

*Children's Health Protection Advisory Committee*

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November 15, 2005

Stephen L. Johnson, Administrator  
 United States Environmental Protection Agency  
 Ariel Rios Building  
 1200 Pennsylvania Avenue, N.W.  
 Washington, DC 20460

RE: Recommendations Regarding Protecting Farmworker  
 Children From Exposure to Pesticides

Dear Administrator Johnson:

The Children's Health Protection Advisory (CHPAC) recently conducted a review of pesticide-related health risks to the children of farmworkers. We began by reviewing previous CHPAC letters to the EPA (including FACA to EPA correspondence from 1999) and then focused on research and policies addressing: 1) exposures levels in pregnant women and children, 2) pesticide residues in homes and cars, 3) pesticide drift, 4) the Worker Protection Standard (WPS), and 5) gaps in research (see Attachment 1). From this information we concluded that farmworker children are not adequately protected and that a number of risk-reduction actions can be taken now. We also found areas where scientific evidence is lacking and recommend that EPA support additional research in targeted areas of inquiry. In conducting our review, we also came to the conclusion that children are best protected through primary prevention measures. We urge the EPA to support agricultural practices that use fewer pesticides, less toxic pesticides, and alternatives to pesticides. We also encourage the EPA to involve all stakeholders (e.g., pesticide manufacturers, growers, and workers) in the development of strategies aimed at reducing risks to farmworker children and pregnant women.

The CHPAC's recommendations fall into two categories, short-term and long-term. Short-term recommendations focus on strengthening the WPS, and reducing exposures from pesticide drift.

Our long-term recommendation focuses on reducing data gaps through research.

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### A. Strengthening the WPS

The Worker Protection Standard (WPS) sets forth grower responsibilities for pesticide safety requirements to protect farmworkers and their children from exposure. In reviewing WPS policies and implementation issues, the CHPAC concluded that much more can be done to reduce risks to farmworker children. Our recommendations can be implemented today, and include:

1. Training to Modify Worker Behaviors: The WPS requires that workers receive training every five years. The CHPAC believes this is inadequate and recommends that training be provided annually to both field workers and pesticide handlers. Training should be expanded to include information about take home exposure pathways, risks to family members from take home exposures, pesticide toxicity, and health risks to infants, children, and pregnant women. Workers also need to be educated about practical risk reduction actions (e.g., changing clothes and showering before going home) and how these actions can help protect their family.
2. Hazard Communication: EPA is considering adding hazard communication information to the WPS. We endorse this concept and suggest that workers be provided with a simplified safety handout addressing: 1) the short- and long- term health effects of pesticides used at that particular workplace, 2) safety precautions (e.g., restricted entry intervals) and 3) first aid information. This brochure should be provided by pesticide manufacturers, and be linguistically-, culturally-, and educationally-appropriate for farmworkers. The use of pictograms and other low-literacy health information techniques should be investigated.
3. Access to Changing Facilities at the Work Site: Because most farms lack places for workers to wash or change their clothes, pesticide residue remains on workers' hair, clothes and shoes when they return home. Children can be exposed to pesticide residue when they hug their parents at the end of a work day. Providing workers with a place to wash and change clothes before returning home will help protect their children from pesticide exposure. Employers should be required to provide farm workers with an area to store clean clothes, change clothes and shoes, and wash, so that pesticides will not be carried from work to home. These washing areas provide a logical place for permanently displaying safety information that shows workers that protecting themselves is part of protecting their children.
4. Protecting Young Farmworkers: Reducing Exposures While Mixing, Loading, and Applying: Under current policy, farmworkers must be at least 16 to mix, load and apply toxicity category I and II pesticides. However, some categories III or IV pesticides have been associated with long-term health effects, including cancer or adverse reproductive effects. In 2000, the National Institute of Occupational Safety and Health recommended that the Secretary of Labor designate all pesticide handling activities as "hazardous" in order to prevent farmworker

children under age 16 from engaging in such activities. We recommend that the EPA adopt this NIOSH recommendation. Because growth and development of many organ systems continues into late adolescence, we hope that EPA, with its fellow agencies, also will develop ways to enhance protection for the 16-20 year old age group.

