[**http://www.doseinfo-radar.com/EPA\_response.html**](http://www.doseinfo-radar.com/EPA_response.html)

**Rebutting EPA: Time for a Policy Change**

In June, 2014, Stabin and Siegel published an article entitled, Does the EPA contradict its own policies? (Stabin MG, Siegel JA. Health Physics News XLII (6):17-19, June 2014), which elicited a response from the EPA in the same newsletter (Puskin JS, Pawel DJ. Response to Stabin and Siegel. Health Physics News XLII (6):19-20, June 2014). Here is a copy of the article and EPA reply.

Siegel and Stabin then rebutted EPA's response (see below) in collaboration with 25 members of SARI in six countries. Scientists for Accurate Radiation Information (SARI) is an international group of experienced, informed and well-respected scientists and professionals with substantial backgrounds in a variety of practices and technologies involving the use of ionizing radiation (http://radiationeffects.org/).

We read with interest the EPA comments by Puskin and Pawel. We would like to offer the following response:

1. The EPA’s response did not fully address the assertions made in our commentary; only their firm belief in the LNT model of radiation carcinogenesis was addressed, a belief that must be vigorously challenged and exposed for being scientific folly. The putative cancer risks due to radiation at low doses are unknown and perhaps such doses may even be beneficial. Even at relatively high doses, radiation is only a weak carcinogen; according to ICRP estimates, at the high dose level of 1 Sv (100 rem), about 95% of people so exposed are not expected to get cancer due to this exposure. The theoretical, and as yet imaginary, effects predicted at low doses are based solely on the LNT model’s linear extrapolation of observed effects at high doses.

2. Their opening sentence, “Alas, the dispute among health physicists over LNT never ends!” indicates that at EPA, LNT is “settled science,” a position that is most curious given that people are living longer despite being subjected to increasing radiation exposures. We must maintain some perspective as to the relative importance of a whole spectrum of hazards, among which radiation is only one. Cancer is not solely a stochastic effect of radiation exposure. Carcinogenesis is a multistage, multimechanistic process involving the interaction of many external and endogenous factors. While radiation is certainly a contributing factor at high doses, at low doses and dose rates, it is misleading to assume that radiation, or any single factor, “causes” cancer.

3. These authors highlight BEIR VII to indicate that LNT represents the “mainstream of expert scientific opinion on the risk of radiogenic cancer.” However, this is just an opinion, not a statement of fact. BEIR VII indicates the large uncertainties associated with this judgment and this so-called consensus “opinion” is inconsistent with evidence, as we have noted. The 2005 French Academy of Sciences report reviewed essentially the same data as the BEIR VII Committee but came to very different conclusions regarding the LNT model. The French report raised doubts about the validity of using the LNT model for doses < 100 mSv, recognizing the abundant evidence for radiation adaptive response in terms of protection and lack of evidence for harm for the indicated dose range. Importantly, following the recent updates and corrections to the two main datasets the BEIR VII report used to justify the LNT model and increased cancer risks from low doses of radiation, these datasets no longer provide evidence for the LNT model or low dose radiation cancer risk. Further, considerable evidence supporting the beneficial effects of low doses of radiation has been reported over the years, including recently.

4. These authors then highlight the UNSCEAR publication for further support of the LNT model. However, its conclusions are quite flawed and it completely ignores historical and recently published evidence for cancer reduction in low dose studies. UNSCEAR violates a fundamental requirement of the scientific method because it disregards its own scientific evidence on the leukemia incidence of the 96,000 Hiroshima atomic bomb survivors, namely that the presence of a large threshold dose in these data indicates that the LNT model is incorrect.

5. The EPA points to a published study by Darby et al. to indicate that rejection of LNT is indefensible when it comes to radon. This study is fatally flawed statistically; the model used assumes an a priori linear association between radon and lung cancer so it is no wonder that the result is consistent with LNT. A more recent pooled Bayesian analysis using linear as well as other dose-response models indicated no evidence of such a linear dependence; in fact, no association between radiation dose and increased lung cancer risk was demonstrated, even if Cohen’s data are excluded. Then Puskin and Pawel go on to state that “EPA’s action level was not chosen on a health-risk basis, but was driven by the technical feasibility of achieving reliable and verifiable reductions by homeowners.” This is an admission that LNT is dependent upon feasibility and has nothing to do with a scientific health-risk analysis.

6. Finally, Puskin and Pawel assert that “The position of EPA remains that, in view of current scientific information, LNT is the most suitable basis for assessing radiation risks at low doses.” This perhaps more than anything else illustrates the authors’ complete misunderstanding of the use and purpose of the LNT hypothesis and of the difference between risk assessment and risk management. In fact, there is no suitable basis for assessing such risks.

In conclusion, Paracelsus, a 16th century Renaissance physician, took an anti-LNT stance before it was even known or fashionable to do so when he said, "Poison is in everything, and no thing is without poison. The dosage makes it either a poison or a remedy." Whereas experimental data indicate low-dose induction of adaptive protection against cancer and a negative excess relative cancer risk, advocates of the LNT model disagree and still believe, in the face of these data, that there is an excess cancer risk at low doses that is simply too small to be detected. However, this claim of ‘statistical invisibility’ is a straw man argument since the data show that the cancer risk is not simply invisible, but is simply not there.

We would be happy to provide additional text and applicable references upon request by the EPA.

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