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Will CARB's Proposal on Formaldehyde Really Reduce Cancer?

Summary

The health benefits of CARB's proposal to lower formaldehyde emissions have been overestimated by a cancer risk assessment that does not use the most current peer-reviewed scientific information. Importantly, more recent and sophisticated risk assessments of formaldehyde by other respected regulatory agencies, including US EPA, Health Canada, and the World Health Organization (WHO), predict the cancer risk is as much as 36,000 times lower than the estimate relied upon by CARB. These assessments indicate that the proposed reductions in formaldehyde emissions will not produce any meaningful reduction in cancer cases in California.

CARB's estimate is based on OEHHA's cancer potency factor

CARB estimated the cancer risk of formaldehyde based on an estimated cancer potency factor from a 1992 risk assessment by the Office of Environmental Health Hazard Assessment (OEHHA); this assessment was reissued essentially unchanged by OEHHA in 2005 as part of the Air Toxics Hot Spots Program.[1] CARB estimated that the benefit of implementing Phases 1 and 2 of the proposal would result in a theoretical net reduction of 12 and 35 cancer cases per million people, respectively, over a 70-year lifetime. Assuming a steady population of 35 million in California and assuming CARB's estimates are accurate, this would amount to a theoretical reduction in of about 6 and 18 cancer cases per year in California from Phases 1 and 2, respectively.

US EPA, Health Canada, and WHO estimate a dramatically lower cancer potency for formaldehyde

OEHHA's cancer potency estimate is at odds with more recent risk assessments by US EPA, Health Canada, and WHO. Substituting these cancer potency estimates in CARB's equations indicates that Phase 2 would prevent 0.001-0.016 cancer cases per million people, which is 0.0005-0.008 cancer cases per year in the entire population of California (Table 1). In other words, implementation of Phase 2 is unlikely to prevent one cancer case in the entire population of California in our lifetime.

Why such a big difference in estimates? OEHHA's cancer potency estimate does not rely on what US EPA calls "the best available peer-reviewed science at this time."[2] In fact, the OEHHA risk assessment of formaldehyde does not even mention the work which US EPA, Health Canada, and WHO relied upon for their risk assessments of formaldehyde.

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[1] OEHHA (1992) Cancer Risk Assessment for Airborne Formaldehyde. January, 1992. OEHHA (2005) Air Toxics Hot Spots Program Risk Assessment Guidelines. Part II. Technical Support Document for Describing Available Cancer Potency Factors. May, 2005. pp. B-287-295.

[2] US EPA (2006) National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products; List of Hazardous Air Pollutants, Lesser Quantity Designations, Source Category List. Fed Reg Vol. 71, No. 32, 8348-49. February 16, 2006.

OEHHA's estimated cancer potency for formaldehyde is 2250-36,000 times greater than that of US EPA, Health Canada, and WHO. Formaldehyde does not become 36,000 times more carcinogenic when it crosses the state border. Either OEHHA has greatly overestimated the risk or US EPA, Health Canada, and WHO all have greatly underestimated the risk.

Conclusion

CARB should carefully evaluate the proposal to reduce exposure to formaldehyde, particularly the extremely low limits proposed in Phase 2, in light of the tenuous public health benefits represented by the estimated reduction in cancer cases in California. If reducing exposure to formaldehyde will not result in any meaningful reduction in cancer risk in California, the proposed action must be questioned. Given the fact that over 100,000 Californians are expected to die annually from cancer, it is especially important to focus the State's resources on actions that will result in real reduction in cancer and improvement in public health.

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