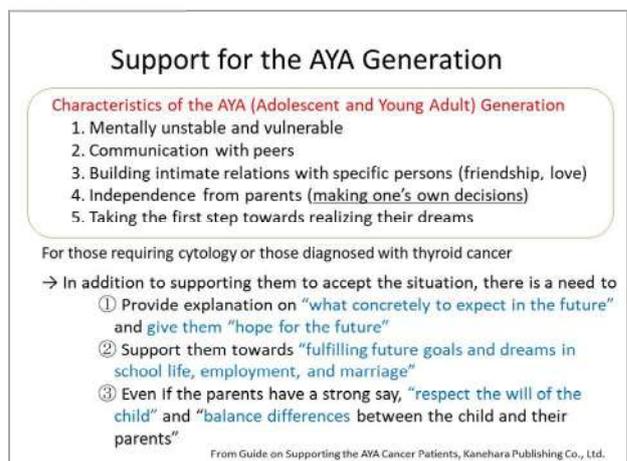
Slide 5

### Thyroid Ultrasound Screening: Past, Present, and Future

	When the screening first started (9 years ago)	Present	Future (for example, 9 years from now)
Time	From December 2011	2020	2029
Age of Examinees	0 to 18 years At the time of the disaster	9 to 27 years	18 to 36 years
Development Stage	Infancy Early childhood School age Adolescence	School age Adolescence~	Adolescence Early adulthood~ (AYA generation)

→ Decrease is being observed in the percentage of those 18 and over who come to receive examination  
→ Need to anticipate examinees' future life-cycle development when providing support

Slide 6



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## 1.4 Training and education for thyroid examiners in Fukushima

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**KITAOKA Masafumi, MD, PhD**

Director, Endocrine and Metabolism Center, IMS  
Miyoshi General Hospital

Pediatric thyroid ultrasonography (hereinafter referred to as "thyroid examination"), which has been conducted as part of the Fukushima Health Management Survey, had to be set up and made operational in a short period of time, so it was inevitable that adequate staffing would be a challenge. To address this, the cooperation of specialists from relevant academic societies all over the country, in response to the call, made a smooth implementation possible. Such cooperation from outside the prefecture continues as needed. However, in order to ensure a long-term implementation of thyroid examinations with consistently high standards, it is essential to expand human resources in Fukushima Prefecture (Slide 1).

The primary thyroid examination divides four diagnostic categories into two groups: A1 and A2 for periodic examination every two or five years, and B and C which require detailed examination (Slide 2). This final judgement is made based on ultrasound images that are appropriately recorded, forwarded, and reviewed by experts at the Radiation Medical Science Center for the Fukushima Health Management Survey.

This primary examination covers a large number of people, and securing human resources is a major prerequisite for implementation. Furthermore, it is extremely important to: eliminate regional differences in consultation, ensure convenience for examinees by making examinations available at nearby medical institutions, ensure long-term continuity in the future, and improve the satisfaction level of all examinees.

For these reasons, the Fukushima Prefecture Thyroid Examination Joint Support Committee was established at the Fukushima Medical Association to certify doctors and technologists who conduct the thyroid examination. This committee consists of executive board members of academic associations related to the thyroid gland, specialists of the Japan Thyroid Association in Fukushima Prefecture, specialists of the Japan Association of Endocrine Surgeons and the Japanese Society of Thyroid Surgery in Fukushima Prefecture, sonographers certified by the Japan Society of Ultrasonics in Medicine (subsurface organ imaging), representatives of Fukushima Medical Association, representatives of the Fukushima Association of Medical Technologists, representatives of the Fukushima Association of Radiological Technologists, and so forth (Slide 3).

This qualification is specific to primary examinations and limited to Fukushima Prefecture. It can be obtained by passing written and practical examinations after taking lectures and practical training. The certification must be renewed every half-decade (Slide 4).

In 2011 and 2012, the qualification program was hosted by the Radiation Medical Science Center for the Fukushima Health Management Survey, and by the Fukushima Medical Association in 2013. It has been conducted as a project of the Ministry of the Environment since 2014. As of October 2019, there are more than 300 certified thyroid examiners, of whom 199 (642 doctors and 137 technologists) belong to institutions that concluded agreements with Fukushima Medical University to conduct thyroid examinations (Slide 5).

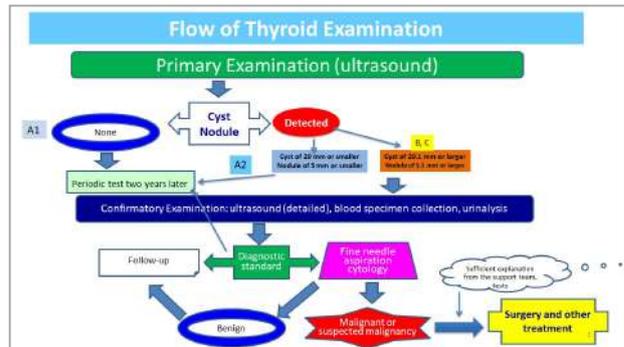
In fiscal 2019, lectures, practical training, skill-up training, qualification examinations, renewal lectures and renewal practical training are held and/or scheduled (Slide 6).

Slide 1

### Thyroid Examination in Fukushima Prefecture

- ◆ To ensure a long-term implementation of thyroid examinations with constant high standard, it is essential to expand the human resource base in Fukushima Prefecture.
  - ◆ Eliminating gaps in different local areas of the prefecture
  - ◆ Accessibility of medical institutions
  - ◆ Ensuring continuity
  - ◆ Increasing satisfaction levels of the examinees

Slide 2



Slide 3

### Fukushima Prefecture Joint Committee for Thyroid Examination

- ◆ To certify the qualification of doctors and technologists conducting the primary examination of the thyroid examination, the Joint Committee for Supporting Fukushima Prefecture Joint Support Committee for Thyroid Examination was established within the Fukushima Medical Association.
- ◆ The members of the committee include board members of thyroid-related academic societies: board-certified fellows of the Japan Thyroid Association, the Japan Association of Endocrine Surgery and Japanese Society of Thyroid Surgery; board-certified sonographers of the Japan Society of Ultrasonics in Medicine; and representatives from Fukushima Medical Association, the Fukushima Association of Medical Technologists, and the Fukushima Association of Radiological Technologists.

Slide 4

### Qualification for the Primary Examination, with Applicability Limited to Fukushima Prefecture

- ◆ For the primary examination of the thyroid examination conducted under Fukushima Prefecture's Fukushima Health Management Survey (hereafter "thyroid examination"), a new qualification was created for doctors and technologists (diagnostic radiologic technologists, clinical technologists, and ultrasound sonographers) who undertake such examination.
  - ◆ Lectures and onsite training
  - ◆ Written exams
  - ◆ Onsite exams
  - ◆ Certification renewal

Slide 5

### Status of Certified Examiners

- Affiliated with an institution with an agreement with Fukushima Medical University  
199 (62 doctors and 137 technologists)
- Affiliated with an institution without an agreement with Fukushima Medical University (Has case experience within the organization)  
23 (4 doctors and 19 technologists)
- Affiliated with an institution without an agreement with Fukushima Medical University (Has no case experience within the organization)  
80 (16 doctors and 64 technologists)

Slide 6

今年度の開催予定	Schedule for FY2019
<p>【甲状腺検査技術者「基礎検定・実技検定」(基礎検定、実用検定)】</p> <p>第1回 令和元年 5月 23日 (日) 講習会、実技検定 (基礎検定・実用検定) 実務講習</p> <p>第2回 令和元年 7月 24日 (水) 講習会、実技検定 (基礎検定・実用検定) 実務講習</p> <p>第3回 令和元年 9月 16日 (日) 講習会、実技検定 (基礎検定・実用検定) 実務講習</p> <p>第4回 令和元年 10月 20日 (日) 講習会、実技検定 (基礎検定・実用検定) 実務講習</p> <p>第5回 令和元年 1月 19日 (日) 講習会、実技検定 (基礎検定・実用検定)</p>	Lecture/skill training (Basic/Applied)
<p>【甲状腺検査技術者「スクリーンアップ検定」】</p> <p>第1回 令和元年 7月 7日 (日) 実務講習</p> <p>第2回 令和元年 10月 20日 (日) 実務講習</p> <p>第3回 令和元年 1月 19日 (日) 実務講習</p>	Upskilling training
<p>【甲状腺検査技術者「検定試験」(検定試験)】</p> <p>第1回 令和元年 11月 10日 (日) 実務講習</p> <p>第2回 令和元年 2月 16日 (日) 実務講習</p>	Certification Exam
<p>【甲状腺検査技術者「更新検定」(更新検定)】</p> <p>第1回 令和元年 7月 7日 (日) 実務講習</p> <p>第2回 令和元年 11月 17日 (日) 講習会・実務講習</p>	Certification renewal lecture/Certification renewal skill training



**Part I**  
**Current status of thyroid examination  
and thyroid treatment**

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**Session 2**  
**Characteristics of thyroid cancer and management of  
thyroid nodules in pediatric and AYA generations**

Chair: OKAMOTO Takahiro (Tokyo Women's Medical University)

**2.1 Pathological characteristics of thyroid cancer in pediatric and AYA generations<sup>†</sup>**

KATOH Ryohei (Ito Hospital)

**2.2 Clinical features and courses of papillary thyroid cancer in young patients**

YOSHIDA Akira (Kanagawa Health Service Association)

**2.3 Management of thyroid nodules in TUE**

SHIMURA Hiroki (Fukushima Medical University)

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## 2.1 Pathological characteristics of thyroid cancer in pediatric and AYA generations†

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### **KATOH Ryohei, MD, PhD**

Director and Scientific Advisor, Surgical Pathology Department, Ito Hospital;  
Professor Emeritus, University of Yamanashi

cancer) and showed a higher tendency for metastasis and/or recurrence (52 out of 250 YTCs). Multivariate analyses on the relationship between possible prognostic factors and clinical behavior suggested that metastasis and/or recurrence of YTCs was significantly related to being male and the presence of lymph node metastasis at operation, intraglandular metastasis, and extrathyroidal invasion (Slides 5, 6).

From the findings described above, it could be considered to recommend lifetime surveillance in light of the frequency of recurrence and/or metastasis in YTCs, as they are very rare and can show a favorable lifetime prognosis.

To select therapeutic strategies based on the underlying biology, it is prudent to know the different clinicopathological features of pediatric or young thyroid cancer (YTC) and adult thyroid cancer (ATC).

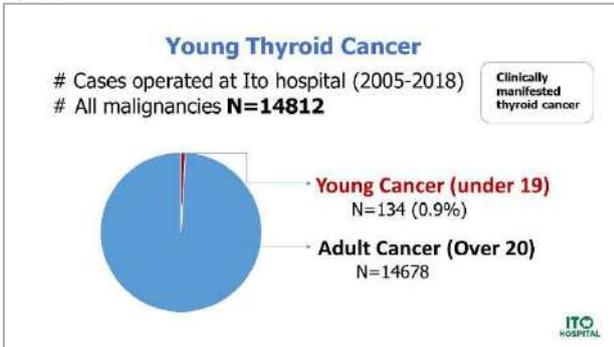
YTC is very rare, comprising less than 1% of all thyroid malignancies (134/14812 cases in Ito Hospital from 2005 to 2018, Slide 1).

As to histological types in YTCs, papillary thyroid carcinoma is most common (85%) and follicular carcinoma and medullary carcinoma are 12% and 3%, respectively (Slide 2). This distribution is similar to that of ATCs, except that the prevalence of follicular variant is slightly higher in YTCs than in ATCs. No case of poorly differentiated thyroid carcinoma or anaplastic carcinoma, both of which have a poor prognosis, was identified among YTCs.

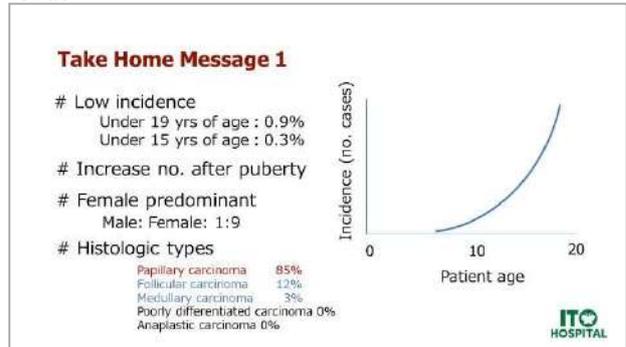
Some histologic variants of papillary carcinoma, namely the solid variant, diffuse sclerosing variant, and cribriform variant, were recognized in YTCs (Slide 3). The solid variant and diffuse sclerosing variant have slightly higher recurrence and metastasis rates than the classic type of papillary carcinoma, but not very much difference in prognosis. It is generally known that the genotypes of these variants differ from those of classic papillary cancer (solid variant: RET/PTC3<sup>†</sup>, cribriform variant: mutation of APC<sup>†</sup> gene, Slide 4).

Our follow-up study of YTCs in Ito Hospital (250 cases) revealed that YTCs were not worse in lifetime prognosis (only 3 YTC cases died of thyroid

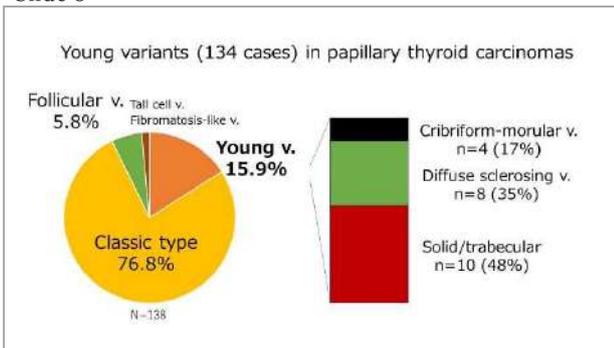
Slide 1



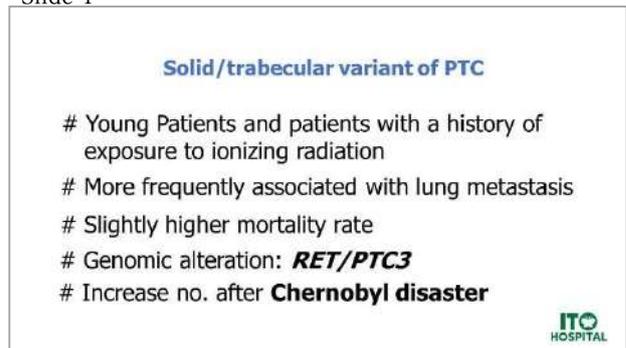
Slide 2



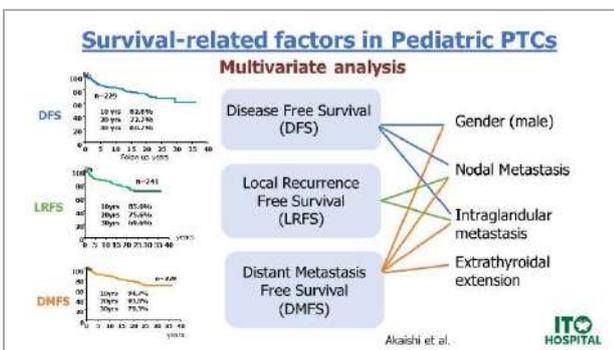
Slide 3



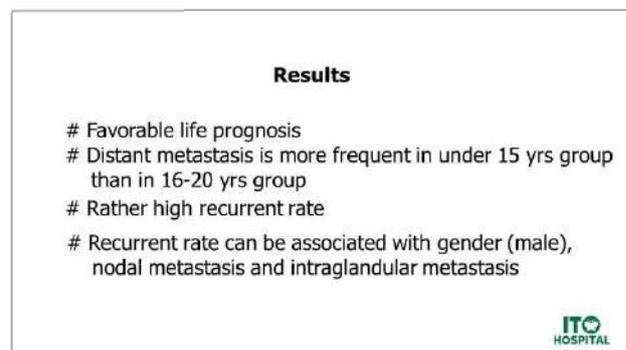
Slide 4



Slide 5



Slide 6



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## 2.2 Clinical features and courses of papillary thyroid cancer in young patients

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### **YOSHIDA Akira, MD, PhD**

Director, Department of Gynecologic and Breast Screening, Kanagawa Health Service Association;  
Visiting Professor, Yokohama City University

Papillary thyroid cancer (PTC) is a rare disease among individuals aged 20 or younger. As a result, reports about many cases of thyroid cancer in young cohorts are rare, and uncertainties persist about their clinical features and prognosis. According to the 2010 Clinical Practice Guidelines for Thyroid Cancer, although pediatric PTC may appear to be advanced at the time of diagnosis, the patient can have a good long-term prognosis if treated appropriately. Per the American Thyroid Association (ATA)'s Management Guidelines for Children with Thyroid Nodules and Differentiated Thyroid Cancer (Thyroid 25:716,2015), therapy recommended for adults with PTC may not be appropriate for children who are at low risk for death but at higher risk for long-term harm from overly aggressive treatment.

