



STATE OF HAWAII
DEPARTMENT OF HEALTH
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In reply, please refer to:
File:

April 6, 2016

Mr. Peter Adler
Members of the Kauai Joint Fact Finding Study Group
The ACCORD 3.0 Network
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Aloha,

I would like to thank the Kauai Joint Fact Finding (JFF) Study Group for the invitations we have received to participate in a JFF working session, to provide data and technical support and now, the opportunity to provide comment on the draft JFF report.

I would also like to acknowledge the citizen members of the JFF for their commitment, collaboration, research and hard work over the past year. The report shows the lengths to which members went to gather and assess all available factual information about off-target pesticide incidence, the prevalence of health conditions on Kaua'i above state- or nationwide rates and any evidence of environmental contamination that can be empirically associated with the use of pesticides.

First, in accordance with the JFF request, we would like to offer the attached table, which provides a concise list of clarifications and factual corrections to improve the accuracy and objectivity of the draft report. In addition, because of the complexity of the subject, we offer the following more detailed comment, with additional information and published research that may help illuminate an important contributing factor to the Waimea Canyon School incidents.

Waimea Canyon School Incident and Odors

While it is unknown whether the concentrations of methyl isothiocyanate (MITC) found in the weed *Cleome gynandra* were present at high enough levels to pose a health risk during the 2006 and 2008 incidents, it is not debatable that the weed is malodorous. Peer-reviewed literature describes numerous incidents where odors trigger health effects in school children similar to what occurred in the Waimea Canyon Middle School incidents.

Studies have shown that it is not uncommon for odors and irritants to cause physical symptoms, stress and concern even when the levels of these chemicals are below concentrations where toxicity may be expected (Smeets and Dalton, 2005)¹. The social phenomenon termed "mass psychogenic illness" strikes otherwise healthy individuals usually in a school or

¹ Smeets, M and Dalton, P (2005). Evaluating the human response to chemicals: odor, irritation and non-sensory factors
Environmental Toxicology and Pharmacology 19 : 581-588

workplace and is seen more often in populations that are subject to stress (Broderick et al. 2011)². As discussed by Broderick et al. (2011)², the outbreak is usually triggered by an odor and common symptoms include nausea, dizziness, fainting, headache, abdominal pain, and hyperventilation. These outbreaks typically affect those who have seen other affected people or who believe the smell is dangerous. These are real symptoms and not imagined. Studies in the literature have described that evacuating students, mobilizing emergency responders, or hospitalizing people for minor symptoms promote psychogenic episodes. Thus, although there are no reports that the weed *Cleome gynandra* has caused illness elsewhere, there is a large body of evidence that odors alone can trigger symptoms in schoolchildren similar to what occurred in 2006 and 2008.

Finally, we offer our thoughts and relevant program information on the recommendations made by the JFF to the Department of Health (DOH). Further, in our continuing role providing technical and toxicological expertise on pesticide study design, data analyses and interpretation, we offer a few specific comments on recommendations made to other agencies.

Dr. Pressler, M.D., Director, Department of Health

1. Initiate a Systematic Surface Water Monitoring Program

DOH has extensive expertise in collecting, analyzing, and interpreting environmental data to detect off-target movement of pesticides, as well as other contaminants. We propose a phased approach to identify potential pesticides of concern in susceptible streams and near shore waters. Currently DOH laboratory capacity, personnel and other budget issues limit the ability of the DOH to take the lead on a surface water monitoring for restricted use pesticides. Depending upon funding from the Hawaii Department of Agriculture, we recommend that a third party agency such as USGS collect, analyze and prepare the report. DOH is prepared to provide scientific and technical expertise to USGS or other contracted parties to determine whether off-target movement of pesticides requires additional state regulatory protections to protect public and environmental health.

2. Initiate Air, Soil, and Dust Sampling Programs

DOH supports limited air sampling to confirm the results from the University of Hawaii Air Study and SEED air sampling project. We note that California has a robust routine air sampling effort in communities with high agricultural activities. It is reassuring that in communities with relatively large amounts (over 28,000 pounds annually, active ingredient) chlorpyrifos used within 5 miles of an air monitor, sometimes applied aerially, no exceedance of subchronic or chronic health based standards were detected over a 3 ½ year period http://www.cdpr.ca.gov/docs/emon/airinit/2560-chlorpyrifosmemorandum_.pdf. The annual budget for routine air monitoring in 3 communities in California is approximately \$500,000 in analytical costs and three full time positions to implement the sampling and report writing

² Broderick, J., Kaplan-Liss, E., and Bass, E., (2011) Experimental induction of psychogenic illness in the context of a medical event and media exposure Am J Disaster Med. May-Jun; 6(3): 163–172.

