

WORKFORCE EDUCATION AND EXPERIENCE AS A FACTOR IN DISEASE CASE INVESTIGATION EFFICIENCY

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OBJECTIVE: DETERMINE THE EFFECT OF WORKFORCE CHARACTERISTICS ON THE DURATION OF A COMMUNICABLE DISEASE CASE INVESTIGATION.

Background

- The impact of a qualified workforce on public health service delivery is unknown
- It is believed that a better trained workforce provides public health services more efficiently
- Efficient communicable disease (CD) surveillance can be measured by cases being quickly and completely resolved
- Efficiency can be measured by the number of days a case is open and whether or not the case is ultimately closed

Research Questions

Does workforce education and experience play a factor in whether or not a local health department (LHD) closes a CD case?

Does workforce education and experience impact the duration of a CD case investigation?

Data Sources

- Survey** of LHD CD employees
 - Education
 - Experience
 - CD Dedicated
 - CD FTE
 - Minutes per Case
- Survey data matched with cases reported in online registry
- Online Registry:** Colorado Electronic Disease Reporting System
 - Case Mix
 - Case Closed Status
 - Duration of Investigation
- Unit of Analysis: Case

Overview of Sample

- 80% of LHDs in CO participated
- 30% had a CD dedicated employee
- 30% had an employee with a public health degree
- 42% had an employee with a graduate degree
- Mean years of experience of CD staff was 9 years
- Mean time per case: 12.5 hours
- Mean CD FTE: 1.86 FTE
- Mean Population Size: 645,033
- Sample Size: 11,375 cases

Models

- Logistic Regression:** $Case\ Closed = \beta_0 + \beta_1 Workforce\ Characteristics + \beta_2 County\ Characteristics + \beta_3 Case\ Characteristics + \epsilon$
- GLM Regression:** $Case\ Duration = \beta_0 + \beta_1 Workforce\ Characteristics + \beta_2 County\ Characteristics + \beta_3 Case\ Characteristics + \epsilon$

		LOGIT	GLM
		Case Closed (y/n)	Case Length
		N=11,374	N=8,126
Workforce Characteristics	CD Dedicated Employee	0.0959***	-0.0419
	CD Employee w/ Grad Degree	-0.0523**	0.2497
	CD Employee w/ PH Degree	0.0329*	-0.4505**
	Number of CD FTE	0.0960***	-0.2948***
	Average Years Experience	-0.0092***	0.1348***
	Average Years Experience ²	0.0006***	-0.0034*
County Characteristics	Total Funding per Capita	-0.0002	-0.00112
	Total FTE per Capita	27.8079	11.59**
	Jurisdiction Size	-1.13e-08***	-7.07e-08
	Average Time per Case (min)	-0.00003***	0.0004***
	Jurisdiction Population	-2.32e-07***	9.97e-07***
	Jurisdiction Poverty Rate	0.0104***	-0.0008
Case Characteristics	Foodborne Case	0.2414***	1.057***
	Vaccine Preventable Case	0.139***	1.050***
	Hepatitis Case	-0.3495***	2.689***
	Lead Poisoning Case	Reference	Reference
	Waterborne Case	0.3167***	1.242***
	Zoonotic Case	0.1378***	1.627***
	Month Case Reported	0.0008	-0.0274**
	Case Was Deleted	Not Included	-0.0761
	Constant	-1.0605***	0.2919

Marginal effects for LOGIT model are reported.*** p<0.01, ** p<0.05, * p<0.1

Results

- Factors that Significantly **Increase Likelihood of Case Closing:**
 - CD Dedicated Employee (9.6% more likely)
 - Employee with PH Degree (3.3% more likely)
 - Number of CD FTE (9.6% more likely)
- Factors that Significantly **Reduce Case Investigation Duration:**
 - Employee with PH degree (reduced by 0.45 days)
 - Number CD FTE (reduced by 0.295 days)

Implications

- Case investigation **efficiency is enhanced** by:
 - having an employee completely dedicated to CD
 - hiring an employee with a public health degree
 - increasing the number of FTE dedicated to CD
- Increasing the number of agency-wide FTE and increasing funding does not have a significant effect on improving efficiency