

A-bomb survivor studies and their long-term implications to health and society

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- March 1947-Atomic Bomb Casualty Commission (ABCC) was established by the U.S. to study effects from A-bomb radiation and resulting diseases.
- March 1948-Hiroshima and Nagasaki Branches of Japanese National Institute of Health joined ABCC research.
- November 1950-ABCC facilities were constructed in Hijiyama Park.
- March 1975-Due to need for longer continuation of research, ABCC and NIH branches were reorganized into RERF under co-jurisdiction of Ministry of Health and Welfare (MHW) and the Ministry of Foreign Affairs.

RERF

- Subsidized by the U.S. and Japanese governments based on the Exchange of Notes (December 27, 1974). (Because some studies are subsidized solely by the Japanese government, the actual subsidy rate between Japan and U.S. is 6:4.)
- The Japanese government provides subsidy based on Article 40-2 of the “Atomic Bomb Survivors’ Support Law.”
 - FY2019 Japanese government budget: **\$17 million**; the number of officers and employees: 197 (Hiroshima and Nagasaki combined)

A-bomb survivor studies

- Major research studies of RERF -

The following cohorts have been followed up since 1950

- Cohort consisting of 86,000 survivors
Cancer incidence and mortality in relation to dose.
- Cohort consisting of 77,000 children of survivors
Genetic effects from parental exposure

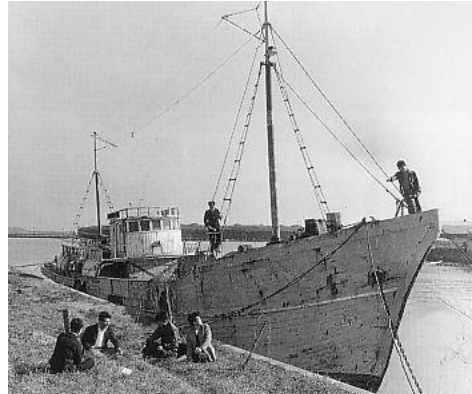
The largest statistic/epidemiologic database of the longest follow-up study in the world

The International Commission of Radiological Protection (ICRP) issues recommendations on radiation exposure dose limits mainly based on RERF study results.

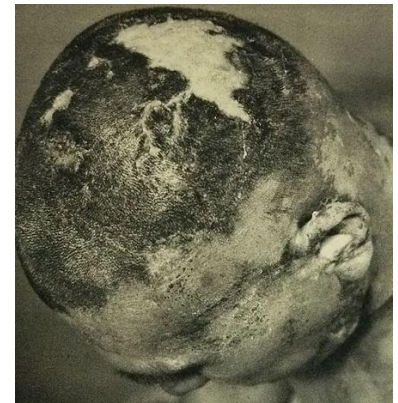
Lucky Dragon No.5 accident pushed the Establishment of Survivors' Support Law (1994)



Castle Bravo 1954



Lucky Dragon No.5



Lucky Dragon Crew

- Both sides settled the case with a commitment that "the Japanese government will not pursue the responsibility of the US government."
- In 1955, the fishery received a compensation of \$2 million (about 720 million yen at the time) from the U.S. gov't.
- The surviving crew received about ¥2 million each.
- The victims would not be given hibakusha status.

Framework of Relief Measures for Survivors

- Health damage inflicted on A-bomb survivors was unique and quite different from other damages caused by the war. Therefore, medical and other benefits are provided as survivors' relief measures based on the Atomic Bomb Survivors' Support Law.

Great Tokyo Air Raids March 10 1945

No compensation



16 square miles (41 km²) of central Tokyo were destroyed, leaving an estimated 100,000 civilians dead and over 1 million homeless.

However, there is no compensation system for these victims.

Definition of atomic bomb survivors

People who fall under at least one of the following criteria are issued A-bomb survivor's certificate.

