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OCCUPATIONAL HEALTH AND SAFETY RISK AND EFFECTS ON ECONOMIC OUTCOMES OF U.S. FARMWORKERS

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AGRICULTURAL LABOR MARKETS, MEXICO-U.S. IMMIGRATION

- Education, child labor, poverty measurement, welfare usage, legal status, labor contracting, locational choice
- Decline in migration streams (AJAE, 2015)
- Effects of recession (AJAE, 2016)
- Health status, pesticides, sanitation risk, injuries, workers compensation
 - Funded by High Plains Intermountain Center for Agricultural Health and Safety, Marshfield Clinic Research Foundation, Colorado State University's College of Liberal Arts

BEHAVIORAL CONTEXT

- Agricultural worker population is highly Hispanic immigrant
- Immigrant agricultural workers, especially those who are undocumented, may:
 - be more cautious regarding safe work practice than otherwise similar workers (due to limited access to workers compensation programs and healthcare), or
 - may behave as if they have a higher risk tolerance in light of safety regulations in order to maximize income under uncertainty (for example, of employment duration and/or when wages are pieceterate)

MICRO-LEVEL DATA

- U.S. Department of Labor's National Agricultural Workers Survey (NAWS)
- Nationally and regionally representative survey of employed U.S. farmworkers
 - Crop worker demographic characteristics including legal status, human capital indicators, family size/composition, wages, and working conditions in farm jobs
- Employer-based survey, 3 seasons per year since 1989



Photos by David Bacon <http://dbacon.igc.org/>

STUDY

- Studied determinants of self-reported diagnosed health conditions and of exposure to health-related risks such as those associated with pesticides and sanitation nationally and regionally
- Linked variables econometrically to economic outcomes within confines of data

