



Editorial Complaints Unit

Dr P Dorfman
Warwick Business School
University of Warwick
Email: Paul.Dorfman@wbs.ac.uk

Ref: CT/1200007

13 March 2012

Dear Dr Dorfman

Bang Goes the Theory, BBC1, 3 October 2011

I am writing to let you know the outcome of the Editorial Complaints Unit's investigation into your complaint about the above programme. As my colleague Colin Tregear explained in his letter of 12 January, we have considered your concerns against the BBC's Editorial Guidelines on Accuracy and Impartiality.¹ We have watched the programme, discussed your concerns with the programme-makers and carried out some additional research into the issues you have raised. I am sorry this has taken somewhat longer than we originally led you to expect

I propose to deal with each of your concerns in turn, using the summary set out in Mr Tregear's previous letter.

- 1. The programme gave an inaccurate and misleading impression of the potential risk to human health from exposure to ionising radiation. The programme said that it set out to "*find out the truth about the effects of radiation*" but failed to carry out a full and complete examination of the available evidence for the known and estimated death toll from Chernobyl and Fukushima. The result was a programme that was "*highly partisan*" and a scientifically limited representation of what is known about this issue, including the health risks associated with low level exposure to ionising radiation.**

As you may recall, the programme set out to examine a number of issues related to nuclear power: how a nuclear power station works, what happened at the Fukushima reactor, how a clean-up operation is conducted for nuclear waste and the effect on the human body of exposure to ionising radiation. In the final section it considered the death tolls from Chernobyl and Fukushima and tried to put the number of deaths into perspective. I take it from your previous correspondence that it was this final part of the programme presented by Liz Bonnin which has prompted your complaint.

¹ <http://www.bbc.co.uk/guidelines/editorialguidelines/>

Your first comment was that it was seriously misleading for Ms Bonnin to suggest there was a single “*truth about the effects of radiation*” because of the ongoing scientific debate about the health effects of exposure to low doses of ionising radiation. I appreciate that there is a range of opinion on the risks associated with low levels of radiation but I’m afraid I cannot agree that the audience would have been misled in this connection. In the context of the programme, I think it was clear that she was acknowledging that the public perception of the dangers of exposure to ionising radiation tends to be based on fear and assumptions rather than evidence. As she said:

Since the atom bomb blasts it’s been difficult to make an assessment of the dangers of radioactivity. But that is what I want to do – I want to wipe the slate clean and find out the truth about the effects of radiation.

This echoed the previous comment from another presenter, Dallas Campbell, who explained that there is a known link between exposure to radiation and the incidence of cancer and said:

So I suppose that’s really what it comes down to. However slight the possible link between cancer and radiation from a nuclear reactor like the one I’m standing on right here might be, it’s enough to generate understandably a real sense of fear in all of us and send the press into overdrive as we saw after the Fukushima incident.

I’m therefore satisfied that the audience would have understood Ms Bonnin to be saying that the aim of the programme was to try to separate the facts that are known about radiation from the public perception.

You have also said that the programme was a scientifically limited representation of what is known about the health risks associated with exposure to low levels of ionising radiation. I accept that this subject prompts strong opinions and there is a wide range of different views and perspectives. However, it is generally understood that it is a matter of legitimate editorial discretion for programme-makers to decide which subjects to address and which aspects of those subjects to include. In this case, Ms Bonnin was explicit; the aim was “*to put the number of deaths caused by radiation into perspective*” (my emphasis). The sequence which followed listed the fatalities arising from a range of different events or activities. I am therefore satisfied that the audience would have expected an assessment of the number of people killed by exposure to radiation from Chernobyl and Fukushima. Consequently, I cannot agree that it was necessary to consider the broader health risks associated with exposure to radiation or that the audience would have been materially misled by the absence of this information.

I will address your concerns about the known and estimated death toll from Chernobyl and Fukushima in my response to Points 3 and 4.

2. The programme failed to report the scale of the post-Chernobyl thyroid cancer incidence. This gave a misleading impression of the scale of as yet unobserved deaths which may occur as a result of nuclear accidents.