- Those exposed in Hiroshima/Nagasaki or adjacent area
- Those who entered within 2 Km from the hypocenter within 2 weeks
- Those engaged in relief activities
- Children of the above people who were in utero at the time

Certificate holders : 155,000
Average age : 82.1
(March 2018)



Certificate holders : 146,000
Average age : 82.7
(March 2019)

Budget for Relief measures for A-bomb survivors (FY 2019 budget)

	Budget million dollars	%
Total Relief Measures	1,170	100
Benefits	777	67
Medical payment (Free medical care)	286	24
Health welfare	65	6
Memorial projects for A-bomb victims	6	1
Research study	33	3

Main benefits

- Health management benefit
\$322/month Recipients : 129,000 (2018)
(received by 83% of survivors)
 - **Special medical benefit**
\$1,310/month Recipients : 7,600 (2018)
- *Those certified as suffering from A-bomb-related disease can receive special medical benefit.

A-bomb disease certification

Certified based on whether a disease

① is attributable to A-bomb radiation; and

② requires medical care.

The A-bomb Survivors Medical Subcommittee

reviews cases professionally and objectively and the Minister of Health, Labour and Welfare grants certification.

The Authorized policy of the A-bomb Survivors in 1994

Special medical benefit

- Establishment of Survivors' Support Law (1994)
Certified : Cancer

Probability of causation (age, dose, sex)

Under the Guideline

Lower than 10%: Rejected

50% or higher : May be authorized

In Reality

10% or higher : Almost always Authorized

Background of A-bomb-related disease certification

1994

- Establishment of Survivors' Support Law. Certification review method is Probability of causation of cancer

2003

- Class-action law suits against the government for A-bomb-related disease certification. Lower courts ruled in favor of plaintiffs in a series of lawsuits.

2007

- Prime Minister Abe instructed review of the policy for A-bomb-related disease certification.

2008

- Establishment of "new review policy." Certified : Cancer + Non-cancer (3.5 km)

2009

- Sapporo District Court, Osaka High Court, and Tokyo High Court ruled against the government.

2013

- "New review policy" was revised and the scope for proactive certification of non-cancer diseases was clarified.

Main research on cancer and non-cancer of RERF

- Preston DL, Kusumi S, Tomonaga M, et al.: Cancer incidence in atomic bomb survivors. Part III. Leukemia, lymphoma and multiple myeloma, 1950-1987. Radiat Res 1994
- Preston DL, Shimizu Y, Pierce DA, et al.: Studies of mortality of atomic bomb survivors. Report 13: Solid cancer and noncancer disease mortality: 1950-1997. Radiat Res 2003
- Preston DL, Ron E, Tokuoka S, et al.: Solid cancer incidence in atomic bomb survivors: 1958-1998. Radiat Res 2007
- Preston DL, Cullings H, Suyama A, et al.: Solid cancer incidence in atomic bomb survivors exposed in utero or as young children. J Natl Cancer Inst 2008.
- Hsu WL, Preston DL, Soda M, et al.: The incidence of leukemia, lymphoma and multiple myeloma among atomic bomb survivors: 1950-2001. Radiat Res 2013.