In and after 2012, Japan's top three hospitals specializing in treatment of thyroid diseases have, one after another, published reports on PTC in young patients (Slides 1, 2). These reports can guide our thinking, first, with some general observations about the clinical features of PTC in young patients at presentation: the tumor size is larger in young patients than in adults, and lymph node metastasis and distant metastasis are more frequent. Furthermore, these features are more conspicuous in children, i.e., patients who are even younger. But male-female ratio does not differ in young patients versus adults (Slide 3). Of the

patients described in these reports, the percentage of those who underwent total thyroidectomy was rather low (9~54%) and many of the remaining patients received hemithyroidectomy<sup>†</sup>. At all three hospitals, neck lymph node dissection was performed on many patients, including many cases of lateral neck dissection (Slide 4). This may be because facilities where RI (radioiodine) could be used were limited in Japan, so total thyroidectomy with RI ablation<sup>†</sup> was not a standard initial treatment of PTC and was performed only for advanced cancer. As for the clinical course, the recurrence rate was more than 20% in young patients, which is notably higher than in adults, but RI treatment is often effective (Slide 5), and in most cases, recurrent cancer in lymph nodes can be successfully removed by reoperation. The number of deaths due to cancer is as low as 1.5%, a minor difference compared with that of adult patients (Slide 6).

It is noteworthy that patients with total thyroidectomy often have hypoparathyroidism and recurrent laryngeal nerve palsy. As these complications increase with reoperation, early detection and early treatment is considered important even for young patients to reduce recurrence and surgical complications as well as for complete cure of thyroid cancer. It is considered that PTC in young patients, which usually has good prognosis, can be left under surveillance in view of potential overdiagnosis issues. However, mis-timing of surgery may cause serious complications, which can afflict patients for extended periods of time. Therefore, the timing for surgical treatment should not be missed due to excessive fear for overdiagnosis.

Slide 1

### Recent reports from Japanese institutions

1. Y. Enomoto, K. Enomoto, S. Uchino et al. Clinical features, treatment, and long-term outcome of papillary thyroid cancer in children and adolescents without radiation exposure. *World J Surg.* 36:1241-1246, 2012. (Noguchi Thyroid Clinic and Hospital Foundation, Beppu)
2. Y. Ito, M. Kihara, Y. Tamura et al. Prognosis and Prognostic factors of papillary thyroid carcinoma in patients under 20 years. *Endocrine J.* 59:539-545, 2012. (Kuma Hospital, Kobe)
3. K. Sugino, M. Nagahama, W. Kitagawa et al. Papillary thyroid carcinoma in children and adolescents: Long-term follow-up and clinical characteristics. *World J Surg* 39:2259-2265, 2015 (Ito Hospital, Tokyo)

Slide 2

### Brief Summary

**Paper 1. 142 papillary thyroid cancer patients under 20 who received the initial treatment at Noguchi Thyroid Clinic and Hospital Foundation from 1961 to 2005, Male 17, Female 25 (male-female ratio 1:7.3)**  
Average age 16.3±2.7 Follow-up period 21.8±12.0 years

**Paper 2. 110 papillary thyroid cancer patients under 20 who received the initial treatment at Kuma Hospital from 1987 to 2007, Male 12, Female 98 (male-female ratio 1:8)**  
Average age 17 (7-19) Follow-up period 149 months (17-296)

**Paper 3. 227 papillary thyroid cancer patients up to 20 who received the initial treatment from 1979 to 2012 at Ito Hospital, Male 26, Female 201 (male-female ratio 1:7.7)**  
Average age 18 (7-20) Follow-up period 155 months (15-422)

Slide 3

### Clinical symptoms of young patients with papillary cancer at the first visit

- Summary of 3 papers -

Factor	Aggregation of 3 papers Young patients	All cases* (≈adults)
M-F ratio	male 55 : female 424 = 1 : 7.7	1 : 7.8
T factor	4cm ≥ cases about 25%	Approx. 10%
N factor	Clear LN metastasis(+) 143/479 (32%)	Approx. 5%
M factor	Distant metastasis(+) from the first visit 31/479 (6.5%)	1.2%

\* Ito Y et al, Risk classification of papillary cancer. *Endocrine J.* 2019, 66:1127  
Ito Y et al, Prognostic factor for recurrence of PTC. *World J Surg.* 2012 36 : 1274

Slide 4

### Treatment for young patients with papillary thyroid cancer

【Thyroid surgery】

	Total thyroidectomy n (%)	Non total thyroidectomy n(%)
Paper 1	12 (8.5)	130 (91.5)
Paper 2	59 (54.1)	50(45.9)
Paper 3	69 (30.4)	158(69.6)
Total	140(29.3)	338(70.7)

【Neck LN dissection】  
Paper 1 dissection(-) 50, central neck dissection 20, lateral neck dissection 72  
Paper 2 central neck dissection 51, lateral neck dissection 91  
Paper 3 dissection(-)17, dissection(+)210. (Prophylactic dissection 147, Therapeutic dissection 63)

† LN: Refer to Glossary P.74

Slide 5

### Radioactive iodine therapy for distant metastasis

**Paper 3** Cases at Ito Hospital

- Distant metastasis at the first visit 20 + distant recurrence 12  
Total 32 cases  
RA therapy 29 cases (RI therapy refusal 2, waiting for the therapy 1)
- Results Complete cure: 4 (14%)  
Lesion reduction : 16 (55%)  
Unchanged:7 (24%)  
Lesion enlargement: 2 (7%)  
  
Effective 20/29 cases = 69%
- PFS (progress-free survival ratio)  
10 years: 84.1%, 20 years: 69.9%, 30 years: 63.2%

Slide 6

### Clinical courses of young patients with papillary thyroid cancer

- Comparison: youth cases vs. all cases -

Reports	Recurrence %	Cancer death %
Aggregation of 3 reports Youth cases n = 479	21.1*	1.5
Kuma Hospital 1987-2004 All cases n = 5845 World J Surg. 2019 : 66,127	regional · LN 10.3 distant 2.6	1.9
Kanagawa Cancer Center 1990-2007 All cases n=488 Stage III/IV = 40%	16.6	6.5

\* Aggregation of two papers with the description of the number of recurrences

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## 2.3 Management of thyroid nodules in TUE

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### **SHIMURA Hiroki, MD, PhD**

Professor and Chair of the Department of Laboratory Medicine and Director of the Department of Thyroid Ultrasound Examination, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

Thyroid cancer in children and adolescents has essentially similar characteristics as in adults, but features unique to children include higher survival rates, faster tumor growth rates, and higher metastatic frequency than adults. On the other hand, papillary thyroid cancer in adults has been increasingly discovered due to recent improvements in, and widespread use of, diagnostic imaging techniques. In Japan, the possibility of over-diagnosing low-risk thyroid cancer has been reported since the 1990s, and guidelines for nonsurgical follow-up (active surveillance) and fine needle aspiration cytology (FNAC)<sup>†</sup> were developed (Slide 1).

The Japan Association of Breast and Thyroid Sonology has proposed a guideline for thyroid nodule<sup>†</sup> management based on the diameter and ultrasonographic findings of the nodule (Slide 2). The guideline states that FNAC is not recommended for a nodule  $\leq 20.0$  mm when the nodule shows only benign findings (Slide 3, diagnostic criteria for thyroid nodules published by the Japan Society of Ultrasonics in Medicine), or when there is a spongiform pattern, even if some malignant findings are observed (Slide 4). FNAC is recommended for a nodule  $\geq 10.1$  mm with some malignant findings (Slide 5). In addition, when most of the ultrasound findings are malignant, FNAC is recommended for nodules  $\geq 5.1$  mm, in which case there would be risks

of extra-thyroid extension and lymph node metastases (Slide 6).

In the Thyroid Ultrasound Examination (TUE) program, FNAC is only performed in those limited cases conforming to the Japanese guidelines. In order to analyze the suitability of the protocol in TUE, we analyzed implementation rates of FNAC in the first- and second-round surveys. Implementation rates of FNAC in the first-round survey were 20.1%, 63.2%, and 87.7% of the subjects with nodules of 5.1-10.0 mm, 10.1-20.0 mm, and  $\geq 20.1$  mm, respectively. In the second-round survey, implementation rates of FNAC were slightly lower than in the first round, with 7.3%, 26.0%, and 50.0% of the subjects having nodules of 5.1-10.0 mm, 10.1-20.0 mm, and  $\geq 20.1$  mm, respectively. Among subjects who received TUE in both the first- and second-round surveys, 0.6% and 0.4% of those found to have nodules  $\leq 5.0$  mm and 5.1-10.0 mm, respectively, in first-round primary examinations, were subsequently diagnosed as having malignant or suspicious nodules in the second-round survey. However, no malignant or suspicious nodules were found in the second round among those who were diagnosed as having nodules  $\geq 10.1$  mm in the first round.

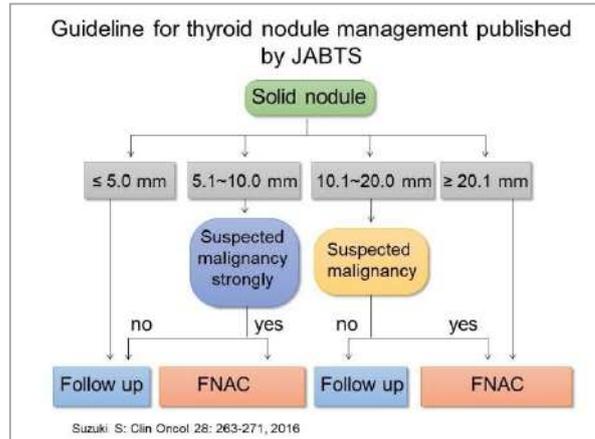
In recent years, overdiagnosis has been pointed out with respect to the increase in the detection rate of thyroid cancer in South Korea. However, results in our study show that the implementation rates in South Korea are obviously much higher than that in our TUE, and the situations in the two countries differ considerably (Slide 7). These results suggest that the protocol using Japanese guidelines can reduce unnecessary FNAC. In addition, this strategy is able to avoid detection failure of thyroid cancers 10 mm or larger in diameter (Slide 8).

Slide 1

### Actions against a risk of overdiagnosis of thyroid cancer in Japan

- 1997: Dr. Miyauchi published a paper warning a risk of overdiagnosis of thyroid cancer in screening.
- 2003: Kuma Hospital started a trial of active surveillance for low risk papillary thyroid carcinoma.
- 2008: Shimura proposed a tentative guideline for management of thyroid nodules found in sonographic screening in the first edition of guidebook for thyroid ultrasonography by Japan Association of Breast and Thyroid Sonology (JABTS).
- 2011: The Japan Society of Ultrasonics in Medicine published the ultrasound diagnostic criteria for thyroid nodule.
- 2012: JABTS published the guideline for management of thyroid nodules in the second edition of guidebook.

Slide 2



Slide 3

### Case 1

- ✓ Regular shape
- ✓ Well-defined and smooth margin
- ✓ Isoechoic
- ✓ Homogeneous echo pattern
- ✓ No high echo spot
- ✓ Regular marginal hypoechoic zone

Typical examples of diagnosis:

- Follicular adenoma
- Cribriform variant papillary carcinoma

Diameter (mm)	≤ 5.0	5.1-10.0	10.1-20.0	≥ 20.1
FNAC	No	No	No	Yes

Slide 4

### Case 2

- ✓ Regular shape
- ✓ Smooth but ill-defined margin
- ✓ Isoechoic
- ✓ Heterogeneous echo pattern
- ✓ No high echo spot
- ✓ Irregular marginal hypoechoic zone
- ✓ Spongiform pattern

A typical example of diagnosis:

- Adenomatous nodule

Diameter (mm)	≤ 5.0	5.1-10.0	10.1-20.0	≥ 20.1
FNAC	No	No	No	Yes

Slide 5

### Case 3

- ✓ Irregular shape
- ✓ Well-defined but jagged margin
- ✓ Isoechoic
- ✓ Homogeneous echo pattern
- ✓ No high echo spot
- ✓ Irregular marginal hypoechoic zone

Typical examples of diagnosis:

- Follicular carcinoma
- Papillary carcinoma

Diameter (mm)	≤ 5.0	5.1-10.0	10.1-20.0	≥ 20.1
FNAC	No	No	Yes	Yes

Slide 6

### Case 4

- ✓ Irregular shape
- ✓ Ill-defined and Jagged margin
- ✓ Hypoechoic
- ✓ Heterogeneous echo pattern
- ✓ Fine high echo spots
- ✓ No marginal hypoechoic zone

A typical example of diagnosis:

- Papillary carcinoma with ETE and nodal metastasis

Diameter (mm)	≤ 5.0	5.1-10.0	10.1-20.0	≥ 20.1
FNAC	No	Yes	Yes	Yes

Slide 7

### Implementation rate of FNAC (Comparison with Korea)

Size of nodule (mm)	Fukushima First round (n=1,489)	Fukushima Second round (n=1,517)	Korea 2009 (n=90)*	Korea 2014 (n=101)*
≤5.0	1.6%	0%	94.4%	53.5%
5.1-10.0	20.1%	7.3%	100%	80.2%
10.1-20.0	63.2%	26.0%	-	-
≥20	87.7%	50.0%	-	-

\* Yang Song Lee, Hang-Seok Chang and Cheong Soo Park. Endocrine J 63:515-521, 2016

Slide 8

### Conclusions

- ✓ The protocol using with Japanese guidelines was able to reduce unnecessary FNAC, especially for nodules smaller than 10.1mm.
- ✓ In addition, this strategy was able to avoid detection failure of thyroid carcinoma more than 10mm in diameter.

# The Proceedings of Part I Discussion 1

**Chair: OKAMOTO Takahiro (Tokyo Women's Medical University)  
MIYAUCHI Akira (Kuma Hospital)**



**Discussant: SUZUKI Satoru (Fukushima Medical University)  
SUZUKI Gen (International University of Health and Welfare Clinic)  
SETOU Noriko (Fukushima Medical University)  
KITAOKA Masafumi (IMS Miyoshi General Hospital)  
KATOH Ryohei (Ito Hospital)  
YOSHIDA Akira (Kanagawa Health Service Association)  
SHIMURA Hiroki (Fukushima Medical University)**



Dr. OKAMOTO Takahiro Dr. MIYAUCHI Akira

Part 1 of the symposium is titled, "Current status of thyroid examination and thyroid treatment." In Session 1, under the theme of "Current status and evaluation of thyroid ultrasound examination," Dr. Suzuki Satoru gave an overview of the Full-Scale Survey of the Thyroid Examination (Second Round), then Dr. Suzuki Gen outlined the concept of evaluation methods for the examination and the results of evaluation based on his role as the chair of the Thyroid Examination Evaluation Subcommittee of the Fukushima Prefectural Oversight Committee for the Fukushima Health

Management Survey (hereafter "Subcommittee"). Next, Dr. Setou Noriko reported on the contents and issues concerning support for examinees and their families participating in Confirmatory Examinations, and Dr. Kitaoka Masafumi reported on the training of examiners specializing in the thyroid examination in Fukushima Prefecture, as the person with a central role in establishing this qualification.

The presentations of Session 2 were given under the theme, "Characteristics of thyroid cancer and management of thyroid nodules<sup>†</sup> in the pediatric and AYA generation." Dr. Katoh Ryohei offered a pathologist's



Dr. KATOH Ryohei

perspective on the characteristics of thyroid cancer in children and adolescents and the need for lifelong follow-up. Dr. Yoshida Akira introduced the clinical features of papillary thyroid cancer in young people and indicated the importance of early treatment. Dr. Shimura Hiroki presented that the cytological examinations have been implemented in accordance with clinical guidelines established by the Japan Association of Breast and Thyroid Sonology, by which the risk of overdiagnosis is reduced. He also explained the evaluation method.

Discussion 1 included questions and answers related to these presentations.

