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Aid not Replace? Produce Safety Rule Supplemental Training and Grower Learning in Latin America

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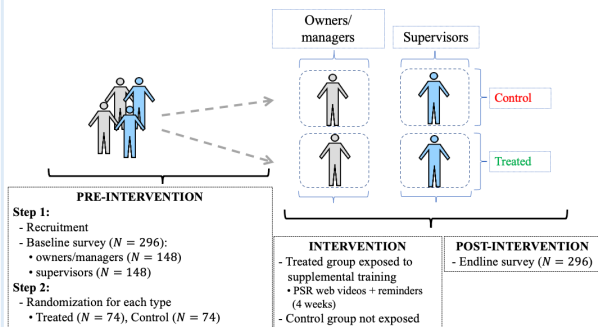
Joint Institute for Food Safety and Applied Nutrition, University of Maryland, College Park

Introduction

- The Produce Safety Rule (PSR) under the Food Safety Modernization Act (FSMA) requires growers (i.e., owners, managers, supervisors) supplying the U.S. market to complete training based on the Produce Safety Alliance's (PSA) standardized PSR curriculum (FDA, 2016).
- Since 2017, U.S. Food and Drugs Administration (FDA) supported building compliance capacity of Latin American growers through PSA curriculum, originally developed for U.S. audience (Narro et al, 2018).
- Concerns over the adequacy of the existing curriculum for Latin American growers led to the development of PSR-based supplemental training materials – to aid, but not replace.
- Very little evidence of training impacts - e.g., Perry et al. (2021) in the U.S. No study in Latin America, except Narrod et al (2021).
- This study evaluates impacts of supplemental training on food safety knowledge, and makes the following contributions:
 - Delineates impacts through randomized evaluation for owners/managers and supervisors in Mexico, Chile, and Costa Rica.
 - Examines the effectiveness of PSR training via a digital platform.
 - Provides feedback to support the justification for scaling up supplemental training.

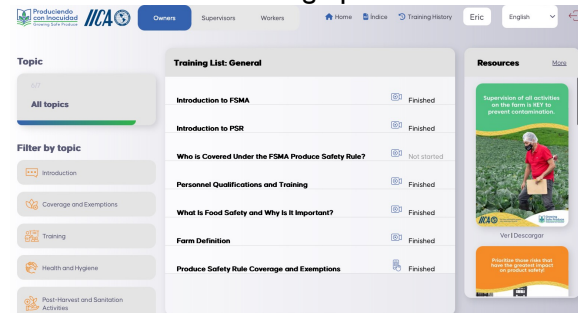
Design and Estimation

Study design:



Intervention:

- Supplemental training => Web videos + reminder memes/infographics



Estimation:

ANCOVA

$$Y_{1ig} = \alpha_g + \beta_g D_{ig} + \gamma_g Y_{0ig} + \delta_g X_{ig} + \varepsilon_{ig}$$

$g \in \{\text{owners/managers, supervisors}\}$

$D = 1$ for treated, 0 for control; Y = knowledge test score ($1=\text{post-}$, $0=\text{pre-training}$); X = covariates

Alternative specification

- Difference-in-difference (DiD)
- Effect on compliers

Results

Intent-to-treat effects of supplemental training by grower and specification:

| Variables | Owners/managers | | Supervisors | |
|-----------------------|---------------------|---------------------|---------------------|---------------------|
| | ANCOVA | DiD | ANCOVA | DiD |
| Constant | 0.345*** (0.123) | 0.483*** (0.077) | 0.289** (0.113) | 0.612*** (0.106) |
| Treated | 0.077*** (0.019) | 0.004 (0.022) | 0.061*** (0.019) | 0.006 (0.019) |
| Post-training | | -0.01 (0.015) | | 0.014 (0.014) |
| Treated×Post-training | | 0.068*** (0.024) | | 0.048** (0.022) |
| Control group mean | 0.589 | 0.589 | 0.706 | 0.706 |
| Covariates | Yes | Yes | Yes | Yes |
| Standard error | Robust | Clustered | Robust | Clustered |
| N | 149 | 298 | 149 | 298 |

Standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$

Average effect on compliers by grower and estimator:

| | Grower | OLS | Residual One-step approach | | LIML | GMM |
|-----------------------------|-----------------|---------------------|----------------------------|---------------------|---------------------|---------------------|
| | | | 2SLS | 2SLS | | |
| Average effect on compliers | Owners/Managers | 0.105*** (0.020) | 0.110*** (0.027) | 0.110*** (0.022) | 0.110*** (0.022) | 0.110*** (0.022) |
| | Supervisors | 0.064*** (0.019) | 0.070*** (0.023) | 0.070*** (0.019) | 0.070*** (0.019) | 0.070*** (0.019) |

Treated group compliance: **72%** for owners/managers, **84%** for supervisors. Control group compliance: **100%** for both grower types. Standard error in parenthesis. LIML=limited information maximum likelihood, GMM=generalized method of moments. *** $p < 0.01$

Conclusion

- Exposure to supplemental training has positive impacts on grower learning.
- Mainstreaming supplemental training as a compulsory or optional supplement to the PSR grower training can be beneficial.
- Use of a digital training platform can expand flexibility in accessing PSR material.

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