**Written evidence submitted by the Institute of Physics and Engineering in Medicine to the Commons Science and Technology Committee 'Science in emergencies: chemical, biological, radiological or nuclear incidents' inquiry – May 2016**

## About IPEM

1. IPEM is a professional association and Learned Society with 4,300 members who are physicists, engineers and technologists working with applications of physics and engineering applied to medicine and biology. Our members work in hospitals, academia and industry, and IPEM has a unique role in linking the three areas.
2. As a charity, IPEM's aim is to advance the application of physics and engineering to medicine for the public benefit and to advance public education in this field. We do so by supporting and publishing research, and supporting the dissemination of knowledge and innovation through project funding and scientific meetings; and by setting standards for education, training and continuing professional development for healthcare scientists and clinical engineers.
3. We also produce information for the public about the role of physicists and engineers in their healthcare services, and hold a series of public lectures each year. Our members are also involved in outreach events for young people and university students, to promote healthcare science careers.
4. In preparing this response, we have consulted with the Chairman and members of our Radiation Protection Special Interest Group, and our Director of the Science, Research and Innovation Council. We have set out our response in line with the specific questions posed in the call for evidence.
5. The following response looks at the radiological side of Chemical, Biological, Radiological and Nuclear (CBRN).

## How prepared the Government is for a CBRN emergency

6. Organisations such as Public Health England and the Office for Nuclear Regulation should be the main bodies offering advice on radiation matters linked to CBRN. Where IPEM could become involved is in communicating advice to members of the public, and IPEM should also be a point of contact for the emergency services in the event of a radiation emergency.

7. The NHS England website provides guidance and information relating to Hazardous Materials (HAZMAT) and CBRN, together with information on the Initial Operating Response programme introduced by the Home Office following a HAZMAT or CBRN incident.

8. In Northern Ireland there are a number of different means by which the local government is prepared for CBRN emergencies. The ambulance and fire and rescue services have dedicated hazardous response teams. The ambulance service has the Hazardous Area Response Team (HART) while the fire service has HAZMAT teams which includes the Detection Identification and Monitoring (DIM) team. These teams get dedicated training on the range of hazardous material and procedures involved in responding to CBRN incidents. The DIM team has a range of chemical, biological and radiation detectors to help identify and, in some instances, quantify the hazards present.

9. There are policies and procedures in place to deal with radioactively contaminated casualties from CBRN and HAZMAT incidents with co-operative working arrangements between the Blue Light Services (Ambulance, Fire Service and Police) for setting up decontamination stations as well as arrangements for hospitals dealing with the same casualties or the self presenting worried well. These responses are partially co-ordinated by the Northern Ireland's Public Health Agency.

10. Regular theoretical and practical training is provided to all five Northern Ireland Trust's hospitals in dealing with CBRN casualties with input from the Public Health Agency, the ambulance service's HART and the Regional Medical Physics Service. The practical training includes use of decontamination tents, PRPS suits and decontamination of radiological casualties. Desktop exercises are also carried out as part of the training.

11. In Scotland, the Scottish Ambulance Service have CBRN training and facilities. The Scottish Fire and Rescue Service has a number of CBRN response units equipped with mobile labs, gamma spec, radiation detectors, and mobile decontamination facilities.

12. The Scottish Government funded the purchase and ongoing calibration costs of ramGenes at A&E hospitals plus additional radiation monitors held by RPA groups at the major health boards. Trusts generally have a CBRN plan.

**The extent to which the Government currently works with scientists and others to identify and assess CBRN risks, and to communicate public advice**

13. Public Health England are closely involved in working with the government on CBRN risk and in particular there is the National arrangements for incidents involving radioactivity (NAIR) scheme. This, however, deals more with responding to and handling the situation as opposed to communicating public advice.

14. Legislatively, the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR) requires prior information to be provided to the members of the public whom the HSE deem to live within an area likely to be affected by a radiation emergency due to an operator working with radioactive material above a certain level. There is also an onus on all local authorities (not just those with REPPIR premises in their district) to prepare information on the facts of the event, steps to be taken and any required health protection measures for the public in the event of a radiation emergency with guidance provided in Schedule 10 of the regulations.

15. In Northern Ireland there is also the Northern Ireland Technical Assessments Group (NITAG) which is set up to analyse and respond to nuclear incidents. The group consists of representatives from AFBI, Belfast City Council, DARD, Derry City Council, DHSSPS, FSA, HSENI, Met office, NIEA, NI Water, Public Health Agency, and the Regional Medical Physics Service. Training and support to this group is also provided by PHE

**The use of scientific evidence in informing current CBRN emergency response plans**

16. Recently the Initial Operational Response (IOR) of first attendees to a scene or for self presenters at an Emergency Department (ED) was updated. Based on recent scientific research it was recommended that dry decontamination was used when

dealing with CBRN or HAZMAT casualties. This information, however, was mainly based on chemical events and not radiological or biological. Common consensus would be that damp (wet wipes or wet sponge) or wet decon is better for radiological casualties, however, this was not reflected in the updated IOR. Additionally, radiological decontamination has the advantage of being able to monitor the casualty to determine how well the decontamination procedure is reducing the contamination levels which was not reflected in the IOR. Further scientific evidence on the most effective means of casualty and environmental radiological decontamination should be carried out.

17. PHE (formerly NRPB and HPA) have also provided a number of publications including NAIR technical handbooks, emergency data handbooks and guidance on radiation monitoring units.

**The mechanisms that are in place to allow scientific advice to be provided to Government in the event of a CBRN emergency, and to share information and response strategies across Government and with local government**

18. As mentioned in point 13 above, there is the NAIR scheme in mainland UK which provides "quick and widely available assistance to the police and other emergency services where no radiation expert is otherwise available" (NAIR website https://www.gov.uk/guidance/national-arrangements-for-incidents-involving-radioactivity-nair).

19. Also mentioned in point 15, NITAG is set up to respond to emergencies in Northern Ireland and is comprised of a range of scientific experts, government and local government members allowing information to be exchanged and strategies to be developed immediately.

20. In Northern Ireland the emergency services have access to a 24/7 radiation emergency on-call service provided by the Regional Medical Physics Service.

**CBRN incidents may also occur as a result of terrorism. In this context, the Committee will be focusing on scientific advice in assessing the possible consequences of incidents and in formulating the necessary response. The Committee does not intend to examine counter-terrorism strategies or the assessment of the likelihood of terrorism-related incidents.**

21. A terrorist attack, in terms of radiological events, is most likely to involve a dirty bomb. The level of radiation in such an event is unlikely to cause high doses to the population and rather is intended to cause panic and disruption. The advice from scientific staff should be sought to confirm the identity of the radionuclides present; confirm the radiation dose levels; help provide context to the exposure levels to keep the public from panic; and help provide advice on decontaminating casualties and the area.

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