FORMALDEHYDE AND CANCER
SUMMARY OF EPIDEMIOLOGY

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SOURCES OF EPIDEMIOLOGICAL DATA

- Cohort studies of industrial workers
- Cohort and proportionate mortality studies of professional groups (anatomists, pathologists, medical technicians, embalmers, funeral directors)
- Case-control studies in the general population

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INDUSTRIAL COHORT STUDIES

- NCI multicentre cohort (chemical manufacture, plastic products, photographic films, plywood)
- NIOSH garment manufacturers
- UK chemical manufacturers
- Other chemical and plastics manufacturers
- Fibreglass workers
- Woodworkers
- Iron foundry workers
- Abrasives industry
- Mixed industrial exposures

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NEW DATA SINCE LAST IARC MONOGRAPH IN 2004

- Cohort study of pest-control workers in France (39 deaths from all causes)
- Case-control study of bronchial adenocarcinoma in Uruguay (338 cases)
- Ecological study of breast cancer incidence in Texas and geographical relation to releases of industrial chemicals
- Case-control study of laryngeal and hypopharyngeal cancer in four eastern European countries

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NASOPHARYNGEAL CANCER

- Elevated mortality in NCI study (SMR 2.1, 8 deaths) with significant exposure-response for cumulative and peak exposure
- Excess in largest US cohort of embalmers (PMR 2.2, 4 deaths) and in employees at Danish companies manufacturing or using formaldehyde (PIR 1.3, 4 cases)
- Fewer cases than expected in other major cohort studies
- Elevations of risk in five out of seven case-control studies

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NASOPHARYNGEAL CANCER: ISSUES IN EVALUATION

- Excess mortality and exposure-response relationships in NCI cohort driven by a single plant with six out of 10 deaths
- No excess in other major cohort studies
- Risk estimates from some case-control studies are surprisingly high
- Plausible site of contact

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SINONASAL CANCER

- Pooled analysis of 12 case-control studies, adjusted for wood and leather dust showed increased risk of adenocarcinoma with higher cumulative exposures
- Increased risk of squamous cell carcinoma in one other case-control study and a PIR study
- No excess in major industrial cohort studies

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SINONASAL CANCER: ISSUES IN EVALUATION

- Possibility of residual confounding by wood dust
- Analyses do not distinguish between cancers of the nose and of the nasal sinuses

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OTHER RESPIRATORY CANCERS

- No consistent evidence for a hazard of laryngeal cancer
- Elevated risk of lung cancer in UK cohort study of chemical workers, but not in other major industrial cohorts. Possible confounding by smoking

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LEUKAEMIA

- Excess mortality in six out of seven studies of professional groups
- Mortality in NCI cohort lower than in general population, but with exposure-response relationship for peak exposures, especially for myeloid leukaemia
- Increased mortality in NIOSH study of garment manufacturers
- No excess in UK cohort of chemical manufacturers

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LEUKAEMIA: ISSUES IN EVALUATION

- Types of leukaemia differ in causation
- Confounding not a major concern
- Low biological plausibility

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CONCLUSIONS

- Epidemiological evidence base is extensive
- Strongest suspicion for nasopharyngeal cancer
- Any risk from current levels of exposure in western countries is small

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