Pesticide Incidents and Labor Violations

County-level analysis for California farmworkers

INTRODUCTION

Farm labor is one of the most dangerous occupations in the United States with the highest rates of worker fatalities compared to all other sectors (Guild et al., 2016). Guild et al. also estimate that 77% of illness and injury that occur on the job are not captured by reporting systems due to reporting exemptions for small farms and fear of reporting among workers (2016). For example, the Environmental Protection Agency's Worker Protection Standard, which regulates pesticide handling and application, does not mandate incident reporting (US EPA, 2013). As a result, there is a lack of data and understanding of where pesticide illness and injury occur and how they can be prevented. Poor training, a lack of enforcement and the type of farm increase the incident rates of pesticide exposure. However, whether or not a worker was hired by a labor contractor is another more surprising indicator of health and safety (Grzywacz et al., 2013). This project aims to investigate the spatial relationship between the prevalence of farm labor contractors and pesticide incidents by asking:

1. Do high rates of labor contractors predict higher rates of pesticide incidents?
2. Is this phenomenon clustered in specific regions of California?

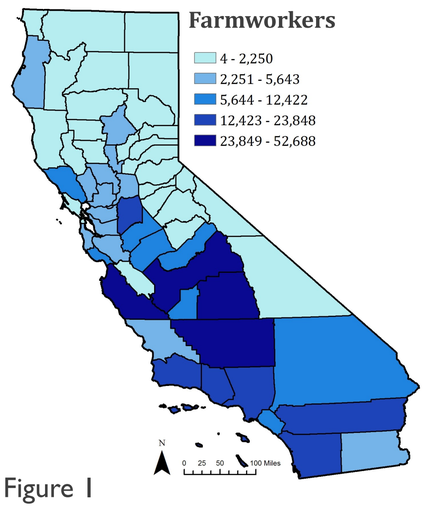

Figure 1

METHODS

Using county level census data on employment in agriculture, pesticide incident and labor violation rates per 10,000 workers were calculated. To generate a count of pesticide incidents in each county, XY centroid coordinates were generated and displayed for each incident observation. A table of addresses of all ineligible labor contractors in California was geocoded using Batchgeo. This variable is a proxy for labor violations, which are not tracked systematically. The incident observations and violation points were joined with the county layer. In order to visualize this data as a rate per 10,000 workers, these layers were spatially joined to the employee layer. Two new rate variables were calculated using field calculator and symbolized by county (Figure 2 and 3). The incident and violation layers were spatially joined to calculate an incident per labor violation rate (Figure 4).

