

# Three-Year Trends in Healthcare Personnel Influenza Vaccination Following National Reporting Requirements

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## BACKGROUND & OBJECTIVES

- Low rates of healthcare personnel (HCP) vaccination have been implicated in nosocomial influenza outbreaks, which can cause increased patient morbidity and mortality and worker absenteeism
- The U.S. Community Preventive Services Task Force recommends assessment of and feedback on vaccination rates to increase uptake
- CDC's National Healthcare Safety Network (NHSN) is a secure, web-based surveillance system that healthcare facilities can use to collect and analyze data on healthcare-associated infections and prevention
- Beginning in January 2013, the Centers for Medicare and Medicaid Services (CMS) included HCP influenza vaccination reporting via NHSN in their Hospital Inpatient Quality Reporting (IQR) program
  - Each influenza season, ~4,000 acute care hospitals report HCP influenza vaccination to CDC and CMS through NHSN
- We examined whether reported vaccination rates changed following implementation of hospital-based HCP influenza vaccination reporting
  - We also examined the proportion of HCP reported with unknown vaccination status to determine whether measurement practices improved irrespective of reported changes in vaccine uptake

## METHODS

- Included data from hospitals reporting HCP influenza vaccination to NHSN in the 2013-14, 2014-15, and 2015-16 influenza seasons
  - 3,771 hospitals (representing ~7.8 million HCP) reported for all three seasons
- Examined reported vaccination rates and proportion with unknown vaccination status among three groups of HCP separately as well as all HCP combined:
  - Employees: all personnel on payroll regardless of clinical responsibility or patient contact
  - Licensed independent practitioners (LIPs): non-employee physicians, advanced practice nurses, and physician assistants
  - Adult students/trainees and volunteers (STVs): non-employee medical, nursing, or other health professional students, interns, medical residents, or volunteers aged 18 years or older
  - Only HCP working physically in the facility for ≥1 day from October 1 through March 31 are included
- Performed a trend analysis using SAS version 9.3 to fit generalized estimating equation (GEE) regression models
  - Models accounted for clustering within facilities and states
  - Results were adjusted for facility bed size and teaching status
  - Trends were considered statistically significant when the p-value for the associated z-score was <0.05

## RESULTS

	Proportion of HCP reported vaccinated*			Proportion of HCP with unknown vaccination status*		
	2013-14 season	2015-16 season	Average annual increase (percentage points)**	2013-14 season	2015-16 season	Average annual decrease (percentage points)**
All HCP	80.8%	84.9%	2.0	11.2%	9.2%	1.0 <sup>††</sup>
Employees	85.1%	88.4%	1.6	5.4%	4.6%	0.4
LIPs	64.9%	70.6%	2.8 <sup>†</sup>	31.0%	26.1%	2.5 <sup>††</sup>
STVs	81.3%	86.4%	2.5	14.5%	10.9%	1.8

\* Teaching status was not significantly associated with reported vaccination coverage or proportion of HCP within unknown vaccination status in any model

\*\* P-value for z-score <0.0001 for all models when examining the effect of influenza season (year)

† Increasing bed size was associated with lower reported vaccination coverage for LIPs, but did not modify the annual trend estimate in this group

†† Increasing bed size was associated with higher proportion with unknown status for LIPs and HCP overall, but did not modify annual trend estimates for either group

Fig. 1 Proportion of HCP reported vaccinated by influenza season

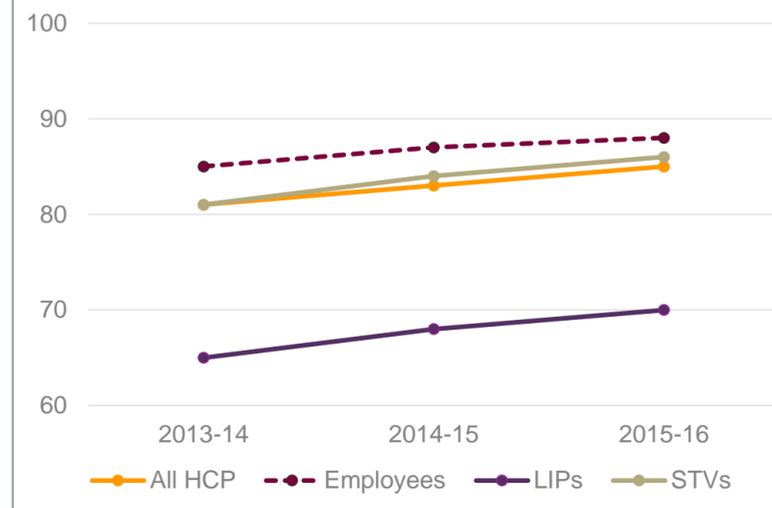
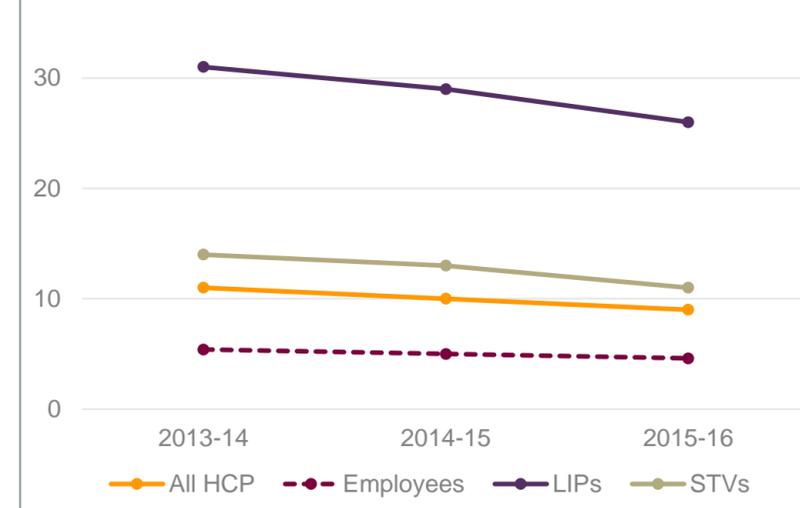


Fig. 2 Proportion of HCP with unknown vaccination status by influenza season



## LIMITATIONS

- Data reported by hospitals are not independently verified
- Changes in reported vaccination coverage may be due to unmeasured factors aside from the CMS reporting requirement, such as hospital policies or programs related to HCP influenza vaccination
- We were unable to identify and exclude the few hospitals not covered by the CMS Hospital IQR program that report to NHSN voluntarily
  - We therefore lack an internal comparison group that would allow us to directly measure the effect of the reporting requirement

## CONCLUSIONS

- Increases in reported vaccination coverage – and decreases in proportion of HCP with unknown vaccination status – were statistically significant overall and in each HCP group during the observation period
  - Annual increases in reported vaccination and decreases in unknown status were highest among non-employee groups (LIPs and STVs)
- Larger changes over time for non-employees may indicate a stronger effect of the reporting requirement on these HCP
  - Consistent with a 2006 study that found most hospitals included only employees in their influenza vaccination measurements
- Increasing bed size was associated with lower reported vaccination coverage and higher proportion with unknown status for some HCP, but did not modify annual trend estimates
  - Consistent with a 2013 evaluation that found greater difficulty measuring non-employees in facilities with >300 beds
  - Indicates larger facilities were equally able to improve over time
- Our findings show standardized measurement of influenza vaccination among employees and non-employees is feasible and may help increase vaccination uptake and ability to track HCP, even in large hospitals

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