From the questions received in advance, a question about similarities and differences between Fukushima and Chernobyl concerning the relationship between the nuclear accident and the development of thyroid cancer was introduced. Dr. Katoh and Dr. Shimura explained that the characteristics were quite different between Chernobyl and Fukushima. Specifically: 1) In Chernobyl, four years after the accident, the number of “solid variant” thyroid cancers, different from the classical type, increased rapidly, and is generally regarded as a radiation effect, while in Fukushima, only two cases of this “solid variant” have been found; 2) Chernobyl is an iodine-deficient area where a lot of radioactive iodine was ingested after the accident, whereas in Fukushima, it is thought that Japanese people’s dietary preferences, including iodine-rich seaweed, might have worked advantageously in reducing the rate of radioiodine absorption; 3) Fukushima’s exposure doses were much lower than in Chernobyl. Then came a question about regional difference of thyroid cancer detection and radiation effects in the thyroid examination [1st Full-Scale Survey (2nd Examination)]. Dr. Suzuki Gen answered:



Dr. SHIMURA Hiroki



Dr. SUZUKI Satoru

1) There were various confounding factors<sup>†</sup>, such as the regions of examinees and the rates of follow-up cytology, which varied by fiscal year, so it is inappropriate to compare radiation effects of regions without adjusting for these factors. 2) It is necessary to perform an analysis using the "internal exposure dose," which shows the level of exposure of thyroid glands and not the "external exposure dose," which measures the air dose rate at a set distance from the ground, but internal exposure levels do not correspond with external exposures even in the same geographic area.

Subsequently, questions from the floor were introduced, and discussion proceeded.

With regard to dose evaluation in thyroid examinations, a question related to the reliability of the estimated thyroid absorbed dose by UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) was brought up. Dr. Suzuki Gen answered that there was still uncertainty in the dose assessment in UNSCEAR's 2013 report<sup>1</sup> used in the analysis of the first Full-Scale Survey (2nd Round Examination). The reasons are as follows: first, estimated volumes of radioactive materials used in the dose evaluations were obtained through



Dr. SUZUKI Gen

simulation, using data such as "timing of release, types of radiation, and how many becquerels per hour," and meteorological data of "winds blowing at the time," so uncertainty was inevitably generated in the process; second, the dose evaluation by UNSCEAR was performed using air doses of radioactive iodine gained from simulation of just one to two assumed behavior patterns in each municipality. He further said that the dose assessment would be improved by the next UNSCEAR report, and that the

<sup>1</sup> See the Prime Minister's Office website ([http://www.kantei.go.jp/saigai/senmonka\\_g66.html](http://www.kantei.go.jp/saigai/senmonka_g66.html)) for an overview.

Subcommittee may analyze and evaluate using the improved data in the future.

In regard to thyroid examinations, a question about the need to support cytology recipients to reduce their anxiety in the confirmatory examination was brought up. Dr. Setou explained that supporting personnel are there with participants on the examination day to provide psychological and social support, and that support is also available before and after the examination. Also, for a question about how participants are treated if judged as “no suspicion of cancer” as a result of the examination, Dr. Shimura replied that while the degree of follow-up differs for each participant, they are followed-up comprehensively. If deemed necessary, participants are recommended to follow-up through insured medical services between periodic examinations, or if the interval until the next regular examination is short or the risk is low, waiting until the next examination may be deemed sufficient.



Dr. SETOU Noriko



Dr. KITAOKA Masafumi

When asked why special credentialing of thyroid examiners is limited to Fukushima Prefecture, Dr. Kitaoka answered that contracts with hospitals having credentialed specialists from relevant academic societies outside the prefecture made it possible for them to examine those evacuees now living outside Fukushima. On the other hand, the higher volume of examinees in Fukushima Prefecture required a rapid increase in qualified examiners, which prompted our prefectural credentialing efforts.

With regard to the clinical course of thyroid cancer, in relation to the presentation of Dr. Yoshida, a question was asked as to whether children and adolescents diagnosed with thyroid cancer through the thyroid examination program could anticipate similar prognoses to those described in the papers presented by three hospitals apart from the program. Dr. Yoshida said the thyroid ultrasound examinations in Fukushima Prefecture had the possibility of finding cancers including preclinical ones, so the prognosis was naturally considered to be excellent. However, if left unchecked, it might lead to clinically significant cancer and follow the same course as described in the three papers.

There was a question about the number of cases for which radioactive iodine therapy (RI therapy) for thyroid cancer is used in Japan, and whether it was available immediately when needed. Dr. Miyauchi, Dr. Okamoto and Dr. Yoshida replied that there were few facilities in Japan for RI therapy, and opinions on the utility of RI therapy were exchanged.



Dr. YOSHIDA Akira

**Part I**  
**Current status of thyroid examination  
and thyroid treatment**

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**Keynote Lecture 1**  
**Session 3**  
**Current progress in the treatment of thyroid cancer**

**Keynote Lecture 1**

Chair: Peter ANGELOS (The University of Chicago, USA)

**Surgical treatment of pediatric thyroid cancer in Japan**

SUZUKI Shinichi (Fukushima Medical University)

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**Session 3**

Chair: KITAOKA Masafumi (IMS Miyoshi General Hospital)

SUZUKI Gen (International University of Health and Welfare Clinic)

**3.1 Clinical practice guidelines for thyroid cancer in Japan**

OKAMOTO Takahiro (Tokyo Women's Medical University)

**3.2 Active Surveillance of low-risk papillary microcarcinoma of the thyroid:  
cumulative evidence and new knowledge**

MIYAUCHI Akira (Kuma Hospital)

**3.3 Current status of thyroid cancer treatment in overseas countries**

Peter ANGELOS (The University of Chicago, USA)

## Surgical treatment of pediatric thyroid cancer in Japan



**SUZUKI Shinichi, MD, PhD**

Professor and Chair, Department of Thyroid and Endocrinology, Fukushima Medical University School of Medicine

After the Fukushima NPP accident that followed the Great East Japan Earthquake of March 11, 2011, the thyroid ultrasound examination (TUE<sup>†</sup>) survey began for people aged 18 years or younger at the time of the disaster. We would like to report the thyroid cancers found in this survey.

From 2012 to December 31, 2018, 180 thyroid cancers among TUE participants were excised in our department. Slide 1 shows 161 cases referred to our department from TUE and 19 cases referred to us for other reasons (Slide 1).

Mean age at diagnosis and at disaster were 17.9 and 13.3 years, respectively, and mean tumor size was 16.0 mm. Among these 180 subjects, 175 papillary thyroid carcinomas (PTCs), 2 follicular thyroid carcinomas, 2 other thyroid carcinomas, and one poorly differentiated thyroid carcinoma were confirmed postoperatively. All cases with tumors 10 mm or smaller were invasive, not encapsulated, PTC.

Postoperative lymph node metastases, extra-thyroidal invasion, and pulmonary metastases were found in 72%, 47%, and 1.7% of all cases, respectively. Total thyroidectomy was performed in only 8.9% and the remaining cases (91.1%) were treated with hemi-thyroidectomy<sup>†</sup>.

Both high-risk cases and super low-risk cases for which active surveillance (AS) would be recommended were very few. Almost all of our cases were classical PTCs, whereas solid variant PTCs, which were prevalent after the Chernobyl NPP accident, were small in number. Intrathyroidal spreading was seen with high frequency (Slide 2). The reasons why most of our cases were performed as hemi-thyroidectomy, unlike Chernobyl, are as follows (Slide 3). 1) Younger age is associated with good prognosis. 2) Prophylactic RAI, except for high-risk cases, is not recommended in Japan.

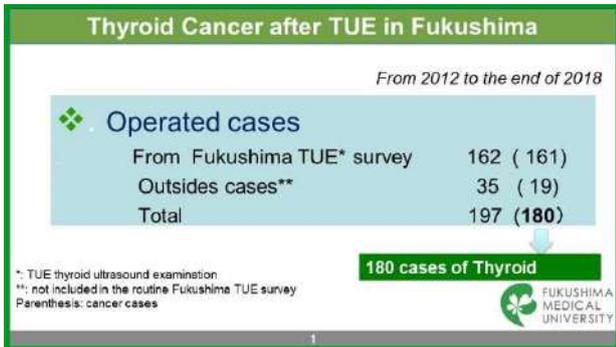
3) RAI for children is outside the usual standard of care in Japan. 4) Levothyroxine<sup>†</sup> supplementation after total thyroidectomy is problematic, especially for younger people, for whom adherence to a lifelong medication regimen would be burdensome. Also, high risk cases were rare among those we operated on. Unless radiation-induced thyroid cancer is found, we will continue by this policy. The above is also an opinion of Japan Thyroid Panels (Slide 4).

Here, we encounter two big arguments: one is regarding the increasing number of child and adolescent thyroid cancers in Fukushima, which some attribute to radiation exposure due to the Fukushima Daiichi NPP accident. Another claim is about overdiagnosis/treatment and this is argued to be due to our large-scale ultrasound screening. We believe neither of these hypotheses is correct. For the effect of radiation exposure, we concluded as follows, based on our published data: 1) There was no significant difference in thyroid cancer occurrence among several areas with different radiation levels<sup>1)2)3)</sup>. 2) Age distribution patterns of our thyroid cancer cases were almost the same as they are now and of a similar pattern to non-radiation-induced pediatric cancer cases<sup>4)5)</sup>. 3) Most cases were diagnosed with classical PTC, and there were few cases with solid variant PTC, unlike in Chernobyl<sup>6)</sup>. 4) Genetic alteration was also different between the children of Chernobyl and Fukushima<sup>7)</sup>. From the above, we can attribute no effect due to radiation exposure in Fukushima thus far (Slide 5).

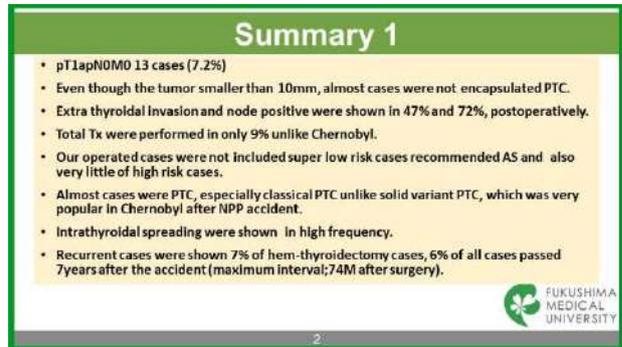
On the other hand, for the question of overdiagnosis/treatment, we answer as follows: 1) For histopathological diagnosis, the borderline cases like NIFTP are diagnosed benign in Japan, unlike USA. 2) For the ultrasound and FNA<sup>†</sup> criteria, our Japanese guidelines are conservative, unlike South Korea. Japanese guidelines are intended to prevent overdiagnosis. 3) Our operated cases with tumors 10 mm or smaller were all invasive and close to the trachea, recurrent nerve, and suspected of extra thyroidal invasion, unlike those recommended for AS in our guidelines. 4) Our treatment also was minimally invasive, avoiding total thyroidectomy and RAI treatment except for high risk cases. Our thyroid cancers are not due to overdiagnosis/treatment and we cannot say or think that TUE is harmful (Slide 6).

In conclusion, our operated cases did not include super low-risk cases, for which active surveillance is usually recommended. And high-risk cases were also very few, and for most cases hemi-thyroidectomy was performed, unlike Chernobyl. The TUE should be continued for a long term to determine whether the risk of childhood and adolescent thyroid cancer due to radiation exposure increases or not.

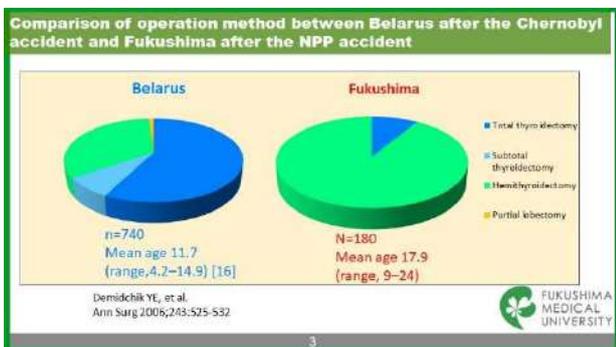
Slide 1



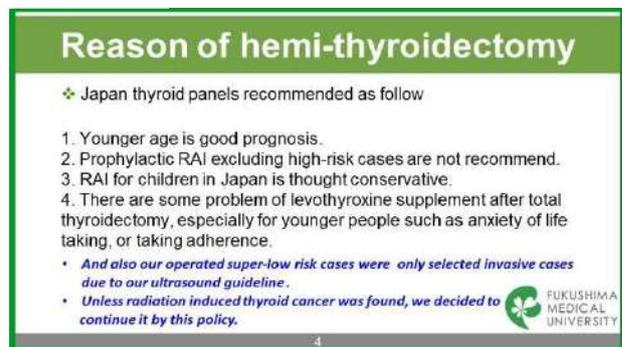
Slide 2



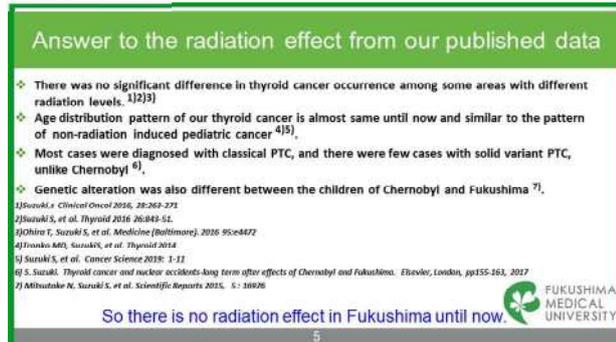
Slide 3



Slide 4



Slide 5



Slide 6



References of Slide 5

- 1)Suzuki S. Clinical Oncol 2016, 28:263-271
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- 3)Ohira T, Suzuki S, et al. Medicine (Baltimore). 2016 95:e4472
- 4)Tronko MD, Suzuki S, et al. Thyroid 2014
- 5) Suzuki S, et al. Cancer Science 2019: 1-11
- 6) S. Suzuki. Thyroid cancer and nuclear accidents-long term after effects of Chernobyl and Fukushima. Elsevier, London, pp155-163, 2017
- 7) Mitsutake N, Suzuki S, et al. Scientific Reports 2015, 5 : 16976

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## 3.1 Clinical practice guidelines for thyroid cancer in Japan

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**OKAMOTO Takahiro, MD,  
MSc, PhD**

Professor and Chair, Department of Breast,  
Endocrine and Pediatric Surgery,  
Tokyo Women's Medical University

According to the cancer statistics in Japan, it is estimated that 15,000 people are diagnosed with thyroid cancer and 1,800 patients die from the disease each year (Slide 1). Papillary thyroid cancer and follicular thyroid cancer account for 94% and 4%, respectively, of the thyroid cancer cases, registered to the National Clinical Database (Slide 2). Total thyroidectomy followed by radioactive iodine therapy and thyrotropin suppression therapy has been a mainstay of the management of differentiated thyroid cancer in western countries. In Japan, however, total thyroidectomy has rarely been indicated, and therefore the adjuvant treatments have not been widely used. Besides, it was a concern that diversity in management might result in different outcomes among hospitals. In response to unsettled issues, the Japanese Society of Thyroid Surgeons and the Japan Association of Endocrine Surgeons (JAES) had developed and published the Clinical Practice Guidelines for Thyroid Tumors in 2010.

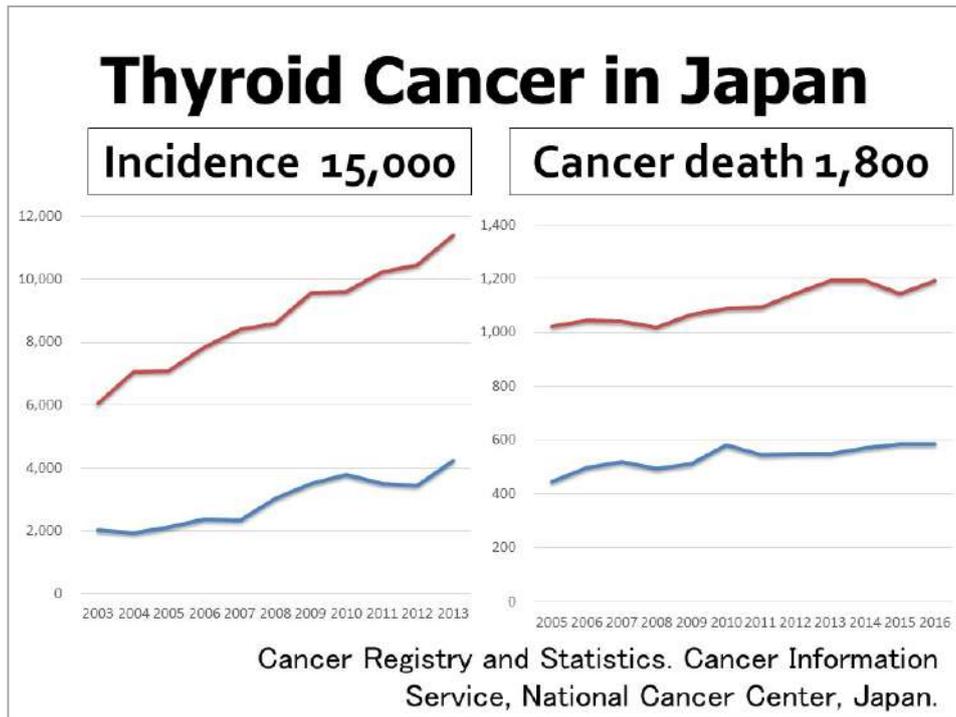
JAES has revised the guidelines in 2018. The objective of the guidelines is to improve health-related outcomes in patients with thyroid tumors by enabling users to make their practice evidence-based and by minimizing gaps in knowledge among physicians. The guidelines give representative flowcharts on the management of papillary, follicular, medullary, and anaplastic thyroid carcinoma, along with recommendations for clinical questions by presenting evidence on the relevant outcomes including benefits, risks, and health

conditions from patients' perspective. Any therapeutic actions were recommended or not recommended either strongly (⊙⊙⊙ or ×××) based on good evidence (⊙)/good expert consensus (+++), or weakly (⊙, ⊙⊙ or ×, ××) based on poor evidence (⊖)/poor expert consensus (+ or ++). Only 15 of the 58 recommendations given in the guidelines were supported by good evidence, whereas 40 were supported by good expert consensus (Slides 3, 4, and 5).

