



**International Academic Conference
on Radiation Health Risk Management in Fukushima
February 25-27, 2013**

Support for Fukushima Provided by the Radiation Effects Research Foundation

**Kazunori Kodama
Radiation Effects Research Foundation (RERF)**

Outline of Presentation

- 1. Introduction about RERF**
- 2. Support provided for Fukushima in early stages following the accident**
- 3. Mid to long-term support RERF can provide**
- 4. Few additional comments**

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Studies on Health Effects of A-bomb Radiation - History -

1945

'47 '48

1975

2000



Hiroshima
6 August

Nagasaki
9 August

**Atomic Bomb Casualty
Commission (ABCC)**

**Japanese National
Institute of Health**

**Radiation Effects
Research Foundation
(RERF)**

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Preparation for Providing Support to Fukushima

- **On March 15, discussions on how to provide support to the long-term survey on residents of the affected areas, if it is implemented, were initiated at the meeting of RERF Committee on Radiation Emergency Medical Preparedness.**
- **On March 29, chairman of RERF proposed to member institutions of the Council of Radiation Effects Research Organizations in Japan that the member institutions unite in supporting Fukushima in order to make maximum contribution.**

Preparation for Providing Support to Fukushima

- **On April 2, ad hoc meeting of the Council was held at Fukushima Medical University. It was agreed that member institutions provide full support to Fukushima Medical University in conducting long-term survey when it is planned.**
- **On April 25, six officials of the Fukushima Medical University visited RERF and exchanged information with RERF senior staff members.**
- **On April 27, the 6th working meeting of the Council of Radiation Effects Research Organizations in Japan was held in Tokyo. Needs and importance of long-term epidemiological survey were emphasized by chairman of RERF and implementation of such survey was recommended.**

Cooperation in Fukushima Health Management Survey

- **May 13, 2011**
Preparatory meeting for Fukushima Health Management Survey (FHMS) Exploratory Committee
- **May 25 and 26, 2011**
Senior researchers of Fukushima Medical University visited RERF and exchanged information with RERF staff members in the Departments of Epidemiology and Clinical Studies.
- **May 27, 2011**
1st Meeting of FHMS Exploratory Committee
- **June 18, 2011**
2nd meeting of FHMS Exploratory Committee

Cooperation in Fukushima Health Management Survey

- **July 24, 2011**
3rd meeting of FHMS Exploratory Committee
- **August 12, 2011**
RERF and Fukushima Medical University entered into collaboration agreement in the field of education, research and health management.
- **October 17, 2011**
4th meeting of FHMS Exploratory Committee
- **January 25, 2012**
5th meeting of FHMS Exploratory Committee

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Areas RERF can provide support

Accumulated know-how for planning and operation of epidemiological surveys:

- 1. Establishment of survey populations**
2. Dose assessment of cohort members
3. Methods to obtain information on causes of death and health
4. Creation of database
5. Infrastructure for conducting studies
6. Liaison with local communities
7. Training and education
8. Improvement of public relations
9. Others

RERF Study Populations

1. Atomic Bomb Survivors	120,000
Life Span Study (LSS)	120,000
Adult Health Study (AHS)	20,000
2. In-utero Exposed	3,600
3. Second Generation (F1)	77,000

Life Span Study (LSS) Cohort

Established;

- **1950 National Census**

Includes;

- **about 54,000 survivors within 2.5 km of the bombings**
- **about 39,000 survivors within 2.5 - 10 km**
- **about 27,000 who were not in either Hiroshima or Nagasaki**

TOTAL NUMBER 120,321

Strengths of LSS Cohort

- **Large, basically healthy non-selected population**
- **All ages and both sexes**
- **Wide range of doses**
- **Well characterized dose estimates**
- **Mortality follow-up virtually complete**
- **Cancer incidence ascertainment virtually complete in cancer registry catchment areas**
- **60+ years of follow-up**

(Adapted from: Ron E et al, Acta Med Nagasaki 2005;50:23-25)

