

ナフタレン(WHOガイドライン値策定 物質)の実態調査について

国立医薬品食品衛生研究所/名城大学薬学部
神野 透人

Naphthalene

WHO GUIDELINES FOR INDOOR AIR QUALITY: SELECTED POLLUTANTS

- The principal health concerns of exposure to naphthalene are respiratory tract lesions, including **tumours in the upper respiratory** tract demonstrated in animal studies and **haemolytic anaemia** in humans.
- Lesions in the nasal olfactory and, at higher concentrations, also in the respiratory epithelia of rats appear to be the critical non-neoplastic effect.
- At concentrations about 100-fold higher than the lowest lesion level, severe inflammation and tumours have been reported to occur at these sites.
- Increased cell proliferation due to cytotoxicity (cell damage) is considered a key element in the development of airway tumours.

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- The likely involvement of cytotoxic metabolites in the carcinogenic response and the apparent primary nongenotoxicity of naphthalene favour the assumption of the existence of a threshold. Therefore, the use of a lowest observed adverse effect level (LOAEL)/NOAEL as a threshold, combined with safety factors, is considered to be an appropriate approach for setting indoor air guidelines to minimize the carcinogenic risk to the respiratory tract of naphthalene exposure.
- Associated with repeated inhalation exposure of 6 hours per day, 5 days a week for 104 weeks, severe effects in terms of inflammation were observed in almost all rats exposed to the lowest (but still relatively high) naphthalene dose of 53 mg/m³. In the absence of adequately published data in relation to less severe effects, this can be taken as a LOAEL, even though it is related to severe effects.

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- Taking this LOAEL as a starting point and adjusting for continuous exposure (dividing by a factor of 24/6 and 7/5), a value of about **10 mg/m³** is obtained. Further, incorporating a factor of **10 for using a LOAEL rather than a NOAEL**, a factor of **10 for inter-species variation** and a factor of **10 for inter-individual variation**, a guideline value of **0.01 mg/m³** is established. This guideline value should be applied as an **annual average**.
- Extensive use or misuse of naphthalene mothballs may lead to haemolytic anaemia. Knowledge of the impact of exposure to naphthalene on the risk of haemolytic anaemia in susceptible individuals (**glucose 6-phosphate dehydrogenase deficiency**) cannot be used to define a guideline owing to the lack of adequate exposure data.

室内空気実態調査

全国実態調査

[2012年度夏季]

2012年 7月 ~ 2012年 9月 (111軒)

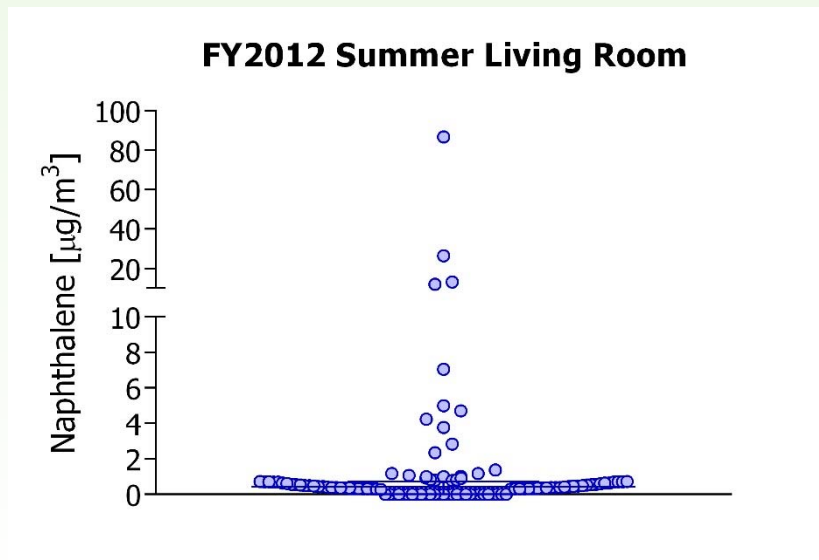
[2012年度冬季]

2012年12月 ~ 2013年 3月 (111軒)