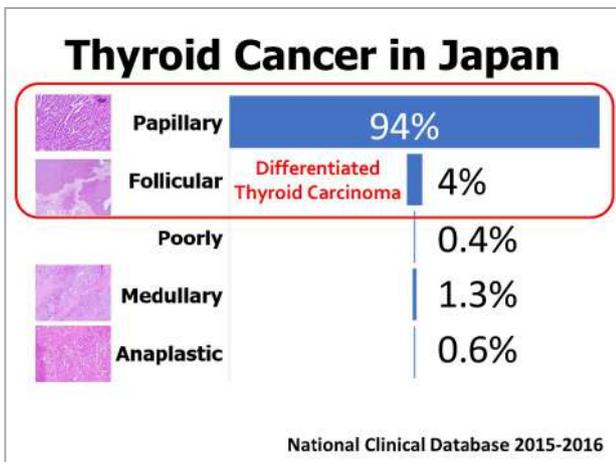
What we found through the revision work was that relevant evidence was lacking for many of the clinical questions posed in the new guidelines. Only 15 of the 58 recommendations for the therapeutic management of thyroid cancers were supported by good evidence, whereas 40 recommendations were aided by good expert consensus. While implementing the current guidelines would be of help to achieve the objective, we need further clinical research to make our shared decision making to be more evidence-based. It would be essential to construct a system that enables us to distribute new findings promptly so that physicians caring for patients with thyroid tumors can catch up with state-of-the-art and latest knowledge.

Japan is in a time of significant change in the medical specialty system. We, endocrine surgeons, have pride in pursuing our practice as professionals that should be certified as a subspecialty.

Slide 1



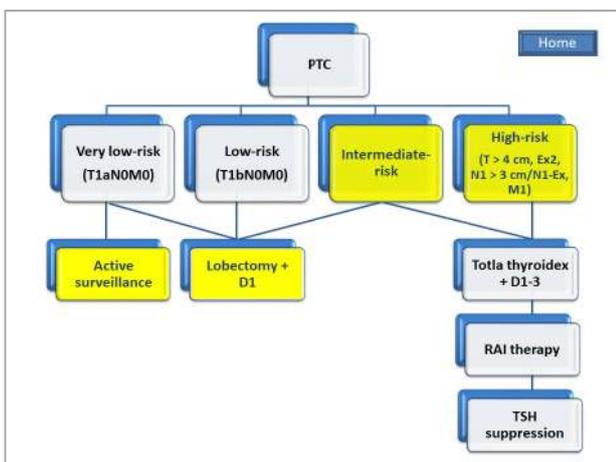
Slide2



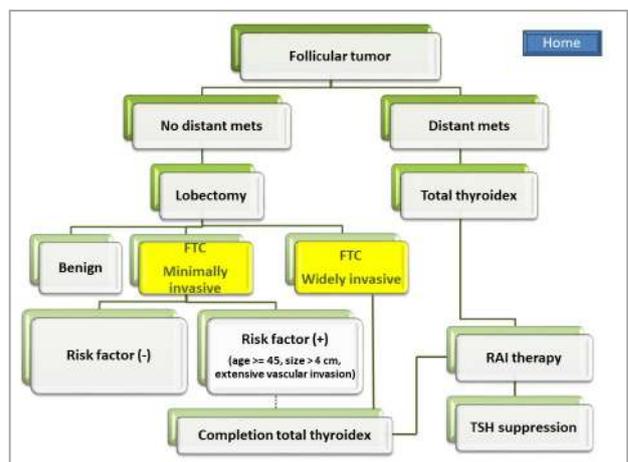
Slide3



Slide4



Slide5



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## 3.2 Active Surveillance of low-risk papillary microcarcinoma of the thyroid: cumulative evidence and new knowledge

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**MIYAUCHI Akira, MD, PhD**

President and COO, Department of Surgery,  
Kuma Hospital

The incidence of small papillary thyroid carcinoma (PTC) is increasing rapidly worldwide, without associated increase in mortality. Thus, many researchers suggested overdiagnosis and overtreatment for small PTC. Because the incidences of latent thyroid cancer on autopsy<sup>†</sup> studies were more than 1,000 times the prevalence of clinical thyroid cancer, we hypothesized that most papillary microcarcinomas (PMC) stay small. In 1993, we initiated active surveillance of low-risk PMC at Kuma Hospital. In 1995, Cancer Institute Hospital in Tokyo started a similar trial. These Japanese trials clarified the oncological safety of the management. During active surveillance only 8.0% of patients showed tumor enlargement  $\geq 3$  mm and only 3.8% of patients showed lymph node metastasis at 10 years. These patients were successfully treated with rescue surgery. None of the patients developed distant metastasis or died of thyroid cancer. We also clarified the superiority of active surveillance compared with immediate surgery in the incidences of unfavorable events and also in medical cost.

Active surveillance was adopted in the guidelines of Japan Association of Endocrine Surgeons in 2010 and 2018 and in the 2015 American Thyroid Association management guidelines.

Accumulation of data on active surveillance revealed the following: In contrast to clinical papillary carcinoma, PMC in young patients ( $\leq 40$  years) is more likely to progress than in older patients. Using the age-decade-specific disease progression rate, we were able

to estimate lifetime probability of disease progression, which markedly decreased with age at presentation. Kinetic analysis of tumor volume during active surveillance revealed moderate growth, slow growth, stable disease, and shrinkage in 3%, 22%, 57%, and 17% of the tumors, respectively.

In 2018, we conducted a questionnaire survey for 1,178 member institutions of the Japan Association of Endocrine Surgery regarding treatment policy for low-risk thyroid microcarcinoma. Responses were received from 134 institutions (11% response rate), wherein 72.4% of the thyroid cancer cases were operated on. The results showed 96.2% of respondents had suggested both active surveillance and surgery for microcarcinoma: of these, 26.1% had presented both options and recommended surgery; 38.8% presented both options and left the decision to patients; and 31.3% presented both options and recommended active surveillance. It was also shown that, of 576 patients who were diagnosed with low-risk thyroid microcarcinoma in the most recent three months at 134 respondent institutions, 310 (53.8%) patients were currently under active surveillance.

In summary, active surveillance of PMC is safe and beneficial for patients and also for the society. Thus, it should be the first line management of PMC.

Slide 1

### Low-risk PMC & High-risk PMC

**High-risk PMC:** having one or more of the followings  
 Lymph node metastases or distant metastases (very rare)  
 Extrathyroid extension  
 High grade cytology (very rare)  
 Located near the RLN or attaching the trachea

**Low-risk PMC:** having none of the above features  
 Did not exclude patients with family history for PTC  
 patients with multiple foci



Slide 2

### Observation without Immediate Surgery (Active Surveillance) for Low-risk PMC

Miyauchi proposed an observation without immediate surgery clinical trial at a doctors' meeting of Kuma Hospital in 1993.

- Made diagnosis with US-guided FNA (PPV is 98%).
- For high-risk PMCs, we recommended surgery.
- For low-risk PMCs, we proposed observation and surgery, and patients chose one of them.
- Followed patients who chose observation with US 6 months later and once a year thereafter.
- Recommended surgery if the tumor showed increase in size by 3 mm or more, or if novel lymph node metastases appeared.



Slide 3

### Unfavorable events following active surveillance and immediate surgery

Unfavorable events	Intended Management		p-value
	Active surveillance 1,179 pts	Immediate surgery 974 pts	
Temporary VCP (%)	7 (0.6%)	40 (4.1%)	<0.0001
Permanent VCP (%)	0 (0%)	2 (0.2%)	n.s.
Temporary Hypo-PT (%)	33 (2.8%)	163 (16.7%)	<0.0001
Permanent Hypo-PT (%)	1 (0.08%)	16 (1.6%)	<0.0001
On L-thyroxine (%)	244 (20.7%)	644 (66.1%)	<0.0001
Surgical Scar	94 (8.0%)	974 (100%)	<0.0001

Oda H, Miyauchi A, et al. Thyroid. 26:150-155, 2016



Slide 4

### Disease progression rate at 10 year AS

Miyauchi A, et al: Surgery. 2018;163(1):48-52.



Slide 5

### Doubling Rates in Individual Patients

A. Miyauchi et al., Surgery 165: 25-30, 2019.

Slide 6

### Current Management Policy for Low-risk PMCs among JAES Member Institutes

Sugitani I, Ito Y, Miyauchi A et al., Thyroid. Epub ahead of printing, 2019.



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## 3.3 Current status of thyroid cancer treatment in overseas countries

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### **Peter ANGELOS, MD, PhD, FACS**

Linda Kohler Anderson Professor of Surgery,  
Vice Chairman for Ethics, Professional  
Development, and Wellness,  
Chief of Endocrine Surgery, Department of  
Surgery, The University of Chicago

Incidence of thyroid cancer is increasing worldwide. In a review of 60 published studies, thyroid cancer increased in almost all the studies. The vast majority of thyroid cancers are well-differentiated carcinoma. They have excellent prognoses and most patients have a normal life expectancy (Slide 1).

Traditional treatment for well-differentiated thyroid cancer includes surgery (total thyroidectomy or thyroid lobectomy), removal of lymph nodes close to the thyroid gland (central compartment lymph nodes), and radioactive iodine therapy to kill residual thyroid cells or thyroid cancer cells. However, it has not been clearly established which of these three treatment modalities is necessary to achieve the best prognosis (Slide 2, 3).

While these three treatment procedures are still widely used, there do exist somewhat different approaches to thyroid cancer treatment in different parts of the world. In this presentation, the published guidelines and recommendations from the US and multiple European countries (including Britain, France, Italy, and Spain) were explored and differences in treatment strategies were compared.

Japan has pioneered active surveillance of papillary microcarcinomas and the 2015 American Thyroid Association (ATA) Guidelines encourages fewer patients to have total thyroidectomy and concomitant radioactive iodine therapy (Slide 4).

European guidelines generally agree with the ATA Guidelines but there are various opinions around the world about what is the optimal treatment. Even in Asia, different approaches are taken: In Taiwan, increasingly more patients with thyroid cancer were treated with partial thyroidectomy between 1998 and 2011, while, in China, 95% of 552 patients treated in Liaocheng People's Hospital in 2017 were treated with total thyroidectomy with central compartment lymph node dissection for tumors less than 2 cm.

Despite guidelines from US and European countries tending to recommend smaller operations, that is, more thyroid lobectomy and less radioactive iodine, such restraint does not seem to extend to actual treatment of patients. In the US, 44,537 patients had surgery for papillary thyroid cancer between 2000 and 2014. The proportion having total thyroidectomy increased from 78.16% in 2000 to 85.67% in 2014, while the proportion having thyroid lobectomy decreased from 16.62% in 2000 to 11.41% in 2014 (Slide 5).

My conclusions are summarized in Slide 6. Not only surgeons but also patients appear to still believe that more extensive operations lead to better outcomes. This assumption is very difficult to change. In my practice, patients ask me to do total thyroidectomy so they won't have to think about the disease if the whole thyroid is taken out. The truth is that they continue to require follow-up and surveillance even though their prognosis is excellent.

Slide 1

**Well-differentiated thyroid cancer (WDTC)**

- Most common thyroid cancer world wide (papillary thyroid cancer [PTC] and follicular thyroid cancer [FTC])
- PTC and FTC make up 95% of thyroid cancers
- Incidence of thyroid cancer is increasing worldwide
- In a review of 60 published studies, thyroid cancer increased in almost all the studies

Systematic Review of Trends in the Incidence Rates of Thyroid Cancer  
Joseph J. Wittshies<sup>1</sup>, Thomas M. Drake<sup>1</sup>, Lesley Uttley<sup>2</sup> and Sabapathy P. Balasubramanian<sup>3</sup>

*Thyroid* 2016 

Slide 2

**We do not know which of the 3 primary treatment modalities is necessary to achieve the excellent prognosis**

- Movement internationally to do less
- Smaller operations (or no operations at all)
- Take out only part of the thyroid gland
- Take out fewer lymph nodes
- Avoid radioactive iodine if possible

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Slide 3

**It is difficult to know which treatments are not necessary without eliminating treatments and following patients for many years**

- Japan has pioneered active surveillance of papillary microcarcinomas
- US has been slow to adopt active surveillance but ATA guidelines have been enthusiastic about doing smaller operations and giving fewer patients radioactive iodine

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Slide 4

**2015 American Thyroid Association Guidelines**

- Encourage fewer patients to have total thyroidectomy
- As a result, fewer patients will be able to receive radioactive iodine
- How does the rest of the world view these changes?

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Slide 5

**Despite ATA Guidelines suggesting smaller operations, many US patients still have total thyroidectomies**

- Study of US SEER database between 2000 and 2014, 44,537 patients had surgery for papillary thyroid cancer
- Proportion having total thyroidectomy increased from 78.16% in 2000 to 85.67% in 2014
- Proportion having thyroid lobectomy decreased from 16.62% in 2000 to 11.41% in 2014

Changes in total thyroidectomy versus thyroid lobectomy for papillary thyroid cancer during the past 15 years  
Benjamin C. James, MD, MS<sup>1,2</sup>, Lavinia Timolina, PhD<sup>3</sup>, Ryan Graham, BS<sup>1</sup>, Peter Angelos, MD, PhD, FACS<sup>4</sup>, David A. Haggstrom, MD, MAS<sup>7,8</sup>

*Surgery* 2019

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Slide 6

**Conclusions**

- Uniformly, thyroid cancer treatment guidelines encourage lobectomy rather than total thyroidectomy
- For tumors between 1 and 4 cm, lobectomy appears adequate treatment, but “patient preference” is important
- Many patients in US and elsewhere in the world continue to have total thyroidectomy even when the data does not suggest that it is necessary
- There is often a significant lag from recommendations to clinical practice
- Many surgeons and patients appear to still believe that more extensive operations lead to better outcomes

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## The Proceedings of Part I Discussion 2

**Chair: KITAOKA Masafumi (IMS Miyoshi General Hospital)**

**SUZUKI Gen (International University of Health and Welfare Clinic)**



**Discussant: SUZUKI Shinichi (Fukushima Medical University)**

**OKAMOTO Takahiro (Tokyo Women's Medical University)**

**MIYAUCHI Akira (Kuma Hospital)**

**Peter ANGELOS (The University of Chicago)**



Dr. KITAOKA Masafumi Dr. SUZUKI Gen

On the morning of our second day, presentations of the latter half of "Current status of thyroid examination and thyroid treatment" were given. In the keynote lecture, "Surgical treatment of pediatric thyroid cancer in Japan," Dr. Suzuki Shinichi overviewed the clinical characteristics of thyroid cancer diagnosed and treated mainly in Fukushima Prefecture after the earthquake and nuclear accident, and results of treatment performed according to Japanese guidelines.

Following the keynote lecture, Session 3 was held with theme of "Current progress in the treatment of thyroid cancer." Dr. Okamoto Takahiro gave a presentation titled, "Clinical practice guidelines for thyroid cancer in Japan," and outlined the current contents of the Japanese guidelines for thyroid cancer treatment from his standpoint as chair of the guidelines committee. Dr. Miyauchi Akira showed the clinical characteristics and benefits of active surveillance as a new option for the treatment of papillary thyroid microcarcinoma. Dr. Peter Angelos, a thyroid specialist in the United States, introduced the current status of thyroid cancer treatment together with the guidelines from countries around the world.

At the discussion session, questions related to these presentations were asked.



Dr. SUZUKI Shinichi

First, among questions received in advance, one concerned the difference between the number of patients diagnosed as malignant or suspected malignant by the Fukushima Health Management Survey (thyroid examination) and the number of patients who actually underwent surgery. Dr. Suzuki Shinichi explained that those diagnosed as malignant or suspected of malignancy by cytology first seek consultation about surgery before proceeding to surgery, so it is not uncommon for surgeries to be counted a year or two after diagnosis.