Main research on cancer and non-cancer of RERF

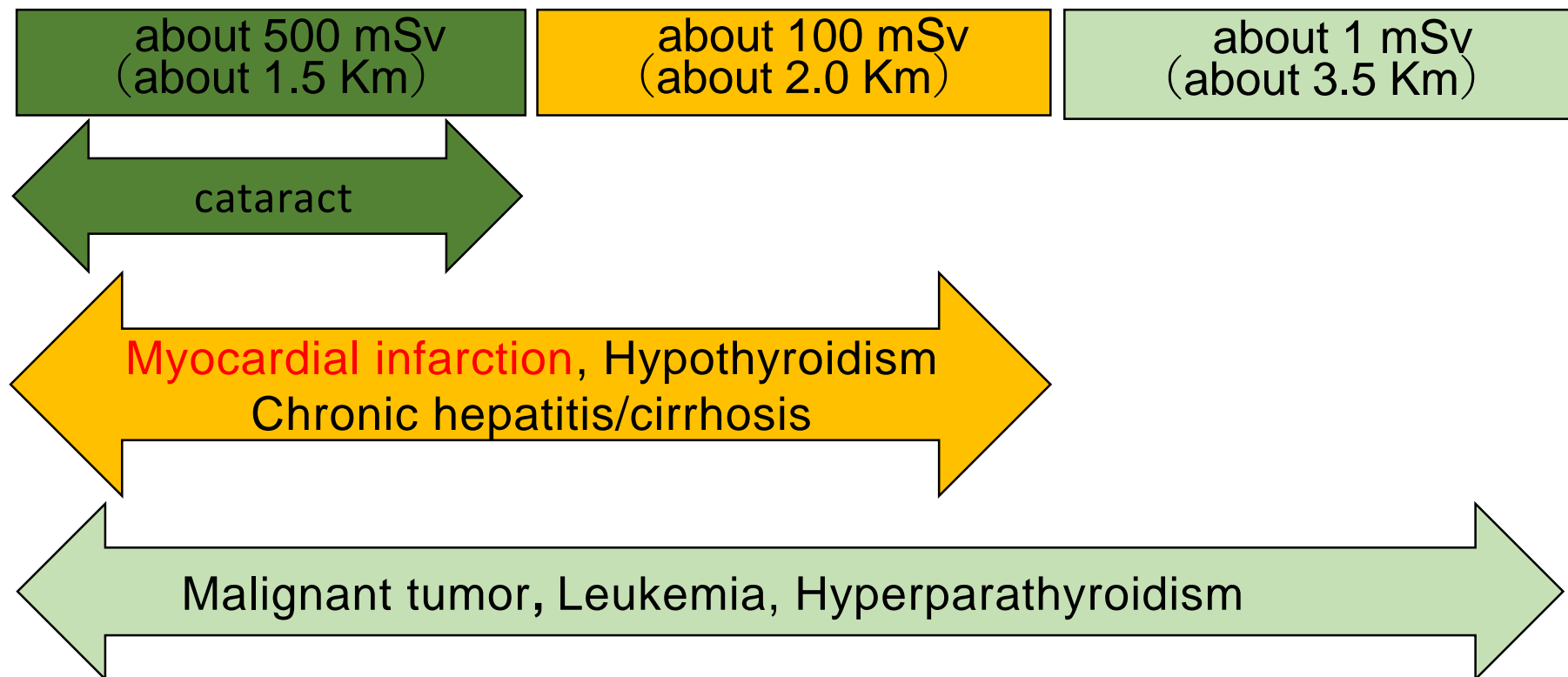
- Shimizu Y, Kato H, Schull WJ, et al.: Studies of the mortality of A-bomb survivors. 9. Mortality, 1950-1985: Part 3. Non-cancer mortality based on the revised doses (DS86). Radiat Res 1992.
- Wong FL, Yamada M, Sasaki H, et al.: Noncancer disease incidence in the atomic bomb survivors: 1958-1986. Radiat Res 1993.
- Shimizu Y, Pierce DA, Preston DL, et al.: Studies of the mortality of atomic bomb survivors. Report 12, part II. Noncancer mortality: 1950-1990. Radiat Res 1999.
- Shimizu Y, Kodama K, Nishi N, et al.: Radiation exposure and circulatory disease risk: Hiroshima and Nagasaki atomic bomb survivor data, 1950-2003. BMJ 2010.
- Ozasa K, Shimizu Y, Suyama A, et al.: Studies of the mortality of atomic bomb survivors, Report 14, 1950-2003: An overview of cancer and noncancer diseases. Radiat Res 2012.

The Authorized policy of the A-bomb Survivors in 2013

Special medical benefit

Disease	Scope for proactive certification
Malignant tumor	<ul style="list-style-type: none">• Direct exposure within 3.5 Km from hypocenter
Leukemia	
Hyperparathyroidism	
	<ul style="list-style-type: none">• Entered area within 2 Km from hypocenter within 100 hours• Stayed one week or longer in area 2 Km from hypocenter between 100 hours and 2 weeks
Myocardial infarction	<ul style="list-style-type: none">• Direct exposure within <u>2.0 Km</u> from hypocenter• Entered area within 1.0 Km from hypocenter by the following day
Hypothyroidism	
Chronic hepatitis/cirrhosis	
Cataract	<ul style="list-style-type: none">• Direct exposure within <u>1.5 Km</u> from hypocenter

