COMMITTEE ON THE CARCINOGENCITY OF CHEMICALS IN FOOD, CONSUMER PRODUCTS AND THE ENVIRONMENT

Preface

Chair's preface to be incorporated here [note departure of Professor Phillips, and PHE Scientific Secretary Ms Frances Pollitt]

COC Evaluations

Response to CMOs consultation on new alcohol guidelines
In January 2016, the COC statement on consumption of alcoholic beverages and risk of cancer (CC/2015/S2, reported in 2015) was published alongside the consultation on the CMOs' new alcohol guidelines.

The Committee prepared and submitted a response to the CMOs' consultation in March 2016, and the Government response and final guidelines were published in August 2016.

Developments in the Mode of Action and Human Relevance Framework
The COC had last considered the Mode of Action and Human Relevance Framework in 2008, though an update had been given at 2013 horizon scanning discussion.

There was recognition that the concepts of key events and adverse outcomes are well accepted, but that dose response information is required to distinguish between adaptive responses and adverse outcomes. It was agreed that updates will be made in the guidance statement series where the framework is mentioned to reflect these considerations and to ensure up to date references are provided.

The Committee noted an interest in the Halifax project cited in this paper, organised by Getting to Know Cancer, and in particular the suggestion that the low levels of exposure to multiple chemicals which individually are not carcinogenic, may cause cancer. This would be considered, along with other recent developments on mixture assessments e.g. from EFSA, as part of the continuing review of the guidance statement series in particular for the mixtures statement and the overarching statement.

Frailty and Cancer
Cancer genetics and the influence of industrial exposure on cancer incidence had been raised as a horizon scanning topic in 2015 with reference to a particular paper. This was part of a commentary series of papers on frailty and cancer, where frailty is the variation in risk due to factors that cannot be measured in individuals and includes inherited differences, environmental influences from conception and through life, and random somatic genetic or epigenetic events. A review of the topic, commentary papers and the review authors' response were discussed by the Committee.

The Committee noted the use of uncertainty factors as a means of addressing known unknowns is well established, but the concept of frailty was interesting from a mechanistic perspective especially considering the mixture of exposures experienced and the diseases acquired through life. It was noted that frailty also covers individual differences in response, whereas uncertainty factors are applied on a population basis. The large variation in individual susceptibility was not always appropriately covered but raised questions about using this kind of information to adopt a more personalised approach, though it was acknowledged that there were a large number of environmental factors, diet and affluence which all affect cancer risk. The link with epigenetics, both in terms of signatures for potential susceptibility and the influence of environmental factors on the epigenome, was noted and frailty could be borne in mind for the joint meeting on epigenetics.

Incinerators
At the November 2016 meeting, the COC reviewed some unpublished research on health effects around municipal waste incinerators. The COC was asked to comment on the new evidence since its last assessment in 2011. This work is part of a wider research project which had previously been reviewed by COM in October 2016, and will be reviewed by COT in 2017. Once this research is published, the Committees' reviews will be made available.

Horizon scanning

The COC undertakes horizon scanning exercises at regular intervals with the aim of identifying new and emerging issues which have potential to impact on public health.

In 2016 the Committee discussed the list from the previous year and noted progress on some activities during the year. The list of priority topics in no specific order following this discussion were:

- Applicability of Margins of Exposure for exposure of young children
- Mechanisms incorporating genomics and the Cancer Genome Atlas
- Epigenetics
- *In vitro* systems - to be undertaken when resource allows
- Immunological and stromal cell modulations relevant to cancer risk
- Nanomaterials
- E-cigarettes and novel tobacco products, and effect of early life exposure to cigarettes

The Committee requested a standing agenda item for future meetings on horizon scanning topics and to update the COC on upcoming topics for IARC and the EU Scientific Committees.

Ongoing work

IGF-I

Insulin-like Growth Factor 1 (IGF-1) is a growth factor which has a variety of biological effects including the promotion of cell division and growth. It has been proposed that exposure to dietary IGF-1 could increase the risk of certain cancers.
The COC is considering an extensive range of data which covers dietary absorption, levels of IGF-1 in food and the association between blood levels of IGF-1 and the risk of certain types of cancer. Further data on IGF-I and lung and colorectal cancers were considered. The review of the relevant literature has been completed and a statement is under preparation.

Guidance statements

The Committee continued to develop the guidance statement series during 2016. In February, two parts of the guidance statement G07 – Alternatives to the 2-year Bioassay were published. These addressed alternative *in vivo* assays, i.e. animal studies, for the 2 year carcinogenicity study, and cell transformation assays, which cited the COM guidance on this.

Two further parts of the guidance statement on alternatives to the 2-year bioassay were discussed addressing alternative testing strategies for carcinogenicity, which included a presentation on work by the OECD on developing an Integrated Approach to Testing and Assessment (IATA) for non-genotoxic carcinogens, and emerging technologies. It is likely that these will be published in 2017.

Further work during the year included discussion of assessing less than lifetime exposures to carcinogens, and an overview of the progress on the series as a whole.