






*Intervention to
 Reduce Pesticide
 Exposures to
 Farmworkers &
 their Families*

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**CENTERS FOR EXCELLENCE:
 CHILDREN'S ENVIRONMENTAL HEALTH**


Farmworker Council

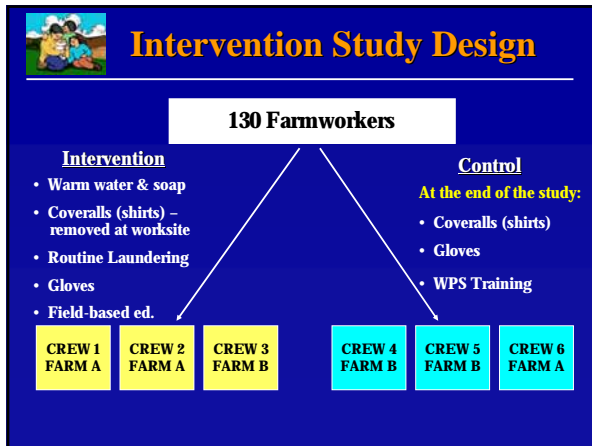



Setting



- Inland area of Monterey County
- 100 miles SE of San Francisco
- 60 miles north to south
- ~30,000 farmworkers
- 15% of county live in rural areas
- 47% Hispanic; 22% born outside of US
- 17% <18 live in poverty





Evaluation

- Changes in knowledge, attitudes, & behaviors (KAB) & malathion exposure.
- Sampling timed to coincide with reentry just after expiration of pre-harvest interval (PHI):
 - Clothing/skin patch
 - Hand rinse
 - Urine

Study Population


130 strawberry harvesters
82% Male
All born in Mexico;
Avg. of 6 yrs. in U.S. and farmwork;

54%	living within 200% of poverty
80%	6 th grade education or less
69%	5+ people living in home
94%	other farmworkers in household
80%	married
67%	≥ 1 child in household



Pesticide Information

- 42% had never received information or training about pesticides.
- 52% did not know when pesticides were applied at their farm.
- 92% did not know the names of any pesticides used at work.




Perceptions

Farmworkers

- 57% worry about the effects that pesticides could have on their health



Family members

- 85% believed their families have higher exposure than other families
- 62% worry that pesticides could hurt their family's health



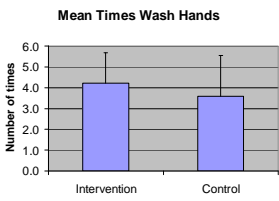
At Home Behaviors

Remove work shoes before entering home	96%
Store work shoes inside home	5%
Wear clothes into home	88%
Store work clothes separately from other family clothes	11%
Wash work clothes separately from other family clothes	10%

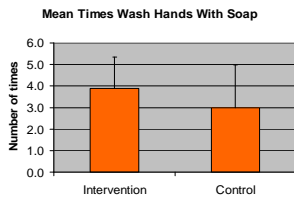
Behaviors in the field: Handwashing

Mean Times Wash Hands




p-value < 0.06

Mean Times Wash Hands With Soap



p-value < 0.02



Handwashing

Handwashing

- Increased?


What would make it easier?

- 43% closer sinks/less lost work time
- 23% more time during breaks
- 38% warmer water

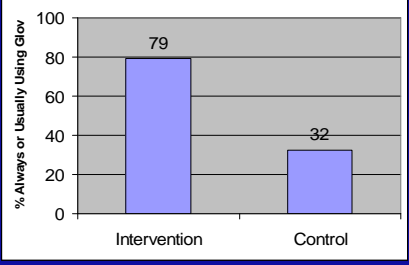
79% said that they would like to be able to wash their hands more often at work.



Glove Use

Behaviors in the field: Glove Use



p-value < 0.001



Would workers continue to use gloves at work?

- 92% Participants found gloves to be easy to work in
- 73% Would like to use gloves at work
- 85% Would always use gloves if their employer provided them.

Workers would use ~ 4 pairs of gloves/day, if employer provided them.



