#003

Completeness of Active and Passive Surveillance in San Francisco

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Introduction

Clinicians, laboratorians, and other mandated reporters are required to notify California local health jurisdictions (LHJ) upon the diagnosis of selected infections. Completeness of these passive notifications has important implications for the ability of LHJs to monitor community health trends and implement effective interventions. Evaluation of core surveillance systems is further considered a fundamental aspect of LHJ preparedness for bioterrorism and infectious disease emergencies.

Valid estimates for completeness of communicable disease notifications to LHJs can be challenging and resource-intensive in the absence of comprehensive integrated lab information systems. The California Emerging Infections Program (CEIP) supplements San Francisco Department of Public Health (SFDPH) passive surveillance through active case finding at 12 clinical labs serving San Francisco clinicians. CEIP active surveillance represents the most complete, readily-available source of data on selected lab-confirmed infections for comparison with SFDPH records.

Aims

- To quantify the completeness of active and passive notifications to SFDPH for 4 communicable diseases.
- To identify and characterize gaps in notifications that inform potential interventions.
- To evaluate the appropriateness of capture-recapture methods for quantifying the fraction of lab-confirmed cases not captured by either surveillance system.

Methods

Cases were SF residents identified separately through passive and active surveillance for specimens collected during the 6 months from January 1 to June 30, 2005. During this period, data from CEIP was not included in the SFDPH database.

We evaluated two pathogens reportable by clinicians (*Cryptosporidium* and *Shigella spp.*), and two others reportable by **both** labs and clinicians (*Salmonella* and *Campylobacter spp.*).

CEIP active surveillance was conducted by surveillance officers who contacted laboratorians in 12 clinical labs serving SF clinicians at least monthly and/or received computerized printouts to ensure that all relevant cases were ascertained.

SFDPH passively received notifications from clinicians and labs per California Code of Regulations Title 17 for all SF residents from multiple sources including labs, clinicians, and other LHJs.

If an individuals had multiple positive lab results for the same pathogen and the tests were done >30 days apart, then we defined them as separate cases.

We merged the SFDPH and CEIP databases using personal identifiers and manually reviewed the matches for accuracy.

We evaluated our data sources for adherence to 4 established assumptions of the capture-recapture method:

1) no change to the population during investigation
2) individuals can be accurately matched between data sources
3) individuals have an equal probability of being in each data source
4) the data sources are independent.

Results

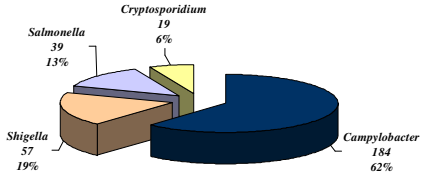

Figure 1. Distribution of unique cases (N=299) by pathogen after merging active and passive data sources, SF, Jan – Jun 2006.

		Reported Passively: Yes	Reported Passively: No	
Reported Actively	Yes	235 (79%)	45 (15%)	280 (94%)
	No	19 (6%)	Unknown	19
		254 (85%)	45	N=299

Table 2. Completeness of active and passive notifications for all pathogens combined.

- 85% (95%CI 80%-88%) of lab-confirmed cases were identified through **passive** surveillance. **Passive** notifications for *Cryptosporidium*, *Salmonella*, and *Shigella* were significantly more complete (each ≥ 95%) than *Campylobacter* (79%, 95%CI 73%-85%).
- 94% (95%CI 91%-96%) of lab-confirmed cases were identified through **active** surveillance. **Active** notifications did not differ significantly by disease.
- Most cases missed by active and passive surveillance were *Campylobacter:* 12 (63%) of 19 cases missed by **active** and 39 (87%) of 45 cases missed by **passive** surveillance were *Campylobacter*.

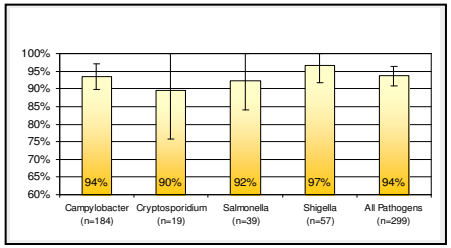

Figure 2.Completeness (with 95% CIs) of active notifications by pathogen, SF, Jan – Jun 2006.

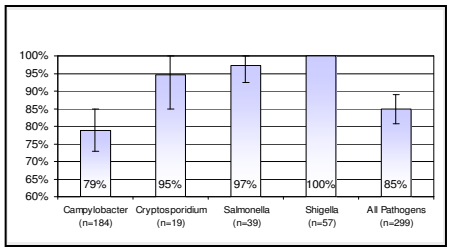

Figure 3.Completeness (with 95% CIs) of passive notifications by pathogen, SF, Jan – Jun 2006.

- Capture-recapture methods could ***not*** be applied to our data because (1) SFDPH receives notifications from laboratories outside the CEIP network or from clinicians using their diagnostic services so each individual does not have an equal chance of being included in both data bases, and (2) the data sources are not independent because laboratories are obligated to report results to both SFDPH and CEIP. Further, laboratorians are reminded to report to SFDPH as a direct result of collaboration with CEIP.

Conclusion

- The fraction of lab-confirmed cases missed by both passive and active surveillance systems in SF labs appears small.
- Completeness of passive case finding was lower for campylobacteriosis than for the other 3 diseases. As SFDPH does not routinely investigate individual cases of campylobacteriosis, these reporting failures did not greatly impact public health response; rather, it affected the valid enumeration of burden of disease trends.
- SFDPH is working with labs to evaluate their information systems and reporting procedures to identify causes for gaps and to prepare for electronic lab reporting (ELR).
- Capture-recapture calculations are not valid when comparing surveillance ascertainment methods that draw from the same source, as demonstrated by clinical laboratories in this analysis. Comparing the cases obtained through both methods is sufficient.

More Information

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