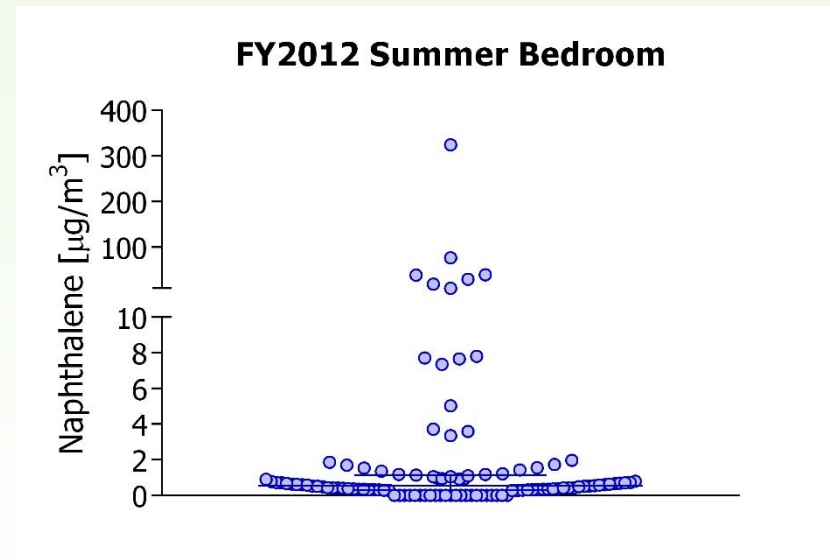
[2013年度夏季]

2013年 7月 ~ 2013年 9月 (93軒)

居間・寝室のNaphthalene濃度 2012年度 夏季全国調査



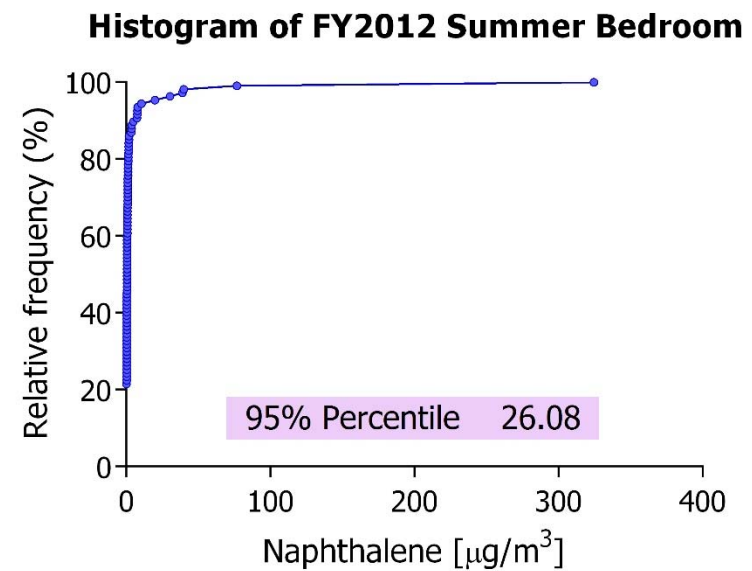
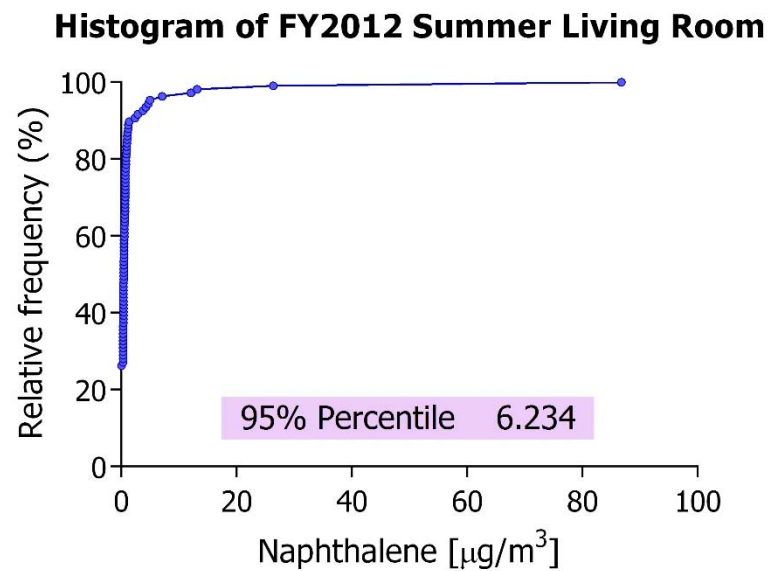
WHOガイドライン超過件数: 4 (4/108*; 3.7%)



