IMPROVING INFLUENZA VACCINE COVERAGE IN HCP: WHAT WORKS AND WHAT DOESN'T

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DISCLOSURES

- Vaccine related
  - SHEA liaison to ACIP
  - Current ACIP working groups: General recommendations, pertussis, hepatitis
  - Member of ACP vaccine group
- Consultation and Speaker's Bureau
  - Merck, Pfizer

SHEA Position Paper

Influenza Vaccination of Healthcare Workers and Vaccine Allocation for Healthcare Workers During Vaccine Shortages

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RATIONALE FOR INFLUENZA IMMUNIZATION OF HCP

- Person-to-person transmission of influenza well documented in hospitals
- Persons with influenza can transmit infection prior to developing symptoms
- Persons with influenza can transmit infection with no or mild infection
- Influenza immunization has been shown to decrease patient mortality in extended care facilities
- Influenza immunization of HCP has been shown to decrese sick days and days lost from work
- Benefits of influenza immunization to individual HCP protects the HCP (especially if they are at high risk for complications), and their household and personal contacts

Talbot T, et al. ICHE 2005;26:882-890

BARRIERS HCP IMMUNIZATION AND RECOMMENDED SOLUTIONS

Barrier to HCW Influenza Vaccination	Recommended Component of HCW Influenza Vaccination Program
Access to vaccine, inconvenience	Off-hours clinics Use of mobile vaccination charts Vaccination of staff and departmental meetings Provision of adequate staff and resources
Cost	Provision of vaccine free of charge to HCWs
Concerns for vaccine adverse events, perception of low risk for influenza, opposition to the vaccine	Targeted education, including specific information to dispel vaccine myths
Fear of needles	Use of live attenuated influenza vaccine for eligible HCWs
Other	Strong and visible administrative leadership Visible vaccination of key leaders Active declination of HCWs who do not wish to be or cannot be vaccinated Accurate tracking of individual and unit-based compliance of HCWs with vaccination Surveillance for healthcare-associated influenza

Talbot T, et al. ICHE 2005;26:882-890

SAMPLE DECLINATION FORM

Declination of Annual Influenza Vaccination

I understand that due to my occupational exposure, I may be at risk of acquiring influenza infection. In addition, I may spread influenza to my patients, other healthcare workers, and my family, even if I have no symptoms. This can result in serious infection, particularly in persons at high risk for influenza complications.

I have received education about the effectiveness of influenza vaccination as well as the adverse events. I have also been given the opportunity to be vaccinated with influenza vaccine, at no charge to myself. However, I decline influenza vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring influenza, potentially resulting in transmission to my patients. If in the future I want to be vaccinated with influenza vaccine, I can receive the vaccine at no charge to me.

Employee's Name: _____ Witness Name: _____

Employee's Signature: _____ Witness Signature: _____

Date: _____ / _____ / _____

INTERVENTIONS TO IMPROVE HCP INFLUENZA IMMUNIZATION

	No. (%) who answered		
Does your hospital provide	Yes	No	*P*[a]
Vaccine free of charge to all HCWs with direct patient care?	410 (98)	10 (2)[a]	.017
Vaccine free of charge to all HCWs?	376 (91)	38 (9)	<.001
Vaccine free of charge to all volunteers?	342 (86)	56 (14)	.019
Adequate staff and resources for influenza vaccine campaigns	354 (85)	63 (15)	.008
Vaccination in wards, clinics, and/or common areas (e.g. outside cafeteria)?	365 (87)	56 (13)	.015
Off-hours vaccination clinics?	236 (57)	178 (43)	.018
Vaccination at any staff and departmental meetings?	193 (47)	218 (53)	.011
Visible vaccination of key personnel?	208 (51)	198 (49)	.004
Tracking unit-based vaccine compliance for at least some units?	237 (59)	163 (41)	<.001
Reporting vaccination rates to HCWs and administration?	285 (72)	111 (28)	<.001
A mechanism for recording off-site vaccination?	115 (29)	280 (71)	.001
A mandatory declination form to HCWs refusing vaccination?	93 (23)	310 (77)	.004
Education to targeted groups of HCWs?	257 (84)	50 (16)	<.001
Active surveillance for health care-associated influenza?	67 (22)	238 (78)	.002

