Author's response to reviews

Title: Influence of various factors on individual radiation exposure from the Chernobyl disaster

Authors:

Pavlo Zamostian (pvzamos@ukr.net)
Kirsten B Moysich (kirsten.moysich@roswellpark.org)
Martin C Mahoney (martin.mahoney@roswellpark.org)
Philip McCarthy (philip.mccarthy@roswellpark.org)
Alexandra Y Bondar (bon@bon.kiev.ua)
Andrey G Noschenko (bon@bon.kiev.ua)
Arthur M Michalek (arthur.michalek@roswellpark.org)

Version: 2 Date: 21 Oct 2002

PDF covering letter
To: Professor Philippe Grandjean

Dear Philippe:

We are in receipt of the comments provided by the three (3) Reviewers of our manuscript (Ref. No. 9957975843407326). We are deeply gratified and pleased with their assessment of our manuscript. As Drs. Clapp and Fischbein allude - this is an interesting paper and deserving of publication. Our responses to the individual Reviewer’s comments are as follows.

Dr. Clapp made several specific comments that we have addressed as follows.

We have modified the sentences in the abstract to state that “the Chernobyl accident was one of the greatest…”

1) Dr. Clapp indicated that we refer to our use of “randomized selection” in the manuscript without further elaboration. In the first case we presented information on whole body counts in the Ukraine. Our second use of the word random was in reference to a field survey conducted by Pavlo (one of our co-authors). These data were collected as part of a government survey and were not conducted in a true randomized process so we have deleted the word random.

2) Per Dr. Clapp’s suggestion, we have substituted the term “Modifying Factors” for “Mitigating Factors”

3) Per Dr. Clapp’s comments we have clearly labeled the y-axis of Figures 2 as “(Bq/L)” and 4 as “Percent” as well as reviewing to see that the title of Figure 3 is not garbled on the PDF file.
4) We have now added a reference to Table 1 (Dosimetry pasportization of the settlements of Ukraine located at the territories radioactively affected after Chernobyl accident. Catalog 5. Kiev: Ministry for health protection of Ukraine (MOH) 1995. (In Russian).)

Response to Dr. Rommens Comments:

Major Comments:

M0: No response is warranted. We do not agree that this manuscript is of “little scientific interest”. Moreover, it is important to note that this opinion is not shared by the other two reviewers who appear to be more enthusiastic regarding the content and significance.

M1: We have followed the Reviewer’s suggestions and have adopted alternate language replacing the term “demonstrate” in the Background section of the Abstract with the phrase “presents a description of”. Further, we have followed the Reviewer’s suggestion to change the wording in the last sentence of the Results section of the Abstract to more accurately reflect what is presented in the manuscript. This sentence now reads “Results show the diminution of individual doses between 1987 and 1991 and then an increase between 1991 and 1994 and the relationship between this increase and changes in the lifestyle of the local population.”

M2: We have clarified the text within our manuscript to describe what is presented in Figure 4.

M3: The Reviewers is concerned that while Figure 3 shows an increase in Dint for Vezhytsia in 1994, it is a year when the caesium concentration in Vezhytsia milk is low and that since milk contributes to about 70-75% of Dint a raise of a factor 2 or 3 in mushrooms and berries consumptions (as shown on figure 4) can not explain this increase.

We would like to point out that the data in these Figures are not equivalent. While Figures 2 and 3 present data from Rokitnovsky Rayon and selected villages, data in Figure 4 are not presented at the village level and, moreover, are based on a survey of consumption alone without any individual measure of dose. To speculate as to the effect on individual dose may introduce the “ecological fallacy”. While contamination of milk, as the Reviewer points out, may have been low in 1994 there is some evidence (Fig 4) that the consumption of more contaminated mushrooms and berries occurred. However, these data are not available at the individual village level.

Minor Comments:
m1: The Reviewer commented … “precise that Chernobyl was the greatest environmental nuclear disaster.” This sentence has been modified.

m2: Reviewer states, “reference for the value quoted for soil to milk transfer coefficient or precise if there where calculated with the data of this study”. This has now been referenced.

m3: We agree with the Reviewer’s comment that “the last paragraph of discussion section seems out of the subject of the paper. The contribution of pork in individual dose was not quoted in the paper so it is of little interest to discuss about the consumption of pork.“ We have deleted this from the manuscript.

m4: We have sited the location of the Power Plant.

m5 & 6: Figures have been corrected.

Response to Dr. Fischbein’s comments.

We are in wholehearted support with Dr. Fischbein’s comment that “The variations of exposure over time are important to consider by those who assess or survey the health status of the populations in the area.” This is further support that our manuscript will be of interest to the scientific community.

Specifics:

Abstract: Dr. Fischbein states “The word ‘accident’ should be replaced by ‘explosion’.” This has been done.

Also that we “add in the second line the text (in bold characters):……greatest known nuclear environmental disaster.” This too has been done.

Dr. Fischbein states “II. Introduction: The type of radiation exposure was different as compared to the atomic bomb detonation, not only subtler. See: 5. Weinberg A., Kripalani S., McCarthy P., Schull W. Caring for Survivors of the Chernobyl Disaster. JAMA, 1995; 274 (5): 408-12.”

We have modified the sentence and added the reference.

Dr. Fischbein recommends that “a short description of the populations and the degree of migration patterns (immigration and emigration) during the period discussed in the paper ought to be provided for the area”. Unfortunately, precise data on this is unavailable. Our Ukrainian colleagues have informed us that within Oblast migration
was more the norm than out-migration and even then it may have been transitory. Given the lack of precision on migration data we consciously chose to not introduce it into this manuscript. While data on Oblast populations are reasonably available, population counts on Rayon and village are not. This is an unfortunate occurrence.

Dr. Fischbein recommends that we “Check that all headings are in a uniform format.” This has been done.

Dr. Fischbein recommends that “…the authors add the following considerations in these sections: Regarding a second phase increase in exposure, although possibly related to the factors that the authors propose, there may be additional exposure sources, such as leakage from the nuclear reactor itself, contamination of soil and groundwater from disintegration of buried organic materials and contamination of drinking water from waterways that are known exposure sources”.

We are reluctant to add this because the area described in this manuscript is far enough away from the reactor to not have been directly influenced by leakage from the reactor into the groundwater.

We appreciate all of the Reviewers’ comments and feel that they have greatly enhanced the value of our manuscript. We look forward to the publication of our manuscript in your journal. Please contact me should you have any further concerns. Thank you.