Subsequently, questions from the floor were introduced, and discussions concerning them were held. With regard to the recurrence rate among 180 cases treated surgically in Fukushima, Dr. Suzuki Shinichi explained that “reoperation” rather than “recurrence” is more appropriate, since hemi-thyroidectomy<sup>†</sup> was common in Fukushima, and that 7 years of data after the disaster showed reoperation rates of 7% after hemi-thyroidectomy and 6% overall, which is quite different from Chernobyl, where the recurrence rate was 20 to 30% even before the nuclear accident. He also mentioned that the survey period in Fukushima was as short as 7 years, so it would be necessary to continue surveillance well into the future.

Related with this issue, there was a question as to why the interventions in Chernobyl or Belarus were different from those in Fukushima. Dr. Suzuki Shinichi explained that this was due to the differences in cases and policies. Specifically, Fukushima has very few low-risk cases, many low-to-medium risk cases, and extremely few high-risk patients, so prognoses for our young people are generally good. Also, unlike Chernobyl, in consideration of the major disadvantages of total thyroidectomy such as the need for life-long medication, Japan has adopted a policy of avoiding total thyroidectomy as much as possible. He added that for thyroid examinees in Fukushima, after consulting with Japanese thyroid specialists, it was decided to recommend total thyroidectomy only to those who really need it.

As to a question of what factors contribute to the increasing number of thyroid cancers diagnosed worldwide, Dr. Miyauchi cited increases in the number of patients in whom thyroid abnormalities were found incidentally through imaging studies ordered for vascular, pulmonary, and other diseases for which patients receive care. He also mentioned that the main factor was improvements in laboratory technique, while there were various theories about other factors. Dr. Angelos said that other causative factors could be chemicals through medical exposure and refractory materials and microorganisms, but they are not fully known.



Dr. MIYAUCHI Akira

With regard to active nonsurgical follow-up (active surveillance), it was asked whether the results of Dr. Miyauchi's research on cancer progression could also be applied to patients in Fukushima, and about the costs of follow-up versus early surgery for young people.

Dr. Miyauchi explained that, comparing the progression of thyroid cancers of 1 cm or less in young patients first consulted in their 20s and subsequently followed up, versus similar lesions in elderly patients, progression rates among young people were clearly higher. So, younger children are presumed to have a high progression rate, though data thus far is insufficient. However, since more than half of patients in their 20s, and 75% of those in their 30s, do not progress to the extent that surgery is required in their lifetime, it is up to each patient's own sense of values to decide on surgery versus follow-up. Dr. Suzuki Shinichi made a supplementary comment that thyroid cancers found and operated on in Fukushima are mainly papillary carcinoma larger than 1 cm and different from what Dr. Miyauchi explained, and these two types should not be confused when considering their long-term prognosis.

Dr. Angelos mentioned that non-surgical follow-up was not being performed in the United States because America lacks a system like Japan's universal health insurance and access to care, which are factors that make follow-up a more attractive option in Japan.



Dr. Peter ANGELOS

Relating to treatment methods, there was a question as to how best to treat thyroid cancer in children and young people. Dr. Suzuki Gen invited opinions of the speakers because the knowledge learned in Fukushima could be applicable to national guidelines.



Dr. OKAMOTO Takahiro

Dr. Okamoto mentioned that the guidelines for the treatment of thyroid cancer presented in this symposium were basically intended for adults, and that guidelines for children would be established in the future, but are still a work-in-progress, as issues pertaining to surgery itself and risk perception are addressed. Dr. Miyauchi suggested that thyroid cancer in Fukushima was found at an earlier stage, and that this experience would be of great value for the treatment of pediatric cancer in the future.

Finally, Dr. Suzuki Gen requested speakers to introduce molecular target therapy<sup>1</sup> which is attracting recent attention as an alternative to radioactive iodine therapy<sup>2</sup>. Dr. Okamoto explained three categories<sup>3</sup> of radioactive iodine therapy in Japanese guidelines, and the current situation in Japan where treatment was limited in part by the number of appropriate hospital rooms.



Dr. Miyauchi and Dr. Suzuki Shinichi explained that, at present, there were two drugs for molecular targeted therapy in Japan, but because of extremely strong side effects, they were only prescribed to patients who were refractory to radioactive iodine therapy and in an immediately life-threatening state; also, such therapy requires a high degree of specialized knowledge to proceed.

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<sup>1</sup> Targeted molecular therapy uses drugs that specifically bind to proteins needed by cancerous cells in order to grow and spread, in contrast to general anticancer drugs that attack normal cells along with cancerous cells. Such therapy may be useful when thyroid cancer is refractory to radioactive iodine, and in case of fast-growing cancers.

<sup>2</sup> Radioactive iodine therapy can be used to prevent recurrence or to treat distant metastases in conjunction with surgical excision. Thyroid tissue (including cancerous cells that metastasize from the thyroid gland) readily take up iodine, stable or radioactive, so therapeutic doses of radioactive iodine will concentrate in thyroid tissue and kill cancer cells.

<sup>3</sup> Refer to “The revised clinical practice guidelines on the management of thyroid tumors by the Japan Associations of Endocrine Surgeons: Core questions and recommendations for treatments of thyroid cancer” P.22 (Table 11 “Radioactive iodine: classifications and definitions”) (URL) [https://www.jstage.jst.go.jp/article/endocrj/advpub/0/advpub\\_EJ20-0025/\\_pdf/-char/en](https://www.jstage.jst.go.jp/article/endocrj/advpub/0/advpub_EJ20-0025/_pdf/-char/en)

## Part II

# Mental health of Fukushima people and care for them: what should we do now?

## Keynote Lecture 2

### Session 4

## Mental health of Fukushima evacuees and its recovery

### Keynote Lecture 2

Chair: MAEDA Masaharu (Fukushima Medical University)

#### Advances in managing psychological effects of disasters

Richard A. BRYANT (University of New South Wales, Australia)

### Session 4

Chair: YABE Hirooki, MD, PhD

Professor and Chair, Department of Neuropsychiatry, School of Medicines, Fukushima Medical University



Dr. Yabe Hirooki received his MD from Hirosaki University School of Medicine in 1983 and his PhD in neuropsychiatry from its graduate course in 1988. He worked as assistant professor from 1988 to 1994 and visiting researcher in the Cognitive Brain Research Unit (CBRU), University of Helsinki, from 1994 to 1995. He worked as lecturer in Department of Neuropsychiatry, Hirosaki University School of Medicine, from 1996 to 2003. He received the Okazaki Award of the 6th International Evoked Potential Symposium in 1998. He worked as assistant professor from 2003 to 2008 in the Department of Neuropsychiatry, Hirosaki University (and became associate professor in 2007). Dr. Yabe joined FMU in 2008 as associate professor and remained in that position until 2013. He directed the Mental Health and Lifestyle Survey at the Radiation Medical Science Center for the Fukushima Health Management Survey, FMU, from 2012 to 2014. He has served as professor and chairman in Department of Neuropsychiatry, FMU, since 2013 and as director of the Center of Brain and Nervous System Disorders since 2018. Outside the university, he has served as president of the Fukushima Mental Health Welfare Association including the Fukushima Center for Disaster Mental Health since 2013, director of the Japanese Society of Psychiatry and Neurology since 2019, director of the Japanese Society of Clinical Neurophysiology since 2012, president of the Society of Fukushima Psychiatry since 2012, and associate editor in Biological Psychology (Elsevier) since 2001.

#### 4.1 Fukushima disaster and its psychosocial effects: Current situation and mental health care

MAEDA Masaharu (Fukushima Medical University)

#### 4.2 The long-term impact of man-made disasters on community mental health and resilience

Douglas W. WALKER (Mercy Family Center, USA)

#### 4.3 Psychological effects on children in Fukushima and their care

UCHIYAMA Tokio (Taisho University)

#### 4.4 Learning from practice in the Fukushima Center for Disaster Mental Health: Current issues and tasks

WATABE Ikuko (Fukushima Center for Disaster Mental Health)

#### 4.5 The current mental health issues among evacuees outside Fukushima Prefecture

NAKAJIMA Satomi (Musashino University)

## Advances in managing psychological effects of disasters



**Richard A. BRYANT, PhD**

Scientia Professor, School of Psychology,  
University of New South Wales

Disasters cause higher prevalence rates of mental illnesses, such as PTSD<sup>†</sup>, depression, anxiety disorders, grief, substance abuse, and suicide. PTSD is considered as the signature psychological injury after disaster, but depression and anxiety disorders are also very common. It is important to understand that these symptoms are fluid and shift between diagnostic categories over time, depending on a variety of factors such as financial issues, illness, and family status (Slide 1).

There are common predictors of mental health problems after disaster. One of the biggest predictors is the appraisals people make on the disaster. After the nuclear accident of 2011, the fear of radiation, not the actual radiation levels that can be objectively measured, was a strong predictor. However, these appraisals can be modified. Another major predictor is economic hardship. A study supports this by showing that the psychological impact of a disaster is far greater in low- and middle-income countries than well-developed countries. Other predictors include sleep problems and lack of social support (Slide 2).

As a general trend, the prevalence rate of PTSD tends to reduce over time. However, depression, anxiety, sleep problems and suicide tend to persist and can even increase, depending on the conditions. Therefore, we have been trying to make the governments realize this and provide mental health interventions<sup>†</sup> with a long-term perspective. The need for the long-term perspective is clear from the study we conducted as a follow up to another study conducted immediately

after a major wildfire in Australia in 1983. What we found out was that children who were not with their parents at the time of the disaster tend to have mental health problems even after 30 years (Slide 3).

Most past studies on disaster mental health have focused on individuals and not much has been studied on support and intervention on a community level. We tried to elucidate this by using an approach called social network analysis and assessed how individuals connect with each other in their communities from a mental health perspective after the wildfire of 2009, the worst natural disaster in Australia on record. The main results were that depressed people tended to selectively connect with other depressed people and that PTSD is contagious and people who were mixing with those with PTSD get more depressed (Slide 4). This highlights that individual support is not sufficient and assessment and intervention on a community level are necessary in large disasters.

The major problem after disasters, however, is that most people do not seek mental support because it is considered as a sign of weakness. One solution is to develop programs that focus on skill building and not package them as mental health programs. I helped the WHO to develop a program called Problem Management Plus (Slide 5). Another way to overcome stigma is digital solutions. There are a lot of apps being developed, which people can access in an anonymous manner and on their own pace and help them improve their resilience (Slides 6).

Responses to disasters tend to be reactionary. However, mental problems are not limited to post-disaster situations and skills that are needed for mental health support after disaster do not differ from those needed for any other day of the week. Therefore, it is important to train the workforce and keep them adequately skilled so that they can function if and when a disaster occurs. At the same time, we need to think about how we can increase people's demand for mental health by removing barriers due to stigma.

Slide 1

## The Mental Health Costs of Disasters

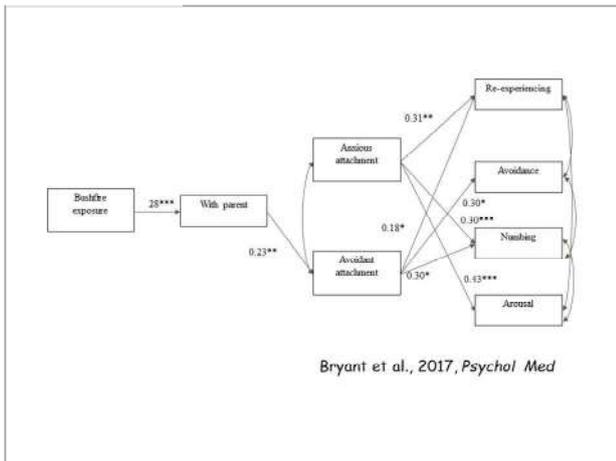
- PTSD
- Depression\*
- Anxiety\*
- Grief
- Substance Abuse
- Suicide

Slide 2

## Predictors

- Direct exposure
- Months of work
- Fear of radiation (including reproduction)
- Economic hardship
- Sleep problems
- Poor social support
- Resettlement issues

Slide 3



Slide 4

## Network results

Important patterns		Depression	PTSD
Sending ties to others			
Receiving ties from others			
Selection/Contagion???			
Brokerage positions???			
Indirect reciprocity (3-cycle)???			

Slide 5

## Problem Management Plus (PM+)

- For whom
  - Adults, **transdiagnostic (stress, depression, anxiety)**
- What
  - Problem-solving counselling (**problem management**) plus behavioural strategies stress management, behavioural activation, strengthening social supports
- Formats
  - 5 sessions face-to-face



Slide 6

## Digital Solutions

- Outreach can be achieved with digital programs
- Apps available with proven efficacy to reduce common mental health problems
- Allows anonymity, self-paced, low-cost
- Meta-analyses indicate these can be as effective as face-to-face programs

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## 4.1 Fukushima disaster and its psychosocial effects: Current situation and mental health care

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### **MAEDA Masaharu, MD, PhD**

Professor and Chair, Department of Disaster Psychiatry, School of Medicine, Fukushima Medical University; Director of the Department of Health Survey Personal Support and Director of the Office of Mental Health and Lifestyle Survey and Care Radiation Medical Science Center for the Fukushima Health Management Survey

Eight years have passed since the Fukushima disaster occurred. While the reconstruction, including decontamination, progressed gradually and many evacuated municipal governments finally returned to their original communities, there are still over 40,000 people evacuated in or out of Fukushima. Such a massive and prolonged evacuation has never been seen in the post-WW2 history of disasters, and as a result, various types of physical and/or psychological problems such as depression and traumatic symptoms have become prevalent among the affected people (Slide 1). Fukushima Medical University has been conducting major mental health surveys every year for evacuees and trying to improve their mental health conditions in cooperation with available local care resources, including municipal governments. In the symposium, mental health situations of the affected people and the care for them were reviewed, and moreover, the current tasks that we should tackle were discussed.

Our survey revealed that, while the prevalence rates of adult evacuees with probable depression or anxiety disorders decreased over the first 4 years, these in the recent 3 years remained unchanged and still higher than that of the general population in Japan (Slide 2). In addition, the prevalence rate among adult evacuees relocating outside Fukushima Prefecture was

higher than that among those staying in Fukushima (Slide 3), suggesting high psychological distress due to difficulties adjusting to unfamiliar environments. Also, interestingly, surveys using K6<sup>†</sup> or PCL<sup>†</sup> methods showed that young adults and adolescents were more likely to have higher psychological distress, which is different from findings of past studies on survivors' mental health in natural disasters (Slide 4).

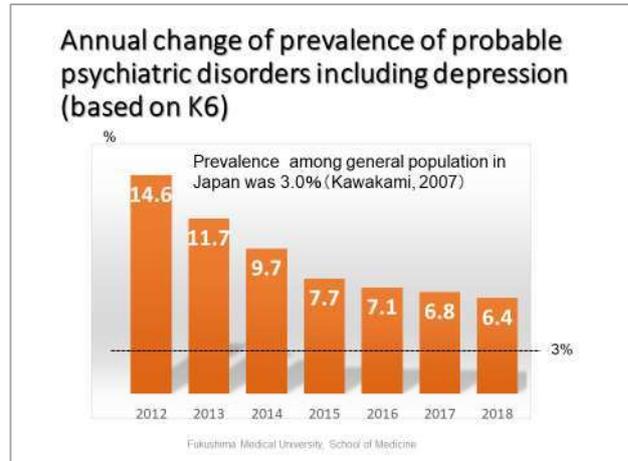
These high prevalence rates of affected people at risk of depression could lead to more self-destructive behaviors such as alcohol abuse or even suicide. The Reconstruction Agency reported that the total number of "disaster-related suicides," identified officially by the Japanese government, reached more than 100 people, exceeding the sum of those in the other two prefectures (Miyagi and Iwate), which were affected more greatly by tsunami (Slide 5).

Furthermore, the results of our survey revealed concerns over radiation health effects including genetic ones among affected people (Slide 6), which could aggravate the public stigma. Surprisingly, such deep-rooted concerns were more strongly associated with depressive symptoms than serious loss experience such as bereavement. Along with countermeasures against stigma towards psychiatric disorders as well as radiation effects, efficient psychological care, including adequate risk communication, will be needed for longer-term period into the future.