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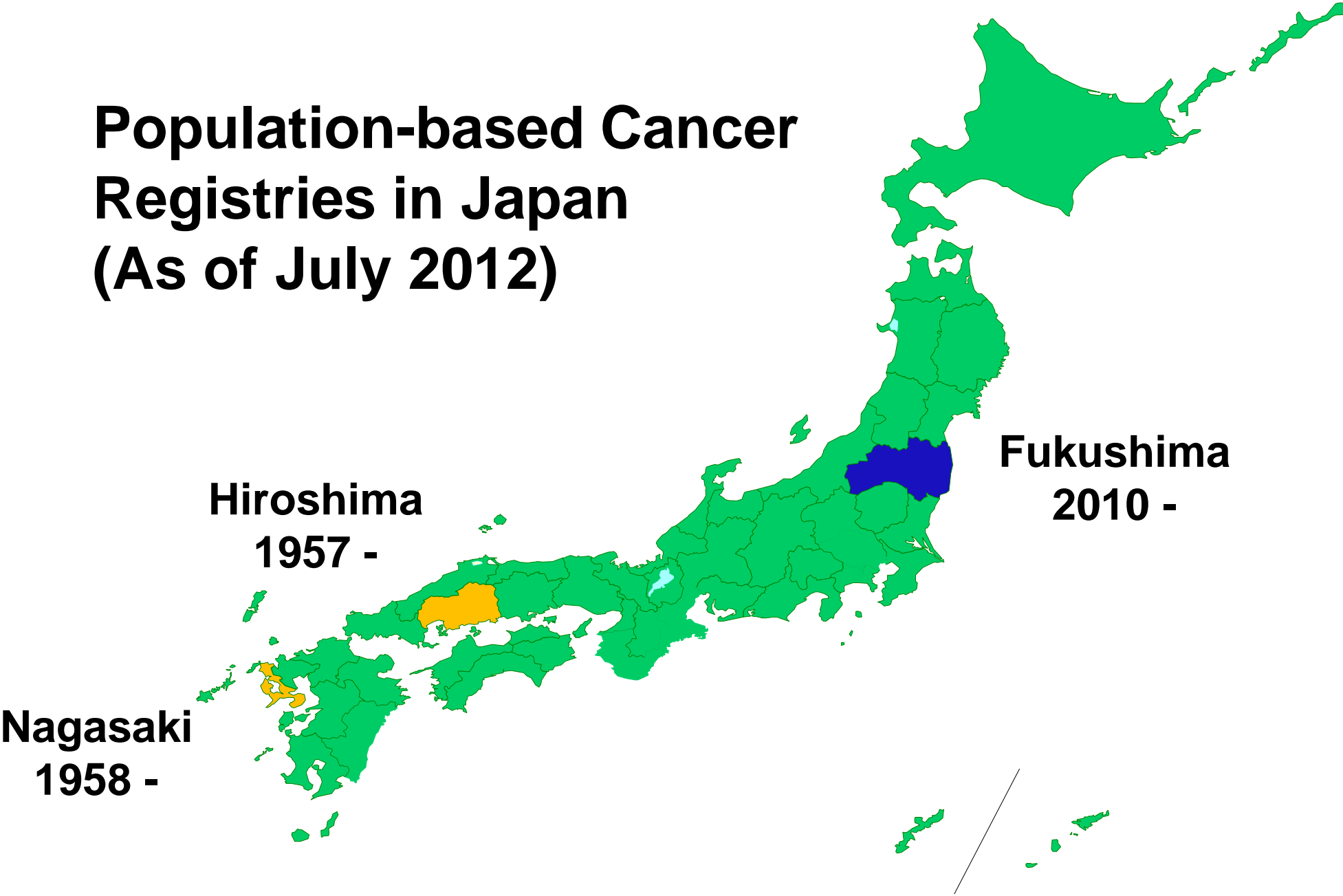
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Epidemiological Studies of A-Bomb Survivors

- Outcome Information -

1. Death certificate
 - Causes of death
2. Tumor/Tissue registries
 - Cancer incidence
 - Pathological findings
3. Health examination
 - Morbidity
 - Biological materials
(serum, lymphocyte etc.)
4. Mail survey
 - Confounders, risk modifiers

Population-based Cancer Registries in Japan (As of July 2012)



Strengths of LSS Cancer Incidence Data

Add a valuable component to radiation risk assessment;

- **Data on non-fatal cancers (e.g. female breast, thyroid, non-melanoma skin)**

Characterized by;

- **High level cancer ascertainment**
- **Accurate diagnoses**
- **Information on histology**
- **Long follow-up**

