Updated investigations of cancer excesses in the vicinity of Seascale and Dounreay

In its eleventh report, the Committee on the Medical Aspects of Radiation in the Environment (COMARE) reiterated its earlier recommendation that the incidence of childhood leukaemia and other cancers in the vicinity of Sellafield should be kept under surveillance and periodic review. This recommendation was made in response to continuing public concern about the excess childhood cancer incidence previously observed in the village of Seascale. Additionally, COMARE considered that it would be of interest to see if there were subsequently any cancer excesses in the same geographical area in older age groups. It was also recommended that equivalent surveillance and review processes be carried out for the area surrounding Dounreay, where similar public concerns exist.

Continuing surveillance of cancer incidence in the vicinity of these two nuclear installations is additionally appropriate in the light of current plans to expand the number of nuclear power stations. Only a thorough and systematic study of cancer incidence in the proximity of existing nuclear installations will provide sound evidence to inform public debate about expansion of the civil nuclear programme.

In response to COMARE's recommendations, the Childhood Cancer Research Group (CCRG) has been commissioned by the Department of Health to undertake this study which will extend earlier investigations into childhood cancer excesses around Seascale and Dounreay and also consider adult cancer incidence in these same areas.

The study will include cancers diagnosed in those born around either nuclear installation from 1950 to 2006 and calculate all age cancer incidence in these individuals to the end of 2006. The two cohorts will be flagged on the National Health Service Central Registers and thus the cohort studies will include cancer cases occurring among individuals who have moved to other parts of England, Wales or Scotland. Separate analyses will examine data relating to those living around the two installations between 1963 and 2006. Identical methods, or as near as possible to identical methods, will be used for data from both Scotland and England and Wales.

Sources of information will include the Office for National Statistics (ONS), the General Registrar's Office (Scotland) (GRO(S)), the Information Services Division (ISD) and the National Registry of Childhood Tumours (NRCT). National cancer registration data for England and Wales and Scotland exist since 1971. The NRCT contains registrations for children aged 0 to 14 from 1963 onwards and the Northern Region Young Persons' Malignant Disease Registry (NRYPMDR) includes cancer registrations for individuals aged 0 to 24 from 1968 onwards. For the earliest years of the study, 1950 to 1963, childhood cancer mortality will be used as a proxy for childhood cancer incidence. Estimates of adult cancer incidence for the period 1965 to 1970 will depend on the availability and reliability of cancer registration data.

More specific details for each of the four parts of the study are given below:

Seascale cohort analysis

Age specific cancer incidence rates will be calculated for individuals born between 1950 and 2006 in each of the following areas: Seascale Ward (as defined in 1981), the County Districts of Copeland and Allerdale excluding Seascale Ward (as at 1981), and the remainder of Cumbria i.e. the 4 County Districts of Carlisle, Eden, South Lakeland and Barrow. In addition to cancer as a whole, incidence rates will also be derived for the five diagnostic categories: Lymphoid Leukaemia and Lymphomas (other than Hodgkin's Disease), Other Leukaemias, Hodgkin's Disease, Central Nervous System Tumours (including benign brain tumours) and Other Malignant Tumours. Standardised incidence ratios and relative risks will be estimated separately for childhood and adult cancers.

The principal source of cancer incidence data will be the ONS (ISD for any cohort members who have migrated to Scotland). However a second, independent, estimate of childhood cancer incidence among cohort members from 1963 to 2006 will be obtained by record linkage of cohort records to an appropriate subset of records from the NRCT. Comparable national incidence rates will be obtained from NRCT and population statistics will be provided by ONS.

Seascale cross-sectional analysis

Childhood cancer incidence rates will be derived for individuals resident in each of the following areas: Seascale Ward (as defined in 1981), the County Districts of Copeland and Allerdale excluding Seascale Ward (as at 1981), and the remainder of Cumbria i.e. the 4 County Districts of Carlisle, Eden, South Lakeland and Barrow during the period from January 1963 to December 2006. In addition to childhood cancer as a whole, incidence rates will also be derived for the five diagnostic categories listed above. Childhood cancer incidence data will be taken from the NRCT and population statistics will be provided by ONS.

Data from the NRYPMDR will be used to derive incidence rates for individuals aged 15 to 24 between 1969 and 2006. As the NRYPMDR does not include individuals resident in Barrow in Furness CD, this area will be excluded from the analysis which will otherwise cover the areas designated above. Incidence rates will be calculated for cancer as a whole and for the five diagnostic categories listed above.

Dounreay cohort analysis

Age specific cancer incidence rates will be calculated for individuals born between 1950 and 2006 in each of the following areas: Thurso Ward, postcode sectors KW14 7, KW14 8, KW13 6 and KW12 6 excluding Thurso Ward and the remainder of Caithness District. In addition to cancer as a whole, incidence rates will also be derived for the five diagnostic categories: Lymphoid Leukaemia and Lymphomas (other than Hodgkin's Disease), Other Leukaemias, Hodgkin's Disease, Central Nervous System Tumours (including benign brain tumours) and Other Malignant Tumours. Standardised incidence ratios and relative risks will be estimated separately for childhood and adult cancers.

The principal source of cancer incidence data will be ISD (and ONS for any cohort members who have migrated to England). However a second, independent, estimate of childhood cancer incidence among cohort members between 1963 and 2006 will be obtained by record linkage of cohort records to an appropriate subset of records from NRCT. Comparable national incidence rates will be obtained from NRCT and population statistics will be provided by ONS.

Dounreay cross-sectional analysis

Childhood cancer incidence rates will be derived for individuals resident in each of the following areas: Thurso Ward, postcode sectors KW14 7, KW14 8, KW13 6 and KW12 6 excluding Thurso Ward and the remainder of Caithness District during the period from January 1963 to December 2006. In addition to childhood cancer as a whole, incidence rates will also be derived for the five diagnostic categories listed above.

Data from ISD will be used to derive incidence rates for individuals aged 15 to 24 between 1963 and 2006 resident in each of the three areas detailed above for cancer as a whole and for the 5 diagnostic categories listed above.

Approval for this study has been obtained from Oxford C Multi-Centre Research Ethics Committee (08/H0606/82), the Patient Information Advisory Group (MR1118 and PIAG 6-06(g)/2008) and the Epidemiology and Registry Group of the Children's Cancer and Leukaemia Group whose members provide much of the data held in the NRCT. The study is funded by the Department of Health's Radiation Protection Research Program (RRX 123).

Preliminary work on the study is currently underway and definitive data analysis is expected to start in January 2010. If you wish to comment on any aspect of the design or scope of this study, please contact michael.murphy@ccrg.ox.ac.uk (01865 617811) or kathryn.bunch@ccrg.ox.ac.uk (01865 617809) before 30 November 2009.

N.B. Completely separate from this study, an updated analysis of the Seascale Schools' Cohort is being undertaken by a team of researchers from the Universities of Southampton, York and Oxford.