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Thyroid Cancer in Fukushima: Science Subverted in the Service of the State

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On 11 September 2012, in a conference room in a hotel in Fukushima city, Professor Yamashita Shunichi presented the latest results of the Fukushima Prefectural People's Health Management Survey, launched in June 2011. Twenty-seven people were in the audience, mainly journalists. The [CRMS](#) (Citizen's Radiation Measuring Station network) was one of two citizen groups present on that day.



Prof. Yamashita, president of the exploratory committee of the Health Survey, presents the results

Last year Yamashita had recommended that the people of Fukushima smile in order to better face radiation, and he stated that 100 mSv per year¹ is an acceptable radiation exposure limit. Today he sits before the "exploratory committee" of the survey, which he presides over. This committee is comprised of eight core members and some thirty collaborators from the Fukushima Medical University. The host of this research project is Fukushima Prefecture with core members from several different Japanese scientific institutions and officials from Fukushima Prefecture, as well as members from Hiroshima and Nagasaki Universities. At the eighth meeting of the exploratory committee, a representative of the health division of the Ministry of Environment and the vice-president of the Science Council of Japan joined the committee.

The [final objectives](#) of the Fukushima health survey were set by Yamashita and Prof. Suzuki Shinichi even before obtaining the first results. They were: "to calm the anxiety of the population" and to convince doubters that "the health impact of the nuclear accident of Fukushima can be assumed to be very minor." The initial statement made at the start of the survey on July 24th 2011 during the third meeting of the exploratory committee was that,

"at the present time, the health effects of the radiation caused by the Fukushima NPP accident might be extremely low as far as both internal and external exposure are concerned. The only symptom (disease) that was clearly recognized after the Chernobyl accident is an increasing number of childhood thyroid cancer cases because of internal irradiation by radioactive iodine, an increase in other symptoms not having been identified" . . . "After the long term effect of the Chernobyl accident, mental health issues were pointed out, so the residents in the areas of exposure presented symptoms of anxiety and inexplicable symptoms of their body" . . . "In Fukushima, the same kinds of psychological effect are expected to emerge."

Clearly, the investigators leading the Fukushima Prefectural People's Health Management Survey have very strong prior beliefs regarding the health impact of the nuclear accident. They believe that the study will not detect any physical effect of the accident; rather, the survey is being conducted "to calm the anxiety of the population." This is a difficult starting point for a scientific investigation. Typically a scientific study is designed so as to be able to detect an effect and lead the investigator to accept or reject a stated hypothesis. This is the basis for calculating the necessary sample size to reject a null hypothesis. In this case, they have a strong prior belief that there is no physical effect of exposure. If the study produces evidence counter to their prior belief, the investigators are left with a problem of how to interpret it. Can they reject their starting beliefs and accept the counter-hypothesis (i.e., that the accident caused some health effects)? It is not clear they have a framework for doing that or have figured out properly what sort of weight of evidence could cause them to reject their starting assumption. Can such a study protect the interests of people in the wake of the most serious nuclear disaster since Chernobyl, which took place twenty-five years earlier with devastating effects on human and animal life and the environment?

Scientific results matching the expectations of the survey makers

The objective of the meeting is ostensibly to present the results of one phase of the Prefectural People's Health Management Survey, namely that portion dealing with thyroid condition among children. The group surveyed is comprised of the 38,114 children of the prefecture residing in the 13 towns and villages located in areas designated as highly contaminated and restricted access zones after the Fukushima Daiichi nuclear power plant meltdown. This means that there was no control sample from elsewhere in Japan that was not affected by fallout at this time or earlier. The survey does, however, include 42,060 children from other parts of the prefecture.



12 September 2012, police roadblock 10km north of Fukushima Daiichi nuclear plant

One case of thyroid cancer was announced on 11 September 2012, one and a half years after the nuclear accident, by Professor Suzuki Shinichi, who heads the division dealing with thyroid checking at the Medical University. The age and the sex of the child were not made public. We should mention that childhood thyroid cancer has occurred in 1-2 out of 1 million children. Such rarity of childhood thyroid cancer in the general population made it difficult for institutions such as the United Nations Scientific Committee on the Effects of Atomic Radiation and the International Atomic Energy Association to ignore the effects of radiation exposure on thyroid cancer following the Chernobyl accident.