As you have noted, figure given in the programme for total deaths resulting from radiation exposure was made up of two components: the figures for deaths to date as a direct result of

exposure to radiation, as estimated in the 2005 Chernobyl Forum report² and the 2008 report by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)³, and Professor Thomas' estimate of future deaths from Chernobyl-related thyroid cancer. The programme-makers say the latter estimate (of 60) this was based on the number of reported cases of thyroid cancer in the region and typical mortality rates for such cancer. I have no reason to doubt that Professor Thomas based her prediction of 60 further deaths on informed and considered scientific data, and I do not think it was necessary also to give a figure for the incidence of non-lethal thyroid cancer. I do, however, have some concerns about how the programme presented the overall figure, but I will expand on that in my response to Point 3.

3. The definitive figure of 122 deaths from Chernobyl was misleading because it omitted any reference to the range of scientifically credible interpretations for the (late-effect or secondary) impacts on human health, including an increased risk of conditions such as childhood leukaemia.

I think it might help if I transcribe the relevant section of the programme (where numbers were displayed but not spoken, I have added them in square brackets):

Liz Bonnin: Gerry Thomas is a world expert on the 1986 Chernobyl Nuclear Power Plant disaster. I've asked her to put the number of deaths caused by radiation into perspective.

Professor Gerry Thomas: The one thing that everyone knows about is the atomic bombings in Nagasaki and Hiroshima OK? Now a lot of people died in those bombings but the majority of the population actually died from the blast injury. Actually only about 15 to 20% of the people who died as a result of those bombings died because of radiation. So you're talking about 20 thousand deaths from radiation.

LB: OK, so where do we go from here?

GT: OK, let's look at something else man had a hand in. This figure [26,000] represents the amount of people that were killed as a result of a dam burst in China in 1975. The dam was there to provide hydroelectric power for the community.

LB: It does put it a little bit more in perspective.

GT: Yes absolutely.

LB: OK, where are we going next?

GT: Well let's talk about something we do to ourselves. We voluntarily do this.

LB: Ah cigarettes.

² <http://www-ns.iaea.org/meetings/rw-summaries/chernobyl-conference-2005.asp?s=10&l=80#3>

³ http://www.unscear.org/docs/reports/2008/11-80076_Report_2008_Annex_D.pdf

GT: Absolutely. Now this [107,000] is the total death toll for 2009 for lung cancer or emphysema or many of the other smoking related diseases that we know results in death

LB: Much lower down the scale Gerry tells me that 2,222 people died in road accidents in 2009, but perhaps most surprising is her next statistic.

GT: How about falling out of bed?

LB: Shut up.

GT: Yeah 106 people in each year...

LB: Oh sorry that's awful to those people that have died falling out of bed. Seriously?

GT: Yeah 106 people each year fall out of bed and die as a result of their injuries.

LB: Gosh that's desperate. I didn't mean to joke about it. Of course all of this serves to make you incredibly paranoid about everything you do in your daily life. Never mind a dam bursting or, God forbid, a nuclear bomb going off.

GT: That's the point – life is risky. Perhaps you'd like to know where Chernobyl fits into this range of horrible fatalities?

LB: I'm going to be shocked aren't I? I think I'm going to be astounded.

GT: I think you might be.

LB: My hunch is it's going to be less than car crashes.

GT: You're absolutely right. It is less than car crashes. I think this is going to be a surprise to you. [122]

LB: Wow ok I didn't realise...

GT: So somewhere between the numbers of people who died falling out of bed and the number of people each year that die on our roads.

LB: I thought it was going to be much closer to 2000 than a hundred odd. It's remarkable how much lower the death toll from radiation at Chernobyl is than that of Hiroshima and Nagasaki. And according to Gerry that figure included both the short term effects of acute radiation sickness and most cancers. So the main thing I'm learning here is not to make the mistake of associating a nuclear reactor accident to something like Hiroshima?

I should say at this point that I share your concern about the way in which the 122 figure was presented. Although I think it is defensible as an estimate, I would accept that the appearance of certainty with which it was presented was somewhat misleading. As you have pointed out, this is an area of debate. and the great majority of scientific reports into the disaster

acknowledge the difficulty of extrapolating a final death toll from the available data. The Chernobyl Forum report of 2005 said:

It is impossible to assess reliably, with any precision, numbers of fatal cancers caused by radiation exposure due to Chernobyl accident. Further, radiation-induced cancers are at present indistinguishable from those due to other causes.

The UNSCEAR report of 2008 refers to the problem of identifying the stochastic effects of radiation (where an increased exposure to radiation may or may not induce cancer). It said:

Because there is currently no means of distinguishing tumours that are radiation-induced from those that are not, it is essentially impossible to attribute definitely a specific case of cancer to radiation exposure.

