

December 22, 2004

Dorothy Shimer
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VIA EMAIL

Dear Ms. Shimer:

Thank you for the opportunity to submit comments on the November 2004 *Indoor Air Pollution in California –Draft for Peer Review*. The following input is limited to sections of the draft text that are related to reports produced by the National Academy of Sciences (NAS).

The scientists found sufficient evidence of an association between exacerbation of asthma and exposure to nitrogen dioxide (NO₂), other nitrogen species (NO_x), and mold, and limited or suggestive evidence of an association of formaldehyde and fragrances with asthma. [Draft Report p. 4]

As discussed earlier, the NAS Institute of Medicine's Committee on the Assessment of Asthma and Indoor Air determined that there is sufficient scientific evidence to conclude that indoor NO₂ can exacerbate asthma (IOM, 2000). [Draft Report p. 55]

The committee responsible for the *Clearing the Air* report found an association between high level exposure to NO₂/NO_x and asthma exacerbation, not exposure in general as implied by the text. Specifically, it noted that this effect would be observed “[a]t concentrations that may occur only when gas appliances are used in poorly ventilated kitchens” [Table 2 footnote, p. 9]. The body of the report provides additional detail:

There is sufficient evidence of an association between brief high-level exposures to NO₂ and increased airway responses to both nonspecific chemical irritants and inhaled allergens among asthmatic subjects. These effects have been observed in human chamber studies at concentrations (400–700 ppb) that may occur only in poorly ventilated kitchens with gas appliances in use. [p. 232]

The text “...limited or suggestive evidence of an association of formaldehyde and fragrances with asthma” [p. 4] is ambiguous. It would be appropriate to edit it as follows: “...limited or suggestive evidence of an association between exposure to formaldehyde or fragrances and asthma exacerbation.”

However, in general, the prevalence of asthma appears to be more strongly correlated with lower socioeconomic status than with race and ethnicity (IOM, 2000). [Draft Report p. 10]

The prevalence of asthma appears to be more strongly correlated with lower socioeconomic status than with race and ethnicity (IOM, 1999). [Draft Report p. 32]

These two statements inconsistently cite NAS report text. The following appears in *Toward Environmental Justice Research...* (IOM, 1999):

The prevalence of asthma appears to be more strongly correlated with lower socioeconomic status than with race and ethnicity (Institute of Medicine, 1993). [p. 21]

The direct quote, if used, should be indicated as such. The 1993 IOM report referenced is *Indoor Allergens: Assessing and Controlling Adverse Health Effects*.

IOM (Institute of Medicine). 1993. *Indoor Allergens: Assessing and Controlling Adverse Health Effects*. Washington, DC: National Academy Press. <http://books.nap.edu/books/0309048311/html/>

A series of statements on page 32 of the draft report are directly quoted from *Damp Indoor Spaces...* and—if used as is—should be cited as such:

Draft Report: Eggleston (2000) reviewed national health data and studies of indoor environmental quality and concluded that ethnicity, poverty and residence combined to influence asthma prevalence in inner-city children in ways that could not be easily disentangled. [p. 32]

Damp Indoor Spaces...: Reviewing data accumulated in the second National Health and Nutrition Examination Survey (NHANES II) and the Harvard Six Cities Study, Eggleston (2000) concluded that ethnicity, poverty, and residence combined to influence asthma prevalence in inner-city children in ways that could not be easily disentangled. [p. 313]

Draft Report: Economic factors also may encourage poor building practices. Combinations of pressure to build quickly and cheaply can result in poorly constructed buildings that are more likely to have water leaks. Poverty combined with the lack of affordable housing may also create incentives to forgo or limit investment in maintenance that might help to prevent moisture problems and subsequent adverse impacts on the health of the occupants. [p. 32]

Damp Indoor Spaces...: Economic factors may encourage poor building practices. Combinations of pressure to build quickly and cheaply can result in poorly constructed buildings that are more likely to have water leaks. ... Poverty combined with the lack of affordable housing may also create incentives to forgo or limit investment in maintenance that might help to prevent moisture problems. [p. 313-314]



Tables 2.2 [Draft Report p. 36], 2.3 [p. 37], 2.9 [p. 79], and 2.10 [p. 81] mischaracterize the results of the NAS reports they cite. The category “Possible but Insufficient Evidence of an Association” does not exist in the conclusions drawn in *Clearing the Air...* and *Damp Indoor Spaces...*. The outcomes are instead listed in the category “Inadequate or Insufficient Evidence to Determine Whether an Association Exists”. In addition, Tables 2.9 and 2.10 refer to “bleeding lung disease in infants”. This outcome should instead be called “acute idiopathic pulmonary hemorrhage in infants”.

If the tables presented in these reports are reproduced, they should be reproduced faithfully and completely, including associated footnotes.

