Breast Cancer Incidence in Burnham on Sea, Somerset 1994-2004.

Further evidence of effects from radioactive discharges from Hinkley Point Nuclear Power Station

Prof. Dr Chris Busby

University of Ulster UK
Julius Kuehn Institute Germany
Scientific Secretary:
European Committee on Radiation Risk

Green Audit
Research Note 06/2008
Sept 23rd 2008
Castle Cottage, Sea View Place
Aberystwyth SY231DZ

Background

Green Audit has been engaged since 1997 on studies of the effects of discharges to the sea and air by nuclear sites. These effects are on cancer, leukaemia and infant mortality in populations living downwind or close to contaminated coastal and estuary intertidal sediment. An account of these and the various arguments over the results can be found in Busby 2006 and in CERRIE 2004. One of the first studies in this series was of breast cancer in populations living near the contaminated coast close to the Hinkley Point nuclear site in Somerset (Busby et al 2000). A series of studies in the early 2000s which employed census ward data from the Office for National Statistics (ONS) showed that Social Class and age adjusted breast cancer mortality risks were approximately double the national average in the ward of Burnham North, and generally significantly higher in wards near the coast downwind of the nuclear plant. Follow-ups of the initial study with data as it became available continued to show statistically significant high risk of dying from breast cancer for women living in Burnham North which is directly downwind from the nuclear plant. The results were disputed by the local South West Cancer Intelligence Unit (SWCIS) even though their own study confirmed the high level of risk. Incidence could not be examined as the data was refused at ward level on the grounds of confidentiality. For this reason, in 2002, a local citizen group, Parents Concerned about Hinkley PCAH carried out a door-to-door survey in Burnham North, which was designed and analysed by Green Audit (Busby and Rowe 2002, Busby 2006).

This survey confirmed the high risk from breast cancer in Burnham North in the 5 years prior to the survey in 2002. It also turned up significant excess leukaemia risks. Again, the SWCIS followed up with a study using incidence data and again their results supported the findings of excess risk in Burnham North. Nevertheless the author of the study, Dr Julia Verne, maintained that these results were due to chance and no effect from radiation existed.

Ionising radiation is a mutagen: it is genotoxic and causes damage to the foetus and germ cells. If the breast cancer excesses downwind from Hinkley Point were caused by releases from the plant, we should expect increases also in miscarriages and in infant mortality in the same area. In 2007, Green Audit examined infant mortality data from ONS for every ward in Somerset between 1994 and 2004 to see if there was any relationship to proximity to the nuclear plant. The study found a statistically significant (up to 3-fold excess) effect on infant mortality in wards close to the coast and estuary and near the nuclear plant, including Burnham on Sea. The results were peer reviewed by experts consulted by the BBC and presented in a BBC Television Programme in 2008.

Also in 2008 a landmark decision in the House of Lords overturned two previous decisions on Freedom of Information to small area cancer incidence data, made by the Scottish Information Commissioner in relation to the matter of childhood leukaemia near the contaminated coast of Dumfries and Galloway. Radioactive discharges from Sellafield on the coast cause increased rates of childhood leukemia along the coast of South West Scotland (Busby 2008). Although the ruling by the FoI Commissioner was overturned in the Lords, the latter did order that incidence data for small areas must be released so long as the numbers of cases involved was greater than 5. The pressure group *Stop Hinkley* accordingly applied to the South West Cancer Intelligence Unit for the breast cancer incidence data for wards in Somerset in two blocks, 1994-98 and 1999-2004 so that the numbers in each block generally would be greater than 5, and the data was released. This enabled, for the first time, the

analysis of breast cancer incidence in the wards of Burnham on Sea in a long enough period to establish whether there is a statistically significant effect on incidence, supporting the breast cancer mortality and infant mortality results already found.

Method

Incidence numbers for female breast cancer ICD10 C50 were supplied by the SWICS for census wards in the whole of Somerset aggregated to two blocks 1994-1998 and 1999-2004.
In this study, only the wards of Burnham North and Burnham South were examined. 5-year age group populations were obtained from the 1991 and 2001 census figures (ONS). The comparison rate for breast cancer incidence in each 5-year group was taken from the 1997 Series ONS MB1 Cancer Statistics Registrations for England and Wales. No adjustment was made for Social Class in this study. Standardised Incidence Ratios were calculated for both periods and for the whole period.

