

Date: December 19, 2018

Topic: 2018 IMPRESS Meeting

From: Scientific Advisory Board (Aaron Blair, Silvia Fustinoni, Len Levy, Mark Montforts)

This statement was prepared by the Scientific Advisory Board following the 2nd Annual Meeting in Edinburgh on December 11, 2018.

Scope of IMPRESS

The IMPRESS project aims to better understand the performance of existing methods of exposure assessment to pesticides used in epidemiological studies and to use this information to recommend improvements in studies of pesticides in the future. This three-year project is designed to assess the reliability and external validity of the surrogate measures used to assign pesticide exposure to individuals or groups of individuals. This information will be used to evaluate the size of recall error, or bias, on misclassification of exposure to pesticides and their impact on estimates of associated health effects. As part of these evaluations, the project team will use existing and newly collected (biological) monitoring data from several ongoing epidemiological studies and historical records across various populations in Europe and elsewhere. The performance of the various exposure assessment methods will be compared, and contrasted, within existing epidemiological studies. A major focus will be the comparison of selected semi-quantitative individual-based exposure assessment methods with measured levels of urinary pesticide metabolites in several settings.

Role of the Scientific Advisory Board (SAB)

The role of the SAB, as described in the project governance document, is to provide independent, scientific oversight on the project to the study investigators by reviewing and commenting on study design and conduct, data collection and analysis, data interpretation, and manuscript production. The SAB members provide individual advice to the IMPRESS investigators and from time to time, may also make group recommendations.

Overall Appraisal of IMPRESS

This document characterizes SAB comments and conclusions regarding IMPRESS following the second meeting of the SAB on December 11, 2018. Since the first SAB meeting in December 2017, SAB members have reviewed and commented on several study documents, including the Project Governance Document, Project Description of Work, Work Package 2, and Work Package 3.

The SAB remains confident that the IMPRESS project will provide important new information on how to assess and characterize pesticide exposure for studies of human outcomes and diseases that might result from pesticide use and exposure.

The SAB thought it was important to restate our view regarding the benefit that this research project may provide. Following the 2017 SAB meeting, we indicated that "In

epidemiologic studies of disease with a lengthy latent period, it is unlikely that there will be many opportunities to entirely base pesticide exposure assessment on monitoring. Thus, use of determinants from interview and/or records will be required in most studies. Such a situation is not unusual in epidemiology and is certainly not restricted to studies of pesticides. Consequently, there is a considerable history in epidemiology of combining information from exposure determinants and monitoring data to create quantitative exposure scales. This project should include an evaluation of the value of using questionnaire information/record information, even if not equal to the level of reliability and validity that might be obtained from comprehensive monitoring and/or biomonitoring. It is not uncommon to entirely overlook the value of such information and to inappropriately conclude that it is without value. For pesticides the issue is often how to compare poorer quality information on exposure over a working career versus high quality information for a very small portion of a working career. It is not obvious which is better for assessing risks from chronic exposures that develop after a long period of time. The question is not just which approach can provide the best estimate of some short-term exposure, but which can provide the most accurate and reliable information over the entire time period of relevant exposure. Any exposure metric(s) used in any epidemiological study should also reflect the biological/toxic endpoints of concern both from the nature of the active ingredient(s) and study design.

At the 2018 SAB meeting, the investigators presented results from their review of the literature regarding exposure assessment techniques employed in epidemiologic studies of pesticides. This is a valuable tabulation that documents what has been employed in the past. Such information provides the necessary data to assess patterns of exposure assessment over the years, by study design, by region of the world, by outcome, and other factors. These data will, undoubtedly, provide information on aspects of exposure assessment that is not appreciated now.

The SAB supports the effort of the IMPRESS investigators to share study plans and results with the scientific community through the study website, presentations at scientific meetings, and publication in the literature.

Although the IMPRESS investigators indicate they need a no-cost extension to complete the various components of the project, considerable progress has been made since the 2017 SAB meeting. We understand that research projects, particularly those with multiple components in different countries, impose complexities that make precise timing and completion of activities difficult. The investigative team still has decisions to make regarding location of some of the activities, e.g., Ethiopia versus Uganda.

The SAB has a few suggestions for the IMPRESS investigators to consider.

- 1) Since they are working with populations where some individuals may receive fairly-high exposure levels, procedures should be clearly developed and stated as to actions to be taken if field teams observe potentially hazardous exposure situations. Are there procedures, or decisions regarding reporting exposure findings to individuals?

- 2) We wondered if it would be possible to perform some literature review of pesticide exposure procedures reported in the literature that do not include a health outcome. We recognize that this is beyond the current scope of the project and would entail added effort, but we believe a tabulation of the monitoring techniques employed might be informative. This need not be a comprehensive review, but a sufficient effort to give an impression of the exposure situations, geographic locations, and populations where exposure information is available.