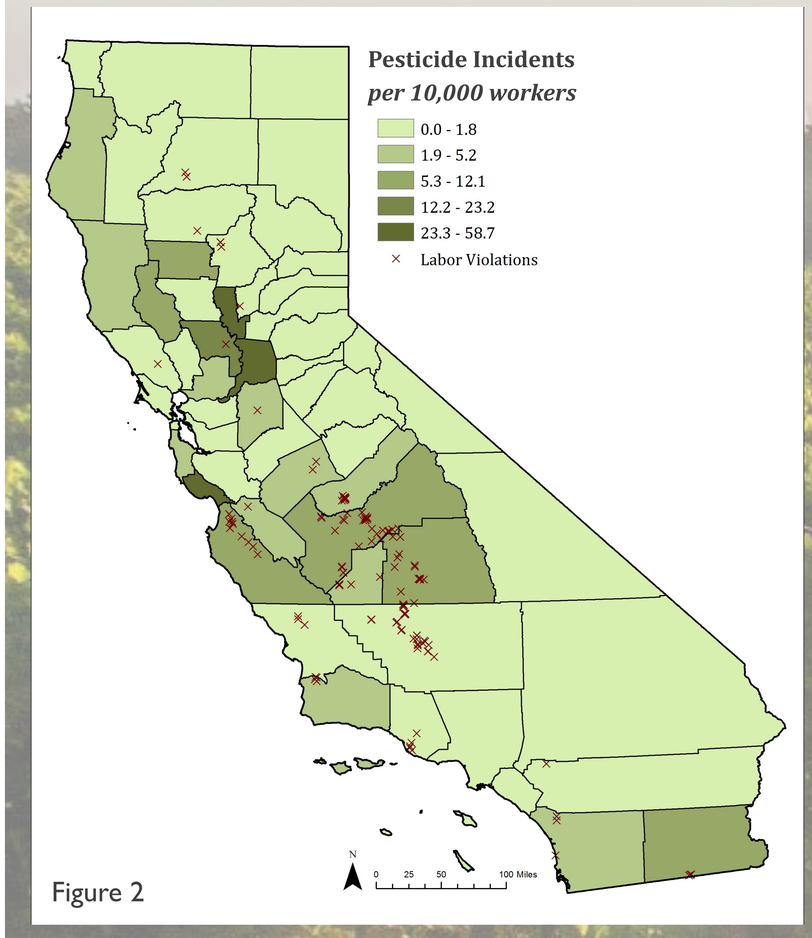

Figure 2

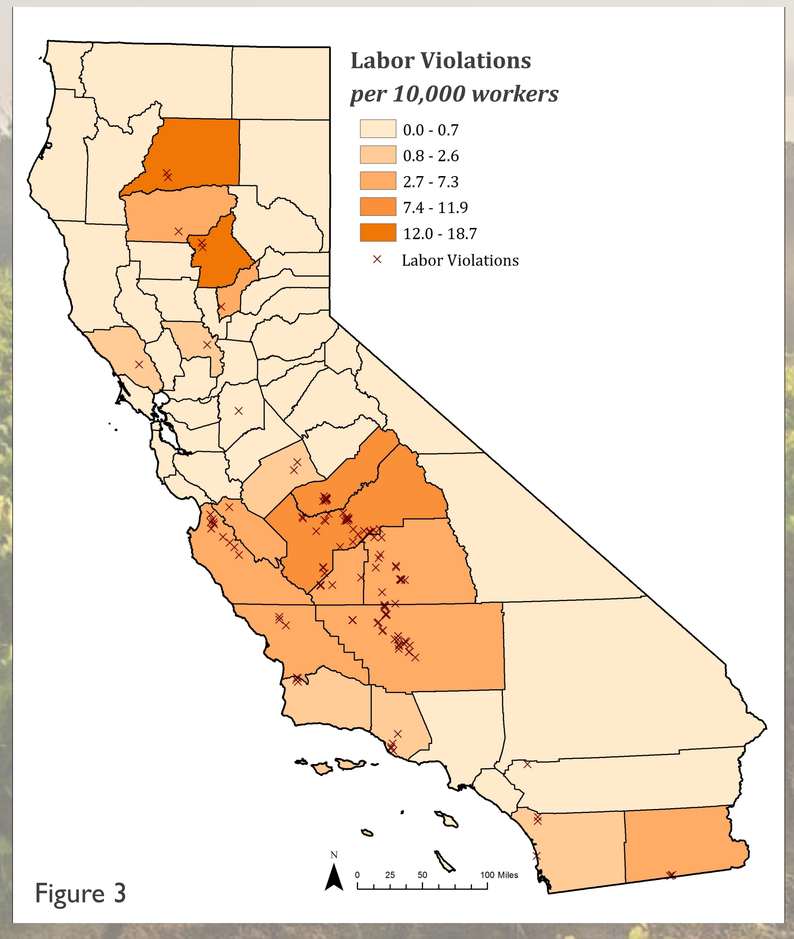

Figure 3

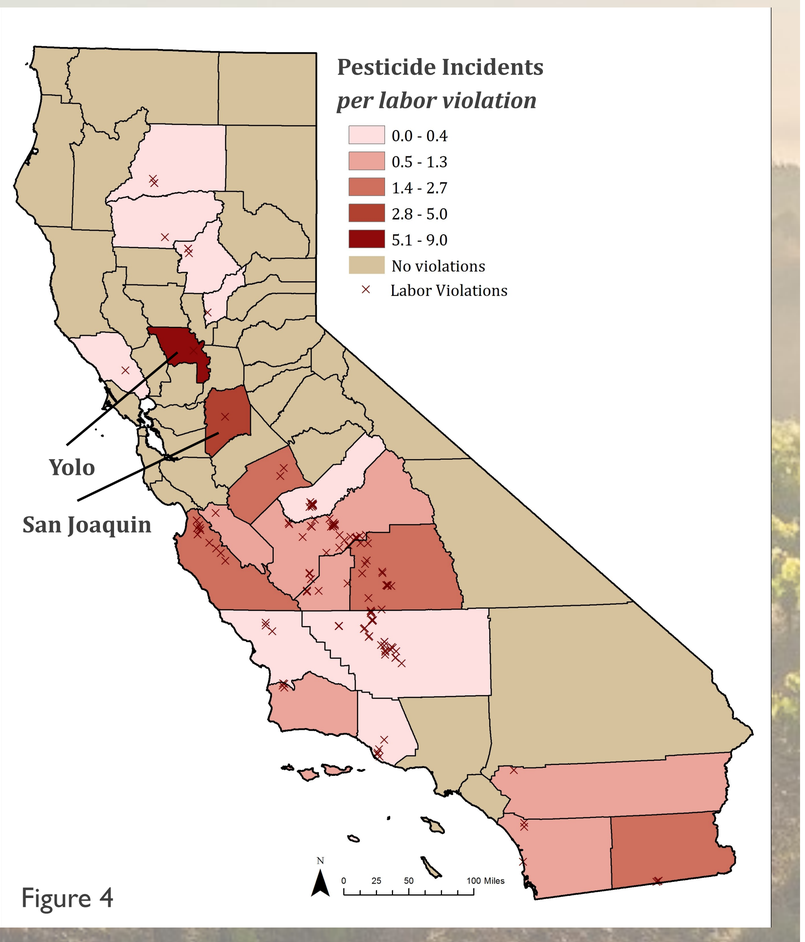

Figure 4

RESULTS

While the largest populations of farmworkers concentrate in the Central Southern half of the state (Figure 1), the counties with the highest pesticide incident rates fall further to the north (Figure 2). Counties with the highest rates of ineligible labor contractors - or labor violations - are seen in two counties (Figure 3) with some of the lowest rates of pesticide incidents. If labor violations predicted pesticide incident rates, the counties with the highest violation rates observed in the Central Northern part of the state should also have high incident rates. This does not appear to be the case. Figure 3 also demonstrates that high labor violation rates are present in counties with few workers. This illustrates that conditions may be just as poor in agricultural as well as less agricultural counties.

Figure 4 shows counties with the highest number of pesticide incidents per ineligible labor contractor, where a ratio of less than one indicates fewer pesticide incidents than violations and greater than one indicates the opposite. Although Yolo County and San Joaquin County have some of the lower incident and violation rates, the number of incidents per ineligible contractor is high. This may indicate poor labor oversight resulting in high incidents, or alternatively, reflect the type of agriculture or other factors.

CONCLUSIONS

The purpose of this analysis was to begin building a picture of health and safety conditions for agricultural workers by county in California. Although it is expected that the prevalence of both incidents and violations would be higher in counties with more workers, the counties with the highest rates of either or both warrant further investigation. A more conclusive method of analysis in the future may be to conduct a vulnerability analysis including incidents and labor violations in addition to health care facilities, worker fatalities and average wages, for example.

