

## **NDA–PHE Epidemiology Governance Group Annual Report FY2016/2017**

The Epidemiology Governance Group of the Nuclear Decommissioning Authority (NDA) and Public Health England (PHE) exists to provide independent governance and oversight of epidemiology and radiobiology work undertaken in relation to the ex-BNFL and ex-UKAEA radiation worker cohorts.

The Governance Group membership includes representatives of the NDA and PHE, data custodians, representatives of both the management and workforces with responsibility (or legacy responsibility) for members of the study cohorts, and an independent chair. The trade union representatives are from GMB, Prospect and UNITE.

This annual report contains a summary of the FY2016/2017 year's activity in relation to work governed by the NDA–PHE Epidemiology Governance Group.

Further information on the epidemiology and radiobiology work can be found online at: [www.gov.uk/government/collections/radiation-epidemiology](http://www.gov.uk/government/collections/radiation-epidemiology)

### **RESEARCH PROJECTS**

Research projects are undertaken to improve the understanding of the effects of radiation and with the aim of protecting the health of workers and the wider population. The Governance Group assures that research activity and the reporting of research is consistent with good practice; the Governance Group does not directly commission or undertake research.

A number of projects have been approved, progressed or completed during the year.

#### **JEM: Job Exposure Matrix for Early Sellafield Plutonium Workers**

The JEM project is exploring the possibility of deriving estimates of doses for those early Sellafield plutonium workers whose limited monitoring data means that internal doses cannot currently be calculated with confidence. A job exposure matrix will provide intake estimates based on information on individual exposure locations and times using data from 'exposure analogues' (individuals with similar exposure histories but who have better monitoring data). Using these intakes estimates doses can be calculated. The project was completed in October 2016 and a report was submitted to and approved by the Department of Health which funded the work. Two papers are now in the early stages of development covering development and validation of the JEM.

### **SOLO<sup>1</sup> SP3 Project – Pooled Plutonium Worker Analysis**

A pooled analysis of plutonium workers from Sellafield and from the Mayak plant in the Southern Urals of Russia was undertaken within the framework of the EC-FP7<sup>2</sup> SOLO project. The SOLO project was a 5-year integrated, multi-disciplinary project to investigate the risks to health of low and protracted radiation exposures. The plutonium worker statistical analyses were jointly performed by PHE, the University of Manchester and the Southern Urals Biophysics Institute. The EC-FP7 SOLO project finished at the end of February 2015. A paper detailing the results of the lung cancer analyses has been approved for publication in the journal Radiation Research and is expected to appear in print in the next few months. A publication on circulatory diseases has also been submitted for publication and is undergoing peer review.

### **Case–control Analysis of Uranium and Plutonium Exposed Workers**

This work, originally part of the EC-FP6<sup>3</sup> Alpha-Risk project, is a case–control study involving a relatively small cohort of uranium and plutonium exposed workers. The project, involving workers from three countries (France, Belgium and the UK), was led by CREAL<sup>4</sup>. A paper regarding the dosimetry protocol was published in August [1] and the epidemiology paper has been accepted for publication [2].

### **Genetic Marker Papers**

A team from the University of Manchester has worked to complete approved genetic marker work which was begun by radiobiology and genetics staff at WSC<sup>5</sup> before August 2010. Radiobiological examination of blood samples, provided by consent, has been undertaken to assess the cellular impact of exposure to ionising radiation. One paper examining chromosomal aberrations in a case of a plutonium contaminated wound was published in the Journal of Radiological Protection [3].

### **LIRICA: Low dose Integrated Research on Internal Contamination by Alpha emitters**

A proposed UK study of health risks for uranium and other alpha-exposed workers was submitted to the call for proposals under the EC CONCERT programme in July 2016 but was not accepted.

### **University of Bristol and Manchester Ischaemic Heart Disease (IHD) case-control study**

A case control analysis involving an existing subset of Sellafield and Springfields workers and aiming to examine the association between radiation and IHD mortality, with adjustment for important lifestyle and occupational confounding factors is being undertaken by collaboration between the Universities of Bristol and Manchester, funded under DH PRP<sup>6</sup>. The study has received appropriate ethical consideration and approval and dose data from the ex-BNFL database will be provided to the researchers once a Data Sharing Agreement is agreed. The results of this work will be published in the peer reviewed scientific literature.