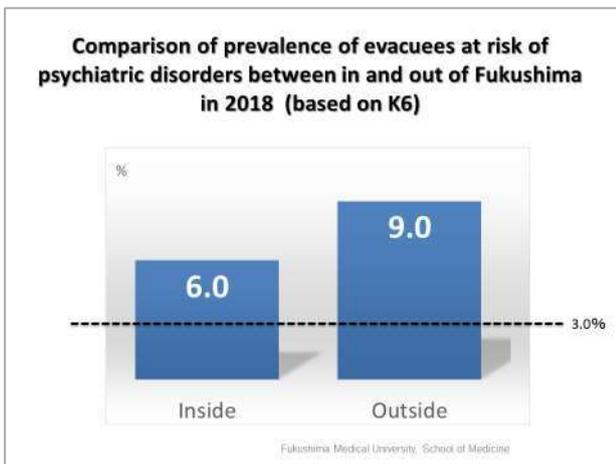
Slide 1



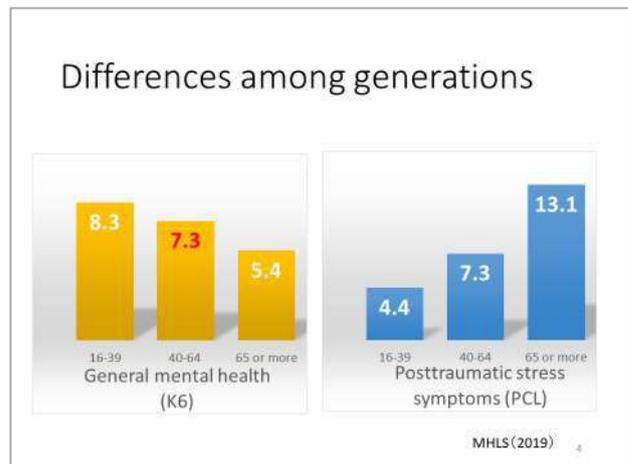
Slide 2



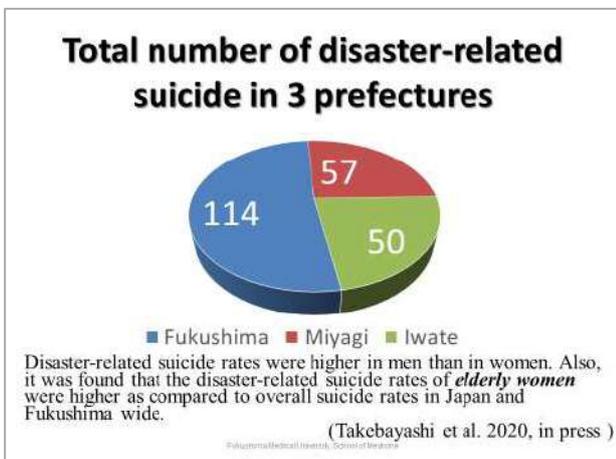
Slide 3



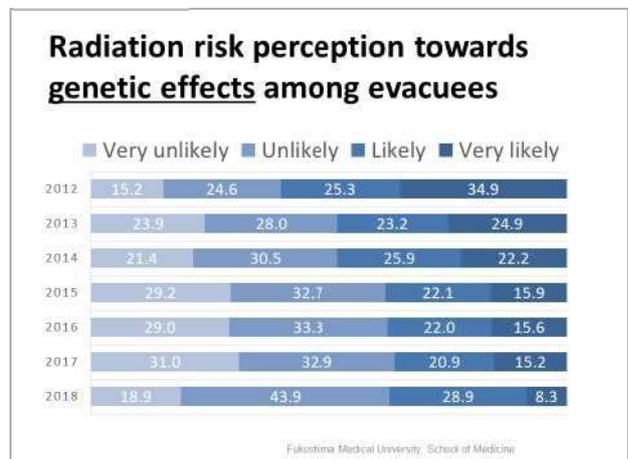
Slide 4



Slide 5



Slide 6



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## 4.2 The long-term impact of man-made disasters on community mental health and resilience

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**Douglas W. WALKER, PhD**  
Chief Programs Director, Mercy Family Center

Man-made and natural disasters both share the common theme of uniqueness. Each type of disaster, or a combination of the two like the Tōhoku earthquake, the resultant tsunamis and the level 7 meltdown at the Fukushima Daiichi Nuclear Power Plant have their own “signature” which makes each unique and difficult to compare. The unique signatures of man-made and natural disasters also make it difficult to compare one to another taking into account factors such as the location of the event, time and duration, magnitude (e.g., number of persons injured/dead, occurring in urban or city setting), cause, and level of exposure to witnesses/survivors.

Although the unique signatures of disasters create challenges in preparation, response, short and long-term recovery, the field of disaster mental health has identified five empirically supported intervention<sup>†</sup> principles which can guide mental health agencies in forming appropriate responses based on the uniqueness of the disaster and the complexities of the culture and communities impacted. Safety, calming, connectedness, self and community efficacy, and hope make up the five principles. Safety refers to establishing an emotional and/or physical sense of safety. Calming is the ability for an individual to manage their emotions and arousal state through skills like meditation or slow breathing. Connectedness is the important principle of being connected to other persons. Self and community efficacy is the belief that a person or community has some agency, or control, over their recovery. Hope is the idea that things will eventually be better, and that

individuals, families and communities will eventually recover fully from the disaster (Slide 2).

Information regarding the disaster and recovery, teaching skills for individuals to care for their own psychological well-being and supporting peer-to-peer support (rebuilding a sense of community) should be priorities after disasters. It is believed that if these are provided to communities after disasters, the need for traditional mental health services (outpatient therapy and psychiatric medicine) will be reduced significantly. Skills for Psychological Recovery (SPR) is an evidence-informed intervention that is intended to foster long-term adaptive coping in disaster survivors who are exhibiting moderate levels of distress, by offering simplified, brief application of skills that are commonly related to improved recovery in post-disaster/emergency settings. SPR teaches skills that support the five principles of safety, calming, connectedness, self and community efficacy and hope. SPR has been used around the world to help communities recover from disasters (Slides 3, 4).

In my experience as a Clinical Psychologist assisting communities in responding to man-made and natural disasters, I believe that creating a sense of community (connectedness), teaching self-care skills (calming), and keeping individuals informed in the short- and long-term recovery phases after disasters (sense of safety and control) are the priorities that NGOs, governments and other agencies responsible for mental health and wellness (Slides 5, 6). These can be achieved through organizing social gatherings where people come together to share meals, learn new skills and information about recovery, and support each other throughout the months and years after a major disaster.

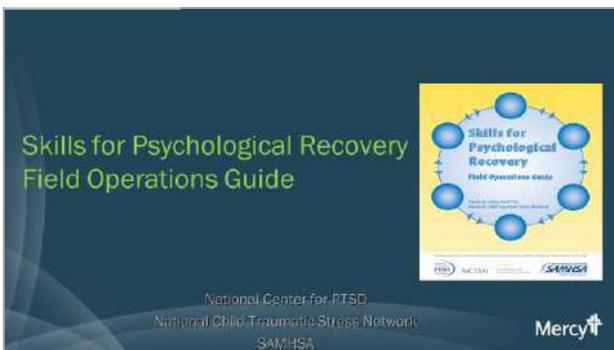
Slide 1



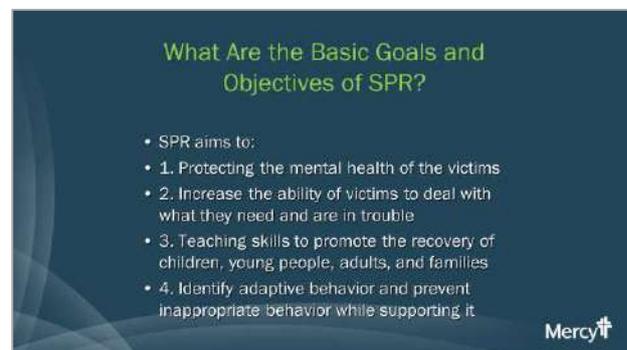
Slide 2



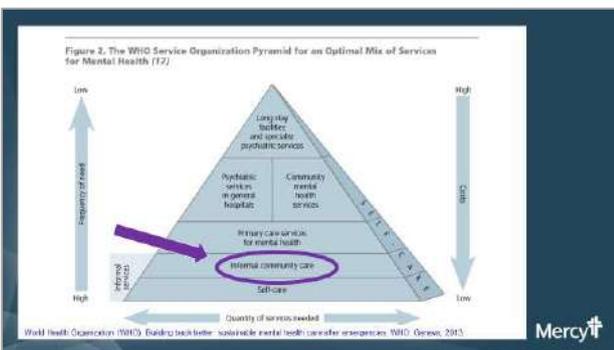
Slide 3



Slide 4



Slide 5



Slide 6



Slide 7



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## 4.3 Psychological effects on children in Fukushima and their care

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### **UCHIYAMA Tokio, MD, PhD**

Professor, Department of Clinical Psychology, Faculty of Psychology and Sociology, Taisho University; Director, Yokohama Psycho-Developmental Clinic; Specially Appointed Professor, Aizu Medical Center, Fukushima Medical University; Specially Appointed Professor, Child Mental Health Care Center, Fukushima University

In the coastal area of Fukushima Prefecture, many parents and children evacuated immediately after the Great East Japan Earthquake of 2011 and moved into temporary housing. After that, the number of parents and children returning home gradually increased, but, due to such a large environmental change, there was a concern about changes in the development and behavior of children. Therefore, we studied their secular changes using the data of 3.5-year-old infant health checkup in coastal City A, which was restarted in June of the same year.

In this survey, we analyzed the health checkup data of 2,777 children before and after the disaster from 2010 to 2018, and examined aspects of child development, parenting, emotions, as well as aspects of parents' mental health. We used a questionnaire consisting of 222 items and a simple questionnaire on the development of children which was compiled in cooperation with community health nurses. The number of children analyzed was 555 in the year before the disaster (2010), and it reduced to 207 in 2011 due to evacuation; thereafter it gradually increased to 360 in 2018 (Slide 1).

In regard to the increase in obese children, analysis showed that the average weight increased from 14.6 kg in 2010 to 15.1 kg in 2011, but then it returned to almost the same level as before, which suggests this trend could be transient (Slide 2).

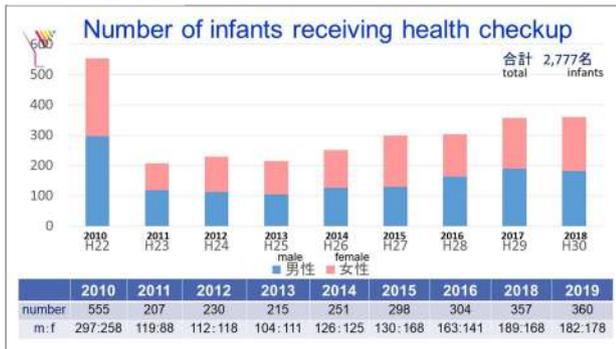
Regarding "behaviors of concern among children," it was said on SNS that the number of children with autistic tendencies, such as poor eye contact, was increasing soon after the earthquake. According to the answers from public health nurses, to my surprise, the ratio of "poor eye contact" in 2011 more than doubled to 11.1% from 4.0% in the previous year, but the rate has returned to the original level now (Slide 3). Also, the number of parents who responded "No" to the question "Are you having fun every day?" has increased after the earthquake and remains high, which indicates further attention is necessary (Slide 4).

On the other hand, "hyperactivity / impulsiveness" and "cannot say fullname" also increased after the earthquake, but, unlike "poor eye contact," they remain high while fluctuating (Slide 3). They once declined in 2016 and appeared to come back to pre-disaster levels, but increased again from 2017 to 2018. In particular, the surveys conducted so far indicate that the cause of "cannot say fullname" has no relation with discipline, such as use of TV/game/smartphone, or 3 daily meals, and no significant relations with carelessness/hyperactivity or mental health of parents. Therefore, the cause of these problems are yet to be identified and further study is necessary.

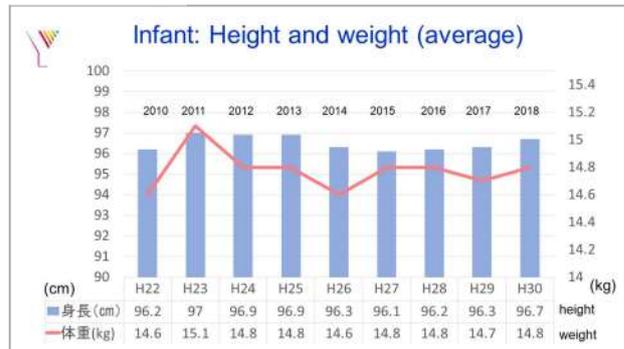
In addition, in 2019, we conducted a follow-up survey on children and parents of second-grade elementary school students (0 to 1 year old at the time of the earthquake) and fifth graders (3 to 4 years old then) of City A. Results showed that the emotional traits of children, such as depression and anxiety, had a strong relationship with the parents' mentality. Also, the parents' own mental health was associated with times of evacuation and the support of family members, school teachers, and friends, which indicated that the necessity of "mental health" support for parents was high (Slides 5, 6).

In summary, according to each analysis related to the 3.5-year-old health checkup, effects of the earthquake remain in some areas of child development, the mentality of children is closely related to the mental health of parents, and some parents are in the need of support. The support for parents has to be continuously provided with a good understanding of what they need.

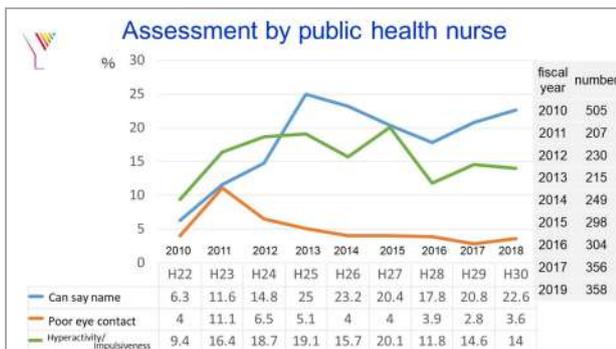
Slide 1



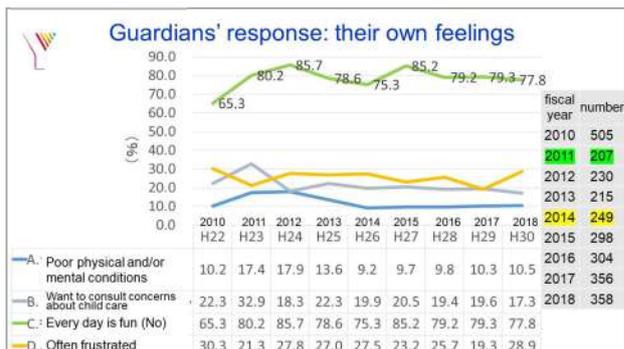
Slide 2



Slide 3



Slide 4



Slide 5

### Are there relations between guardians' mental state and support they receive?

- Guardians of the 2nd graders of elementary school.....
  - The frequency of evacuation is correlated with guardians' high K6 score (strong depression and anxiety)
  - "Family support (insufficient)" is correlated with "general health", "vitality", "social functioning", "role (emotional)", "mental health"
- Guardians of the 5th graders at elementary school ...
  - "Family support (insufficient)" is correlated with "social functioning"
  - "Support from teachers (insufficient)" is correlated with "role (physical)"
  - "Support from friends of caregiver (mother) (insufficient)" is correlated with "mental health"

Slide 6

### Condition of parents and their children (2nd graders, 5th graders)

- 2nd graders
  - Children: Overall scores do not differ significantly from the Japanese average
    - Children in high needs for "emotion" are slightly higher than general
    - Problems seen at 3-1/2-year-old health checkups are becoming less noticeable?
  - Guardians: High support needs for "sense of well-being" and "mental health"
    - Possibility of having continuous stress from the time their children were smaller
- 5th graders
  - Children: Compared with the national average, support needs may be higher for "hyperactivity" and "peer relationship"
  - Guardians: High support needs for "mental health"

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## 4.4 Learning from practice in the Fukushima Center for Disaster Mental Health: Current issues and tasks

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### **WATABE Ikuko**

Manager, Operations Department, Fukushima Center for Disaster Mental Health, Fukushima Association for Mental Health and Welfare

The Great East Japan Earthquake, which struck on March 11, 2011, had enormous impacts on the activities of municipal public health nurses. Especially after TEPCO's Fukushima Daiichi Nuclear Power Station accident, we had to deal with unprecedented issues related to the radiation disaster. This talk addressed what I had learned as a municipal public health nurse from our response activities. At the time of the accident, while working as a public nurse in one of the heavily affected municipalities, I, too, experienced the confusion and fear that local residents were feeling. This continues to impact my work as a support provider even now. This presentation wove personal experiences after the accident into a narrative about current activities of the Fukushima Center for Disaster Mental Health as we face various new and ongoing challenges.

(First half) As a public health nurse of a disaster-stricken local government, I learned it would be necessary to establish a work scheme with relevant organizations to cope with disasters. Since I experienced the difficulty of passing administrative information to disaster-vulnerable residents at the time of disaster, I advocated the necessity of developing disaster tolerance within communities. I also talked about the importance of mental care for the staff members who support residents.