Results
Results are given in Table 1 below.

Table 1 Breast cancer risk relative to England and Wales between 1994 and 2004 (Age Standardised Incidence Ratio, SIR)

	Burnham North	**Burnham South**	**Burnham on Sea**
Expected 94-98	24.5	24	48.5
Observed 94-98	39	30	69
SIR 94-98 (RR)	**1.6**	**1.3**	**1.4**
Expected 99-04	35.1	29.6	64.7
Observed 99-04	45	53	98
SIR 99-04 (RR)	**1.3**	**1.8**	**1.5**
Expected 94-04	59.6	53.6	113.2
Observed 94-04	84	83	167
SIR 94-04 (RR)	**1.4**	**1.6**	**1.5**

Table 2 Statistics of excess risk in Burnham on Sea, both wards, 1994-2004

Relative Risk	1.47 (95% CI 1.25<RR<1.72)
χ^2	22.37
p-value (Mantel Haenszel)	0.0000022

Discussion

The incidence of breast cancer in Burnham on Sea is clearly significantly high over the entire period. Over this 11 year period, over 50 more women developed the illness than could expected on the basis of national rates.

From earlier studies it is clear that many of these women died. It is of interest that these incidence data now show that Burnham South was also affected: this was not so clear from the mortality data.

The continuous denial of adult cancer excess near nuclear sites and contaminated sediment has been made by the government and by radiation risk agencies on the basis of deductive comparisons with Japanese A-Bomb victims. Scientific method demands that we examine similar populations with similar exposures. The evidence for the cancer producing effects of chronic exposure to low levels of radioactive fission products and uranium is now so alarming and massive that it is a criminal disgrace that those agencies who are employed with public money to protect the public seem mainly concerned with denial of what is now clear to everyone. The SWCIS argument that the excess in Burnham on Sea was due to chance, that there are bound to be some areas where the rates are high, cannot be sustained in the face of the incidence data. Since incidence data brings in a larger number of cases than mortality, we can calculate a p-value of 0.000002 for the excess risk. This means that we should expect an excess risk of this magnitude in one ward in 450,000. In other words, this is not a chance affair, and these cancer cases were caused by some exposure. The infant mortality study and the other cancer excesses point to the nuclear site and its releases. The ability to analyse incidence data to the small area of Burnham on Sea is important, and shows the value of such data in examining environmental risks. It is outrageous that the House of Lords, 'advised by' the British government, overturned the reasonable decision by both the Scottish Freedom of Information Commissioner and the Scottish Appeal Court of Sessions which supported this decision.

The EU has recently set up a modestly named 'High Level Expert Group' to deal with the increasing concern about the health effects of low dose radiation and the belief that the current risk models are in error (something which the risk agencies themselves do not, in fact, concede). This group will apparently recommend research over the next 30 years. This is unacceptable. The results of this present study, and the many others which support it, argue that the current radiation risk model is wildly inaccurate for internal exposures to fission products and uranium discharges from nuclear sites (Busby 2006, Busby and Fucic 2006, CERRIE2004). Until this matter is properly addressed, women (and men) living near nuclear sites will continue to die, and their children will continue to die.

References

Busby Chris (2008) Is there a sea coast effect on childhood leukaemia in Dumfries and Galloway, Scotland, 1975-2002 ? *Occupational and Environmental Medicine* 65, 4, 286-287

Busby C and Fucic A (2006) Ionizing Radiation and children's health: PINCHE conclusions *Acta Paediatrica* S 453 81-86

Busby Chris (2006) *Wolves of Water. A Study Constructed from Atomic Radiation, Morality, Epidemiology, Science, Bias, Philosophy and Death.* Aberystwyth: Green Audit

CERRIE 2004: Busby CC, Bramhall R and Dorfman P (2004) *CERRIE Minority Report 2004: Minority Report of the UK Department of Health/ Department of Environment (DEFRA) Committee Examining Radiation Risk from Internal Emitters (CERRIE)* Aberystwyth: Sosiumi Press

Busby Chris, de Messieres Mireille and Morgan Saoirse (2007) Infant and Perinatal Mortality and Stillbirths near Hinkley Point Nuclear Power Station in Somerset,1993-2005. Occasional Paper 2007/6 Aberystwyth: Green Audit.