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(personal communication with California Department of Pesticide Regulation staff). As discussed in the previous comment, DOH laboratory capacity, personnel and other budget issues limit the ability of DOH to take the lead on air monitoring for pesticides.

DOH believes soil and dust sampling should be given a lower priority, because pesticide house dust concentrations are dependent upon numerous factors and interpretation is not as straightforward as air sampling. In addition to proximity to an agricultural field, the presence of pesticides in dust will depend upon carpeting, hygiene practices in the home, age of the dwelling, presence of pets, professional application of restricted use pesticides for pest infestations, occupation of the resident (i.e. farmworker) and even the type of vacuum cleaner used.

The work by Quirós-Alcalá et al. (2011)³ illustrates the complexity of designing a study to assess whether agricultural drift results in higher indoor pesticide dust concentrations. They compared house dust levels of agricultural and residential-use pesticides from low-income homes in an urban community (Oakland, CA) and an agricultural community (Salinas, CA). This study did not find a statistically significant difference in diazinon and chlorpyrifos concentrations in house dust in the agricultural locations and the urban location despite intense agricultural organophosphate pesticide use in the agricultural community. Previously, these same authors found a significant correlation with local agricultural use and chlorpyrifos dust concentrations (but not diazinon) for homes throughout the same agricultural area. Small sample size (28 homes) and the location of the farmworkers families in the agricultural community could have been the reason that no differences were detected. To conduct a scientifically valid evaluation of indoor pesticide house dust levels resources such as analytical laboratory costs, and staff to obtain Institutional Review Board approval, design a robust sampling plan, design a validated questionnaire, interview participants, collect dust samples using High Volume Small Surface Samplers, interpret results and report writing are significant. There is no program within DOH that currently has the staff or budget to conduct such a study.

3. Update Critical Health Surveillance Data

Birth Defects and Cancer Registry Data

Currently the birth defects data are not available for the years 2006-2009 for Kauai. Data are available for 1986-2005 and 2010-2014. The priority of the Department is to conduct surveillance statewide and not focus on one geographical area at the expense of the other islands. Given the limited staff resources, DOH is abstracting birth defects for all other Hawaiian Islands for 2010-2015 to ensure statewide coverage for birth defects surveillance.

The Hawaii Tumor Registry is not missing years of data on cancer statistics. The Hawaii Tumor Registry is a member of the Surveillance, Epidemiology and End Results Program (SEER) the nation's cancer surveillance and reporting system and it receives its primary financial support

³ Quirós-Alcalá L¹, Bradman A, Nishioka M, Harnly ME, Hubbard A, McKone TE, Ferber J, Eskenazi B.(2011) Pesticides in house dust from urban and farmworker households in California: an observational measurement study. *Environmental Health* 10:19

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from the National Cancer Institute (NCI). Collection of tumor data is in accordance with strict national guidelines.

Other Health Surveillance

DOH has several concerns regarding the recommendations for increased health surveillance. First there is no existing evidence that drift from agricultural operations is harming the health of the community. Without exposure estimates it is not possible to link pesticide use to harmful effects. The surveillance that is proposed is costly, beyond the resources of the State, and unlikely to yield scientifically valid information due to small numbers. For example, because of the small numbers, data need to be aggregated over several years and zip codes need to be combined to get stable estimates.

A large part of why the DOH is able to conduct any disease surveillance is because the conditions we monitor are reportable (i.e., the data are mandated by law to be *provided* to us). Without that stipulation (and even with it), surveillance, even when passive, requires considerable resources (personnel, IT, software, servers, etc.). What is proposed by JFF group would be costly. Additionally, basing any surveillance on ICD-9/10 codes would potentially have validity issues as; 1) often the codes are insufficient for the clinician's true diagnosis, and 2) clinicians (or their office managers) will code for what will provide the optimal remuneration from insurers.

The recommendation that a statistical analysis be conducted to determine the sample size of the population necessary to conduct an epidemiological study would be a good first start.

Finally, DOH is committed to learning more about the concerns of the physicians treating people living near agricultural areas and will be conducting outreach efforts in the next several months.