The UNSCEAR report concluded:

The Committee has decided not to use models to predict absolute numbers of effects in populations exposed to low radiation doses from the Chernobyl accident, because of unacceptable uncertainties in the predictions. It should be stressed that the approach outlined in no way contradicts the application of the LNT model for the purposes of radiation protection, where a cautious approach is conventionally and consciously applied.⁴

One could illustrate the extent to which estimates by qualified scientists do in fact vary, but I think the point is adequately made by the UNSCEAR report, with its reference to “unacceptable uncertainties”. I am therefore upholding this aspect of your complaint, on the basis that the figure of 122 was presented as definitive whereas certainty is in fact lacking.

4. The claim by Professor Gerry Thomas that there would be no death toll from Fukushima was inaccurate and misleading. The programme did not explain that this was just one of a number of equally supportable scientific predictions. This led to a lack of due impartiality.

You have said that the programme gave a misleading impression of the expected death toll from the accident at Fukushima and this led to a lack of due impartiality. However, I do not believe there are grounds to uphold this point of complaint. Firstly, I think viewers would have understood that Professor Thomas was offering an informed judgement, not stating an established fact, when she said “*There will not be a death toll from Fukushima. I would be extremely surprised if anybody loses their life as a result of exposure to anything from Fukushima*” (my emphasis). Furthermore, my understanding is that the consensus among relevant scientists and radiation experts is that the likelihood of someone dying as a result of exposure to radiation from the Fukushima plant is very small. There have been no deaths from acute radiation syndrome and, as thyroid cancer is generally considered to be treatable, future fatalities from that cause are not inevitable. We have considered the paper by Stohl et al⁵ to which you referred but, while it suggests that more Caesium 137 may have been released than the official Japanese estimates, it does not offer any conclusions as to the impact on the health of the population. I note that figures reported to the International

⁴ UNSCEAR report 2008 para 98.

⁵ <http://www.nature.com/news/2011/111025/full/478435a.html>

<http://www.atmos-chem-phys-discuss.net/11/28319/2011/acpd-11-28319-2011.html>

Atomic Energy Agency in June suggest that the total airborne release of Caesium 137 from Fukushima amounts to just 17% of the release from Chernobyl.⁶

Other reports and studies appear to support Professor Thomas' assessment. The Japanese government issued a preliminary accident report⁷ for the International Atomic Energy Agency which said:

Most of the 195,354 people checked as of May 31 were under the 100,000 cpm (counts per minute) limit. Decontamination was performed for 102 people exceeding 100,000 cpm but their contamination levels fell to levels of no concern after such decontamination.

It also said:

In addition, from March 26 through March 30 the Nuclear Emergency Response Local Headquarters implemented a survey on thyroid exposure for infants in Iwaki City, Kawamata Town and Iidate Village in cooperation with Fukushima Prefecture in order to understand more precisely the current exposure dose, particularly the health effects to infants who are highly-sensitive... From the results among the 1,080 children from 0 to 15 years old that were surveyed for thyroid exposure, there were no children who exceeded the screening level of 0.2 μ Sv/h (an equivalent to a thyroid gland equivalent dose of 100 mSv for a one-year-old baby).

The chairman of UNSCEAR, Wolfgang Weiss, recently told the news agency Reuters "As far as the doses we have seen from the screening of the population ... they are very low". He went on to add "If we find out that what we know now is representing the situation, then the answer would be yes ... the health impact would be low".⁸

Gregory Jackzo, the chair of the US Nuclear Regulatory Commission, the federal body which oversees the regulations governing US nuclear reactor and nuclear material safety and security, told a conference organised by the American Association for the Advancement of Science⁹ in October 2011 that "there have been no fatalities we are aware of that are directly related to radiation exposure". This view is repeated in the Commission's review of the Fukushima accident¹⁰ in which it says "The outcome — no fatalities and the expectation of no significant radiological health effects".

Finally, I do not believe that the fact that only Professor Thomas' view was included in the programme can be considered evidence of a lack of due impartiality. The Editorial Guidelines on Impartiality say:

Impartiality does not necessarily require the range of perspectives or opinions to be covered in equal proportions either across our output as a whole, or within a single programme, web page or item. Instead, we should seek to achieve "due weight". For example, minority views should not necessarily be given equal weight to the prevailing consensus.