5. Ensure Young Farmworkers: Respiratory Protection: Under OSHA's standard workers who use respirators must be medically cleared and have the respirator properly fitted to their face. For youth (ages 16 and older) who need to use a respirator, EPA regulations should be expanded to address respirator fit testing for farmworkers. This change would provide farmworkers with the same level of protection that all other workers receive under OSHA.
6. Strengthen WPS Enforcement. Compliance with the WPS and the prohibition against children mixing, loading and applying certain pesticides needs to be improved. However, states currently impose few penalties for violations of these provisions. Consequently, employers have little economic incentive to obey the law. For example, in California (often considered to have a strong state pesticide program), state data indicate that for the period 1997-2000, worker safety laws were violated in 41% of reported poisoning cases involving agricultural workers. Fines were issued for less than 20% of these violations, and the vast majority were for less than \$400. Workers also rarely report violations because they fear employer retaliation. The CHPAC urges EPA to improve enforcement of the WPS and related safety laws. This should include a requirement that states issue meaningful fines for violations found, that complaints of worker poisoning or employer retaliation be prioritized and promptly and thoroughly investigated, and that EPA issue an annual report summarizing enforcement activities (e.g., number and type of violations found, penalty imposed, if any, etc.).

#### **B. Reducing Exposures from Pesticide Drift**

Children living in agricultural areas are potentially exposed to drift at home and at school. Child protective policies need to consider the evolving science addressing pesticide drift as well as the realities of field work, living conditions, cumulative exposures, and the proximity of agriculture fields to housing, schools and day care settings. By taking preventive actions to protect farmworker children, all children may be protected as well.

Further work is needed to understand the effects of secondary as well as primary drift. To date EPA's models have focused primarily on modeling dispersion patterns from primary drift (e.g., dispersion at the time of application); such models do not account for exposures to secondary drift (e.g., revolitalization and/or windblown dust) and thus underestimate exposure.

1. Require prior notification of pesticide spraying: All families, farmworker and non-farmworker alike, should be informed about spray drift that can potentially affect them. Requiring applicators to notify nearby people (i.e., all areas where children live, work, and play) of spraying will allow them to take risk reduction actions (e.g., shutting windows, bringing children inside) if they so choose. These types of common sense strategies can foster trust between growers and local residents as well as reducing risks to local children. The EPA should require notification of pesticide spraying as well as investigating ways to reduce the burden of notification on growers.
2. Explore the effectiveness of no-spray buffer zones: Preliminary evidence suggests that buffer zones around homes, schools, and parks may be child-protective. Many school districts have already adopted no-spray policies on district properties. Buffer zones around schools have the potential to protect large numbers of children; their effectiveness should be evaluated.
3. Develop and field-test comprehensive drift models: It is critical to have pesticide drift models that focus on human health as well as ecologic risks. We recommend that EPA consider the development of new and/or expanded models that account for exposures from both primary and secondary pesticide drift. Models should be tested by comparing predicted drift to actual field measurements of drift.
4. Develop specific drift-control strategies: EPA should use current information to develop compound and/or classification-specific drift control strategies. Such strategies need to consider common types of application (e.g., aerial, air blast), spray release height, and meteorological conditions. In addition, the EPA should also require pesticide labels to include clear instructions on application in different types of wind and temperature conditions. Such information, based on modeling, should take into consideration the drift potential of that formulation.

### **C. Reducing Data Gaps Through Research**

While mindful of special considerations regarding human subjects protection related to intentional dosing and the applicability of the National Children's Study, the CHPAC makes the following research recommendations to obtain critical knowledge for informed decision making:

1. Conduct research addressing the environmental transformation products of pesticides: We do not understand the relationship between exposure to environmental transformation products of pesticides and measured human urinary metabolites. In addition, population-based metabolite data are lacking on children under age six, a potentially vulnerable age group. Research is underway that quantifies how much of a metabolite is attributable to the parent compound as opposed to direct exposure to the environmental transformation product. This is a general issue, but is particularly urgent in regards to organophosphates and their urinary metabolites. We want to

encourage the continuation of this research with a wider range of chemicals especially other pesticides where the metabolites may be harmful.