(Adapted from: Ron E et al, Acta Med Nagasaki 2005;50:23-25)

Comparison of Risk Estimates between Mortality and Incidence Data in the LSS

(Mortality:1950-2003, Incidence:1958-98)

Cancer site	# of cases	ERR/Gy *	CI **
Female breast			
Mortality	324	1.50	0.93 – 2.3
Incidence	1,073	0.87	0.55 – 1.3
Non-melanoma skin			
Mortality	-	-	-
Incidence	330	0.17	0.003 – 0.55
Thyroid			
Mortality	-	-	-
Incidence	471	0.57	0.24 – 1.1

*: At age 70 after exposure at age 30.

** : Mortality 95%, Incidence 90%

(Ozasa K et al. Radiat Res 2012;177:229-243)

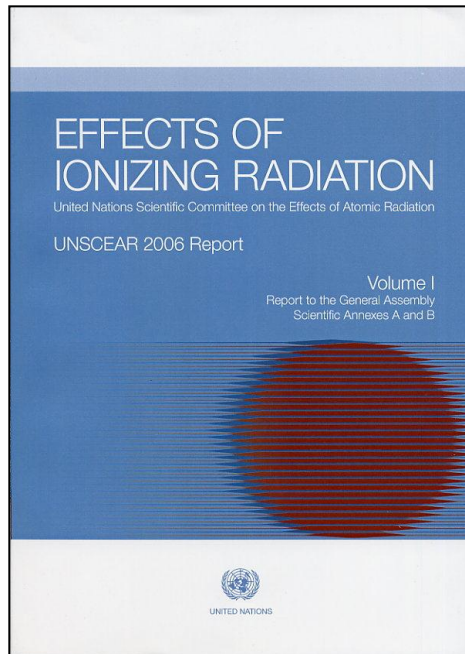
(Preston DL et al. Radiat Res 2007;168:1-64)

Solid Cancer Incidence in Atomic Bomb Survivors: 1958–1998

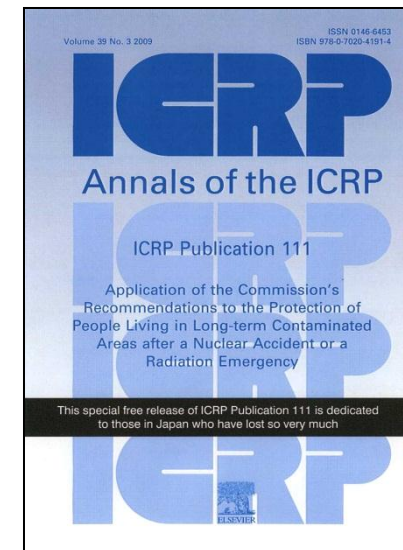
D. L. Preston,^{a,1} E. Ron,^b S. Tokuoka,^c S. Funamoto,^c N. Nishi,^c M. Soda,^c K. Mabuchi^b and K. Kodama^c

^a Hirosoft International, Eureka, California; ^b Division of Cancer Epidemiology and Genetics, National Cancer Institute, Bethesda, Maryland; and ^c Radiation Effects Research Foundation, Hiroshima and Nagasaki, Japan

(Preston DL et al. *Radiat Res* 2007;168:1-64)



UNSCEAR 2006 Report: Vol. 1



ICRP Publication 103 (2007)