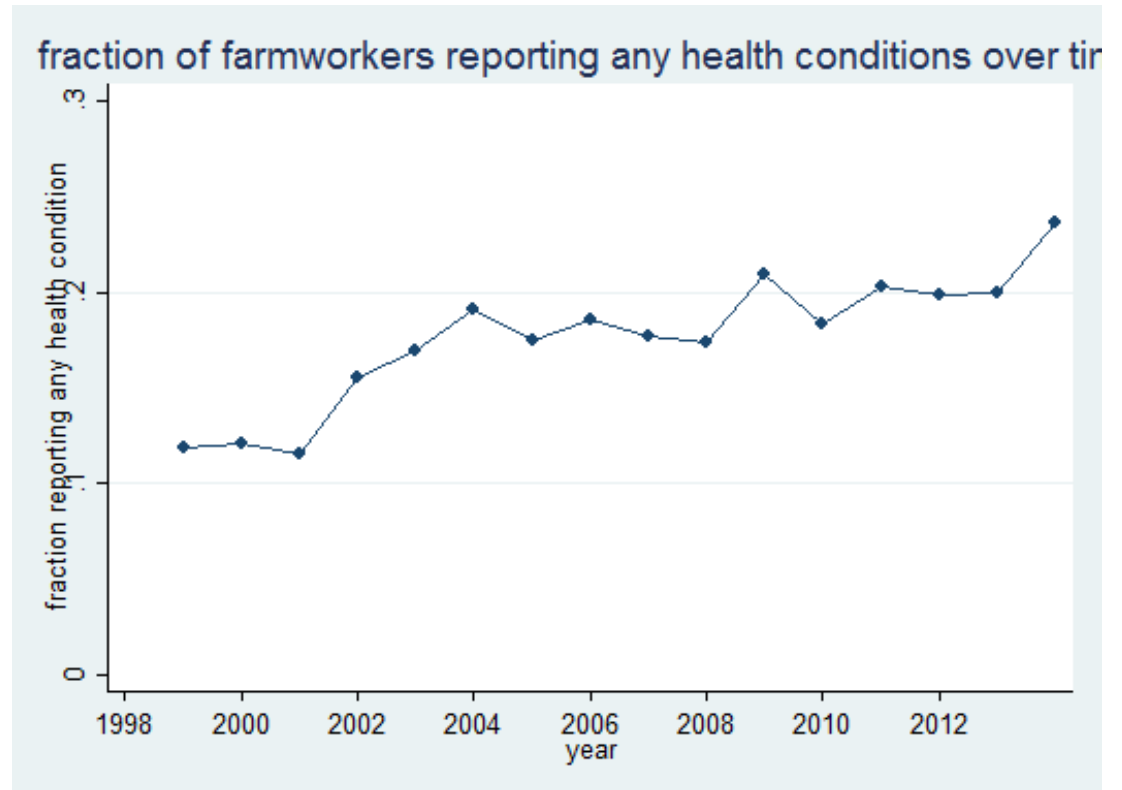


THEORY

- Neoclassical economic theory suggests that workers' wages should be reflective of productivities (which presumably could be affected by injuries and pain)
- Public health literature suggests that time worked may be affected by illness
 - “absenteeism,” i.e. missing labor hours/days due to health conditions, or “presenteeism,” i.e. amount of labor time spent impaired by health condition

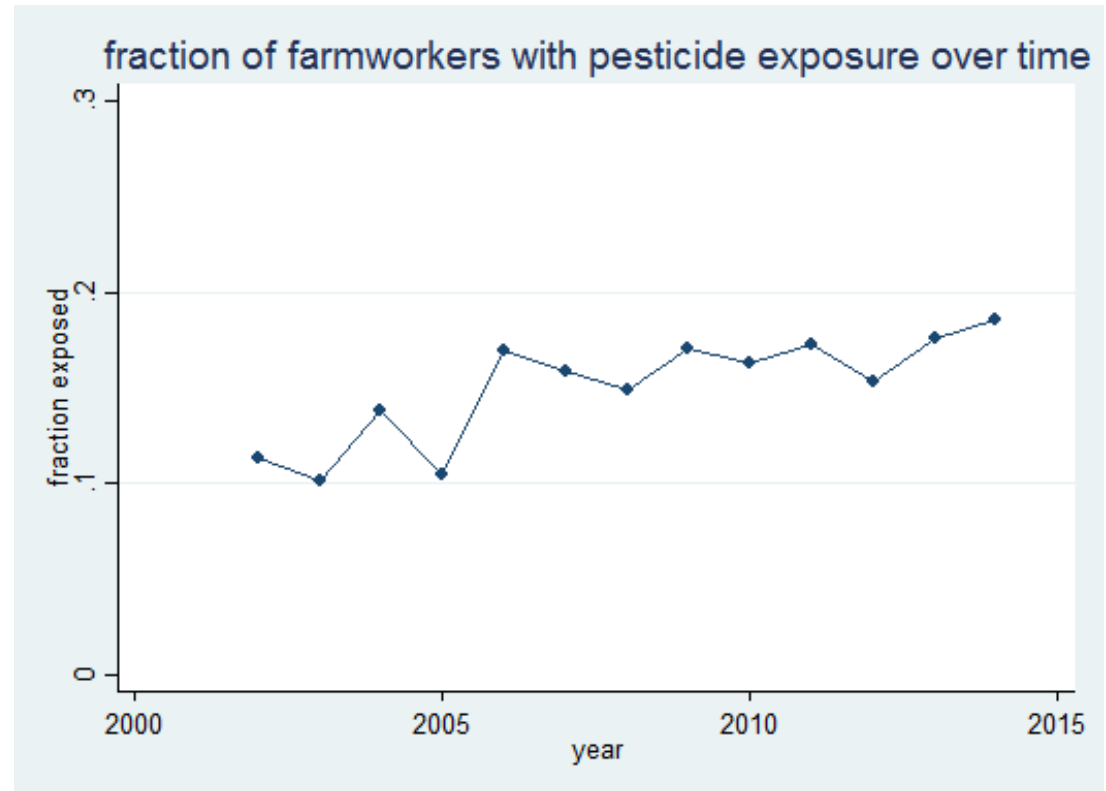
HEALTH CONDITIONS?