## ASSETS

### Ex-BNFL and ex-UKAEA Databases

Databases holding the information required for the ex-BNFL and the ex-UKAEA epidemiology projects are managed by PHE. The operation of the ex-UKAEA database is undertaken by Nuvia Ltd; the ex-BNFL database is operated by PHE.

### Digitisation of ex-UKAEA internal radiation doses

Funded by an EC-FP7 project (DoReMi), work was undertaken to digitise bioassay data previously only held on paper. All bioassay data from the UKAEA cohort has now been loaded into the SHIELD database. Software, making use of IMBA<sup>7</sup> techniques, has been developed to calculate organ doses from this data which can now be used in future epidemiology studies.

### Biological Samples

The biological samples (from blood) that had been collected, with consent, from radiation workers and their families as part of the pre-2010 WSC Genetics Group's radiobiology programme of work, continue to be stored at the Newcastle University Biomedicine Biobank (NBB). Viability testing of the samples and a review of the associated databases is nearing completion.

## STAKEHOLDERS AND RELATED ENGAGEMENTS

The Governance Group met three times during the reporting year, on 15 July 2016, 4 November 2016 and 8 March 2017.

Project researchers have engaged throughout the year with other radiation researchers within the UK and internationally. This has largely been through engagement in follow on from collaborative projects such as SOLO, CURE, and DoReMi but additionally through involvement in MELODI<sup>8</sup>, CONCERT<sup>9</sup> and other opportunities such as scientific meetings or conferences. Key fields of interest have been epidemiology, radiobiology and dosimetry.

## ANNUAL REQUIREMENTS

### Terms of Reference

The terms of reference for the Governance Group were reviewed and supported at its meeting held on 11 March 2016.

### Information Governance (IG) Training

All relevant staff have completed annual IG training.

### Subject Access Requests

No subject access requests were received during the FY2016/2017 period.

## Caldicott Audits

A Caldicott audit of the ex-UKAEA database work was conducted on 20 October 2016 and reported a satisfactory outcome.

A Caldicott audit of the ex-BNFL database work was conducted on 3 November 2016 and reported a satisfactory outcome.

## PUBLICATIONS

[1] Bingham D *et al.* Reconstruction of Internal Doses for the Alpha-Risk Case-Control Study of Lung Cancer and Leukaemia Among European Nuclear Workers. *Radiat Prot Dosimetry*. 2017 May 1;174(4):485-494. doi: 10.1093/rpd/ncw227 [Open Access]

[2] Grellier J *et al.* Risk of Lung Cancer Mortality in Nuclear Workers from Internal Exposure to Alpha Particle-emitting Radionuclides. *Epidemiology*. 2017 Sep;28(5):675-684. doi: 10.1097/EDE.0000000000000684 [Open Access]

[3] Tawn *et al.* Chromosome analysis in a case of a plutonium contaminated wound. *J Radiol Prot*. 2017 Jun 26;37(2):N13-N19. doi: 10.1088/1361-6498/aa595c [Open Access]

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<sup>1</sup> SOLO – Epidemiological Studies of Exposed Southern Urals Populations

<sup>2</sup> EC-FP7 – European Commission's 7<sup>th</sup> Framework Programme for Research and Technological Development

<sup>3</sup> EC-FP6 – European Commission's 6<sup>th</sup> Framework Programme for Research and Technological Development

<sup>4</sup> CREAL – Centre for Research in Environmental Epidemiology in Barcelona (CREAL is now part of a merged organisation, ISGlobal)

<sup>5</sup> WSC – Westlakes Scientific Consulting

<sup>6</sup> DH PRP – the Department of Health's Policy Research Programme for Radiation Protection Research

<sup>7</sup> IMBA – Integrated Modules for Bioassay Assessment (dose calculation software)

<sup>8</sup> MELODI – Multidisciplinary European Low Dose Initiative (an EU platform for low dose radiation risk research)

<sup>9</sup> CONCERT – European Joint Programme for the Integration of Radiation Protection Research