2. Examine the physical-chemical properties of pesticides that influence drift: Existing information can be used to take child protective actions now; however, additional research is needed to understand the health implications of pesticide drift. EPA should support additional technical research addressing the physical-chemical properties and other determinants of mobilization of pesticides and inerts. EPA also needs to support field research so that best practices to test pesticide drift in actual settings can be understood.
3. Conduct methodological research addressing practical approaches to data collection: Develop applied research methods to help us understand exposure, including stable and reliable biomarkers in readily accessible biomedial media such as saliva. These methods should be applicable to adults and children and should reduce the burden of data collection, a limiting factor to understanding exposures.
4. Examine pesticide metabolism in prenatal and post-partum women in observational studies: Research should focus on physiological variations in pregnant, post-partum and nursing women and children. Compared with pregnant women, recent studies have suggested an increase in post-partum urinary metabolite levels. Additional observational research is needed to determine whether this post-partum increase is reproducible and, if so, to understand the mechanism and implications of this phenomenon on children's exposure.
5. Conduct research to identify effective and acceptable personal protective equipment (PPE): Encourage and support research to develop PPE that is comfortable for workers including teens and pregnant women. It is quite possible that disposable protective clothing for example could be developed (or exists) which is far more comfortable than impervious materials while still providing adequate protection. Similarly, eye, hand, and respiratory protection may be significantly addressed using more comfortable technology.
6. Support the collection of data at relevant times during the growing season: Exposure data collection needs to be timed to coincide with specific instances of pesticide application. Such research requires access to field sites, which is limited due to the inherently adversarial social context in which exposure research takes place. Thus, EPA should build and expand partnerships to help enhance access and facilitate information flow (e.g., with growers and or community-based groups).
7. Conduct research on the best ways to provide incentives for growers to implement changes in agricultural practices: We recognize that primary prevention actions are the most effective way to protect children. Such actions include long-term changes in agricultural practice to reduce farmworker children's exposure to pesticides. Applied research is needed to understand how best to encourage long-term changes in agricultural practices.

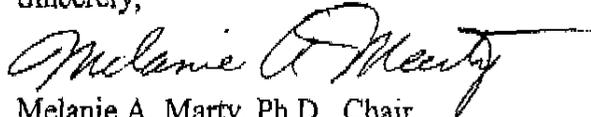
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#### D. Conclusion

Our review provided evidence of the need for further actions to protect farmworker children from pesticide-related health risks. Our recommendations focus on: 1) strengthening the WPS, 2) reducing exposures from pesticide drift, and 3) reducing data gaps through research. Along with these recommendations, we also urge the EPA to concurrently pursue prevention initiatives aimed at reducing pesticide use in both farmworker housing and agricultural settings. Together, this child-protective agenda provides a strong foundation for comprehensive, pragmatic, and science-based policy development. We propose these ideas for your consideration and look forward to your response.

Sincerely,



Melanie A. Marty, Ph.D., Chair  
Children's Health Protection Advisory Committee

Cc: Susan B. Hazen, Acting Assistant Administrator for Prevention, Pesticides, and  
Toxic Substances  
Dr. William Sanders, Acting Director, Office of Children's Health Protection  
Ms. Joanne Rodman, Associate Director, Office of Children's Health Protection

**Attachment 1****Materials Reviewed by CHPAC Pesticides Task Group in Preparing This Letter**  
(does not include speakers' PowerPoint presentations)**A. Relevant Historical CHPAC/EPA Correspondence**