Workers' Reactions

Workers noted reductions in skin problems.

"One day I didn't wear them and it messed me up right here. Just one day and I got bumps on my fingers..."

The majority who didn't use before, changed.

"No problem [to use gloves at work]. I didn't use them before, but now I am used to them and I feel very good [working]."

Some workers had problems using gloves.

"I haven't been able to use gloves. I have tried many time, but when I do, I can't identify the ripe strawberries. I have tried many times, I am sorry but I can't use them."



Coveralls



Coveralls

- 93% Compliance rate
- 81% Always or usually wore coverall
- 96% Felt productivity was the same

83% of all workers said they would always wear coveralls if employer provided them.



Worker Feedback

Participants were very accepting of the coveralls and appreciated the option of removing work clothing at the fields.

"... I like the coveralls.... there's a little bit more protection for us, from pesticides ... you don't come home the same, with ... pesticides on your clothes."



Biological & Environmental Data



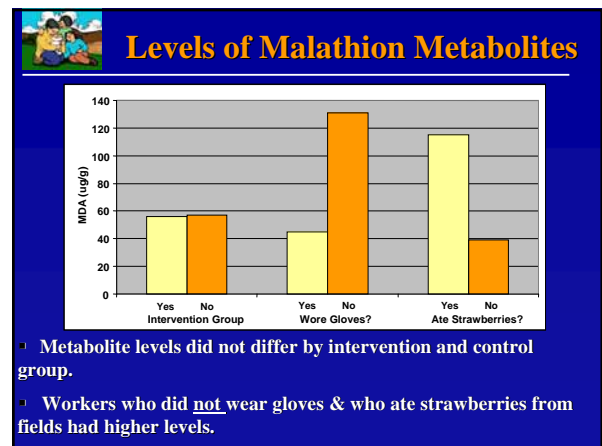
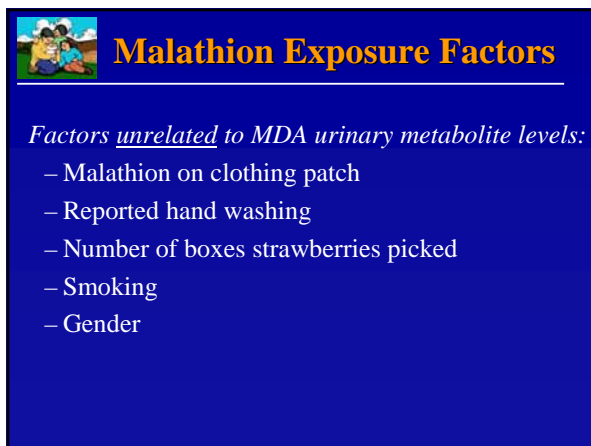
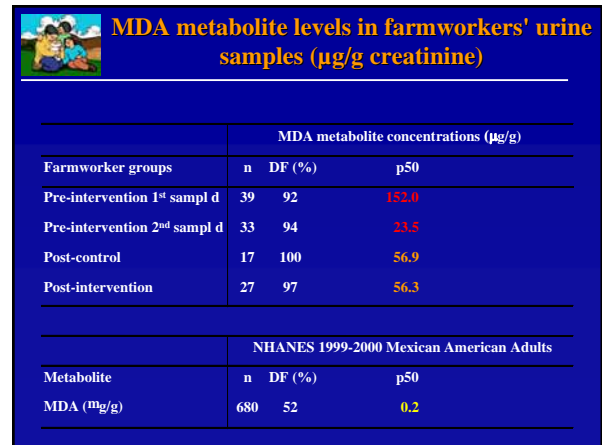
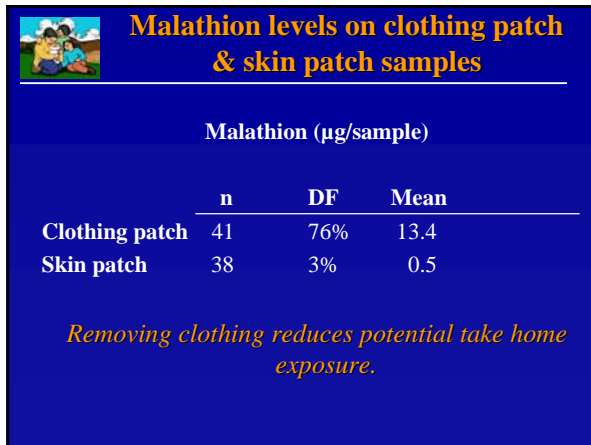
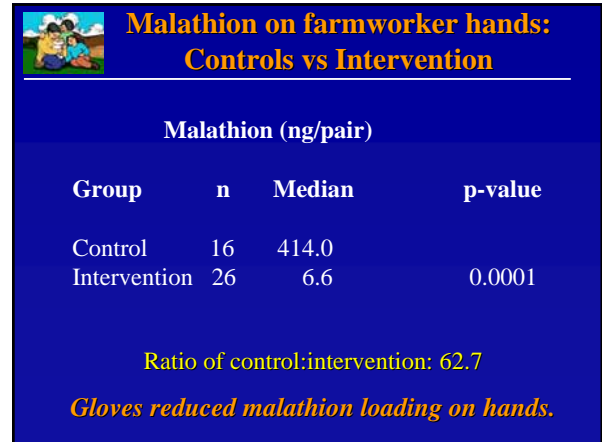
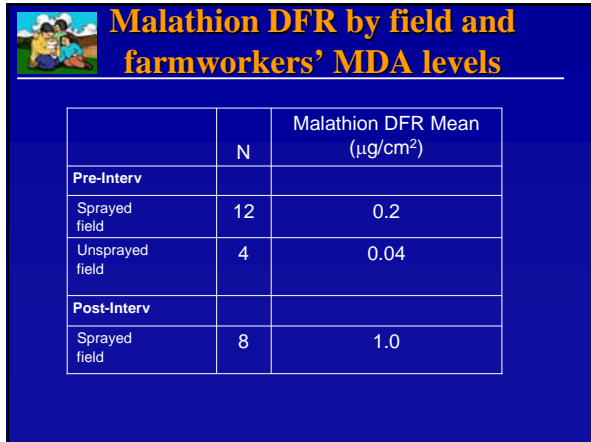
Malathion dicarboxylic acid (MDA) in urine.