(Second half) I explained about the foundational activities of the Fukushima Center for Disaster Mental Health established after the disaster and consultation

support by its multi-disciplinary team, which characterizes the Center, and its request route for consultations based on its activity concept chart.

I also reported that among the residents who require support, the young generation is increasing in number, that the consultation supports are provided mainly by visiting or by phone, and that the places of consultation have shifted from temporary houses to permanent residences or new public housing for returning evacuees.

Lastly, I talked about the findings from my visits last year to 13 municipalities designated by the Act on Special Measures for Nuclear Evacuees. Through these visits, I found out that there were differences in the returning situation of residents depending on when their evacuation orders were lifted, and that the returnees were mostly elderly and many were living alone.

In addition, it also became evident that some people have begun complaining of PTSD<sup>†</sup> symptoms and anxiety recently, and that the number of problems among the child-raising generation has increased. As local governments have returned to their original municipalities and staff members are now concentrated at one location, the relational distance between staff members and still-displaced residents became greater.

Under these circumstances, expectations for our Center are high, and issues that need to be considered in the Center include: (1) support for mothers, children, and adolescents, (2) support for evacuees who moved out from their original towns, (3) support for social resource development for municipalities where evacuation orders were lifted, (4) support for supporters, and (5) alcohol and suicide countermeasures. We will continue to work in cooperation with existing organizations.

Slide 1

- March 11
  - 14:46 Great East Japan Earthquake strikes
  - 15:50 7-meter tsunami strikes Soma City
  - 16:36 Declaration of Nuclear Emergency Situation
  - 21:23 Evacuation order issued to residents within 3-km radius
- March 12
  - 5:44 Evacuation order issued to residents within 10-km radius
  - 15:36 Hydrogen explosion from Reactor 1
  - 18:25 Evacuation order issued to residents within 20-km radius
- March 13
  - 8:20 TEPCO notifies the government of "emergency situation"
- March 14
  - 11:01 Hydrogen explosion from Reactor 3
- March 15
  - 6:00 Hydrogen explosion from Reactor 4
  - 6:10 Sound of an explosion from Reactor 2
  - The rain causes a surge in radiation dose in Fukushima City (maximum 25µSv)



計画的避難区域と緊急時避難準備区域

From: Iij.com (April 22, 2012)

Slide 2

## Learning from My Experience as a Public Health Nurse

- Need to build a system for discussing with related organizations on how to collaborate at a time of a disaster and to respond to emergency situation
- The elderly, disabled, and others who are particularly vulnerable to disaster have difficulty obtaining information issued by the government, and require the support of neighbors
- Anxiety about radiation is particularly felt by mothers with children. Need to establish a system for consultation as soon as possible. (Coordinating with expert organizations is essential: Radiation Class for Mothers and Children)
- Important to provide psychological care for workers supporting affected people (those who are directly exposed to complaints and expressions of anger from affected people)

Slide 3

## Fukushima Center for Disaster Mental Health (FCDMH): Overview



■活動拠点

Core Center  
Kanto Regional Center  
東北方面センター  
Aizu Branch Office  
会津出張所  
Core Center  
基幹センター  
県中・県南方面センター  
Kenchu-Kennan Regional Center

Core Center  
基幹センター  
Soma Regional Office  
相馬方面センター  
Futaba Branch Office  
ふたば出張所  
いわき方面センター  
Iwaki Regional Center

The center was set up in February 2012. It began with the core centers(headquarters), six regional centers, and three branch offices. In light of the actual conditions of affected people whom the center supports, it is now operating with the core centers, four regional centers, and two branch offices.

Slide 4

## Interview Survey of 13 Local Municipalities (July 2019)



Slide 5

## Results from Visits to Municipalities

### Residents' housing, etc.

- There are differences in residents' return to their hometowns, depending on when the evacuation order was lifted
- Many of the returnees are elderly and people living alone
- Recently, there are residents who complain of PTSD symptoms and other anxieties.
- There are people relocating in the municipalities as a result of policies to promote inflow of child-rearing generation and to create and rebuild industry
- As a result of the restoration of municipal government functions and consolidation of staff members, municipal offices outside of towns and villages have been downsized or abolished. Municipal government has become less accessible to residents.

Slide 6

## From the Results of Visits to Municipalities

### [Issues That Need to be Considered in the Future]

- Support for mothers with children and for adolescents
- Support for those evacuating to outside municipalities
- Support for resuming home-care services for the disabled and the elderly in areas where the evacuation order was lifted. Support for development of social resources.
- Consultation and mental health care for workers supporting residents
- Countermeasures to prevent alcohol abuse and suicides

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## 4.5 The current mental health issues among evacuees outside Fukushima Prefecture

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### **NAKAJIMA Satomi, MD, PhD**

Professor, Faculty of Human Sciences,  
Graduate School of Human and Social  
Sciences, Musashino University;  
Director, Musashino University Cognitive  
Behavioral Therapy and Research Institute

The Fukushima Daiichi nuclear power station accident caused by the Great East Japan Earthquake led to the evacuation of many people from Fukushima Prefecture. Even 8 years after the earthquake, about 31,000 people are still living outside the prefecture. The Fukushima Health Management Survey reported that higher psychological distress (K6<sup>†</sup> score  $\geq 13$ ) has been observed among those who continued living outside of the prefecture after the incident (17.8%), compared to those who continued living within Fukushima Prefecture (13.8%) (Suzuki et al., 2015). This trend continued in 2017 (the rate of poor mental health state was 9% among evacuees outside Fukushima and 6% among evacuees within Fukushima). The survey conducted by Niigata Prefecture (2016) revealed that many evacuees outside Fukushima had difficulties in daily life and concerns about their health, future, and lack of social support and social capital (Slide 1).

We conducted an interview survey of support organizations for evacuees outside Fukushima (funded by the Ministry of the Environment). The result of the survey showed that the causes of evacuees' communication difficulties within the receiving society were their concerns on possible stigma and discrimination from the original residents, and their conflicting feeling on returning, which makes it difficult for them to have the sense of belonging.

It should be noted that there seems to be an "ambiguous loss" in the background of their internal

conflicts for returning. The concept of ambiguous loss was introduced by Pauline Boss (1972), a family psychologist, and it means "a loss that remains unclear and thus has no closure" (Slide 2). The effects of ambiguous loss include immobilization of individuals by fixation of their inner contents and relationships with others, disturbances in decision-making, isolation from community members and so on.

Currently, the evacuees outside Fukushima still think of their hometown residences as where they are meant to be, but since they know the difficulty of returning, their homes are ambiguously lost for them. This situation differs for each family. Therefore, many people are having difficulties making decisions about returning or resettling in new locations. Such conflicting feelings not only make it difficult for people to move forward but also affects their physical and mental health, often leading to a high level of stress (Slide 3).

Dr. Boss recommends that evacuees should not make clear resolutions if they are experiencing ambiguous loss and, rather, efforts should be toward improving their resilience to make their current daily lives more forward-looking.

It is necessary to continue to support the evacuees outside Fukushima in the future, focusing on creation of their sense of belonging to new locations and making their lives meaningful, while maintaining their connections with their hometowns, increasing social capital and collaboration with regional services (Slide 4).

Slide 1

### Summary of Troubles among the Evacuees Outside Fukushima

- Difficulties of daily life**
  - Financial matters
  - Housing
  - Getting jobs
- Worries about health**
  - Decreased strength
  - Health problems
- Anxiety about future**
  - Unclear prospect
  - Uncertainty regarding future living place
- Lack of social support and social capital**
  - Separation of family members
  - Separation from friends and neighborhood before evacuation
  - Difficulties of adapting to new location

Slide 2

### “Ambiguous Loss”

- Ambiguous Loss (AL) (Boss, P., 1973) is a loss that remains unclear and thus has no closure.
- The loss has no certainty or finality; it can continue for years or a lifetime.
- AL can be physical or psychological.
- AL can be the loss of a beloved person, an object (a house, a farm) or the loss of “your way of life.”
- AL assumes a relationship or attachment to what was lost—your home, your land, your animals, your family, your neighbors, etc.

Slide 3

### Effects of Ambiguous Loss

Psycho social effects	It follows that ...
<ul style="list-style-type: none"> <li>◦ Immobilizes individuals &amp; relationships</li> <li>◦ Confuses decision making for the system</li> <li>◦ Blocks coping</li> <li>◦ Anger and aggressiveness against self or others</li> <li>◦ Self-blame, shame, and hopelessness</li> <li>◦ Marriage and family relationships ruptured and unclear roles</li> <li>◦ Community members are distant</li> <li>◦ Family/community anger and conflict</li> </ul>	<ul style="list-style-type: none"> <li>• Difficulties of making decisions on important issues, such as permanent residence, housing, and employment</li> <li>• Disintegration of family</li> <li>• Difficulties of maintaining good relationships with neighbors</li> <li>• Difficulties of help seeking</li> <li>• Worsening of physical and mental health</li> </ul>

Pauline Boss : Loss, Trauma, and Resilience : Therapeutic Work with Ambiguous Loss, 2006

Slide 4

### Support for “ Ambiguous Loss”

- ◆ Applying of “Both-And Thinking “
- ◆ To look for and build on people’s natural resilience instead of resolving the situation of ambiguous loss

The following matters may be considered ...

- Short and long stay in home town ( the idea of two residences)
- Guarantee of receiving support, information, and communication with home town after transferring resident card
- Facilitating communication with people in evacuation destinations such as through exchange meeting and volunteer activities → Creation of a feeling of belonging and a meaningful life

## The Proceedings of Part II Discussion 3

**Chair: MAEDA Masaharu (Fukushima Medical University)  
UCHIYAMA Tokio (Taisho University)**



**Discussant: Richard A. BRYANT (University of New South Wales, Australia)  
Douglas W. WALKER (Mercy Family Center, USA)  
WATABE Ikuko (Fukushima Center for Disaster Mental Health)  
NAKAJIMA Satomi (Musashino University)**



Dr. UCHIYAMA Tokio Dr. MAEDA Masaharu

On the afternoon of day two, we proceeded to the second part of our symposium, “Mental health of Fukushima people and care for them: what should we do now?” Mental health experts from Japan and abroad gave presentations and exchanged opinions on their efforts and challenges.

Dr. Richard Bryant, a trauma care expert, presented the keynote lecture, “Advances in managing psychological effects of disasters,” with many thought-provoking results from recent research, as follows:

- Among mental health problems after disasters, problems affecting community cohesiveness may lead to prolongation of various psychological reactions that occur among victims and associated stigmas (e.g., disaster victims’ and first responders’ reluctance to seek psychological support).
- To address such social problems, interventions<sup>†</sup> based on individual resilience, digital tools, and other new psychological methods scalable to help many affected people, including brief and transdiagnostic psychological interventions, are considered.
- The inclusion of Prolonged Grief as a diagnosis in WHO’s ICD-11<sup>1</sup> is important when considering care for bereavement reactions.



Dr. Richard A. BRYANT

In Session 4, “Mental health of Fukushima and evacuees and its recovery,” Dr. Maeda Masaharu addressed characteristics and issues of psychosocial impacts of the Fukushima disaster, based on results from the Fukushima Health Management Survey. Dr. Douglas Walker, who has devoted more than 20 years to mental health care as a clinical psychologist in the United States, said that based on his various experiences, victims’ having a favorable sense of connection within the community, and their own active involvement, were effective for restoring mental health.

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<sup>1</sup> Abbreviation of the 11th edition of the International Classification of Diseases by the World Health Organization (WHO). Chapters such as "Sleep / arousal disorders" have been added as diagnostic criteria. Adopted at the WHO General Assembly in May 2019, effective in 2022.

Then, Dr. Uchiyama Tokio, who is also a specialist in developmental disorders, reported that the results of infant health checkups in the coastal area of Fukushima Prefecture showed continuing psychological effects on both parents and children even after eight years since 3.11, hence long-term support is required. Ms. Watabe Ikuko of the Fukushima Center for Disaster Mental Health reported on the current activities and issues at the Center based on her experiences as a community health nurse affected by the disaster. Dr. Nakajima Satomi pointed out that mental health issues of evacuees outside the prefecture have been prolonged and complicated, which was referred to as "ambiguous loss," and that there were specific challenges in supporting them.



Dr. Douglas W. WALKER

The discussion included questions and answers related to these presentations. Many of the questions were about the recovery of mental health among children and young people, mental health support for teachers and schools, measures to address stigma (prejudice) against Fukushima, and anxieties about administration.

With regard to the mental health of young people, a question about the slow recovery of adolescents and those in their 20s compared with elderly was asked. People in this generation are hesitant to ask help from others. Dr. Bryant focused on the suicide rate, and explained the high suicide rate in this generation was caused by not recognizing or acknowledging their psychological issues, and their tendency to not seek specialist services. Ms. Watabe said that consultations on truancy and withdrawal of junior and senior high school students were increasing, and that she had the impression that there were few support organizations for young people.

As countermeasures, Dr. Bryant discussed the importance of having school-based programs to foster social and emotional development of young people, with parental involvement. There was also an opinion that it might be easier for adolescents to get expert advice through digital platforms (SNS, games, etc.) that young people access frequently. In connection with this, Dr. Uchiyama also indicated the need for youth support with a view toward correspondence schools.



Panel discussants

Dr. Walker referred to cases in the US, where many young people who committed suicide without receiving specialized mental health treatment had consulted physicians within three weeks before their suicide, and explained that there is a newly implemented program to assess all patients' mental health including asking about suicidal ideation at primary care encounters, including dental care.

One question concerned support for teachers, who are likely to be overworked. Dr. Walker said that in the event of Hurricane Katrina, responders devoted themselves to child care with inattention to teachers; as a consequence children – as students – were adversely affected. This was a big mistake. He said support for teachers to enable sufficient self-care was provided later, but schools had little support for managers such as principals, and how to support people in such positions was also an issue. Dr. Uchiyama reported about his visits to schools through

a program of Fukushima University to provide various interventions following 3.11. He said the program was highly appreciated by the schools, so he would like to continue, but currently there are difficulties due to shortages of manpower and budget.

With regard to measures against stigma (prejudice), Dr. Bryant stated that the following measures were important: providing accurate information through public health methods and the internet, etc., with help from appropriately skilled, exemplary people (role models); since mental health issues accompany pain and lack of sleep, a skill set should be provided to general practitioners so that they can recognize such issues and correctly refer the patients to specialists; it should be noted that general practitioners may be also overworked, with mental health challenges of their own.

Dr. Uchiyama said that discrimination is a complicated issue even in Fukushima Prefecture. It is more difficult for supporters in areas closer to the nuclear power plant to do visible activities, and long-term education on discrimination and prejudice in school education is essential.



Ms. WATABE Ikuko

Ms. Watabe said in light of the changing situation in communities, she would like to talk with stakeholders and listen to residents at the Center, with the existence of stigma in mind.

A related question was asked if many victims outside the prefecture were exposed to stigma in their host communities.

For this, Dr. Nakajima pointed out the current issues concerning evacuees outside the prefecture. Although direct discrimination is less likely compared with just after the disaster, negative information is reported in biased manners by print and other media, and the situation of evacuees remains uneasy. As countermeasures, school-based education should be emphasized (similar to Dr. Bryant), for example, programs to address discrimination and bullying should be implemented in schools, which are among the centers of community life.



Dr. NAKAJIMA Satomi

As for relating to the administration, Dr. Uchiyama introduced the activities of the "Mental Support Council" led by the Fukushima Prefectural Board of Education.

Specifically, twice a year, the Prefectural Board of Education and the Children's Future Bureau, representatives of clinical psychologists and social workers from outside, and child psychiatrists from Fukushima Medical University and other universities participate to address issues in school management together with various supporters, and he said that he would like to continue to do it in the future, too.

Lastly, Dr. Bryant paid tribute to the efforts of the Fukushima Health Management Survey so far. Especially with regard to mental health, he emphasized the importance of careful, individual analysis of various interventions because it would be difficult to see the essence by looking at survey results only at the level of overall incidence rates and averages. Though the time was limited, it was a thought-provoking and meaningful discussion.

## Closing Remarks



SAITO Kiyoshi, MD, PhD  
Vice President of Fukushima Medical University

Thank you Dr. Nollet for your kind introduction. I am Saito Kiyoshi of Fukushima Medical University. As introduced, I have been serving as a vice president to Fukushima Medical University since last April. Let me say a few words of appreciation.

Thanks to the participation and cooperation of many people, the symposium has been a success. I would like to extend my sincere gratitude on behalf of the University.

Fukushima Medical University is working to improve the health of everyone in Fukushima through the Fukushima Health Management Survey, while receiving cooperation and support from universities, research institutes in Japan and overseas, governments, along with international organizations and academic societies.

We held this international symposium for the purpose of deepening people's understanding of the activities of our university and to share knowledge and experiences with the world.