According to Prof. Suzuki, "in Fukushima there was neither the major external exposure found in Hiroshima and Nagasaki, nor the major internal exposure found in Chernobyl." In his view, there is no relation between this first declared case of thyroid cancer and the nuclear accident in Fukushima. This is for three reasons:

First, according to Suzuki, aside from times of disaster, it is rare to have thyroid examination surveys and echographies of children. So no "reference" survey is available with which to understand the prevalence of thyroid disease in children,

subjected to similar intensive thyroid screening, in the absence of radiation exposures from an accident. However, in fact a survey was conducted by Prof. Yamashita and his team in 2000. This [survey](#) examined abnormalities of the thyroid among 250 school children in Nagasaki where only 0.8% of the children surveyed were found to have nodules and none had malignant disease.² So, while the sample is limited, it should be considered a useful reference survey.

Second, again according to Suzuki, "if we refer to data from Chernobyl, an increasing incidence of childhood thyroid cancer was found from four years after the Chernobyl accident." However, such an argument is silent on the political context in the years following the 1986 accident. At that time there was no reliable access to data and surveys. The testimony of Dr. Alexey [Yablokov](#) is helpful for grasping the situation: up to 1990, the Health Ministry of the Soviet Union ordered doctors not to "connect diseases with radiation" and "all data were classified for the first three years." Two important decisions were taken right

after the Chernobyl accident by the Soviet authorities under the seal "Absolutely Confidential". The first was to keep secret any information related to the catastrophe, especially information related to the health of the affected population. The second was taken by both Ministries of Health and of Defense of the USSR: it was aimed at concealing the level of radiation received by the population and by the "liquidators". Moreover the two decisions instructed the medical staff not to mention the diagnosis of "radiation disease" in the personal files and to replace it with another disease.³ In other words, Soviet political calculations overrode scientific considerations in the four years following the Chernobyl accident. It would be regrettable if political calculations led to the suppression of scientific findings in the Fukushima case. Also, Prof. Yamashita's [past report](#) on Chernobyl concluded that the data from before 1990, that is before the Soviet break-up, but which were only made available later, are not relevant and are not sufficiently detailed. In other words, he concluded, it is difficult to quantify levels of cancer in Chernobyl in the years immediately following the accident.

Third, again according to Suzuki, the technical tools available to scientists today are so developed that even small size cancers can be detected, something that was impossible in the past. We note that such an argument was also widely used to explain the large increase in thyroid cancer cases from 1990 in Chernobyl. If we recognize that the development of technical tools makes it possible to detect more thyroid abnormalities and cancer cases today, and to detect them earlier than in the past, then if these tools had been available at the time of the Chernobyl accident, the evolution of excess thyroid cancer cases might have been detected earlier. In short, such arguments cannot disconnect the present effects of radiation from the thyroid cancer cases which are detected.

Surprisingly, there was no discussion at all about the possible effect of migration on the thyroid abnormality rate of the two groups. As noted above, 35% of the first group of 38,114 children examined were identified as having nodules of a size under 5 mm and cysts under 20 mm, while among the 42,060 children in the second population subject to thyroid screening, this figure was 43%. The first group was drawn from 13 towns and villages located in areas designated as highly contaminated and in restricted access zones after the accident at the nuclear power plant, where the migration rate following the accident was 14%. The second group was drawn from Fukushima city, which is more distant from the plant, and where the migration rate was much lower at 3%. Since in both groups the children who migrated were also tracked and tested, does it mean that the more children migrated, the fewer abnormalities of the thyroid are to be found? If such a relation were to be confirmed, it would help to identify a *direct* relation between thyroid abnormalities and the degree and length of exposure to the fallout. It would also deeply call into question the government's strategy of limitation of population movements after the accident that was clearly set forth in the definition and settlement of concentric evacuation zones. From the beginning, the Japanese state placed Fukushima city (and other "distant" cities) beyond the reach of the fallout. Detailed data should be made available to make it possible to check the reality of such relationships. It could also help to consider whether evacuation of children, who are particularly vulnerable to exposure to other radionuclides, should be considered even now from Fukushima City and other localities outside the evacuation zones.