Malathion on clothing patch & skin surfaces.




Malathion in handrinse (0.1% Sur Ten solution), including 2 validation studies.






Summary & Conclusions

- Participants believe there is a potential risk to themselves & family;
- Many are not aware of the ways they and their families may be exposed to pesticides;
- Few reported receiving WPS training;
- Workers experienced higher exposures at reentry compared to national reference data;
- Reducing consumption of strawberries in the field will reduce worker exposures.




Summary (cont.)

- Intervention did not reduce worker exposures as assessed by biomarker;
- Glove use associated with reduced loading on hands and urinary metabolites;
- Any clothing prevents dermal exposure;
- Glove use, handwashing, and removing work clothes or outer garments likely to reduce the potential for take-home exposures



Limitations

- Farms not necessarily representative;
- Small sample size;
- Compliance;
- Single crop/task;
- Single chemical.



Intervention Costs

Latex Gloves	<ul style="list-style-type: none"> • Nitrile (or Latex) disposable gloves • 33 cents/pair • Recommend 4-5 pairs/day/worker or approximately \$1.50/day/worker
Water heater	<ul style="list-style-type: none"> • ~ \$1250 + labor to build water heater • ~ \$40 + labor /tank to insulate tanks <p><i>1 time purchase; can be used for multiple fields</i></p>
Soap	<ul style="list-style-type: none"> • Kresto Select Soap (STOKO Skincare) • ~ \$10/2000 ml bottle
Coveralls	<ul style="list-style-type: none"> • Cotton-polyester long-sleeve coveralls • Custom-made by Sweet Manufacturing • ~ \$28/ coverall



Future Success

Successful field-based interventions will depend on active involvement by employers to provide resources & establish jobsite policies.




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