Diagnoses of at least one health condition (from asthma, diabetes, high blood pressure, tuberculosis, heart disease, urinary tract infections, and other conditions) increased from around 10 percent to more than 20 percent



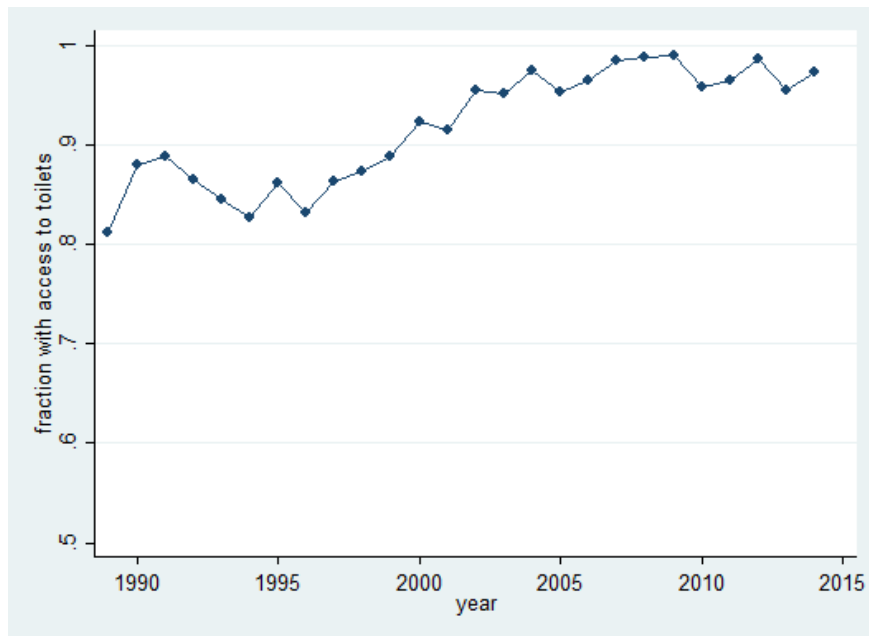
PESTICIDES?

Proportion of U.S. farmworkers who indicate exposure to pesticides via loading, mixing, or applying moves from around 10 percent to more than 15 percent

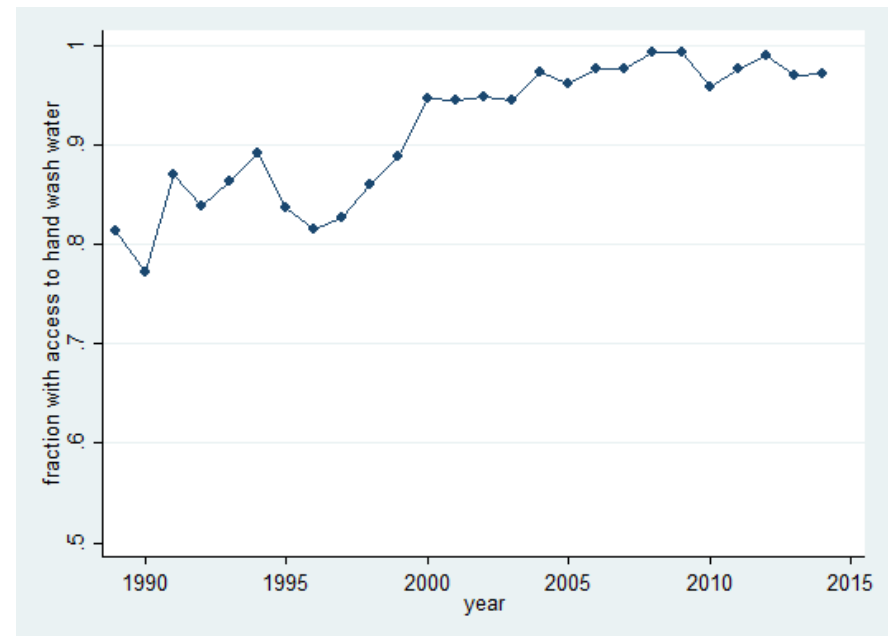


SANITATION?