Of course the first possible factor to consider in order to explain the numbers of nodules and cysts is the level of radiation people were exposed to. What can presently be said is that:

1. A [massive amount](#) of I-131 in the form of gas and dust was diffused from the explosion of the third reactor on March 14, 2011.
2. Some towns and villages close to the nuclear power plant evacuated part of their population from Fukushima Prefecture on the 12th, 13th or 14th of March, depending on each local government.
3. Personal dose reconstruction by simulation and estimation is to be conducted by the National Institute of Radiological Sciences and the results have not yet been published. Therefore, we still don't know how much internal radiation people received at the very beginning of the accident.
4. Basic research (questionnaire on activity and food intake from March 11 to 31 included in the Health Management Survey) has produced results for only 22.9%, 470,593 out of the total Fukushima population of 2,056,994.
5. [Research](#) on dose estimation from external exposure alone has been completed only on 7.8% in a first group drawn from 13 towns and villages, while for the entire prefecture only 23.5% has been completed. Up to now, we can only conclude that the question should remain open pending further data.
6. The data should be made accessible and transparent to the public, including the results of the thyroid screening, the health examination and the total amount of estimated personal dose.

We don't know the precise amount of received dose. But the question remains and only transparency and freedom of information will allow us to draw conclusions. Therefore, the role of third parties consisting of scientists, lawyers, politicians and residents is necessary. We are surprised to learn that a radiation's epidemiology research team from the French Institut National de la Santé et de la Recherche Médicale (INSERM) contacted Prof. Yamashita and his team in order to obtain access to the thyroid survey data last June, but received no reply to their request.

Although it should be considered praiseworthy to so quickly launch such a large health survey with significant technical and human resources, we still cannot understand clearly the real motives of Yamashita and Suzuki as illustrated by the following. First, Yamashita failed to arrange for the distribution of stable iodine pills to the population immediately after the accident. Second, Yamashita and Suzuki have repeatedly tried to slow the process of examination of children through other health structures inside and outside Fukushima. In a [letter](#) sent to the members of the Japan Thyroid Association on January 16, 2012, discussing the parents of children being examined without any finding of "abnormal" nodules and/or cysts, Yamashita and Suzuki made the following request: "Please explain to them well to be sure they understand that any further testing is not necessary before the next scheduled examination two years hence unless symptoms appear."

Dr. Hoshi, Commissioner of the Fukushima Medical Association, who participated in the health survey presentation, reiterated the researchers' fear of losing the high ground on their sample when he observed that the second level examination of children is moving too slowly, and that "if we don't prepare the second level examination more quickly, the patients will slip through our hands."

We should also bear in mind that we owe to Yamashita and his colleagues the idea of tracking all those who took refuge outside of Fukushima prefecture, using their application for compensation payments as people affected by the nuclear accident. The statements quoted above clearly reveal the concern on the part of survey committee members to discourage the 70,000 people who officially left the prefecture (not to mention the many undeclared migrants) from receiving health examinations not conducted under the supervision of by the Fukushima Medical University team. In response to such determination, medical associations in Sapporo (Hokkaido) decided to conduct their own independent examinations of child migrants from Fukushima to Hokkaido following the protocol of the Fukushima Medical Association, and citizens associations are now organizing to pressure the authorities to provide access to free medical examinations for nuclear refugees outside Fukushima Prefecture.

The unification of information

A few hours after the conference, [Kyodo News](#) echoed the official press release, saying that "a single case of thyroid cancer was identified among the 80,000 children examined." This was a grave mistake!