Survey of 468 healthcare facilities (rate of immunization = 41%-60%)

Polgreen PM, et al. CID 2008;46:14-19

IMPROVING INFLUENZA VACCINE COVERAGE OF HCP: WHAT WORKS

- Mobile carts (ICHE 2004;25:918, ICHE 2004;25:923, ICHE 2009;30:691)
- Free vaccine (ICHE 2006;27:612, CID 2008;46:14)
- Adequate staff resource for vaccine campaign (CID 2008;46:14)
- Education and promotion (ICHE 1998;19:337, AJGS 1993;41:928)
- Incentives (ICHE 2009;30:691)
- Immunizations available on weekends (ICHE 2010;31:456)
- Administrative support (ICHE 2009;30:1137)
- Sanctions for nonvaccination (ICHE 2009;30:1137)
- Employment conditional upon receipt of vaccine (CID 2010;50:459; AJC 2012;40:771)

IMPROVING INFLUENZA VACCINE COVERAGE OF HCP: WHAT DOESN'T

- Declination forms {modest benefit, 10%-15%}(ICHE 2008;29:675, ICHE 2008;29:302, ICHE 2009;30:474)
- Incentives; raffle (AJIC 2008;36:301)

IMPACT OF STRATEGIES TO IMPROVE HCP INFLUENZA VACCINATION

Intervention and Study	Preintervention immunization rate, %	Postintervention immunization rate, %	Overall change in vaccination rate, %	Randomized, controlled trial of intervention	Implemented with other interventions
Declination					
Polgren et al [23]	54	65	+11	No	Yes
Bertin et al [25]	38	55	+17	No	Yes
Ribner et al [27]	43	65	+22	No	Yes

Intervention and Study	Preintervention immunization rate, %	Postintervention immunization rate, %	Overall change in vaccination rate, %	Randomized, controlled trial of intervention	Implemented with other interventions
Mandatory vaccination					
Virginia Mason [23]	30	98	+68	No	Yes
BJC HealthCare [39]	71	99	+28	No	Yes

IMPACT OF STRATEGIES TO IMPROVE HCP INFLUENZA VACCINATION

Intervention and Study	Preintervention immunization rate, %	Postintervention immunization rate, %	Overall change in vaccination rate, %	Randomized, controlled trial of intervention	Implemented with other interventions
Education and promotion					
Harbath et al [31]	13	37	+24	No	Yes
Thomas et al [32]	8	46	+38	No	Yes

Intervention and Study	Preintervention immunization rate, %	Postintervention immunization rate, %	Overall change in vaccination rate, %	Randomized, controlled trial of intervention	Implemented with other interventions
Mobile cart					
Sartor et al [29]	7	32	+25	No	Yes
Cooper et al [30]	8	49	+41	No	Yes
Incentives (raffle) [35]	38[a]	42	NS	Yes	Yes
Educational letter from leadership [35]	38[a]	39	NS	Yes	Yes
On-site expert education [33]	21[a]	22	NS	Yes	Yes

Talbot T, et al. Cid 2009;49:773-779

FACTORS ASSOCIATED WITH HIGH HCP VACCINATION RATES

Component	No. (%) of facilities with component (n = 47)	Vaccination rate, mean ± SD, %		P
		At facilities with component	At facilities without component	
Provision of vaccination on weekends	37 (97)	58.8 ± 12.0	58.8 ± 14.9	.01
Train-the-trainer programs	33 (70)	59.5 ± 12.5	59.5 ± 13.2	.005
Feedback of vaccination rates provided to board of trustees	10 (21)	63.9 ± 9.7	53.4 ± 14.1	.01
Administration sends letter emphasizing vaccine importance	33 (70)	59.3 ± 11.9	47.0 ± 15.0	.01

Survey of 50 hospitals; median vaccination rate 55% (range, 25.6% to 80.6%)
Talbot T, et al. ICHE 2010;31:456