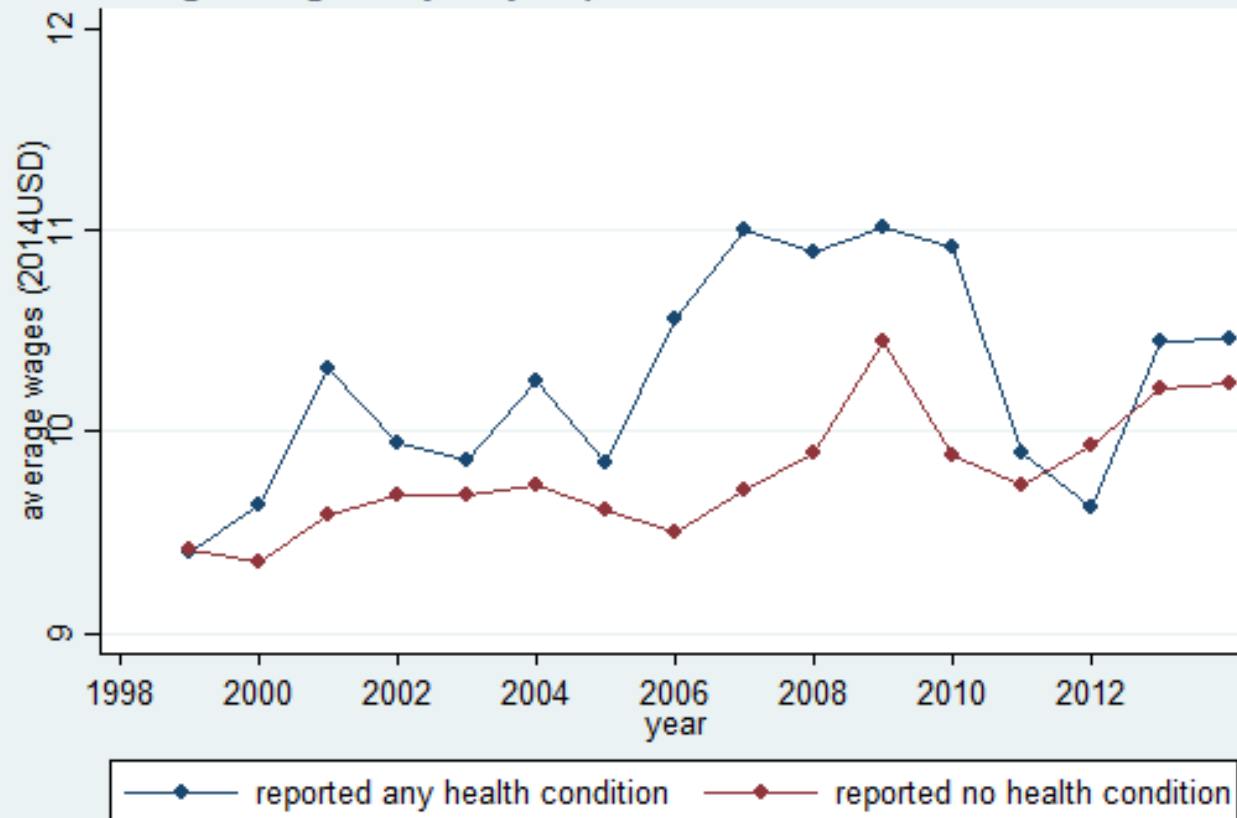
Toilets



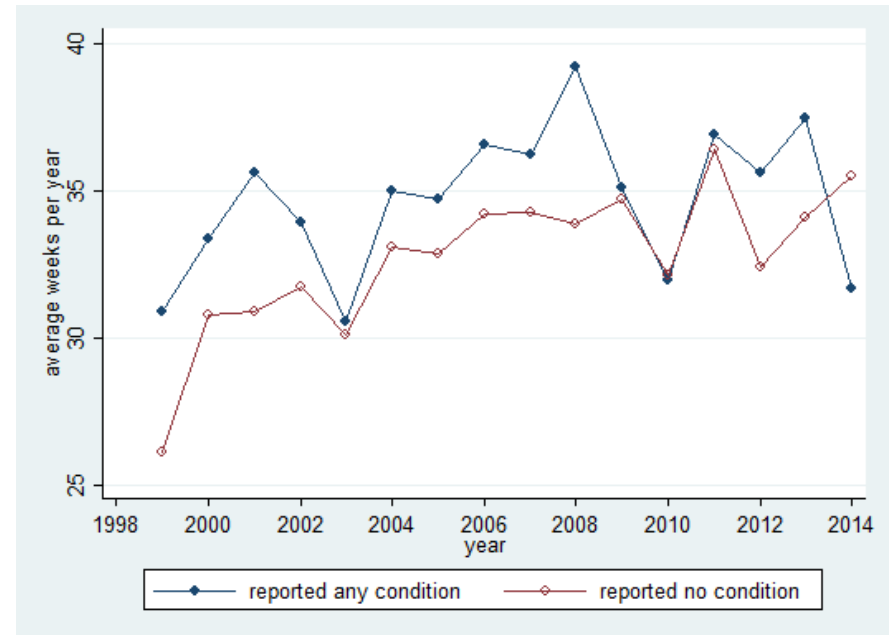