⁶ <http://www.nature.com/news/2011/110907/full/477139a.html>

⁷ http://www.kantei.go.jp/foreign/kan/topics/201106/pdf/chapter_vii.pdf

⁸ <http://www.reuters.com/article/2012/01/31/us-japan-fukushima-health-idUSTRE80U1AS20120131>

⁹ <http://cnsnews.com/news/article/no-one-died-radiation-exposure-fukushima-says-top-us-nuclear-regulator>

¹⁰ <http://pbadupws.nrc.gov/docs/ML1118/ML111861807.pdf>

I think that makes it clear that due impartiality does not require equal time or weight for minority views or opinions. I am therefore satisfied that in the context of this programme, where the reference to the potential death toll at Fukushima was extremely brief, that there was no requirement to reflect what appears to be a minority view.

5. The conclusion of the programme that “*Figures like these certainly suggest that radiation from accidents like Chernobyl is not as worrying as a lot of the media coverage would have us believe*” lacked the necessary due impartiality because the programme did not reflect an appropriate range of views on a controversial subject.

In my view, the summary was reasonable in the light of the broad scientific consensus among experts that the available evidence suggests that the death toll from Chernobyl is unlikely to be as high as predicted at the time. I also think it is worth noting that the section of the script which you have highlighted went on to acknowledge that radiation can and does kill:

Figures like these certainly suggest that radiation from accidents like Chernobyl is not as worrying as a lot of the media coverage would have us believe. But it can and does kill and I want to understand how. I'm meeting Dr Susan Short who's going to show me what radiation can do to human cells.

I am therefore satisfied that the programme gave due weight to the range of views on this matter and achieved due impartiality, in the sense of balance that was adequate and appropriate to the output. I think it is worth noting that almost all countries follow the recommendations made by the International Commission on Radiological Protection (ICRP) for calculating the risk to human health from exposure to ionising radiation. These are based on “*The central assumption of a linear dose–response relationship for the induction of cancer and heritable effects, according to which an increment in dose induces a proportional increment in risk even at low doses, continues to provide the basis for the summation of doses from external sources of radiation and from intakes of radionuclides*”.¹¹

I acknowledged in my response to Point 1 that there is a range of opinion on the risks associated with exposure to ionising radiation, especially at low levels or low doses. I appreciate that there are those who believe this Linear No Threshold theory (which put simply, says there is a direct, linear correlation between dose and risk at all levels) is flawed. Some argue that low levels of radiation may pose less of a risk to human health (sub-linear), others argue that there may be a relatively higher risk at low doses (supra-linear). However, as I have explained previously, the impartiality guidelines do not require that all views or opinions on a subject be accorded equal weight. I believe a broader discussion about this aspect of radiation was not necessary in the context of this particular programme.

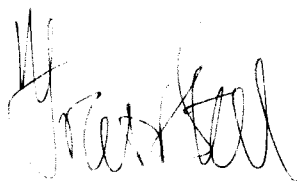
In conclusion, then, I am upholding one aspect of your complaint. A summary of my finding, with a note of the action taken as a result of it, will be published in due course in the complaints section of the BBC website, bbc.co.uk and I shall let you know when it has been posted. I should say that if you are not satisfied with my decision I would be happy to consider any points you might wish to make on my finding. I would be grateful if you could let me have any comments within ten working days of this letter. You can also ask the

¹¹ [http://www.icrp.org/docs/ICRP_Publication_103-Annals_of_the_ICRP_37\(2-4\)-Free_extract.pdf](http://www.icrp.org/docs/ICRP_Publication_103-Annals_of_the_ICRP_37(2-4)-Free_extract.pdf)

Editorial Standards Committee of the BBC Trust to review any aspect of my finding. Correspondence for the Committee should be addressed to Lucy Tristram, Complaints Advisor, BBC Trust Unit, 180 Great Portland Street, London W1W 5QZ or you can send an email to trust.editorial@bbc.co.uk. The Trust normally expects to receive an appeal within four weeks of the date of this letter, or of any subsequent correspondence between us, and expects complainants to limit the details of their appeal to no more than one thousand words.

Meanwhile, I'd like to thank you for giving us the opportunity of investigating your concerns and I hope you'll accept my apologies, on behalf of the BBC, for the breach of editorial standards which you identified.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Fraser Steel', written in a cursive style.

Fraser Steel
Head of Editorial Complaints