The 95-page report presenting the survey results reveals a different reality. According to previous results published on 26 April 2012, 35% of the first population of 38,114 children being examined were identified as having nodules of a size under 5 mm and cysts under 20 mm, symptoms that the scientists in charge of the survey considered "normal". However, one hundred and eighty six children, 0.5%, were identified with nodules over 5mm and cysts over 20 mm. Those children are to receive a second examination (more precise echo examination, blood testing, urine testing, and aspiration biopsy cytology). Yet five months later, only 60 of the 186 children scheduled to receive a second examination have actually received it, and only 38 of those examined actually completed the second examination: 10 of them have been reintroduced into the "normal" cycle of an examination every 2 years; 28 were directed toward a thyroid cytology. Half of those children were finally told that "there is no necessity for an aspiration biopsy cytology" with the result that it was performed on just 14 children. It is thus among those 14 children alone that one thyroid cancer case was officially diagnosed.

Among the 42,060 children comprising the second population subject to thyroid screening, 239, 0.6%, have been identified with nodules over 5mm and cysts



12 September 2012, in Odaka, Minami-Soma city, 18 km north of the Fukushima Daiichi nuclear plant. Iwata Wataru collects water from the Pacific Ocean to be analysed at CRMS.

over 20mm. Those children will also receive a second examination. We cannot say anything about them prior to the second examination.

So if we bring together the 239 children of this second population waiting for a second examination and the 148 children (186-38) of the first population who are to be reexamined but who have not yet been reexamined, we have a total of 387 children about whom nothing can be said prior to completion of examination.

Consequently, the unique case of thyroid cancer identified thus far cannot be compared either to the 38,114 children who comprise the first population group, or to the 42,060 children of the second population group, still less to the 80,174 children of the total surveyed population.

Any attempt, even tentative, to provide a ratio at present is pure speculation. Once the 387 children scheduled to receive the second step examination have completed it, it will be possible to compare the total number of observed cancers to the whole population of children surveyed and to a control population. Of course, the validity of such a ratio will only hold until the next examination of the same children, and the 280,000 other children from other parts of the Prefecture

that the Medical University of Fukushima plans to check who are still waiting to receive their first examination.

It is therefore premature to draw conclusions about these findings in the absence of control groups. Large scale screening of thyroids tends to lead to detection of many abnormalities that would otherwise go undetected, which makes it difficult to interpret the screening results. The single case found is itself important given the rarity of the outcome, but without details on the age, sex, and location of the case, and without completion of the pending tests, it is hard to judge how rare it really is.

To provide medical care or "to set a science record"?

Such clarification is crucial since we cannot neglect the fact that never, even in Chernobyl, has science had access to such a large population sample. Last year in an interview with a [newspaper](#) Yamashita described the Fukushima health survey: "We know from Chernobyl that the psychological consequences are enormous ... relocation is not easy, and the stress is very great. We must not only track those problems, but also treat them. Otherwise people will feel they are just guinea pigs in our research."

Yamashita's prime objective is "to set a [science record](#)." The Medical University of Fukushima has announced it will engage next year in a large "[collection](#) of DNA samples from volunteers and hunt for abnormalities in their genes due to radiation damage."

The first problem, as explained above, is that there is a risk that the team in charge of the Fukushima Prefectural People's Health Management Survey is biasing the results since its final objective was "to calm the anxiety of the population."

Second, there is a lack of transparency concerning the survey results. The research is closed and the data are not made available to the public. For example, even though patients receive prints of their own ultrasound, they have to make a complex request through the Freedom of Information Act in order to obtain access to the complete set of their own file. The quality of the prints, moreover, is terrible. Matsui Shiro, in charge of public relations at the Fukushima Medical University, has stated that the reason for not providing the patients with high quality prints is that people could rather easily "falsify" them. We would like to know who, and for what purpose, Fukushima Medical University expects that someone would wish to falsify the prints. Shimizu Tsutomu, chief committee member of the committee on information and communication from the Japan Federation of Bar Associations points out that concern that the picture of the echo-screening might be falsified could not be the reason for refusing access to information since the Fukushima Medical University needs only to keep the original record ([Mainichi newspaper](#), 26 August 2012).