There is compelling evidence that ETS is a risk factor for induction of new cases of asthma (in children and adults) and increases the severity of disease among children and adults with established asthma (IOM, 2000). [Draft Report p. 73]

This statement mischaracterizes conclusions drawn in *Clearing the Air...*. The IOM report does not conclude that ETS is a risk factor for the development of asthma in all children or in adults. It finds:

- There is sufficient evidence to conclude that there is an association between ETS exposure and the development of asthma in younger children.
- There is inadequate or insufficient evidence to determine whether an association exists between ETS exposure and the development of asthma in school-aged or older children, or in adults [p. 280–281].

In addition, the IOM report states:

- There is sufficient evidence to conclude that there is a causal relationship between ETS exposure and exacerbations of asthma in preschool-aged children.
- There is limited or suggestive evidence of an association between chronic ETS exposure and exacerbations of asthma in older children and adults. Limited or suggestive evidence of an association between acute ETS exposure and exacerbations also exists for asthmatics sensitive to this exposure. [p. 280–281]

... consistent allergy testing materials are available for only four common species: *Alternaria alternata*, *Cladosporium herbarum*, *Aspergillus fumigatus* and *Penicillium chrysogenum* (IOM, 2004). [Draft Report p. 80]

No NAS report states this. The four named species are listed, with others, in an inventory of major allergens isolated from fungi in Table 5–2 of *Clearing the Air...* [p. 160] and Table 2–6 of *Damp Indoor Spaces...* [p. 67]. Only one sentence in *Damp Indoor Spaces...* references these species only and it does not address the availability of testing materials:

A 2001 study found an association between age and IgE sensitization to *Alternaria alternata*, *Aspergillus fumigatus*, *Cladosporium herbarum*, and *Penicillium chrysogenum* in atopic children 0–15 years old, with maximal sensitization prevalence at about 8 (Nolles et al., 2001). [p. 230]



In addition, occupants of moldy buildings have reported some health outcomes that are not usually associated with allergy (such as memory loss, depression, chronic fatigue, mood swings, bloody nose, rheumatoid disease and loss of appetite) (IOM, 2004). [Draft Report p. 80]

The cited report (*Damp Indoor Spaces...*) does not address chronic fatigue. It states:

Occupants of damp and moldy buildings have sometimes reported central nervous system symptoms—such as fatigue, headache, memory loss, depression, and mood swings—that they attribute to the indoor environment. [p. 157]

While the report notes that “hemorrhage in the mucous membranes of the intestinal and respiratory tracts” is an outcome not generally associated with an allergic response [p. 125], a bloody nose is associated with allergic rhinitis.

There is currently insufficient evidence to determine if pesticides cause or exacerbate asthma (IOM, 2000).

As the subject statement notes, this finding was published in 2000. No NAS report addresses whether the finding is “currently” (in late 2004) true. *Clearing the Air* notes:

...research on asthma is burgeoning and significant new papers are constantly being published. Although the committee did its best to paint an accurate picture of the state of the science at the time the report was completed, it is inevitable that research advances will overtake its conclusions. [p. 4]

Data in IOM (2000) indicate that self-reported asthma prevalence in California was 7.1% versus 6.4% for the U.S.; however, more recent data (Rhodes *et al.*, 2002) indicate that the prevalence of current asthma in 2002 was 6.4% in California versus 7.5% for the full U.S.[Draft Report p. 106]

The data noted in the subject sentence are contained in Table 3–2 of *Damp Indoor Spaces* [p. 74–75]. As noted in the text, the source of this information is a 1998 *MMWR* paper by Rappaport and Boodram.

Rappaport S, Boodram B. 1998. Forecasted state-specific estimates of self-reported asthma prevalence—United States, 1998. *Morbidity and Mortality Weekly Report* 47(47):1022–1025.



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Below are edits to the reference citations to the National Academies reports that include the URLs for the report text. The URL presently listed for *Clearing the Air*, while presently correct, is not a stable link to the report. Please note that the National Academy Press recently changed its name to the National Academies Press. This change is noted in the citation to the (2004) *Damp Indoor Spaces...* report.

IOM (Institute of Medicine), 1999. *Toward Environmental Justice Research, Education, and Health Policy Needs*. Washington D.C: National Academy Press.
<http://books.nap.edu/books/0309064074/html/>

IOM (Institute of Medicine), 2000. *Clearing the Air: Asthma and Indoor Air Exposures*. National Academy of Sciences. Washington D.C: National Academy Press.
<http://www.iom.edu/report.asp?id=5511>. <http://www.nap.edu/books/0309064961/html/>

IOM (Institute of Medicine), 2004. *Damp Indoor Spaces and Health*. National Academy of Sciences. Washington D.C: National Academies Press. <http://www.nap.edu/books/0309091934/html/>.

Please feel free to contact me with any questions regarding these comments.

Yours sincerely,

«signed»

David A. Butler, PhD
Senior Program Officer