Extending the *IARC Monographs*: The Conduct of Meta-, Pooled, and Quantitative Exposure–Response Analyses in Recent Volumes

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BACKGROUND

Meta-, pooled, and quantitative exposure–response analyses are recognized as valuable tools in the identification of carcinogenic hazards by providing information to support:

- Causal inference
- Risk estimation
- Calculations of attributable risk and cancer burden.

Using meta-, and pooled, and quantitative exposure–response analyses has previously been identified as a priority for the *IARC Monographs* (2014 review recommendations).

Aim: Describe and characterize meta-, pooled, and quantitative exposure–response analyses undertaken in recent Monographs

RESULTS: 14 Monographs since 2014

The Working Group undertook meta-, pooled, and/or quantitative exposure–response analyses in **6 Monographs**

Reasons for undertaking analysis:

- Updating the evidence to improve precision
- Refining the evidence with improvements to exposure or outcome measurement
- Extending the evidence with dose–response or meta-regression analysis

The Working Group ***did not*** undertake meta-, pooled, or quantitative exposure–response analyses in **8 Monographs**

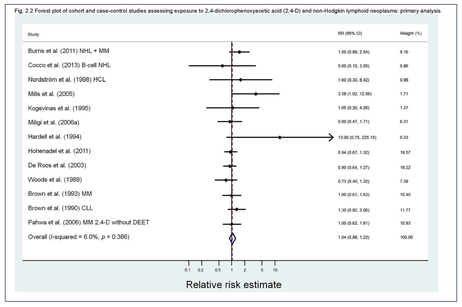
Reasons for not undertaking analysis:

- High-quality meta-analysis already available
- No or few human cancer studies available
- Exposure is rare
- Level of evidence did not warrant it

Key Examples

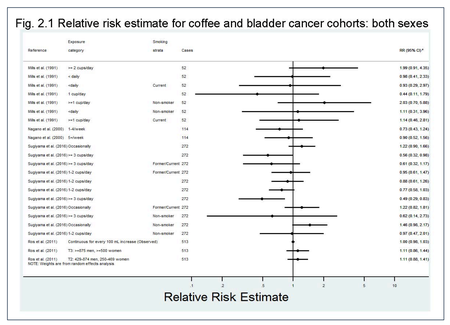
June 2015 – Volume 113

2, 4-D and non-Hodgkin lymphoma (NHL)



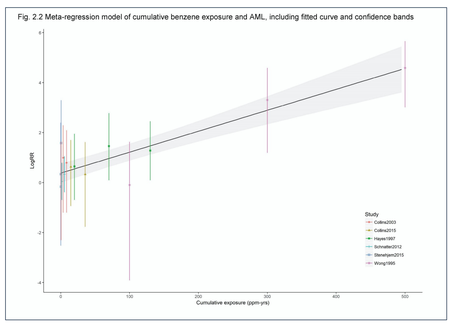
May 2016 – Volume 116

Coffee and bladder cancer



October 2017 – Volume 120

Benzene and haematopoietic cancers



October 2015 Volume 114

Red meat and processed meat and colorectal cancer


The Guardian

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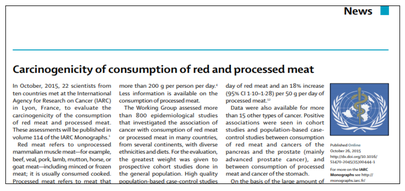
dia Society Law Scotland Wales Northern Ireland

Processed meats rank alongside smoking as cancer causes - WHO


News

Carcinogenicity of consumption of red and processed meat

In October, 2015, 22 scientists from ten countries met at the International Agency for Research on Cancer (IARC) in Lyon, France, to evaluate the carcinogenicity of the consumption of red meat and processed meat. These assessments will be published in volume 114 of the IARC Monographs.[1]

Red meat refers to unprocessed mammalian muscle meat—for example, beef, veal, pork, lamb, mutton, horse, or goat meat—including minced or frozen meat; it is usually consumed cooked. Processed meat refers to meat that more than 200 g per person per day.[2] Less information is available on the consumption of processed meat.

The Working Group assessed more than 800 epidemiological studies that investigated the association of cancer with consumption of red meat or processed meat in many countries, from several continents, with diverse ethnicities and diets. For the evaluation, the greatest weight was given to prospective cohort studies done in the general population. High quality population-based case-control studies

day of red meat and an 18% increase (95% CI 1·10–1·28) per 50 g per day of processed meat.[3]

Data were also available for more than 15 other types of cancer. Positive associations were seen in cohort studies and population-based case-control studies between consumption of red meat and cancers of the pancreas and the prostate (mainly advanced prostate cancer), and between consumption of processed meat and cancer of the stomach.

On the basis of the large amount of

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For more on the IARC Monographs see http://monographs.iarc.fr/

Vol. 110 – Perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone

Vol. 111 – Fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes

Vol. 115 – Some industrial chemicals

Vol. 117 – Pentachlorophenol and some related compounds

Vol. 119 – Some chemicals that cause tumours of the urinary tract in rodents

Vol. 122 – Isobutyl nitrate, β-picoline, and some acrylates

Vol. 123 - Some nitrobenzenes and other industrial chemicals

Other examples: Volume 112 – Glyphosate and NHL; Volume 118 – Welding and lung cancer; Volume 121 – Styrene and NHL

DISCUSSION

- The *Monographs* Working Groups seek opportunities to undertake meta-, pooled, and quantitative exposure–response analysis where it is warranted.
- Key considerations include the availability and quality of data; pre-existing meta-analysis; the extent of the exposure; and the magnitude of the risk.
- Including meta-, pooled, and quantitative exposure–response analysis in the *Monographs* can improve public health messages and cancer burden estimates.
- A more clearly defined and systematic approach to Working Groups documenting their reasoning on whether (or not) to conduct meta-, pooled, and quantitative exposure–response analysis could be considered.

International Agency for Research on Cancer

World Health Organization

monographs.iarc.fr

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handbooks.iarc.fr