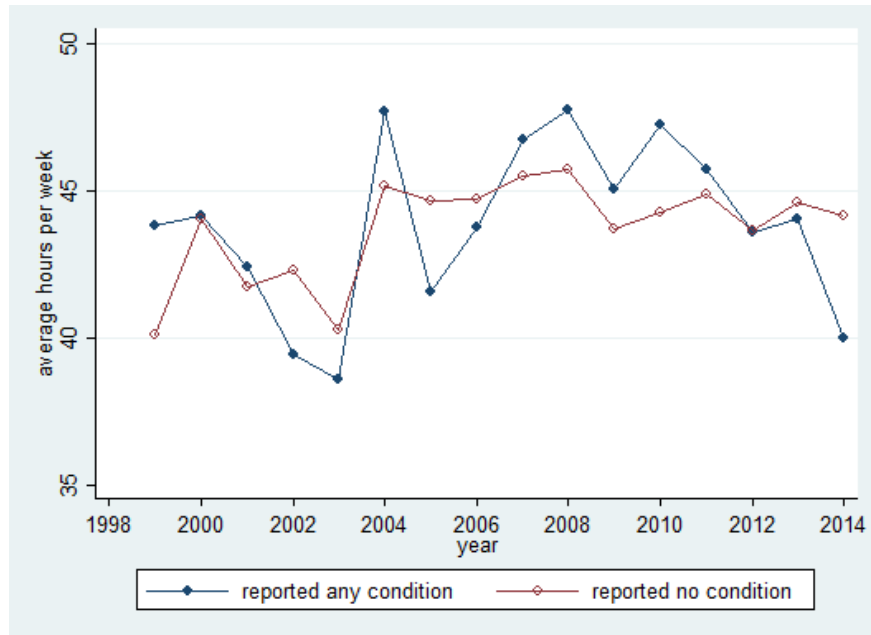
Hand wash water