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY OCTOBER 2010, VOL. 31, NO. 10

SHEA POSITION PAPER

Revised SHEA Position Paper: Influenza Vaccination of Healthcare Personnel

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SHEA GUIDELINE: 2010 UPDATE

- No endorsement of requiring unvaccinated persons to wear a mask
- Use of declination forms should not be viewed as primary method for increasing vaccination rates
- Recommendations for coverage include ALL HCP (contract workers, volunteers, students, product vendors, independent practitioners)
- Exemptions to vaccine mandates should only be allowed for medical contraindications
- SHEA does not endorse religious exemptions or philosophical exemptions
- SHEA endorses that influenza vaccination be a condition of employment

Table 3: Variables Associated with a Significant Change in Vaccination Rates

Variable	Variable present		Variable absent		P[a]
	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	
Type of Hospital					
Accredited by the Joint Commission	58	72 (55-85)	59	60 (43-75)	<.0375

Variable	Variable present		Variable absent		P[a]
	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	
Type of care provided					
Acute care	79	71 (57-85)	38	50 (42-71)	.0028
Psychiatric	13	50 (37-60)	104	70 (50-85)	.0022
Rehabilitation	10	48 (36-59)	107	70 (50-85)	.0087

Variable	Variable present		Variable absent		P[a]
	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	
Type of patient served					
Children	72	70 (56-85)	44	52 (43-72)	.0037
Oncology	20	75 (61-87)	96	65 (46-79)	.0021
Pregnant women	42	73 (60-85)	74	58 (48-75)	.0030
Intensive care	61	72 (60-85)	56	52 (39-75)	.0004

Variable	Variable present		Variable absent		P[a]
	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	
Type of program					
Voluntary	41	50 (40-65)	75	72 (60-85	<.0001
Required declination	75	72 (60-85)	41	50 (40-65	<.0001

Table 3: Variables Associated with a Significant Change in Vaccination Rates

	Variable present		Variable absent		
Availability of the vaccine	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	P[a]
mobile vaccination carts	50	74 (60-85)	67	60 (41-75)	.0011
Vaccination in wards, clinics, and common areas	72	72 (57-84)	75	72 (60-85	.0030
Vaccination on nights and weekends	82	71 (51-85)	35	60 (40-71)	.0213

	Variable present		Variable absent		
Advertisement of the program	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	P[a]
Fliers	86	70 (52-85)	31	53 (37-75)	,0148
Emails	82	70 (55-85)	35	50 (37-73)	.0003

	Variable present		Variable absent		
Consequences of no vaccination	No. of responses	Vaccination rate, median % (IQR)	No. of responses	Vaccination rate, median % (IQR)	P[a]
No consequences	86	60 (46-75)	25	85 (72-92)	<.0001
Wear mask during patient contact	20	86 (80-92)	97	60 (46-75)	<.0001