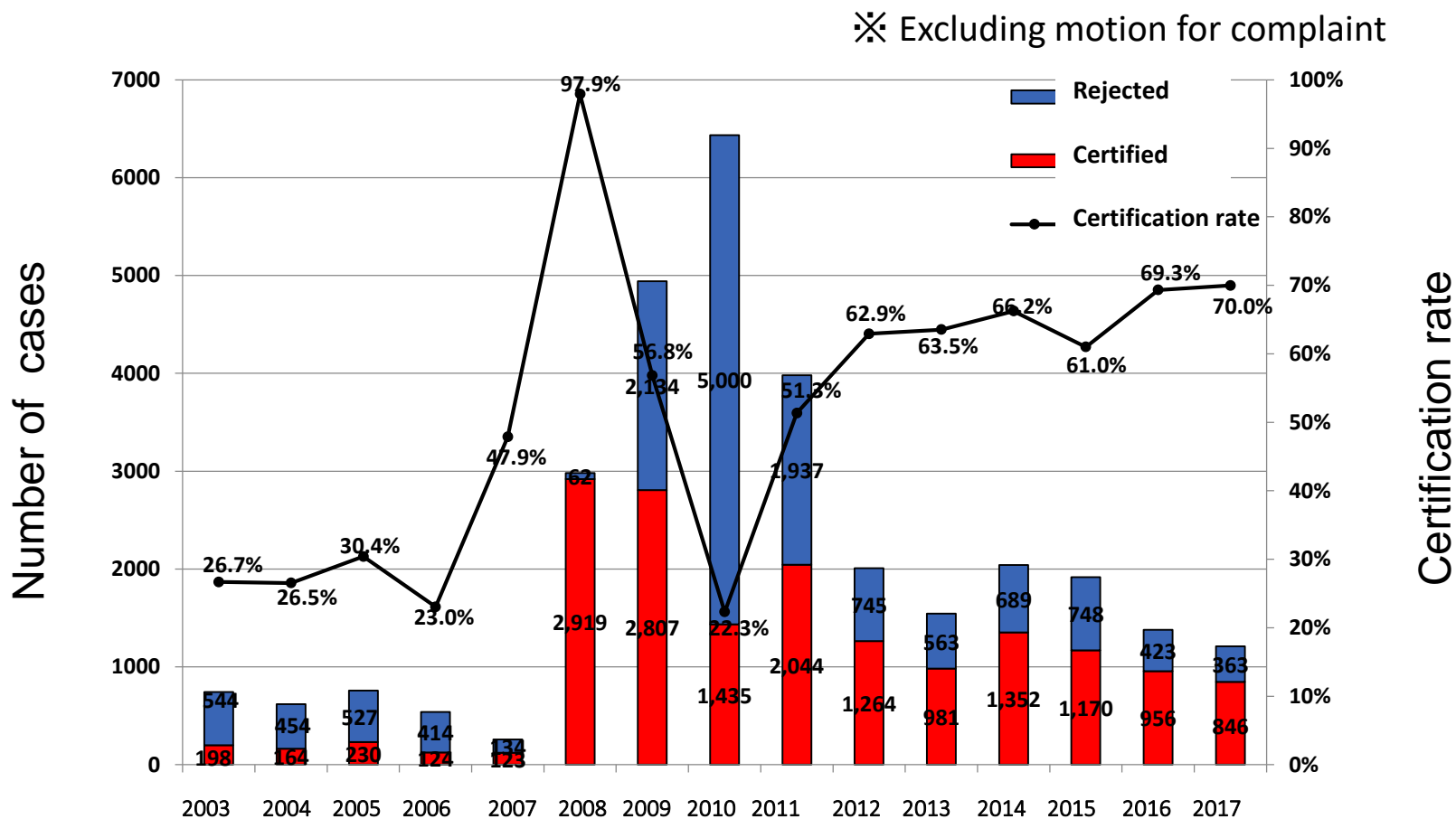
Relationship between dose/distance and disease for certification



*1 Other than myocardial infarction, the increased risk is not obvious.

*2 \$161/month to pay special attention to victims within 2km from the hypocenter to prevent illness and maintain health in daily life is provided.