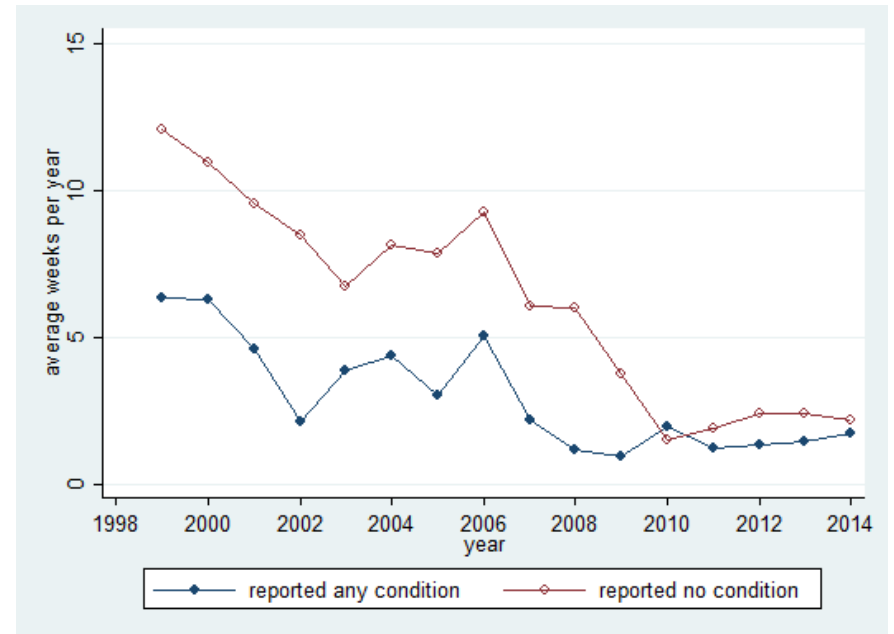
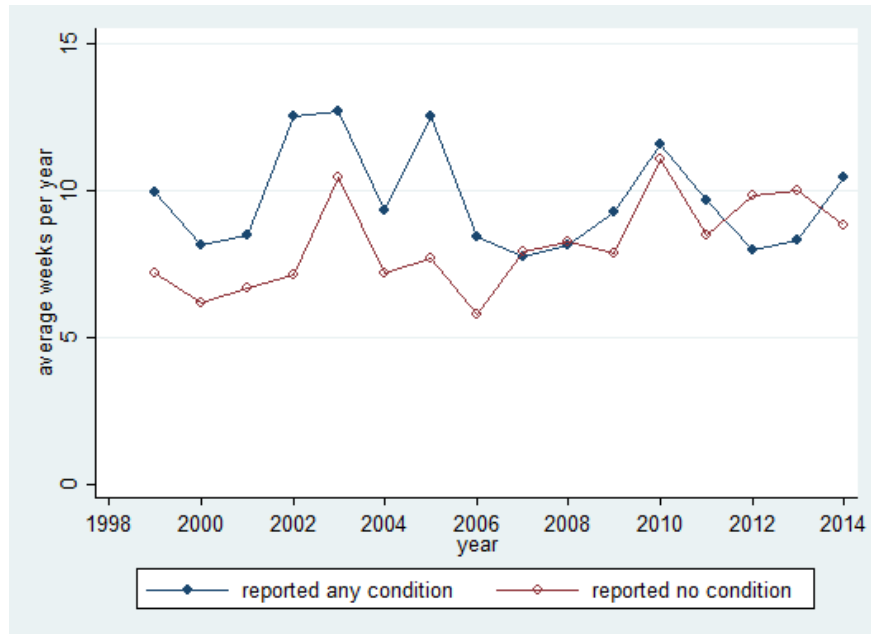
average wages by any reported health conditions over time