Busby C and Rowe H (2002) Cancer in Burnham on Sea North. The PCAH Questionnaire Study. Occasional Paper 2002/5 Aberystwyth: Green Audit

Busby C, Dorfman P, Rowe H (2000) Cancer Mortality and Proximity to Hinkley Point Nuclear Power Station in Somerset: Part I Breast Cancer. Occasional Paper 2000/2 Aberystwyth: Green Audit

Review by Dr Derek Pheby, University of the West of England and former Director of the South West Cancer Intelligence Service:
9/12/08

Thank you very much for asking me to review this paper. The first point that I would like to make is that it is outrageous that the 'Stop Hinkley' campaign had to invoke the Freedom of Information Act, backed by a judgment in the House of Lords, to obtain incidence data from the South West Cancer Intelligence Service.

This is exactly the position I found myself in over osteosarcoma in young people in Helston, where the SWCIS insisted (on the basis of no research) that there were no environmental risk factors operating, and refused absolutely our request for cooperation and for incidence data. In fact we obtained our data by other means, and demonstrated a very strong link between domestic radon and osteosarcoma.

In our case, I wondered if the motivation for this was financial, because the cost of effective anti-radon measures in all houses in high radon areas would be immense, and I wonder whether similar considerations are involved in the Burnham breast cancer situation.

This was certainly not the situation when I was Director of the South-Western Regional Cancer Registry. I took the view that the principal purpose of a cancer registry was to support research into the causes and distribution of cancer, and into the outcomes of interventions, both preventive and therapeutic. For that reason I worked very hard to introduce modern technology into the process, and to improve the quality of the data so as to make it fit for purpose. I had no problem whatsoever releasing incidence data to *bona fide* researchers, subject of course to their acceptance of our protocol which ensured conformity to the Data Protection Act and protection for the confidentiality of data subjects.

I have not always agreed with Chris Busby in the past. I remember, some years ago, crossing swords with him on '*You and Yours*' about the La Hague reprocessing plant, which was a most interesting discussion. He is, however, a respected scientist of

considerable repute, whose views are challenging and who needs to be taken seriously. He, and the Stop Hinkley campaign with whom he has been working, deserve better than to be treated so contemptuously by the SWCIS, particularly in view of the public importance of the issues in which they are engaged.

I am at a loss to understand for what purpose the SWCIS considers it collects data, unless it is to enable scientific investigation by *bona fide* researchers of important questions of public concern. It should not be deploying considerable sums of public money in order that the data it collects should disappear into a black hole.

Turning to the paper itself, I have repeated Professor Busby's calculations, and come to a very similar conclusion. Taking both Burnham wards together, over the whole study period, I calculated a chi-squared value for the association between incidence of breast cancer and residence in Burnham, in comparison with England and Wales as a whole. The figure I calculated was 25.526. In other words, the increased incidence of breast cancer in Burnham was very unlikely to have arisen by chance. The probability of this being so was 0.00000044, i.e. the odds against this association arising by chance were more than two million to one.

What we cannot know from the data made available is what this means, and how it has arisen. We need to know, for example, the precise distribution of the cases within Burnham, which would enable us to model with some degree of accuracy levels of exposure to environmental hazards that may be causal factors in the development of these cancers. We also need to know more detail of the nature of these cancers, because breast cancer is not a single disease, but there are several different sorts, with different risk factors involved in each.

All this makes the attitude of the SWCIS all the more incomprehensible. I can understand that they would have difficulty releasing data with all the detail outlined above which is necessary for a comprehensive study of the issue, because such detail could make individual data subjects identifiable to third parties, which could compromise their entitlement to confidentiality. There is all the more reason, therefore, why in such cases, both in Burnham and in the instance I previously cited at Helston in which I was involved, they should be undertaking the research themselves, in collaboration with independent investigators such as Professor Busby and myself. They should not be dismissing out of hand the conclusions of respected scientists, while behaving as proprietors of the cancer registry database, and treating it as their own private fiefdom. Rather, they should see themselves as custodians of what should be an immensely valuable public asset, which should be used in ways that contribute to the public good.

I hope very much that the SWCIS can be persuaded to see the light, and start cooperating with other investigators over matters of serious public concern such as this. I am afraid, though, as I found when I was Director of the cancer registry, you get no medals for being off-message, and the culture of concealment is probably now so deeply ingrained as to be very difficult to change.

With best wishes,

Derek.