LETTERS TO THE EDITOR

Unfounded statements tending to overestimate Chernobyl consequences

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LETTERS TO THE EDITOR

Unfounded statements tending to overestimate Chernobyl consequences

Dear Sir

The article by Mikhail Balonov (2013) provides some broadly based statements relating to health effects arising from the Chernobyl accident. These statements require further discussion and qualification so that readers can appreciate the difficulties that exist in interpreting the available data on health effects. Here follow several citations from Balonov (2013) with the comments.

“The background rate of thyroid cancer among children under age 10 years is approximately 2–4 cases per million per year.” (Balonov 2013) Thyroid cancer (TC) was comparatively rarely diagnosed in the former Soviet Union (SU) before the Chernobyl accident: in Belarus during 1981–85, the absolute number of TCs diagnosed in children under 15 years was 3, and the reported annual rate per million children under 15 years was 0.3; for Ukraine, the corresponding figures were 25 and 0.5 (Stsjazhko et al 1995). For the northern regions of Ukraine, where contamination after the Chernobyl accident later occurred, these values were correspondingly 1.0 and 0.1 (Stsjazhko et al 1995). The same numerical data were published by IARC (2001). These incidence rates are low in comparison with those for other developed countries. Paediatric TC incidence in different countries from Parkin et al (1999) are summarised in a table in Demidchik et al (2007).

It can be seen from table 1 that incidence of paediatric TC was higher in more developed countries, probably as a consequence of better diagnostics and coverage of the population by medical checkups. In the Russian Federation, TC was first registered as a separate entity only in 1989 (Parshkov 2006), when the screening after the Chernobyl accident had been initiated and the registered TC incidence started to increase. Therefore, mass screening detected not only small incidental cancers but also advanced TC. This predictable phenomenon was confirmed by the fact that the ‘first wave’ TCs after the accident were on average bigger and less differentiated than later ones (Williams et al 2004). The percentage of more advanced cancers among the ‘first wave’ cases after the accident was high (Tronko et al 1999).

Table 1. Thyroid cancer incidence in children 0–14 years old: an extract from the table published by Demidchik et al (2007) compared with the data for Belarus and Ukraine (Stsjazhko et al 1995).

<table>
<thead>
<tr>
<th>Country (region)</th>
<th>Years</th>
<th>Cases per million per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus</td>
<td>1981–85</td>
<td>0.3</td>
</tr>
<tr>
<td>Ukraine</td>
<td>1981–85</td>
<td>0.5</td>
</tr>
<tr>
<td>Ukraine (northern regions)</td>
<td>1981–85</td>
<td>0.1</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1980–89</td>
<td>0.7</td>
</tr>
<tr>
<td>Canada</td>
<td>1982–91</td>
<td>1.6</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>1984–92</td>
<td>0.7</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>1980–89</td>
<td>1.1</td>
</tr>
<tr>
<td>Nigeria (Ibadan)</td>
<td>1983–92</td>
<td>0.2</td>
</tr>
<tr>
<td>Norway</td>
<td>1980–89</td>
<td>1.4</td>
</tr>
</tbody>
</table>
However, examination of figure 3 of Balonov (2013) shows the post-accident rates increasing to between 30 and 120 cases per million per year. This increase is so substantial that an increase in the background incidence rate to as much as several cases per million per year would have little impact on the interpretation of the bulk of this increase in incidence as due to the Chernobyl accident. In the author’s opinion it was false-positivity and false registration of non-exposed patients that have contributed to the drastic incidence increase; more details are in Jargin (2009, 2011a, 2011b).

Table 1 “Summary of updated dose estimates for the main population groups exposed from the Chernobyl fallout” is printed in the article by Balonov (2013) with reference to the non-existent Annex J to the UNSCEAR 2008 Report (probably a misprint). In fact, it is a reproduction of table 2 from page 54 of Annex D to the UNSCEAR 2008 Report; however, the third line “Inhabitants of areas of strict radiation control” was added to the table without a reference. The numerical data from table 1 are absent from Annex D to the UNSCEAR 2008 Report. Inaccurate citation was noticed also in previous publications by the same author, discussed in Jargin (2013).