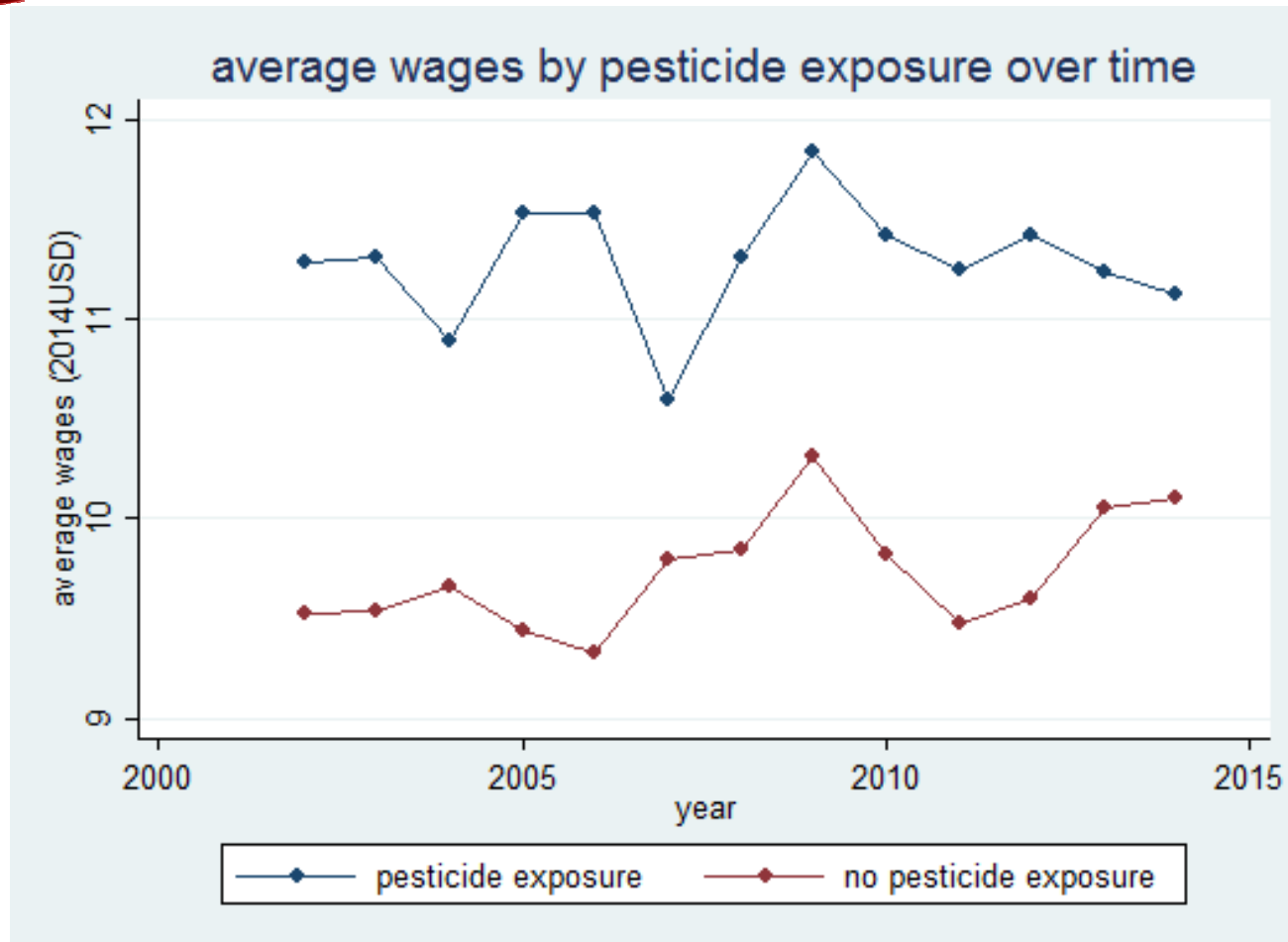


HOURS AND WEEKS WORKED



NON-WORK AND ABROAD WEEKS





ECONOMIC WELLBEING

- Diagnosis of diabetes has strong negative association with wages both for piece-rate and hourly workers
 - Magnitude corresponds to about 4 percent in full sample and 3-4 percent in the hourly sample with controls for observable variables

FURTHER RESULTS?