Survey of 153 hospitals in Louisiana, 2011-2012 flu season

Fricke KL, et al. ICHE 2013;34:723-729

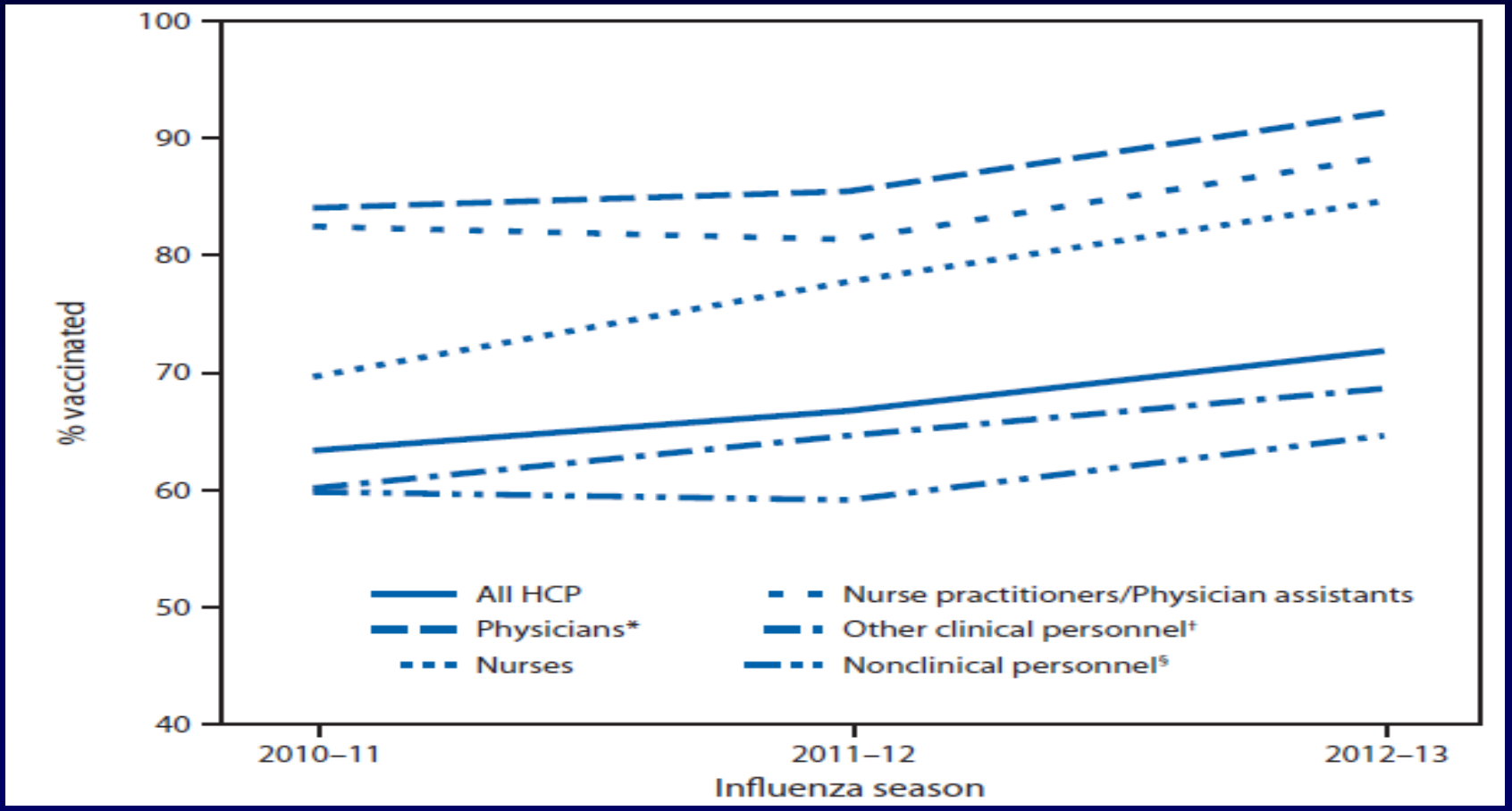
IMPACT OF "MANDATORY" INFLUENZA REQUIREMENTS

Reported institutional level seasonal influenza vaccination coverage of pre- and post-requirement influenza seasons among US hospitals.[a]

