EXPOSURE ASSESSMENT: SIGNIFICANCE VS IMPORTANCE

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EOHS professionals and scientists who perform and/or evaluate potential exposure related health outcomes and provide expert litigation support services tend to utilize or rely on exposure assessment data statistical significance in an effort to decide whether a causal relationship exists between a potential exposure and the subsequent level of importance of the adverse health outcome. The underlying principle is that a non-significant relationship is more likely to be due to chance than a true causal relationship.

Consequently, it is critical that the professional review as much of the scientific literature as possible or feasible (based upon the project scope of work and especially so with regard to expert litigation support services and meeting the Daubert standard/challenge requirements) before making a decision and/or providing an opinion about the probability/chances of a serious/adverse health outcome resulting from an exposure.

The following considerations are provided in an effort to assist in making better informed decisions regarding these exposure determinations:

- Are there peer reviewed and/or scientifically validated studies that have evaluated a relationship between the exposure and adverse health outcome?

  If no, then the possibility of a causal relationship still exists.

- Is there at least one peer reviewed and/or scientifically validated study that establishes a strong causal relationship?

  If yes, the professional should consider the quality of the study, specific exposure conditions/similarities, the degree of association and the severity of the adverse health outcome.

- Are there a few peer reviewed and/or scientifically validated studies that document at least a weak causal relationship?

  If yes, indications are there is either a marginally significant or significant causal relationship but the overall risk is considered low.

- Are there numerous peer reviewed and/or scientifically validated studies that indicate a weak causal relationship?

  If yes, indications are there is a probable causal relationship, and the professional must consider specific exposure factors between actual field/site conditions and those of the study before a final determination is made and/or action is taken.

- Are there adequate peer reviewed and/or scientifically validated studies that clearly establish a causal relationship?

  If yes, the professional must undertake appropriate actions immediately.

In summary, when scientific literature searches do not identify adequate peer reviewed and/or scientifically validated studies, the possibility of a causal relationship remains viable. If adequate studies exist that indicate no causal relationship, the professional can conclude that the exposure adverse health outcome is unlikely. If adequate studies exist that indicate a weak or marginal causal relationship, the professional should consider other specific exposure factors, such as (without limitation) field/site environmental conditions/parameters, contaminant concentration, duration, and PPE/human behavioral factors before making a final determination on significance and importance. And finally, the obvious one of course (although rare) is if there are adequate peer reviewed and/or scientifically validated studies that clearly establish a causal relationship between a known exposure and an adverse health outcome, this is both significant as well as important and action needs to be taken immediately.

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