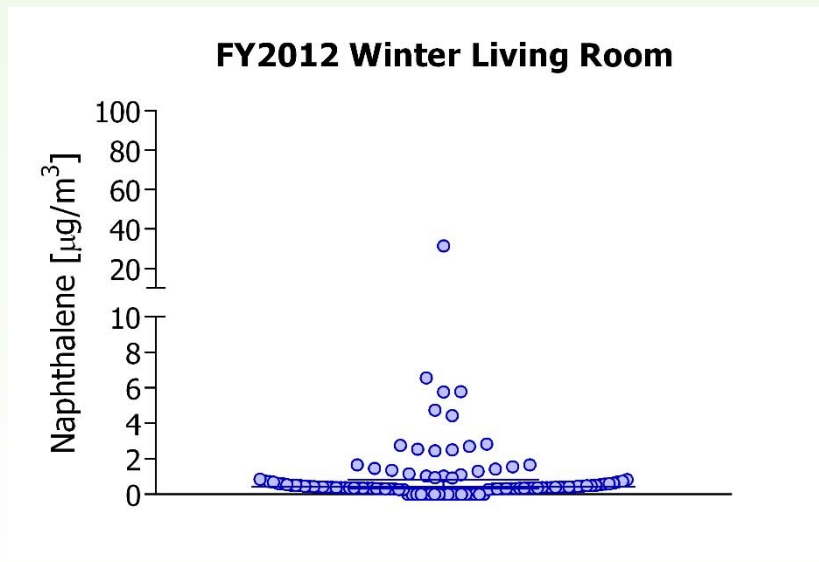
WHOガイドライン超過件数: 7 (7/108*; 6.5%)