Number of certified and rejected cases regarding A-bomb-related disease certification (2003-2017)



A-bomb Survivors Medical Subcommittee

Once a month



MD 28 persons



Lawyer 3 persons

Blood physician

Judge's experience

Cardiologists

Dermatologist

Ophthalmologist

Epidemiologist

Pathologist

Endocrinologist

Physician

Gastroenterologist

Public health expert

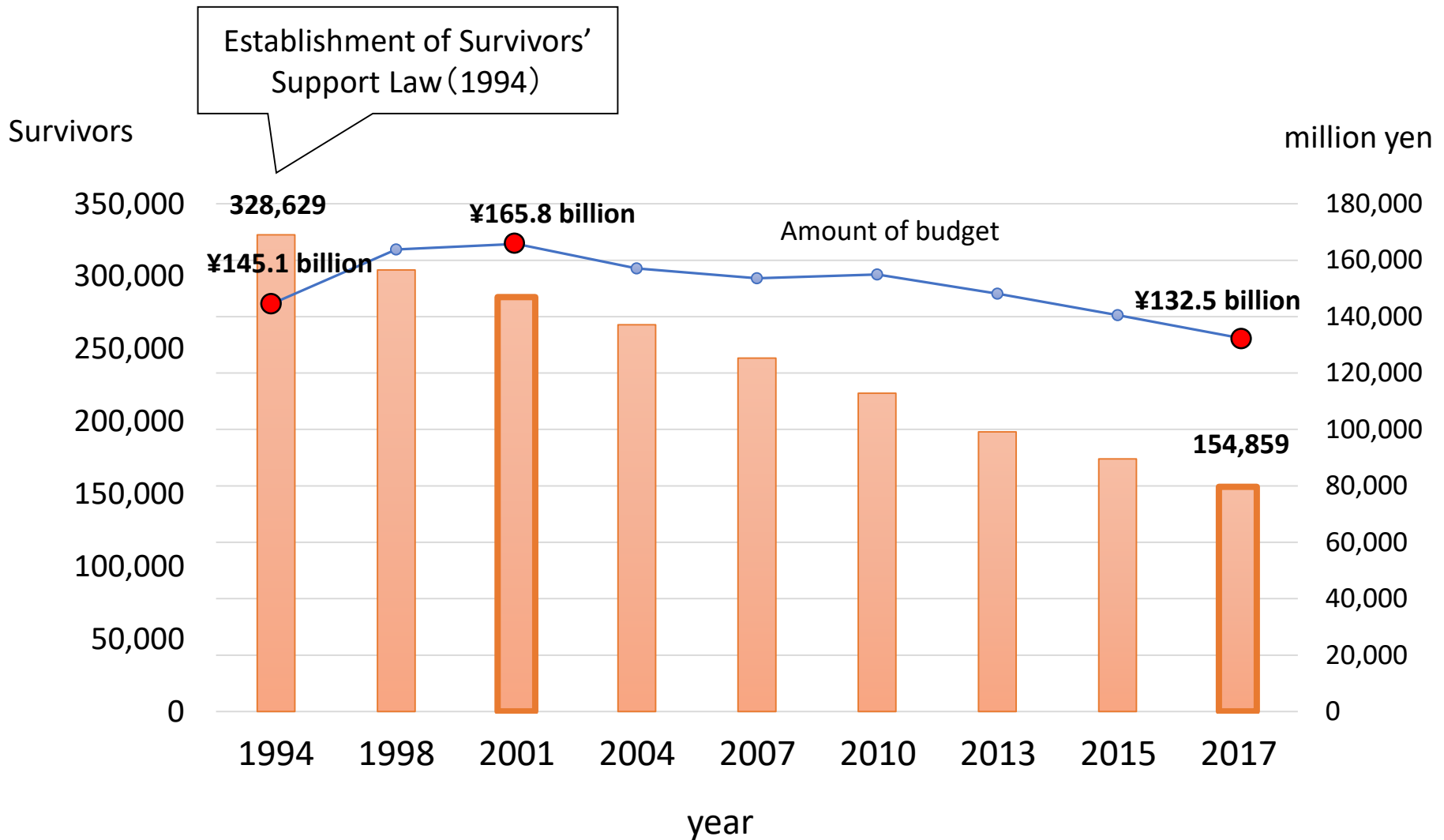
Gynecologist

Radiologist

Liver Physician

Surgeon

Change in the number of survivors and relief measure expenses (1994-)



Total amount of relief measures 1994 – 2019 (26 years)

54 billion dollars

* Defense expenses in Japan of
49 billion dollars in 2019

Conclusion

- Government has been providing general compensations to the survivors.
- The older the survivors get, the more law suits are filed to claim the causal relationship between diseases and radiation.
- Close attention will be paid to the effects on the second generation from now on.