For two days since yesterday, prominent experts from Japan and abroad gave talks on thyroid and mental health issues, expressing their professional insights in an understandable manner. Also, we received a lot of questions from many participants in the venue, which made the symposium very meaningful. Thank you very much. We will continue our efforts to disseminate knowledge and lessons learned from the Fukushima Health Management Survey in scientifically-based, plain language to deepen everyone's understanding.

In order to support, from various medical perspectives, Fukushima's recovery from the Great East Japan Earthquake, in 2016 our university established an overarching Fukushima Global Medical Science Center, within which are five supporting entities, including the Radiation Medical Science Center that hosted this symposium and two departments that monitor the health of Fukushima citizens. Other supporting entities strive to improve health care delivery and promote advanced research and industrial recovery. We will continue to work for the reconstruction of Fukushima, so I would like to ask everyone for their understanding and support of our university.

Finally, I would like to conclude by expressing my sincere gratitude to all those who have contributed to and cooperated with this International Symposium. Thank you very much.

# Photo Gallery



Venue: The Celeceton Fukushima



Entrance



Navigator: Dr. Kenneth NOLLET



Presentation Hall



Theme of this Symposium



Reception



Simultaneous interpretation (Japanese-English) was provided



DAY 1 Introduction: Overview of the Fukushima Health Management Survey (FHMS) p.15-



DAY 1 Part I: Current status of thyroid examination and thyroid treatment p.21-  
<Session 1, 2>



DAY 2 AM Part 1: Current status of thyroid examination and thyroid treatment p.41-  
<Keynote Lecture 1, Session 3>



DAY 2 PM Part 2 : Mental health of Fukushima people and care for them: what should we do now? p.53-  
<Keynote Lecture 2, Session 4>

 FUKUSHIMA MEDICAL UNIV.

The 2nd International Symposium of the Radiation Medical Science Center  
for the Fukushima Health Management Survey

Build Back Better, Together.

Fukushima Health Management Survey updated,  
focusing on thyroid and mental health

Simultaneous  
Japanese-English  
Interpretation  
Admission free

**February 2-3, 2020**

Nanko Park (Shirakawa City)

**VENUE** The Celecton Fukushima 3F "Adatarara"  
13-73 Ota-machi, Fukushima 960-8068

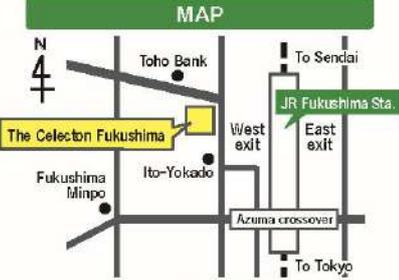
**INTENDED AUDIENCE** Fukushima residents, health care/medical professionals, students, public employees and anybody interested in the theme of this symposium (pre-registration required)

**Pre-registration Deadline** **January 26th, 2020** 

Please visit our website for pre-registration and the detailed program

**URL** [http://kenko-kanri.jp/en/news/2nd\\_intl\\_symposium.html/](http://kenko-kanri.jp/en/news/2nd_intl_symposium.html/)

**MAP**



1 minute walk from the west exit of JR Fukushima Station to the venue

**< Organizer >** Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University  
**< Nominal Support >** Fukushima Prefecture, Hiroshima University, Nagasaki University, Fukushima University, The University of Aizu  
**< Contact >**  
Office of International Cooperation, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University  
Phone: +81 24-581-5454 / E-mail: [kenkani@fmu.ac.jp](mailto:kenkani@fmu.ac.jp)

## Results of Questionnaire

We asked all of the visitors to participate in the survey on the day(s) they attended, and 117 of 300 people answered over the course of two days. Their responses will guide our future planning. We would like to thank everyone for their cooperation.

### Breakdown of respondents

Age			Location of residence			Occupation		
Group	No.	Ratio	Group	No.	Ratio	Group	No.	Ratio
60s	30	26.1%	Fukushima	83	73.5%	Health care professional	32	31.1%
50s	24	20.9%	(residing outside the prefecture)	(1)	(0.9%)	Public servant	24	23.3%
40s	21	18.3%	Out of Fukushima	29	25.7%	Teacher	8	7.8%
70s and above	16	13.9%	Out of Japan	1	0.9%	Company Employee	8	7.8%
30s	14	12.2%				Housemaker	7	6.8%
20s	9	7.8%				Business owner	5	4.9%
10s	1	0.9%				Student	4	3.9%
						Other	15	14.6%

### Main results of tabulation

Item	5	4	3	2	1	Total
Overall impression No. (ratio)	Very good 50 (45.5%)	38 (34.5%)	Average 18 (16.4%)	3 (2.7%)	Very bad 1 (0.9%)	110
Theme selection No. (ratio)	Very good 48 (43.2%)	37 (33.3%)	Average 19 (17.1%)	5 (4.5%)	Very bad 2 (1.8%)	111
Conciseness of presentations No. (ratio)	Very good 28 (25.9%)	40 (37.0%)	Average 29 (26.9%)	10 (9.3%)	Very bad 1 (0.9%)	108

# Glossary

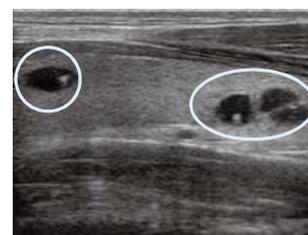
Explanation on the terms with †.

## Part I Current status of thyroid examination and thyroid treatment

confounding factors	P.5, P.24, P.39	A confounding factor is a variable that affects analysis results of the relationship of two phenomena A and B, whereby A and B appear to have a causal relationship that actually does not exist.
ecological fallacy	P.5, P.24	Ecological fallacy is faulty reasoning in ecological studies, where in causal relationships observed at a group level are considered applicable to an individual level within that group.
UNSCEAR	P.5, P.24	Acronym of the United Nations Scientific Committee on the Effects of Atomic Radiation. The committee evaluates the effects of ionizing radiation on humans and the environment from an impartial and scientific standpoint and reports the results to the UN General Assembly every year.
AYA (generation)	P.8, P.10, P.26, P.31, P.32	AYA is an acronym of adolescent and young adults and the AYA generation refers to a generation from 15 to 39 years old (or 15 to 29 depending on definition). The AYA generation may develop both pediatric and adult cancers and require different types of care and support as it is a time of a major life stage change.
fine needle aspiration cytology (FNAC, FNA)	P.22, P.26, P.36, P.42	Fine needle aspiration cytology is a medical procedure for microscopic examination of cells extracted by inserting a fine needle attached through the skin. As FNAC allows direct sampling of tissues, more accurate diagnosis of benignity/malignancy will be possible.
nodule, cyst	P.8, P.18, P.19, P.22, P.26, P.31, P.36, P.38	See explanation below.
APC	P.32	The APC gene controls differentiation and proliferation of colorectal mucosa cells and mutation to this gene causes familial adenomatous polyposis (FAP) and sometimes thyroid cancer too.
RET/PTC3	P.32, P.33	A type of gene mutations induced by rearrangement of RET, a cancer-causing gene, and another gene. This mutation was highly prevalent in pediatric thyroid cancers found after Chernobyl.
hemithyroidectomy/ lobectomy	P.34, P.42, P.43, P.48, P.51	The thyroid gland is a butterfly-shaped organ with lobes (wings) connected by a central part called the isthmus. Hemithyroidectomy or thyroid lobectomy is surgical removal of either lobe. If the entire thyroid gland is removed, it is called total thyroidectomy. If a single lobe and the isthmus are removed, it is called lobectomy with isthmusectomy.
RI ablation	P.34	RI ablation, or radioiodine ablation therapy, is an adjuvant (supportive) treatment after thyroidectomy to destroy residual thyroid tissues.
LN	P.35	Abbreviation of lymph node.
levothyroxine	P.42	L-thyroxine, or levothyroxine, is a thyroid hormone that stimulates endosomatic metabolism and, in children, promotes growth. It is also administered as a medicine for hypothyroidism.
TUE	P.42	Acronym for Thyroid Ultrasound Examination. This acronym is used only to refer to the thyroid examinations conducted in the Thyroid Survey as part of the Fukushima Health Management Survey.
thyrotropin	P.44	Thyrotropin, also abbreviated as TSH, is a thyroid stimulating hormone that regulates thyroid growth and function.

### • Cysts and nodules

A cyst is a sac-like structure filled with liquid; thyroid cysts are benign and often found in healthy individuals. Cysts with no cells inside do not lead to cancer. Many people have cysts that may frequently change in size or number. Previous surveys found that cysts are seldom found in babies and infants, but are found frequently in children of primary and secondary school age. In the FHMS, cysts of 20 mm or smaller are classified as A2 (confirmatory examination not necessary) and cysts of 20.1 mm or larger are classified as B (confirmatory examination recommended).



Cysts

A nodule is caused by differential growth of thyroid cells. While some can be cancerous, most nodules are benign. In the FHMS, nodules of 5.0 mm or smaller are classified as A2 and nodules of 5.1 mm or larger are classified as B, with recommended management as described above for A2 and B cysts.



Nodule

• **Schedule and intended groups for thyroid examinations**

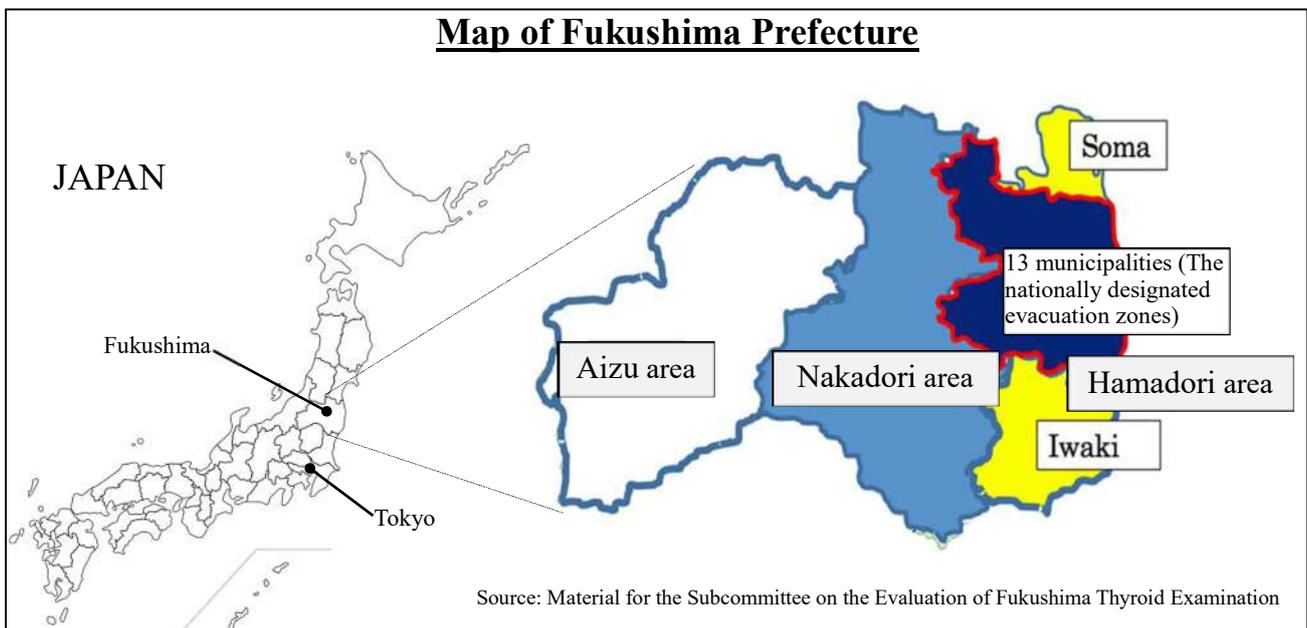
		Period	Target group
1 <sup>st</sup> round (completed)	Preliminary baseline survey * to establish baseline thyroid gland conditions	October 2011 - March 2014	Residents of Fukushima Prefecture aged 18 years or younger as of March 11, 2011 (Those born between Apr. 2, 1992 and Apr. 1, 2011) 【~370,000 residents】
2nd round 3rd round (completed)	Full-Scale Survey (2nd Examination) Full-Scale Survey (3rd Examination) * For comparison with Preliminary Baseline Survey results	April 2014 - March 2018	In addition to the residents mentioned above, residents of Fukushima Prefecture who were born between Apr. 2, 2011 and Apr. 1, 2012. 【total ~380,000 residents】 * These residents can have thyroid examinations every 2 years; after reaching age 20, they can take examination at ages that are multiples of 5 (age 25, 30, 35, etc.).
4th round	Full-Scale Survey (4th Examination)	April 2018 -	

Source: Material for the Oversight Committee meeting on Oct. 7, 2019.

Explanation on the terms with †.

**Part II Mental health of Fukushima people and care for them: what should we do now?**

PTSD	P.13, P.54, P.55, P.62,	PTSD (post-traumatic stress disorder) is a mental health disorder caused by a traumatic event in which individuals suffer from repeated experiences of the trauma in such forms as flashbacks, nightmares, and hallucinations.
intervention	P.54, P.58, P.66, P.68	Intervention is a combination or series of programs, measures or strategies delivered by professionals or trained non-professionals to help individuals or a community to cope with or recover from a crisis situation.
K6	P.56, P.57, P.64	K6, or the Kessler Psychological Distress Scale, is a self-reporting questionnaire comprised of 6 questions about psychological distress and used to assess risk for serious mental illness in the general population.
PCL	P.56	Abbreviation of PTSD Check List. This is a self-reporting questionnaire to monitor the onset of PTSD symptoms.



## Time, and Again



**Kenneth E. NOLLET, MD, PhD**

Professor, School of Medicine (Clinical Medicine), Department of Blood Transfusion and Transplantation Immunology; Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

How much time goes into an international symposium? Staff at the Fukushima Health Management Survey's Office of International Cooperation spent most of a year preparing for this one. Reflecting more deeply, our three speakers from overseas brought more than a century of education and experience to us, at exactly a time when their countries of origin, Australia and the United States, had competing needs for their expertise.

News reports about corona virus prompted us to make face masks and hand sanitizers freely available at the conference venue. This gesture preceded the World Health Organization's official declaration of a pandemic, but was consistent with Japanese sensibilities about hygiene. As it was after Japan's 2011 earthquake, tsunami, and nuclear crisis, the global corona crisis is changing the way people live. From uncommon events, common lessons may emerge. In 2011, we did not suffer major disease outbreaks in crowded evacuation facilities. Cooperation, rather than aggression, prevailed. This brings to mind the theme of our 2019 International Symposium: "From the World to Fukushima, from Fukushima to the World."

The promise of nuclear power played well on Fukushima's Pacific coast for more than two generations of our human history. Then, abruptly, it didn't. Employees and contractors associated with Fukushima Daiichi were going about the business of providing electrical power for Tokyo and security for their families. Next, they were fighting to save the land and people they loved from a disaster that could have depopulated eastern Japan and beyond. We owe those heroes, heroines, and their families our eternal gratitude.

We also owe them our own best efforts. Since 3.11, the people of Fukushima have heard from many authorities with hard-earned experience in radiation biology, oncology, endocrinology, mental health, and other related disciplines. The people of Fukushima also encounter those who do not seem to attract speaking invitations, but who nevertheless are eager for an audience. Credit many with good intentions, and let the diversity of opinions inspire one's own examination of conscience. In modern times, most of us face a mirror every morning. The reflection should make us reflect:

*Today, will I be of service to others?*

*Today, will I act with integrity?*

For all of us involved in the Fukushima Health Management Survey, each of these questions requires the same answer: *Yes*. This commitment to service and integrity will drive everyday efforts for our next International Symposium. Once again, the people we serve, with evolving needs and growing aspirations, will guide the symposium's theme and time.



A picture of our 1st symposium, convened in 2019

## Biography

Kenneth Nollet earned MD and PhD degrees from the Mayo Clinic, and stayed at Mayo to specialize in pathology and transfusion medicine. After Mayo, he joined North Central Blood Services of the American Red Cross. Concurrently, he served as blood bank medical director of the Minneapolis Veteran's Affairs Medical Center and became an assistant professor at the University of Minnesota.

Dr. Paul Holland invited Nollet to be an associate medical director at BloodSource in Sacramento, a position held until Dr. Holland's retirement. Thereafter, Dr. Nollet was recruited by Dr. Joanne Pink to be the Australian Red Cross Blood Service's National Medical Education Program Manager and to work as a transfusion medicine specialist in Queensland.

By invitation of Professor Hitoshi Ohto, Nollet joined Fukushima Medical University's Department of Blood Transfusion and Transplantation Immunology in 2008. Contrary to evacuation advice given to American citizens after the Great East Japan Earthquake, Dr. Nollet stayed at Fukushima Medical University to participate in disaster relief and, for the long term, Fukushima Prefecture's revitalization.

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