*全111家屋のうち、夏季および冬季の調査で対応のある108家屋について解析した結果を示した

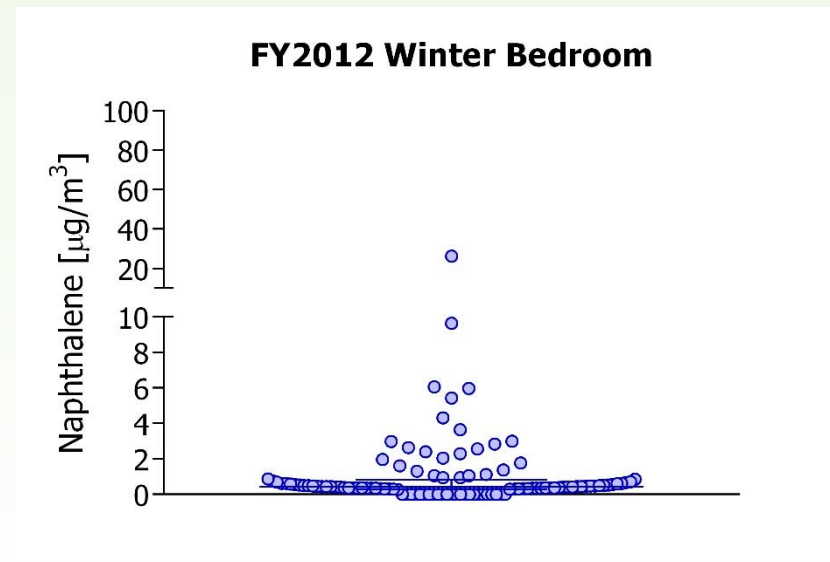
Naphthalene濃度: 累積度数分布 2012年度 夏季全国調査



居間・寝室のNaphthalene濃度 2012年度 冬季全国調査



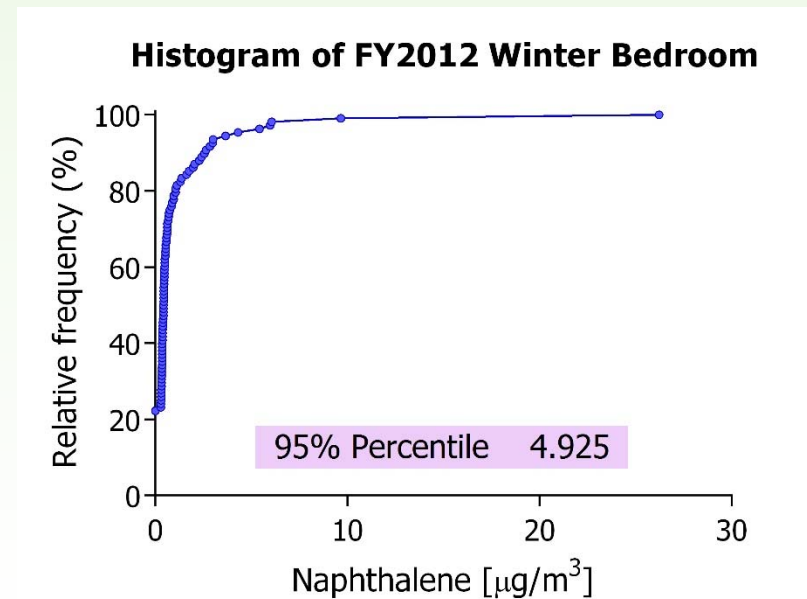
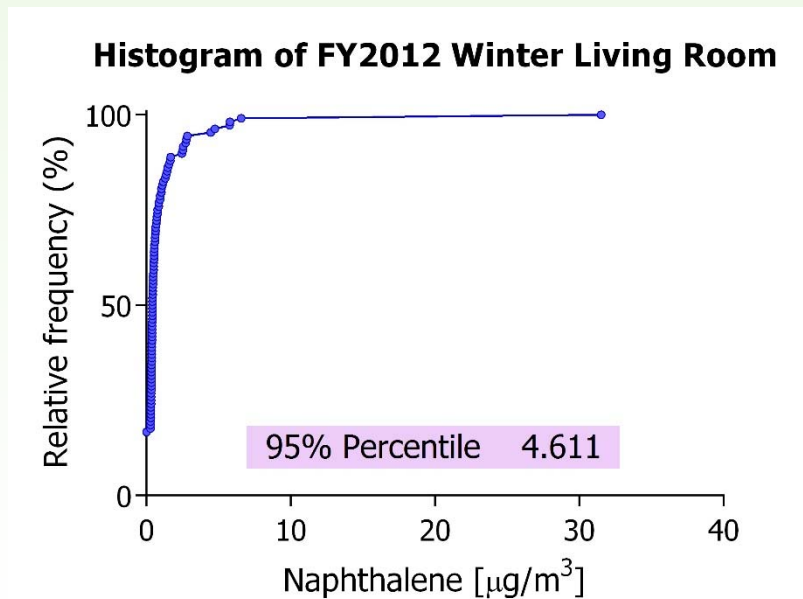
WHOガイドライン超過件数: 1 (1/108*; 0.9%)