It is likely that the number of workers, incidents and labor violations are all underestimated due to the prevalence of undocumented workers in agriculture. Since labor violations in agriculture are prevalent, but under-enforced and under-reported, the number of labor contractors who become ineligible is likely an extremely low estimate of actual violations. A more accurate proxy may be the number of labor contractors currently in operation. However, without tracking violations more systematically, the proxy will continue to be a gross estimate. The number of pesticide illness and injuries is also likely much higher since the data only captures what is reported to the state.

This same analysis may be more insightful using a smaller spatial unit. Currently, pesticide incident data is not available at this granularity. Land use data could be added to the analysis to convey which parts of each county are in agricultural production.

SOURCES

Data:

1. California Open Data Portal: County boundaries
2. American Fact Finder: Number workers employed in agriculture
3. California Department of Pesticide Regulation: Pesticide incidents, 2014
4. US Department of Labor: Ineligible Farm Labor Contractors, 2017

Literature:

1. Grzywacz, J. G., Lipscomb, H. J., Casanova, V., Neis, B., Fraser, C., Monaghan, P., & Vallejos, Q. M. (2013). Organization of Work in the Agricultural, Forestry, and Fishing Sector in the US Southeast: Implications for Immigrant Workers' Occupational Safety and Health. American Journal of Industrial Medicine, 56 (8), 925–939.
2. Guild, A., Richards, C., & Ruiz, V. (2016). Out of Sight, Out of Mind: The Implementation and Impact of the Affordable Care Act in US Farmworker Communities. Journal of Health Care for the Poor and Underserved, 27(4), 73–82.
3. US EPA, O. (2013, September 11). Worker Protection Standard Inspection and Enforcement Accomplishments Reports [Reports and Assessments]. Retrieved November 26, 2017, from https://www.epa.gov/compliance/worker-protection-standard-inspection-and-enforcement-accomplishments-reports

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