

## SIX OF THE AUTHORS REPLY

Bowman and Thomas (1) cite two concerns about a residential magnetic field exposure index based on distance from homes to overhead transmission and three-phase primary distribution power lines that we used to evaluate childhood leukemia risk: 1) the simplicity of our model, and 2) the possible importance of unmeasured magnetic field characteristics. In our study conducted in nine Midwestern and mid-Atlantic States, we found no evidence of a positive association between leukemia risk and a magnetic field exposure index based on distance (2). In a reanalysis of data from a study in Los Angeles, Bowman et al. previously found a twofold risk for childhood leukemia in a high exposure group defined by a magnetic field exposure index based on distance (3) that was more complex than the one we used. Bowman and Thomas suggest that the different epidemiologic results in Los Angeles and the nine-state study might be explained by the models used or differences in unmeasured magnetic field characteristics between the two studies.

As Bowman and Thomas point out, the mathematical forms of both models were derived from the same general physical principles (4). Our exposure model was simpler than theirs because we chose to focus solely on transmission and distribution lines, the types of lines that generally emit the strongest magnetic fields (5). Along with these types of power lines, Bowman et al. also included secondary distribution lines and service drops in their model.

Bowman and Thomas used residential magnetic field measurements from their dataset to determine the values of several parameters incorporated in their model, that is, to essentially "tune" their model for the homes in their study. We did not follow this course, but instead utilized an "expert estimate" of the relative strengths of the magnetic fields produced by the average transmission and three-phase primary lines to select the key parameter in our model. We used this approach based on simplicity and experience with an earlier model developed by one of us (4). The earlier, more complex model did not predict magnetic fields for residences other than the original 43 homes in Seattle, Washington, for which the model was developed. Furthermore, it was not feasible for us to separately tune our model for the geographic regions within the nine-state area that were served by more than 100 different utility companies.

Unmeasured magnetic field characteristics may be effect modifiers, as Bowman and Thomas suggest, but any notable influence on the risk of childhood leukemia from any postulated effect modifier has yet to be demonstrated (6). We recently reanalyzed the nine-state study results on field measurements (7) by using a variety of magnetic field metrics, including rate of change, peak exposures, and measures of

short-term variability (8). We concluded (7, 8) that there is little evidence of an association between any measure of magnetic fields and risk of childhood acute lymphoblastic leukemia (8).

## REFERENCES

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