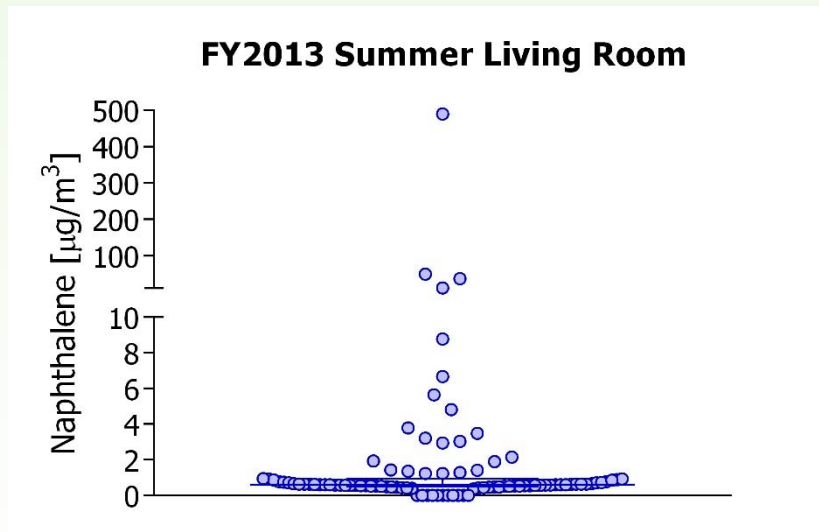
WHOガイドライン超過件数: 1 (1/108*; 0.9%)

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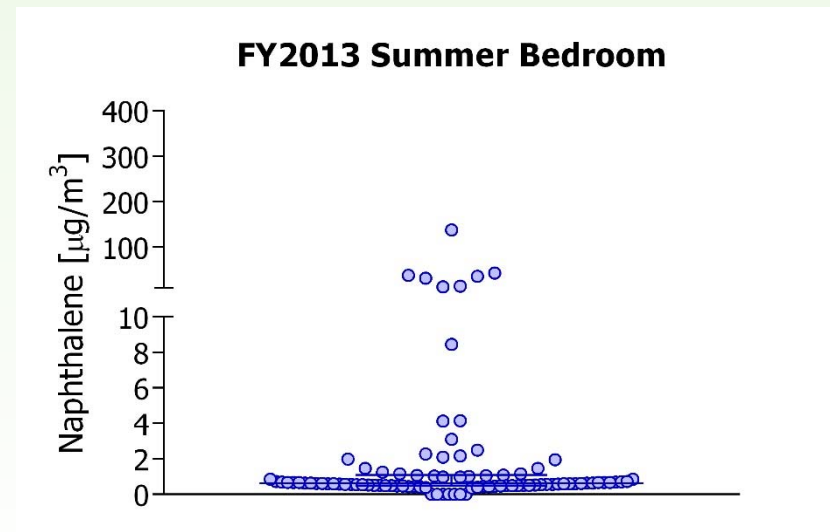
Naphthalene濃度：累積度数分布 2012年度 冬季全国調査



居間・寝室のNaphthalene濃度 2013年度 夏季全国調査



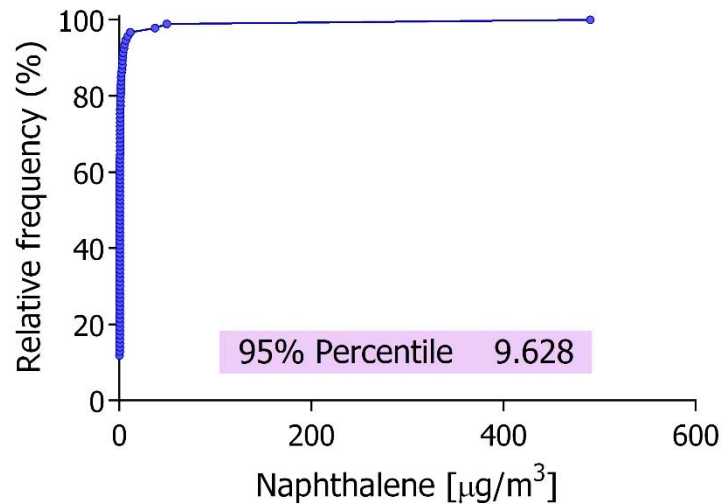
WHOガイドライン超過件数: 4 (4/93; 4.3%)



WHOガイドライン超過件数: 7 (7/93; 7.5%)

Naphthalene濃度：累積度数分布 2013年度 夏季全国調査

Histogram of FY2013 Summer Living Room



Histogram of FY2013 Summer Bedroom