Characteristic	Hospitals No.	Pre-requirement season Mean coverage (95% CI)	Post-requirement season Mean coverage (95% CI)
Overall	228	62.0 (59.8-64.2)	76.6 (74.5-78.8)
Vaccination coverage, pre-requirement season			
<50%	44	37.8 (35.9-39.7)	62.4 (56.7-68.2)
50-64%	84	57.6 (56.7-58.4)	73.3 (70.2-76.4)
65-79%	67	71.8 (70.8-72.9)	83.0 (80.6-85.4)
80+%	33	88.4 (86.5-90.3)	91.8 (88.0-95.7)
Consequences imposed for vaccine refusal	Hospitals No.	Pre-requirement season Mean coverage (95% CI)	Post-requirement season Mean coverage (95% CI)
Yes, termination	18	72.1 (66.6-77.7)	95.4 (93.5-95.5)
Yes, other[b]	105	63.5 (60.1-66.8)	81.9 (79.0-84.9)
No	105	58.8 (55.9-61.6)	68.3 (65.7-71.0)
Post-requirement season	Hospitals No.	Pre-requirement season Mean coverage (95% CI)	Post-requirement season Mean coverage (95% CI)
2007-2008, on or before[c]	74	54.5 (50.8-58.2)	67.0 (64.1-69.8)
2008-2009	38	60.1 (54.4-65.9)	71.4 (66.2-76.7)
2009-2010	71	65.4 (61.9-68.8)	85.1 (81.8-88.3)
2010-2011	45	68.7 (63.1-74.2)	83.2 (79.3-87.0)
Location[d]	Hospitals No.	Pre-requirement season Mean coverage (95% CI)	Post-requirement season Mean coverage (95% CI)
Urban	131	59.0 (56.2-61.7)	75.8 (72.9-78.8)
Rural	97	66.2 (62.5-69.9)	77.7 (74.5-81.0)

Miller BL, et al. Vaccine 2011;29:9398-9403

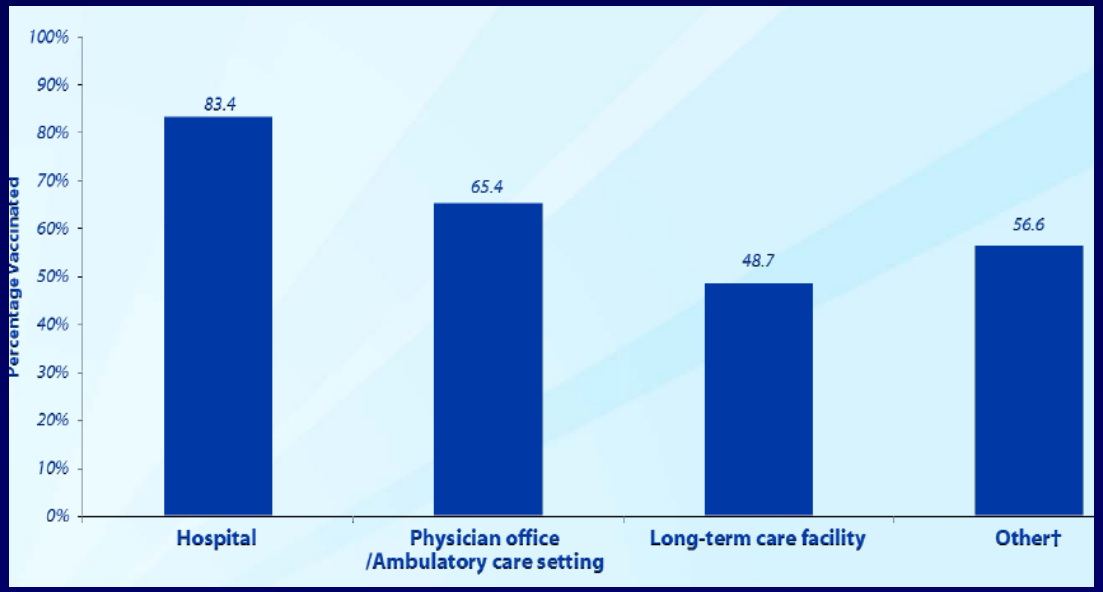
INFLUENZA VACCINE COVERAGE, HCP, 2010-11, 2011-12, AND 2012-13



MMWR 2013;62:781-786

INFLUENZA VACCINE COVERAGE IN SELECTED HCP

- Non-hospital personnel (53.9%) vs hospital personnel (74.3%) received novel H1N1 vaccine (ICHE 2012;33:737)
- Allied health students, 31.8% schools had policy to immunize, 2011 (J Allied Health 2014;43:12)
- Students, trainees, medical residents, 58% of facilities included these HCP in 2006 (ICHE 2009;30:1150)
- VA community living centers, 59.6% vaccinated in 2007-8 (ICHE 2010;31:191)