1. Letter from Routt Reigart regarding EPA's science policy issue paper on Residential Exposure Assessments, being prepared as part of the implementation of the Food Quality Protection Act (February 18, 1999).
  - Response letter from EPA to Routt Reigart regarding the implementation of the Food Quality Protection Act (FQPA) (March 25, 1999).
2. Letter from Routt Reigart to Carol Browner offering additional comments on the Residential Exposure Standard Operating Principles (January 21, 2000).
3. Letter from Routt Reigart to Carol Browner requesting clarification on how the Environmental Protection Agency (EPA) assesses risks to farmworker children, and presenting recommendations for EPA's consideration to further protect children who are working in agriculture (October 20, 2000).
  - Response from EPA to Routt Reigart on the October 20, 2000 letter to Carol Browner requesting clarification on how the Environmental Protection Agency (EPA) assesses risks to farmworker children, and presenting recommendations for EPA's consideration to further protect children who are working in agriculture (January 9, 2001).
4. Letter from Melanie Marty to Christine Todd Whitman recommending the Agency undertake certain steps to address some of the remaining concerns raised by the GAO in its report, Pesticides: Improvements Needed to Ensure the Safety of Farmworkers and Their Children GAO/RCED-00-40 (March 2000) ("GAO Report") (March 29, 2003).
  - Response from Stephen L. Johnson, Assistant Administrator, to Melanie Marty regarding the CHPAC's recommendations for strengthening the WPS program (May 22, 2003).
5. Advisory Committee Regulatory Re-evaluation Report - Office of Children's Health Protection, Report of the Children's Health Protection Advisory Committee to the U.S. Environmental Protection Agency Regarding the Selection of Five Regulations for Re-Evaluation, Submitted by Dr. J. Routt Reigart, Chair Children's Health Protection Advisory Committee, May 28, 1998.

B. Articles and Reports

- a. "Agricultural and Residential Pesticides in Wipe Samples from Farmworker Family Residences in North Carolina and Virginia," Sara A. Quandt, Thomas A. Arcury, Pamela Rao, Beverly M. Snively, David E. Camann, Alicia M. Doran, Alice Y. Yau, Jane A. Hoppin, and David S. Jackson, *Environmental Health Perspectives*, Volume 112, Number 3, March 2004.
- b. "Agricultural Task and Exposure to Organophosphate Pesticides Among Farmworkers," Gloria D. Coronado, Beti Thompson, Larkin Strong, William C. Griffith, and Ilda Islas, *Environmental Health Perspectives*, Volume 112, Number 2, February 2004
- c. "Assessing Exposure to Organophosphorus Pesticides by Biomonitoring in Epidemiologic Studies of Birth Outcomes," Larry L. Needham, *Environmental Health Perspectives*, Volume 113, Number 4, April 2005.
- d. "Biologically Based Pesticide Dose Estimates for Children in an Agricultural Community," Richard A. Fenske, John C. Kissel, Chensheng Lu, David A. Kalman, Nancy J. Simcox, Emily H. Allen, and Matthew C. Keifer *Environmental Health Perspectives*, Volume 108, Number 6, June 2000.
- e. "Correlating Agricultural Use of Organophosphates with Outdoor Air Concentrations: A Particular Concern for Children," Martha Harnly, Robert McLaughlin, Asa Bradman, Meredith Anderson, and Robert Gunier. *Environmental Health Perspectives*, Volume 113, Number 9, September 2005.
- f. "Cumulative Organophosphate Pesticide Exposure and Risk Assessment Among Pregnant Women Living in an Agricultural Community: A Case Study from the CHAMACOS Cohort," Rosemary Castorina, Asa Bradman, Thomas E. McKone, Dana B. Barr, Martha E. Harnly, and Brenda Eskenazi, *Environmental Health Perspectives*, Volume 111, Number 13, October 2003.
- g. "Evaluation of Take-Home Organophosphorus Pesticide Exposure among Agricultural Workers and Their Children," Cynthia L. Curl, Richard A. Fenske, John C. Kissel, Jeffrey H. Shirai, Thomas F. Moate, William Griffith, Gloria Coronado, and Beti Thompson, *Environmental Health Perspectives*, Volume 110, Number 12, December 2002.
- h. "Epigenetic Transgenerational Actions of Endocrine Disruptors and Male Fertility," Matthew D. Anway, Andrea S. Cupp, Mehmet Uzumcu, and Michael K. Skinner. *Science* 3 June 2005: 1466-1469.

