

Scientists for Accurate
Radiation Information
(SARI)

Mr. Shinzo Abe
Prime Minister, Japan

02.10.2013

Subject: **Scientific bases for assessing potential health effects
of low-dose ionizing radiation related to Fukushima**

Dear Prime Minister,

We, the undersigned members of **Scientists for Accurate Radiation Information (SARI)**, are writing to support your efforts of calming the Japanese people and to provide a short discussion on what is known about the health effects of low-doses of ionizing radiation such as may have been received or may be received by down-wind populations of the Fukushima nuclear power plant. Casualties have already occurred among some members of the Japanese population related indirectly to radiation-phobia-promoting misinformation about the health effects of low radiation doses. The misinformation mainly relates to hypothetical harm (e.g., radiation-induced cancers) based on the linear-no-threshold (LNT) model.

The LNT model of radiation-induced stochastic effects assumes that every dose of ionizing radiation, no matter how small, constitutes increased (linear with the dose) risk of the effect of interest. The LNT model is presently used for cancer risk assessment by advisory bodies and as such it is the basis for radiation safety regulation. The LNT model is also widely accepted by the general public. However, the scientific validity of this model has been seriously questioned and debated for many decades. The recent memorandum of the ICRP (International Commission on Radiological Protection) Task Group (Gonzalez et al. 2013) states that:

*"While **prudent for radiological protection**, the LNT model is not universally accepted as biological truth, and its influence and inappropriate use to attribute health effects to low dose exposure situations is often ignored..."*

*"**Speculative, unproven, undetectable and 'phantom' numbers** are obtained by multiplying the nominal risk coefficients by an estimate of the collective dose received by a huge number of individuals theoretically*

incurring very tiny doses that are hypothesised from radioactive substances released into the environment." (highlighted by the undersigned).

The Task Group of the ICRP, one of the main bodies promoting the LNT model, also admits that LNT predictions at low doses are "*speculative, unproven, undetectable and 'phantom'*," raising the reasonable wonder how such a model can be "*prudent for radiological protection.*" This position is similar to that published by the US Health Physics Society (1996) where it states: "*... estimates of risk should be limited to individuals receiving a dose of 50 mSv in one year or a lifetime dose of 100 mSv in addition to natural background... Below these doses, risk estimates should not be used. Expressions of risk should only be qualitative, that is, a range based on the uncertainties in estimating risk ... emphasizing the inability to detect any increased health detriment (that is, zero health effects is a probable outcome).*" Similarly, the American Nuclear Society (2001) states: "*It is the position of the American Nuclear Society that there is insufficient scientific evidence to support the use of the Linear No Threshold Hypothesis (LNT) in the projection of the health effects of low-level radiation.*"

In addition, the French Academy of Sciences/National Academy of Medicine report (2005) states the following regarding use of the LNT model: "*... the use of this relationship to assess by extrapolation the risk of low and very low doses deserves great caution. Recent radiobiological data undermine the validity of estimations based on LNT in the range of doses lower than a few dozen mSv ...*"

Further, the American Association for Physics in Medicine (2011) states the following related to LNT-based cancer risk estimation for diagnostic imaging: "*Predictions of hypothetical cancer incidence and deaths ... cause some patients and parents to refuse medical imaging procedures, placing them at substantial risk by not receiving the clinical benefits of the prescribed procedures.*"

The supporters of the LNT model claim that its use is "conservative" and that after small radiation doses to each member of a very large population cancer is likely to be induced but at possibly an undetectable level. However, numerous experimental animal studies conducted in Japan (cutting-edge research) and elsewhere and some epidemiological studies show that low doses of ionizing radiation may be beneficial to human health – similar to low-level ultraviolet radiation. Also, the healing and pain-reducing properties of radon have been utilized in spas for centuries and radon therapy is still popular in Japan and Europe. The above facts and others (Academy of Sciences/Academy of Medicine 2005) promote emerging scientific support for beneficial effects of low-level ionizing radiation including inflammatory disease prevention and therapy.

It is our sincere view that the present LNT-based regulations as they apply to Japan impose excessive cost on the society, effectively leading to harm rather than benefit. An example is loss of lives related to the evacuations that took place from around Fukushima, which are linked to LNT-based radiation exposure limits for the public. Importantly, there has been no death and no casualty from radiation-

exposure related to Fukushima and none should be expected if current exposure limits are not exceeded by two orders of magnitude.

We hope that the above information helps to communicate proper messages to the Japanese people related to Fukushima, stipulate the return of the evacuees to their homes, and find cost-efficient solutions to the existing problems. We would be pleased to engage you in further discussions and provide you with additional information or assistance with respect to these issues.

Sincerely yours,

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