2012 internet panel survey
Kennedy ED, CDC
www.cdc.gov/vaccines/ed/ciinc/downloads/2013-01-24/Kennedy-flu-2013-01-24.pdf

POSSIBLE REASONS FOR LOWER COVERAGE AMONG NURSING HOME PERSONNEL

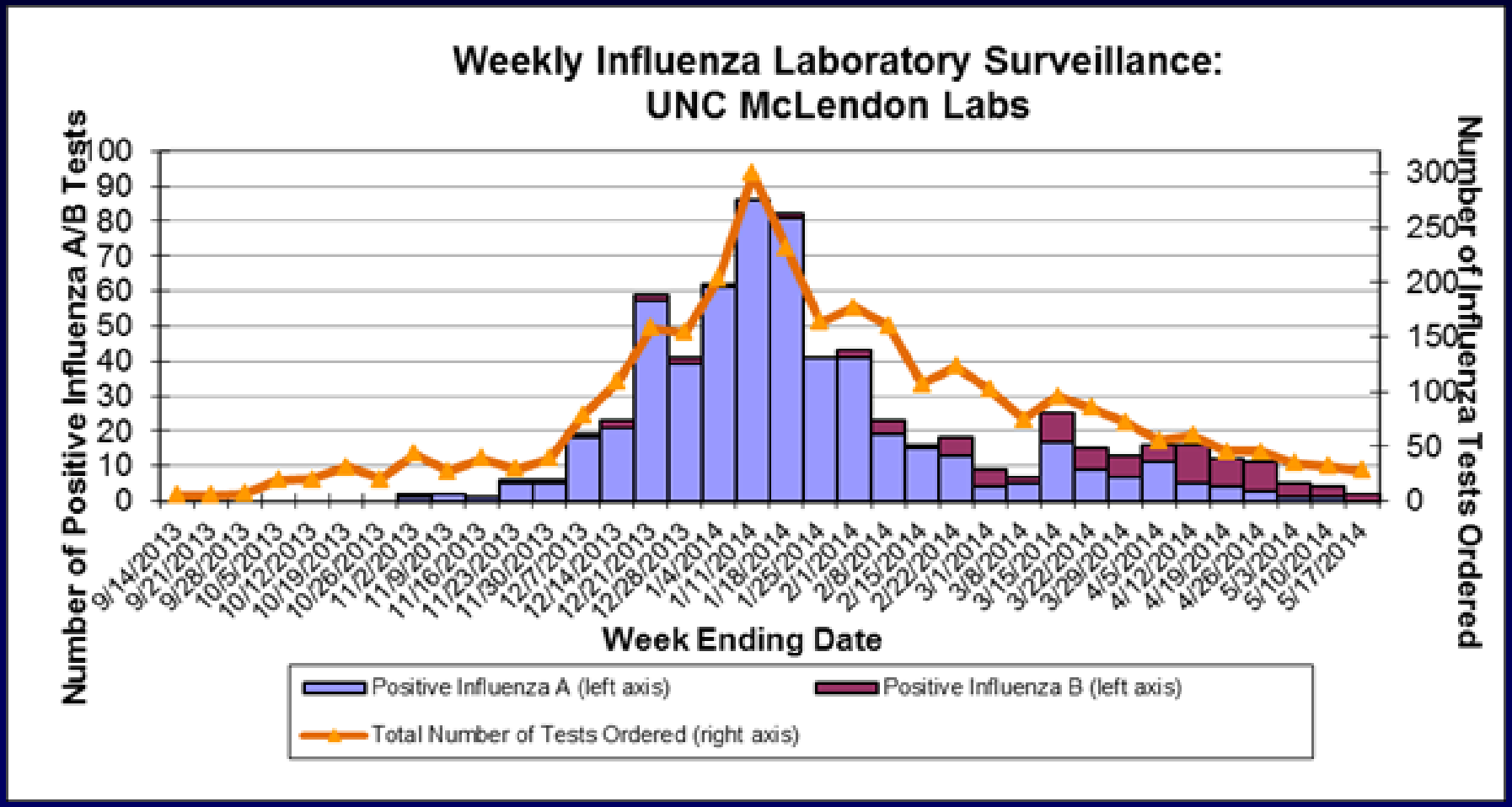
- Resource constraints
- Occupational health often off-site
- Limited infection control presence (usually no physician and often no IP)
- High turnover among staff
- Less administrative support