- i. Imidacloprid; Order Denying Objections to Issuance of Tolerance, and Final Order Imidacloprid; Pesticide Tolerance; Part IV, Final Rules, Federal Register, Wednesday, May 26, 2004.
- j. "Organophosphate Pesticide Exposure in Farmworker Family Members in Western North Carolina and Virginia: Case Comparisons," Thomas A. Arcury, Sara A. Quandt, Pamela Rao, Alicia M. Doran, Beverly M. Snively, Dana B. Barr, Jane A. Hoppin, and Stephen W. Davis, *Human Organization*, Volume 64, No. 1, 2005.
- k. "Pesticides and Childhood Cancers," Julie L. Daniels, Andrew F. Olshan, and David A. Savitz, *Environmental Health Perspectives*, Volume 105, Number 10, October 1997.
- l. "Pesticide Contamination Inside Farm and Nonfarm Homes," Brian D. Curwin, Misty J. Hein, Wayne T. Sanderson, Marcia G. Nishioka, Stephen J. Reynolds, Elizabeth M. Ward, and Michael C. Alavanja, *Journal of Occupational and Environmental Hygiene*, 2:357-367, July 2005.
- m. "Pesticides in Household Dust and Soil: Exposure Pathways for Children of Agricultural Families," Nancy J. Simcox, Richard A. Fenske, Sarah A. Wolz, I-Chwen Lee, and David A. Kalman, August 1995.
- n. "Pesticide Take-Home Pathway Among Children of Agricultural Workers: Study Design, Methods and Baseline Findings," Beti Thompson, Gloria D. Coronado, Julia E. Grossman, Klaus Puschel, Cam C. Solomon, Ilda Islas, Cynthia L. Curl, Jeffry H. Shirai, John C. Kissel, and Richard A. Fenske, *Journal of Occupational Environmental Medicine*, Volume 45, Number 1, 42-53, January 2003.
- o. "Potential Exposure and Health Risks of Infants Following Indoor Residential Pesticide Applications," Richard A. Fenske, Kathleen G. Black, Kenneth P. Elkner, Chong-Li Lee, Mark M. Methner, and Ralph Soto, Volume 80, Number 6, *AJPH* June 1990.
- p. Report on the National Assessment of EPA's Pesticide Worker Safety Program, U.S. Environmental Protection Agency, Office of Pesticide Programs, Washington, DC, [www.epa.gov/pesticides](http://www.epa.gov/pesticides), undated.
- q. "Reporting Pesticide Assessment Results to Farmworker Families: Development, Implementation, and Evaluation of Risk Communication Strategy," Sara A. Quandt, Alicia M. Doran, Pamela Rao, Jane A. Hoppin, Beverly M. Snively, and Thomas A. Arcury, *Environmental Health Perspectives*, Volume 112, Number 5, April 2004.
- r. "Secondhand Pesticides, Airborne Pesticide Drift in California," Susan Kegley, Anne Katten, Marion Moses, Pesticide Action Network, California Rural Legal

Assistance Foundation, Pesticide Education Center and Californians for Pesticide Reform. © 2003, Pesticide Action Network North America.

- s. "United States General Accounting Office Report to Congressional Requesters: Pesticides, Improvements Needed to Ensure the Safety of Farmworkers and Their Children," US GAO, March 2000.
- t. "Urinary and Handwipe Pesticide Levels Among Farmers and Nonfarmers in Iowa," Brian D. Curwin, Misty J. Hein, Wayne T. Sanderson, Dana B. Barr, Dick Heederik, Stephen J. Reynolds, Elizabeth M. Ward, and Michael C. Alavanja, *Journal of Exposure Analysis and Environmental Epidemiology*, 2005, 1-9.
- u. "Work Characteristics and Pesticide Exposures among Migrant Agricultural Families: A Community-Based Research Approach," Linda A. McCauley, Michael R. Lasarey, Gregory Higgins, Joan Rothlein, Juan Muniz, Caren Ebbert, Jacki Phillips, *Environmental Health Perspectives*, Volume 109, Number 5, May 2001.
- v. Workshop on Environmental Exposures Among Migrant Farm Worker Children: Research Needs, Stone Mountain, Georgia, February 25-26, 2003, Record of the Proceedings, convened by the U.S. EPA and Centers for Disease Control and Prevention.