

Improving Varicella Investigation Completeness in Pennsylvania

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Objective

The objective of this study was to evaluate the impact of efforts made to improve the completeness of select varicella (chickenpox) case investigation variables.

Introduction

Routine childhood administration of varicella-containing vaccine has resulted in the number of varicella (chickenpox) cases in Pennsylvania falling from nearly 3,000 cases in 2007 to less than 400 cases in 2017. Prior to 2018, the completeness of varicella case investigation data documented in Pennsylvania's electronic disease surveillance system (PA-NEDSS) was not routinely monitored by Department of Health (DOH) staff. A pilot project was initiated in April 2018 to monitor and improve completeness of select varicella case investigation variables.

Methods

Varicella cases reported to PA-NEDSS during MMWR year 2018 (MMWR weeks 1 – 26) in Pennsylvania (excluding Philadelphia County) with a classification status of probable or confirmed were included in the pilot project (n=223). DOH epidemiology staff prioritized 11 key varicella investigation variables and developed a SAS program to identify cases with missing data, which were summarized in weekly reports and provided to DOH immunization staff for follow-up. DOH immunization staff reviewed missing data reports and communicated with case investigators to reconcile missing data. Varicella case data from the project period were compared with a 10-year baseline to evaluate the 11 targeted variables for change in percent completion.

Results

Percent completion of all 11 variables improved during the intervention period, with a median relative increase of 10.2% (range: 4.2% — 25.5%) compared to baseline. All but two variables (pregnancy status and number of days hospitalized) exhibited a statistically significant ($p < 0.05$) improvement in percent completion. In addition, among eight variables that include an unknown response option, only one variable (number of varicella vaccine doses received) measured an increase in the percentage of unknown responses during the project period compared with baseline; however, this increase was not statistically significant ($p = 0.180$).

Conclusions

Prioritization of key varicella investigation variables for improved completion was successful and did not result in significant increases of unknown responses. As varicella cases become less common, varicella case investigation data become increasingly important. Increased completeness of these data will enhance DOH communication of varicella surveillance findings, particularly for severe cases. Based on the success of this interagency collaboration, similar efforts are being developed for additional reportable conditions.

Table 1. Varicella variable completeness during 2008-2017 and 2018.

Variable	2008-2017 (n=8,895)	2018 (n=223)	



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	Mean Percent Complete (standard deviation)	Percent Complete	Relative Percent Change	χ^2 p-value
Onset date	92.4 (2.9)	99.6	+7.8	<0.001
Hospitalization	90.8 (5.0)	100.0	+10.2	<0.001
Days hospitalized ¹	72.4 (11.7)	90.9	+25.5	0.161 ⁴
Pregnant ²	89.8 (3.2)	97.7	+8.8	0.0590 ⁴
Rash onset date	94.2 (1.3)	99.6	+5.7	<0.001
Lesion severity	89.9 (1.7)	99.6	+10.7	<0.001
Immunocompromised	81.5 (4.9)	99.6	+22.1	<0.001
Complications	81.2 (7.4)	99.6	+22.6	<0.001
Transmission setting known	82.9 (4.5)	99.6	+20.1	<0.001
Received varicella vaccine	90.9 (1.8)	99.6	+9.5	<0.001
Varicella vaccine doses received ³	96.0 (1.7)	100.0	+4.2	0.0204 ⁴

¹Denominator: Hospitalized cases; n=167 (2008-2017), n=11 (2018); ²Denominator: Female cases, >12 years; n=1,001 (2008-2017), n=44 (2018); ³Denominator: Vaccinated cases; n=5,037 (2008-2017), n=79 (2018); ⁴Fisher exact (right-sided)



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