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Evaluating Notifiable Disease Reporting by Providers: Analysis of Data Element Completeness

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Objective

To examine the completeness of data elements required for notifiable disease surveillance from official, provider-based reports submitted to a local health department.

Introduction

Completeness of public health information is essential for the accurate assessment of community health progress and disease surveillance. Yet challenges persist with respect to the level of completeness that public health agencies receive in reports submitted by health care providers. Missing and incomplete data can jeopardize information reliability and quality resulting in inaccurate disease evaluation and management (1). Additionally, incomplete data can prolong the time required for disease investigators to complete their work on a reported case. Thus, it is important to determine where the scarcity of information is coming from to recognize the characteristics of provider reporting.

Methods

Data from 1,195 unique patient cases across 7 notifiable diseases were abstracted from official reporting forms (2) and were submitted to a local health department serving a large metropolitan area. The selected diseases were chlamydia, gonorrhea, syphilis, salmonella, histoplasmosis, hepatitis B-acute, and hepatitis C-chronic. Table 1 represents the duration and collection period for each of the selected diseases. Diseases were purposely chosen to represent the broad range managed by local health departments.

A set of data elements consisting of patient, clinical, and provider information was then evaluated for completeness. The level of completeness was determined using a classification method similar to that used by Dixon et al. (3). Fields were considered complete if they contained a value; the recorded value was not validated for accuracy.

Results

Table 2 depicts the level of completeness for the selected data elements across the targeted diseases. Completeness levels and percentages varied by disease and data element with completeness being higher for patient demographic information (e.g., name, address) than provider demographics (e.g., name, clinic address). The majority of data elements for patient demographics were categorized as mostly to always complete.

Conclusions

It is important that provider reports are completed in a thorough and timely manner. To increase documentation of provider information, analyses of provider characteristics such as workflow patterns, organizational constraints, and information needs are essential to understand the completeness level of provider information reporting. This will allow us to develop implementation of strategies to increase completeness of reporting across all data elements necessary to assess and investigate notifiable diseases.

Table 1 Duration and collection period of diseases studied

Disease	Duration	Collection Period
Chlamydia	3 months	May 2012 - July 2012
Gonorrhea	3 months	May 2012 - July 2012
Syphilis	8 months	December 2011 - July 2012
Histoplasma	24 months	August 2010 - July 2012
Salmonella	24 months	August 2010 - July 2012
Hepatitis B-Acute	24 months	August 2010 - July 2012
Hepatitis C-Chronic	6 months	February 2012 - July 2012

Table 2 Provider reporting for the level and percentage of completeness of data elements across observed diseases.

Data Element	Completeness (%)						
	Chlamydia	Gonorrhea	Syphilis	Histoplasma	Salmonella	Hepatitis B Acute	Hepatitis C Chronic
	n = 838	n = 201	n = 22	n = 16	n = 29	n = 6	n = 83
Patient Last Name	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Patient First Name	99.9	100.0	100.0	100.0	100.0	100.0	100.0
Patient Middle Initial	23.3	23.9	40.9	87.5	51.7	50.0	67.5
Patient Date of Birth	96.2	95.5	100.0	100.0	100.0	100.0	100.0
Patient Age	82.3	76.1	81.8	100.0	93.1	66.7	88.0
Patient Sex	98.7	97.5	95.5	100.0	86.2	83.3	94.0
Patient Race	93.4	92.0	86.4	93.8	75.9	83.3	94.0
Patient Ethnicity Group	75.2	75.6	59.1	75.0	65.5	66.7	91.6
Patient Phone Number	86.4	85.6	63.6	87.5	96.6	100.0	89.2
Patient Street Address	99.3	98.5	95.5	100.0	93.1	100.0	98.8
Patient City of Residence	94.6	92.5	95.5	43.8	89.7	100.0	92.5
Patient Zip Code	93.3	95.5	90.9	93.8	93.1	100.0	100.0
Patient County	83.6	79.1	72.7	37.5	75.9	83.3	88.0
Test Name	50.6	47.3	86.4	93.8	89.7	100.0	83.1
Test Date	88.3	83.1	95.5	93.8	79.3	66.7	84.3
Reported Facility Code	38.7	42.8	27.3	31.3	65.5	50.0	69.9
Hospital Name	69.2	71.1	50.0	87.5	72.4	83.3	88.0
Physician Last Name	58.1	63.7	72.7	62.5	82.8	83.3	68.7
Physician First Name	54.7	61.2	72.7	62.5	75.9	66.7	67.5
Physician Phone Number	93.4	95.5	90.9	62.5	79.3	83.3	92.8
Physician Address	84.7	83.1	81.8	25.0	72.4	83.3	85.5
Physician City and State	57.6	57.2	31.8	18.8	51.7	50.0	45.8
Physician Zip Code	57.0	57.7	36.4	18.8	51.7	50.0	42.2
Report Date	99.9	100.0	100.0	43.8	93.1	100.0	90.4
Reported By	62.6	57.7	86.4	43.8	79.3	83.3	90.4

Completeness Percentage	Completeness Level
100%	Always Complete
80 – 99.99%	Nearly Complete
50 – 79.99%	Mostly Complete
30 – 49.99%	Partially Complete
0 – 29.99%	Mostly Incomplete

Keywords

Public Health Surveillance; Disease Notification; Data Quality; Completeness; Communicable Disease Control

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