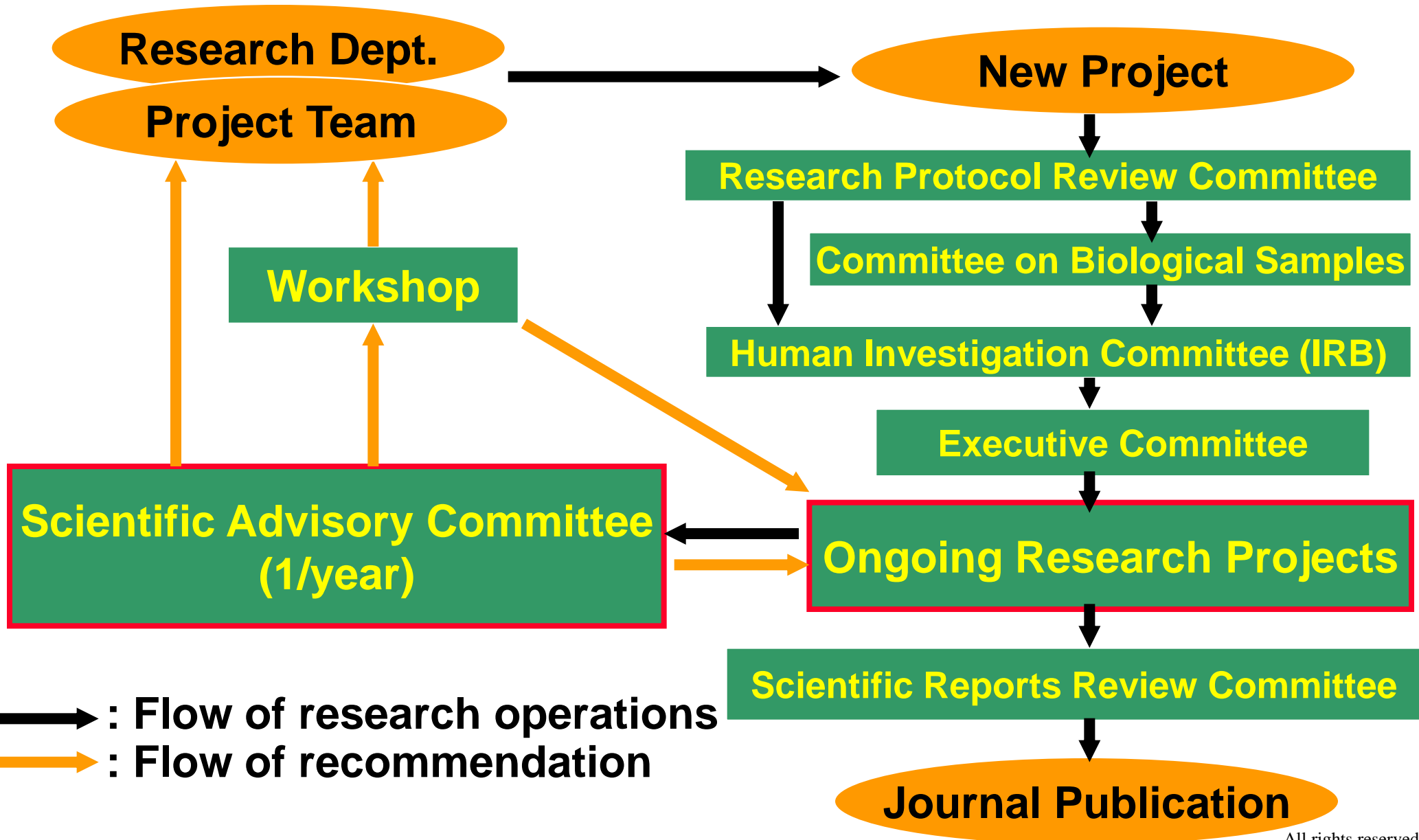
**HIGH QUALITY
CANCER REGISTRY
is of
absolute necessity!**

Areas RERF can provide support

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9. Others

Flow Diagram of Research Operations at RERF



RERF Scientific Advisory Committee - Members -

Ten members:

Five from US, five from Japan

- Epidemiology**
- Statistics**
- Clinical medicine**
- Genetics**
- Radiobiology/ molecular biology**

Ad hoc Members when appropriate

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RERF Local Liaison Councils: Objectives

The Council will investigate and deliberate the following matters in order to have the wishes of the local communities for preservation of the health and improvement of the well-being of atomic bomb survivors reflected in the programs of the Foundation:

- (1) Matters pertaining to liaison, coordination and cooperation between interested local institutions (including the university and medical institutions) and the Foundation.**
- (2) Matters pertaining to measures for securing better understanding of the local communities and for putting together their wishes concerning the programs of the Foundation.**

Local Liaison Councils - Members -

15 members in Hiroshima, 20 in Nagasaki

- Universities**
- Medical institutions**
- Medical associations**
- A-bomb survivors organizations**
- Municipal office (city and prefecture)**
- Media**
- Others**

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Training and Education

- **Methods of long-term follow-up**
 - Mortality**
 - Cancer incidence**
 - Morbidity**
 - Mail survey**
- **Biodosimetry**
- **Methods of data analysis**
- **Health effects of A-bomb radiation**