It is a deficiency in Balonov (2013) that the comment about the increase that “has been confirmed in several case control and cohort studies that have related the excess incidence of thyroid cancer to estimated individual doses due primarily to the radiiodine released during the accident” is not referenced. This text is taken verbatim from paragraph 69 of Annex D of UNSCEAR (2008), where it is also unsupported by references. That paragraph also points out that the estimates of radiation risk from these studies remain somewhat uncertain and may have been influenced by variations in the use of ultrasonography and mass screening after the accident. In these circumstances, it would have been appropriate to seek out the original data and also to have reviewed criticisms of those studies (e.g. Jargin 2011a, 2011b).

“Evidence has also emerged since the UNSCEAR 2000 Report indicating that iodine deficiency might have influenced the risk of thyroid cancer resulting from exposure to the radioactive isotopes of iodine released during the accident (Cardis et al 2005).” (Balonov 2013) This paragraph, although attributed to Cardis et al (2005), is actually taken verbatim from paragraph 73 of Annex D of UNSCEAR (2008), where it is supported by references to both Cardis et al (2005) and Shakhtarin et al (2003). In view of this verbatim reproduction of the UNSCEAR text, there must be some doubt as to whether Balonov (2013) has critically inspected and evaluated the underlying references.

Unlike Poland, where the rapid, countrywide distribution of potassium iodide was organised to reduce the dose from iodine isotopes to the thyroid, no widespread systematic prophylaxis occurred in the most contaminated areas of Belarus and the Russian Federation immediately after the accident. The timing of iodine supplementation in the studied subjects is not exactly specified in the article by Cardis et al (2005), so it is not immediately possible to assess the reliability of conclusions on its efficacy. It was pointed out by Boice (2005) with reference to Cardis et al (2005) that action mechanisms of a late iodine supplementation ($t_{1/2}$ of $^{131}$I is about 8 days) are not readily conceivable.

Furthermore, under the subtitle “New knowledge and practical lessons” the following are listed: “High effectiveness of environmental countermeasures” and “Need to take prompt countermeasures.” (Balonov 2013) The text of Balonov (2013) on this topic is too brief to be useful. It would be more helpful to analyse the strengths and weaknesses of various countermeasures. This is a matter that has recently been addressed in detail by the IAEA (2012). Decontamination within the 30 km zone was regarded as largely unsuccessful (Smith and Beresford 2005, Kriuchkov et al 2011, Konstantinov 2006). Moreover, it appears to have been largely senseless considering that the 30 km zone has remained nearly uninhabited for decades. Several hundred thousand personnel were involved in the clean-up and recovery
operation within the 30 km zone (Smith and Beresford 2005). The works included manual
removal of soil, washing of houses and roofs in the evacuated city of Pripyat, demolitions of
buildings (Mould 2000, Beresford and Smith 2005), grinding off a layer up to 1 mm thick from
external surface of brick buildings by manual grinding machines (Konstantinov 2006) etc. Trial
deactivation of buildings in Pripyat was started on 2 May 1986 when the dose rate in the city
was 1.5–4 mSv/hour. By June 1986, 70% of houses in Pripyat had been decontaminated by
washing, and adjacent territories cleaned (Konstantinov 2006). The town has remained nearly
uninhabited until today. The initially high rates of exposure declined rapidly due to the decay
of short lived radionuclides, movement of radiocaesium into the soil, its binding etc (IAEA
2006). Attempts to decontaminate forests were regarded as unsuccessful (Mould 2000). A
paradigm of an inadequate countermeasure was that, instead of people being advised not to
loiter in uninhabited or thinly populated areas until the radioactivity had decayed, these areas
were inundated by workers and machinery involved in remediation. Works were not always
well organised and purposive (Ignatenko 1997); the liquidators (many of them were military
servicemen) were exposed themselves and carried radionuclides on them and machinery to
populated places. Such measures in fact increased collective doses, especially if those to the
liquidators are counted as well (Kriuchkov et al 2011). Furthermore, rumours that alcohol
decorporates radionuclides contributed to drunkenness, which probably increased collective
doses due to irresponsible behaviour. Alcohol was available to workers in the contaminated
territories (Diachkin 2004), although it was during the anti-alcohol campaign (1985–1988).
In conclusion, it seems that Balonov (2013) may have relied unduly on secondary sources
and not given the primary literature the attention that it deserved.

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Yours sincerely,

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