

Aug 22, 2022

Marcia McNutt, PhD  
President National Academy of Sciences  
500 Fifth St., N.W.  
Washington, D.C. 20001

RE: Scientific ethics of NAS

Dear Dr. McNutt,

Recently, I read an article by Drs. E.J. Calabrese and J. Giordano (1) and learned that the NAS Report by the BEAR 1 Genetics Panel in 1956 (2) was neither written nor approved by the NAS Panel. This provokes me to question the scientific ethics of the NAS.

More than a decade ago in July, 2011, I engaged in measuring the radio-contamination of evacuees in Fukushima. A part of our activities was later reported (3). I took a GM counter for a training course in radiobiology and examined evacuees. At the same time, I measured radioactivity at various locations. In Okayama, my home town, the radioactivity was less than 100 cpm, but counts were high in Fukushima, with the highest being 6,000 cpm. While conducting these measurements, I became anxious about my own health, because I had been taught that radiation is limitlessly hazardous, as the linear no-threshold model (LNT) indicates. So, I scrutinized the effects of radiation on our health. As a result, I found the LNT to be invalid, mainly because it is lacking in solid scientific data; is based on the hit theory; ignored human data collected in Hiroshima and Nagasaki; and above all, contains falsifications. Later, LNT was adopted by the International Commission on Radiological Protection (ICRP), which rules the limit dose of radiation to the public is 1 mSv/y. The threshold model of 2 mGy/d or 500 mGy/y set in 1934, without any problems, was replaced by LNT.

After the earthquake in Fukushima, the Japanese government enforced evacuation from some contaminated areas and victimized around 2,000 people, even though no one died from radiation itself. The LNT was an indirect cause of death. My understanding is that the Fukushima accident was a big accident. However, LNT has made it a tremendously huge accident by enforced evacuation, unnecessary decontamination, and stockpiling of tritiated water, etc.

There is a large body of evidence that supports hormesis. Hormesis and LNT are mutually incompatible. If hormesis is valid, then LNT is invalid, and vice versa. The NAS has ignored scientific progress such as hormesis for decades. In 2006, the NAS published the BEIR VII report and supported LNT on the basis of the Life Span Study (LSS) of A-bomb survivors (4). When I examined this LSS closely, I found that most survivors had longer lifespan and lower cancer risk than the general Japanese population (5). These findings contradict the BEIR VII report. You may say that LNT depends more on the

BEIR VII report (4) than the Science paper (2). This report, however, is also problematic. I would like to point out several issues I have noted with Figure ES-1 below, published in the BEIR VII report. Several scientific omissions have been made in its interpretation, no doubt to maintain LNT.