- Pesticide exposure associated with approximately 6-7 percent higher wages all else equal in both full sample and hourly wage subsample
 - Consistent with compensating wage differential: since control for differences in crop, task, region, year, and wide variety of demographic and work-related variables, remaining difference can be hypothesized to be related to increased risk taking associated with pesticide application and handling
- Various measurable effects on time allocations

DIFFERENCE IN MEANS BY INJURY ¹⁶

| VARIABLES | (1) Injury | (2) No Injury | Difference |
|-----------------------------|---------------|------------------|------------|
| Wage (2014USD) | 10.19 | 9.835 | * |
| Piecerate=1 | 0.0704 | 0.123 | ** |
| Hourly=1 | 0.858 | 0.816 | |
| Female=1 | 0.164 | 0.242 | *** |
| Age (years) | 35.49 | 34.15 | |
| Education (years) | 8.026 | 7.571 | * |
| Farm Experience (years) | 12.37 | 10.85 | * |
| Tenure (years) | 6.110 | 4.896 | *** |
| Has Spouse in U.S.=1 | 0.518 | 0.420 | *** |
| Children (number) | 1.033 | 0.803 | * |
| U.S.-born=1 | 0.272 | 0.229 | |
| Naturalized Citizen=1 | 0.0566 | 0.0380 | |
| Green Card or Other Auth.=1 | 0.246 | 0.230 | |
| Undocumented=1 | 0.425 | 0.503 | ** |
| Speaks English=1 | 0.395 | 0.324 | |
| from Mexico=1 | 0.708 | 0.722 | |
| Observations | 612 | 26,482 | |

DIFFERENCE IN MEANS BY PAIN ¹⁷

| | (1) | (2) | Difference |
|-----------------------------|--------|---------|------------|
| VARIABLES | Pain | No Pain | |
| Wage (2014USD) | 9.948 | 9.821 | |
| Piecerate=1 | 0.136 | 0.118 | * |
| Hourly=1 | 0.805 | 0.821 | |
| Female=1 | 0.303 | 0.227 | *** |
| Age (years) | 36.87 | 33.63 | *** |
| Education (years) | 7.399 | 7.646 | * |
| Farm Experience (years) | 12.76 | 10.51 | *** |
| Tenure (years) | 5.591 | 4.809 | *** |
| Has Spouse in U.S.=1 | 0.476 | 0.411 | *** |
| Children (number) | 0.832 | 0.805 | |
| U.S.-born=1 | 0.256 | 0.226 | * |
| Naturalized Citizen=1 | 0.0595 | 0.0342 | *** |
| Green Card or Other Auth.=1 | 0.256 | 0.224 | ** |
| Undocumented=1 | 0.429 | 0.515 | *** |
| Speaks English=1 | 0.364 | 0.321 | *** |
| from Mexico=1 | 0.695 | 0.725 | * |
| Observations | 5,068 | 22,327 | |

CONCLUSIONS

- Results suggest how poor worker health can translate into poor productivity (affecting employer) and poor wages and financial wellbeing (affecting worker)
- Research suggests specific and targeted prevention and treatment as direction for public health officials with goals of maintaining the agricultural workforce when supplies of experienced workers and of health resources supporting workers are limited
- Data presents limitations
 - Diagnosed conditions may relate to availability and usage of medical care which may vary systematically across workers
 - Health conditions may be underreported for other reasons

FUTURE WORK

- Continued research and continued data collection warranted and necessary in order to better understand the health challenges of the U.S. farmworker population
- Future research needs:
 - Detailed analysis of health care usage
 - Analysis of injuries
 - Additional data on pesticide training and on sun and other exposures
- Further interdisciplinary work exploiting more detailed information on agricultural context





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Photos by David Bacon <http://dbaon.igc.org/>