Scott Enright, Director, Department of Agriculture

1a. Pesticide Advisory Committee

Establish New State Standards for Chronicity that Take Account of Low Level Continuous Exposures

This recommendation should be based on evidence that pesticide drift is exposing people to unacceptable pesticide levels. The existing environmental monitoring does not support the need to develop new standards more stringent than the Environmental Protection Agency's (EPA) label requirements. For example, the state of California has developed both subchronic and chronic health based levels for airborne pesticides to protect people from potential health risks of long-term exposure to pesticides. These screening levels were used by the University of Hawaii's Kaua'i Air Study to evaluate whether ambient levels of detected pesticides were posing a health risk. The pesticides detected did not exceed California's subchronic or chronic air screening levels, when available. Likewise, the surface water sampling conducted by the HEER Office, HDOA and USGS compared the data to benchmark chronic levels for fish and invertebrates. Any new pesticide label requirement more stringent than EPA's should be based on data and evidence that the existing requirements are not adequately protective.

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3. Establish a Rapid Response Protocol for Possible Incidents

DOH supports a modification of this recommendation to encourage the regulatory agencies (DOA, DOH, DLNR) and County first responders to share data and enhance rapid response protocols when suspected human and environmental exposure incidents occur. Such measures might include collection of additional on-scene information and appropriate environmental samples when there is strong evidence that pesticides may be implicated in environmental exposure incidents, or potential spills or releases of pesticides. We would not recommend that first responders or agencies conduct bio-monitoring (i.e. medical sampling). DOH administers the Hawaii Poison Control Center contract, and we will work with them on protocol recommendations for patients and doctors who are concerned about potential exposures.

Please contact my staff, Fenix Grange or Dr. Barbara Brooks at 808-586-4249 if you have questions or need further information about our comments. We are pleased to be able to support your efforts to finalize the report in accordance with the project objectives.

Sincerely,



Virginia Pressler, M.D.
Director of Health

Attachment

c: Governor David Y. Ige
Keith Kawaoka, Deputy Director for Environmental Health

Page	Section/Page	Comment
23-24	III A	Clarify that MCLs are drinking water standards and that the California health screening levels include both sub-chronic and chronic values
35	IV A	Third paragraph - replace "below EPA action standards" with " below EPA water quality criteria and state and federal benchmarks"
37	IV B ii 7	Discussion of honey study - replace "samples of honey were obtained from beekeepers..." with "samples of honey were obtained from beehives.." as many of the samples came from wild hives or bee hobbyists.
38	IV B ii 13	Kauai DOW and USDA studies didn't come to contrary conclusions. DOW used the approved SDA method which has a detection limit of 0.050 ppb. The USDA study used a lower detection limit of 0.001 ppb, and so was able to detect a trace concentration that would not be visible with the regulatory method.
47	IV C vi	We examined information regarding the test kit used for the initial testing of wetland waters by DOFAW in July 2105. The kit measures multiple water quality indicators, and has a presence/absence indicator for non-specific "pesticides". This method is unreliable with respect to pesticide detection, but DOH is coordinating with DLNR to provide technical assistance for follow up sampling.
80	VII	Not accurate to say that 2013 Kauai Air Sampling study "focused its attention on MITC", study currently used and historic pesticides, and a number of volatile constituents from <i>Cleome g.</i> , including MITC.
101	3	There is no missing cancer registry data. Please remove "cancer and" from the sentence describing missing data.
Appendix II		Inconsistency in reporting in two sections of appendix below
50	Chlorpyrifos, Bifenthrin, Metolachor	Air sample data were compared to California DPR Health Screening Subchronic rather than Acute Levels Please replace "Acute Exposure" with "Sub-Chronic Exposure". It is worth noting that the chlorpyrifos detection was also below the more conservative chronic level of 510 ng.
50	Bentazone Cis-propiconazole Iprodione	s/b USGS Human Health Benchmark
136, 140		Inconsistency in reporting National Tropical Botanical Garden staff role in two sections of appendix below
136	11/14/06 entries	States "that collection manager from NTBG agreed the odor was from blooming stinkweed".
140	11/14/06 entries	States " <i>Cleome gynandra</i> identified as wild spider flower, spider wisp, hohohina, "ilii'ohu from botanical literature by NTBG staff". Does not mention source id by NTBG.