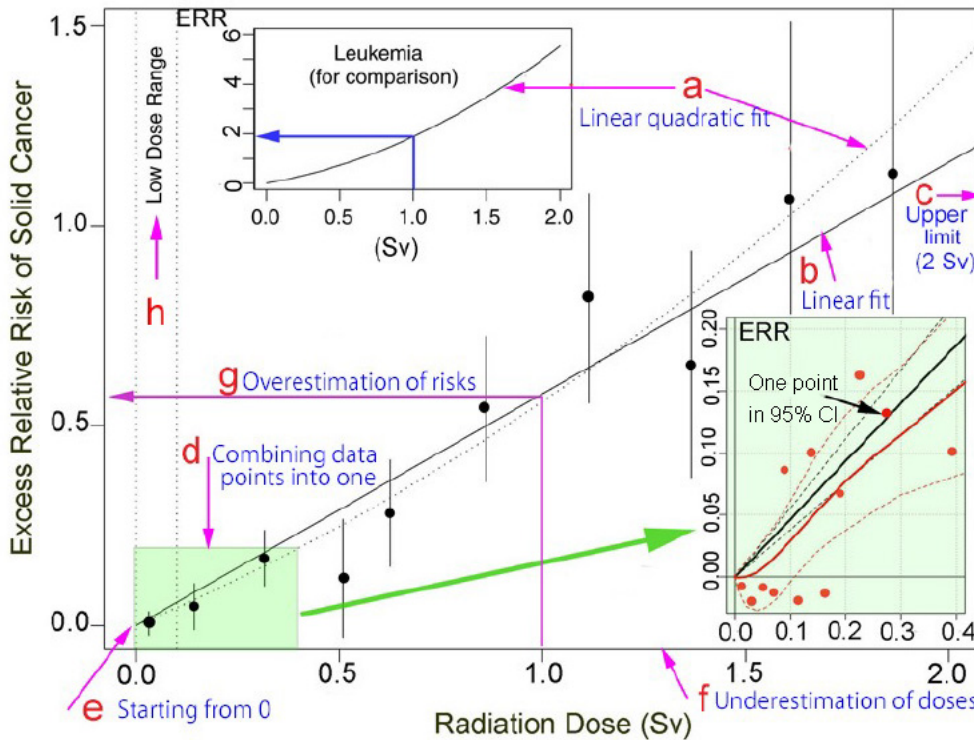


Figure ES-1 (4).

1) Excess relative risk (ERR) of leukemia and solid cancer fits better to the linear quadratic model (a) than the linear model (b), but BEIR VII supports LNT. 2) The highest dose in this model is limited to 2 Gy, concealing the downturn of ERR at 3 or 4 Gy (c). 3) Low dose groups examined at 12 data points were combined into three points for reporting (d). This old statistical trick is successful in giving the impression of linearity, when in fact, the response is hormetic (see bottom-right insert) (6). 4) Since people who visited Hiroshima and Nagasaki after the A-bomb were exposed to residual radiation, the dose-response curve should not start from 0.0 (e). 5) Exposure doses are underestimated by 2- to 3-times, owing to the neglect of residual radiation (f). 6) In turn, ERR, estimated on the basis of those underestimated doses, is overestimated (g). 7) Doses in our daily life are usually less than 100 mSv or even less than 10 mSv. Despite the importance of this range, the results within it are compressed narrowly to a low dose range, as if it were almost negligible (h).

In addition, the BEIR VII estimates of health risks are based on faulty assumptions and data analyses (7). ERR of leukemia in the LSS shows hormesis (8), disproving LNT. The

authoritarian attitude of the NAS to ignore scientific evidence and to maintain LNT for decades reminds me of the Roman Catholic Church when it found Galileo guilty in 1633 and apologized to him in 1992.

The invalid LNT has done a lot of harm without benefit. The precautionary principle, based on LNT, to protect people from harm has actually killed people. LNT propagates radiophobia that is a fundamental obstacle to the reasonable development of nuclear power, which is indispensable to prevent global warming. No nuclear power plants have been constructed in the US since 1976, while China has erected multiple sites. Those who dominate energy dominate the world.

I agree to the assertion that the previously accepted Science paper (2) should be retracted so that LNT can be abolished. If retraction is difficult, some correction or at least an addendum to the effect that the paper was neither written nor approved by the Panel should be publicized.

- (1) Edward J. Calabrese, James Giordano. Ethical Issues in the US 1956 National Academy of Sciences BEAR I Genetics Panel Report to the Public. *Health Phys* 123:Online ahead of print. doi: 10.1097/HP.0000000000001608.
- (2) Anonymous. Genetic effects of atomic radiation. *Science*, 123, 1157-64, 1956.
- (3) S. Sutou, M. Doss, H. Tanooka (Eds). Fukushima nuclear accident: Global implications, long-term health effects, and ecological consequences, Nova Science Publishers, Inc., New York, 2015.
- (4) The National Academy of Sciences. Health risks from exposure to low levels of ionizing radiation: BEIR VII – Phase 2 (Free Executive Summary), the National Academy of Sciences 2006.
- (5) S. Sutou, Low-dose radiation from A-bombs elongated lifespan and reduced cancer mortality relative to un-irradiated individuals. *Genes Environ*. 2018 Dec 19;40:26. doi: 10.1186/s41021-018-0114-3.
- (6) K. Furukawa, et al. A Bayesian semiparametric model for radiation. dose-response estimation. *Risk Analysis*:1-13, 2015. DOI: 10.1111/risa.12513
- (7) JA Siegel et al. The BEIR VII estimates of low-dose radiation health risks are based on faulty assumptions and data analyses: a call for reassessment. *J Nucl Med*. 2018 Feb 23. pii: jnumed.117.206219. doi: 10.2967/jnumed.117.206219.
- (8) UNSCEAR, 1994. Sources and Effects of Ionizing Radiation. Report of the United Nations Scientific Committee on the Effects of Atomic Radiation. Annex B: Adaptive responses to radiation in cells and organisms. United Nations.

Sincerely,

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