itself is considered a normal background radiation area with individual doses like any other area in Iran, and differentiation should be made between the two high and normal natural background radiation areas in Ramsar city.

Further, a scientific analysis of hormetic responses has concluded that the main problems related to the hormesis model remain in the low reproducibility of the results and low predictability.[4] Therefore, the hormesis model still has shortcomings that need to be resolved before it can be considered for practical use.

Bridging LNT, hormesis

The LNT and hormesis models both have health risk versus dose-responses above national natural background doses, which vary from country to country from 1 to 10 mSv/y.[12] In particular, the hormesis model considers the observed effects over a control group exposed to natural background radiation with no observed health effects; such data have been rather difficult to reliably obtain in light of a number of different confounding factors. The assumption of both models ignores the unavoidable fact that a worker in a country with a mean national natural background dose value of about 1.0 mSv/y and a worker in another country with a mean natural background dose value of about 10.0 mSv/y have different health risks, even if both workers are exposed to a 20 mSv/y dose limit. This means that workers in different countries around the world will have widely varying human health risks due to differences in the actual integrated doses received.

Although the International Atomic Energy Agency's *International Basic Safety Standards on Radiation Protection and Safety of Radiation Sources*[19]—which I helped to implement as an IAEA radiation protection regional manager and expert in order to standardize the radiation protection infrastructures of different member states—the occupational exposures of a worker cannot be standardized by applying the current dose limit of 20 mSv/y without taking into account the nonoccupational exposures by either the LNT model or the hormesis model. The LNT model has a linear response valid above about 100 mSv, with no reproducible risk data below this dose. The hormesis model cannot be valid by ignoring the nonoccupational exposures—in particular, natural background radiation exposures. Perhaps humans have already received the stimulatory and beneficial hermetic effects of natural background radiation since the creation of Earth to a point that we are here today. Therefore, a border between the past and new stimulatory effects seems to be impossible to measure.

The controversies over the two models seem to be mainly at lower doses of the dose-response curves. Since there are no convincing health risk data at low doses, consideration of the URPS model can be an immediate option to overcome the shortcomings of the two models, while still respecting the LNT response at higher doses.

Figure 3 shows the probability of cancer versus dose response by applying a dose correction fractionation factor in the low-dose region, where the LNT and hormesis models fail to respond due to the lack of reproducible health risk data. The response above the colored low-dose response is the actual LNT response, which seems not to be seriously controversial. At lower doses, both occupational and nonoccupational exposures can be integrated by applying a correction fractionation factor within a dose limit yet to be formulated.

As a simple preliminary example of setting a dose limit, the present dose limit of 20 mSv/y can be adopted as a base. It can then be corrected for the fractionated occupational duration as an example until a more elaborated—possibly biologically based—correction factor can be determined. Assuming that a worker is on the job for only 8 hours/day × 250 days/year,