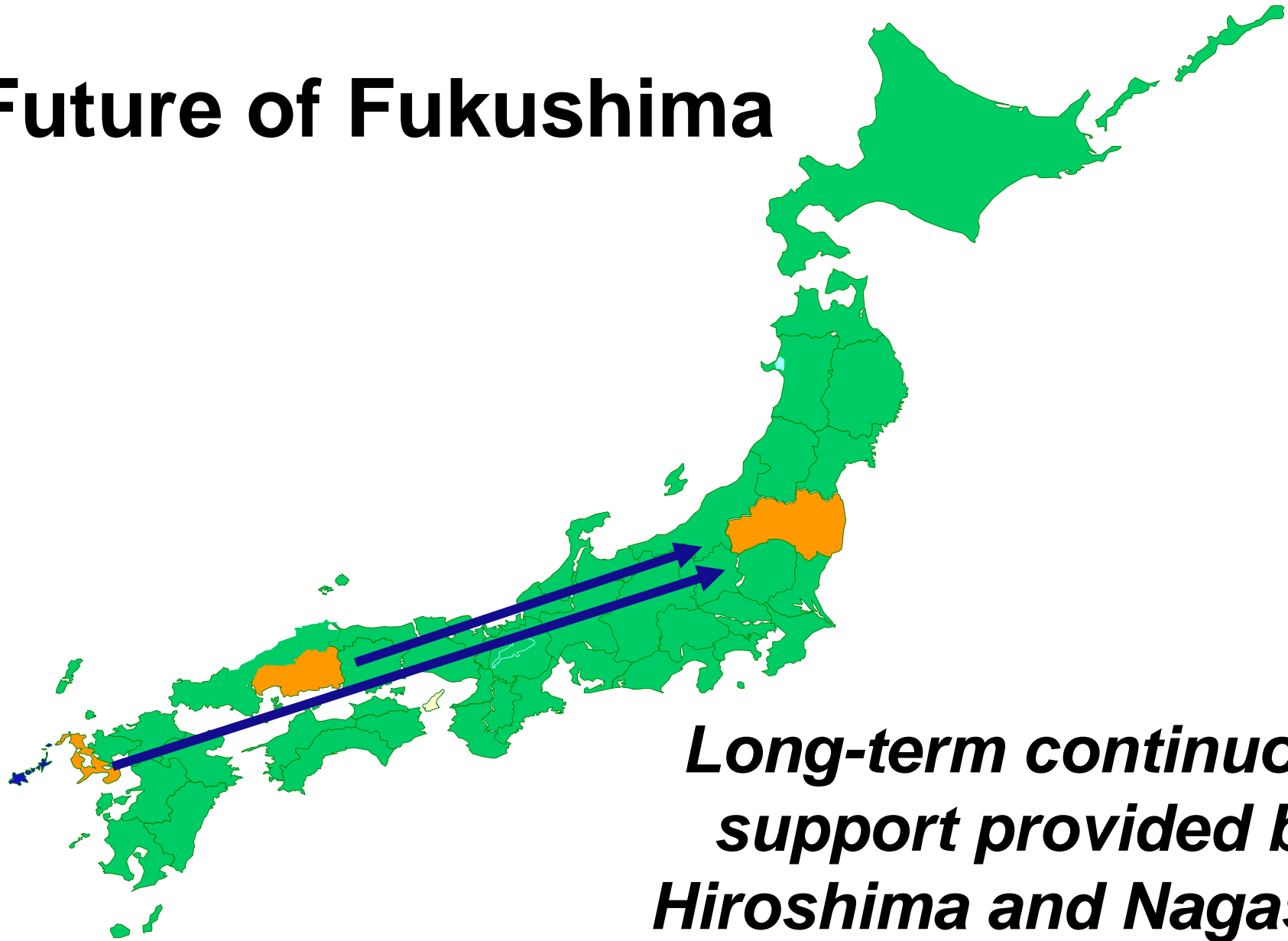
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Key Components for the Success

- **Leaders**
- **Researchers and general staff**
- **Local Medical Community**
- **A-bomb Survivors**

Future of Fukushima



***Long-term continuous
support provided by
Hiroshima and Nagasaki***