Third, the quantitative concern of Yamashita's team is related to its goal of controlling the scientific results and the process of securing such results. The objective is to be accepted as an authority, and Prof. Yamashita has a certain experience in that field. Actually he and his team already "set a scientific record" with the research surveys they conducted with 200,000 children from Chernobyl in the early 1990's.⁴ Those surveys underestimated the effects of the Chernobyl accident on children by supporting the idea that only some thousands of "avoidable cases" of thyroid cancer (meaning cancers considered to be medically treatable) appeared after the nuclear accident. Two thousand such "avoidable cases" were found according to a report from WHO (Les conséquences de Tchernobyl et d'autres accidents radiologiques sur la santé -WHO/EGH95II – Geneva 20/23 novembre 1995); 6000 cases according to Dr. Malcom Crick, Principal Officer of UNSCEAR who recently declared : "after Chernobyl, the only public health impact that we have seen has been the more than 6000 thyroid cancers among those people that were children at the time of the accident, drinking contaminated milk. Of those 6000 or more perhaps 15 have died." (Video [Fukushima and Chernobyl – Myth and Reality](#), 26 march 2012).

Those surveys underestimated the effects of the Chernobyl accident on children by supporting the idea that only some thousands of "avoidable cases" of thyroid cancers (meaning cancers considered to be medically treatable) appeared after the nuclear accident without mentioning that when the Chernobyl thyroid cancer cases were found in the early 1990s, it was also found that the cancer had already metastasized to the lung and lymph.

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Sources:

[Results](#) of Fukushima Prefectural People's Health Management Survey presented on September 11, 2012

[Site](#) of the Fukushima Prefectural People's Health Management Survey

[English translation](#) of the first part of the Survey

Articles on related subjects

- Masuda Yoshinobu, [From "Black Rain" to "Fukushima": The Urgency of Internal Exposure Studies](#)
- Shaun Burnie, Matsumura Akio and Murata Mitsuhei, [The Highest Risk: Problems of Radiation at Reactor Unit 4, Fukushima Daiichi](#)
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- Kodama Tatsuhiko, [Radiation Effects on Health: Protect the Children of Fukushima](#)
- Say-Peace Project and Norimatsu Satoko, [Protecting Children Against Radiation: Japanese Citizens Take Radiation Protection into Their Own Hands](#)
- APJ Feature, [Save the Children: Radiation Exposure of Fukushima Students](#)

¹ The internationally recognized acceptable dose limit for members of the general public is 1mSv per year from environmental contamination, one hundred times less than that proposed by Yamashita. In Japan, according to the Atomic Energy Basic Act established in 1955 and revised in 2010, the effective dose limit to the "general public" is also 1 mSv per year. In the wake of the Fukushima nuclear meltdown, the Japanese government on various occasions issued other limits for the general population, notably 20mSv, which is the recommended annual occupational dose limit for workers in the nuclear industry.

² This figure should be compared to the 35% out of 38,114 of the first population in the Fukushima survey as explained below.

³ Quoted by Alla Yarochinskaga in her account entitled "Absolument confidentiel": Les Autorités Soviétiques face à la catastrophe", in "Les silences de Tchernobyl - L'avenir contaminé", Editions Autrement, Collection Mutations n°10 2004, p. 27.

⁴ S. Yamashita, Y. Shibata (ed), Chernobyl. A Decade. Proceedings of the Fifth Chernobyl Sasakawa Medical Cooperation Symposium, Kiev, Ukraine, 14-15 October 1996, Elsevier Science 1997. This book collects the results obtained from the research conducted on 160,000 children since 1991. It will be followed by S. Yamashita, Y. Shibata, M. Hoshi, K. Fujimura (ed), Chernobyl: Message for the 21st Century Proceedings of the Sixth Chernobyl Sasakawa Medical Cooperation Symposium, Moscow, Russia, 30-31 May 2001, Elsevier Science 2002.