UNC INTERVENTIONS TO IMPROVE HCP COVERAGE

- Includes all HCP entering hospital (medical staff, students, contract workers, volunteers, product vendors)
- Flu fair (24 hour availability with multiple sites)
- Mobile carts
- After hours clinics
- Vaccination at work site (e.g., meetings)
- Free vaccine
- Train-the-trainer (vaccines provided by nursing supervisors)
- Administrative support
- Education and promotion
- Vaccination a condition of employment
- Electronic registration (at both occupational health and remote sites)
- Real time noncompliance feedback to managers
- Influenza surveillance with weekly feedback to medical staff
- Multiple vaccine choices (preferential purchase of quadrivalent vaccine)
- Coverage of adverse events by Worker's Compensation

INFLUENZA VACCINE, UNC HEALTH CARE, 2012-13, 2013-14

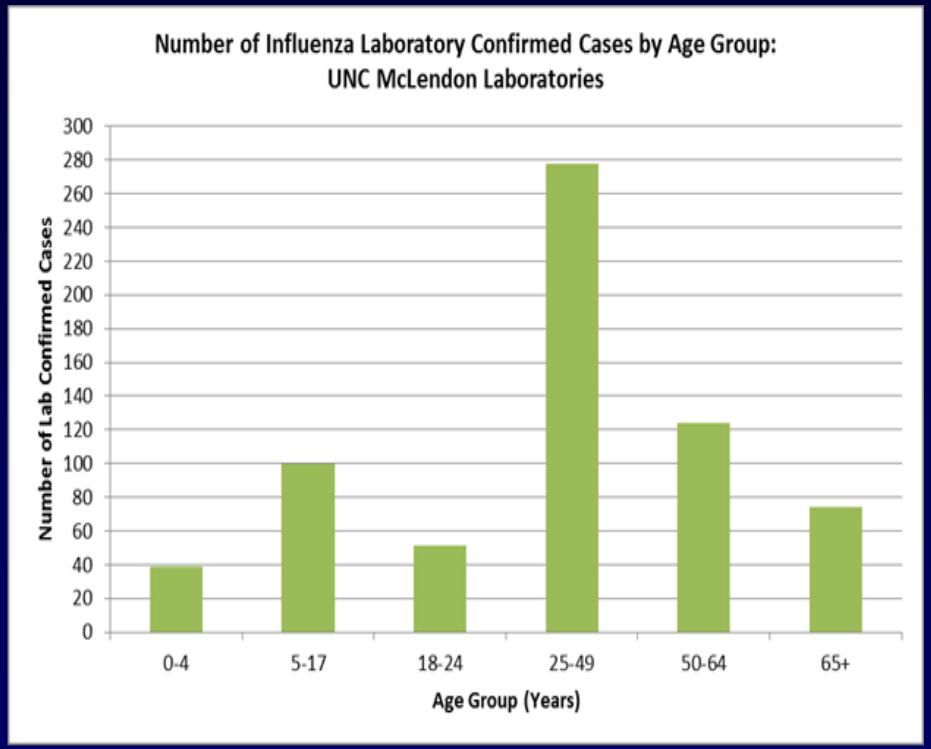
- Employment conditional on receipt of vaccine
- 9,614 employees; 10,133
  - **9,610 compliant with policy (99.9%); 10,131 (99.9%)**
  - **9,129 vaccinated (95.0%); 9,790 (96.6%)**
  - **114 medical contra-indication (per ACIP)(1.2%); 125 (1.2%)**
  - **367 granted a religious objection (3.8%); 216 (2.1%)**
- Vaccine choices (9,640 – includes some medical staff)
  - **IIV3 = ~8,600 (89.2%)**
  - **LAIV = ~460 (4.8%)**
  - **ID = ~580 (6.0%)**

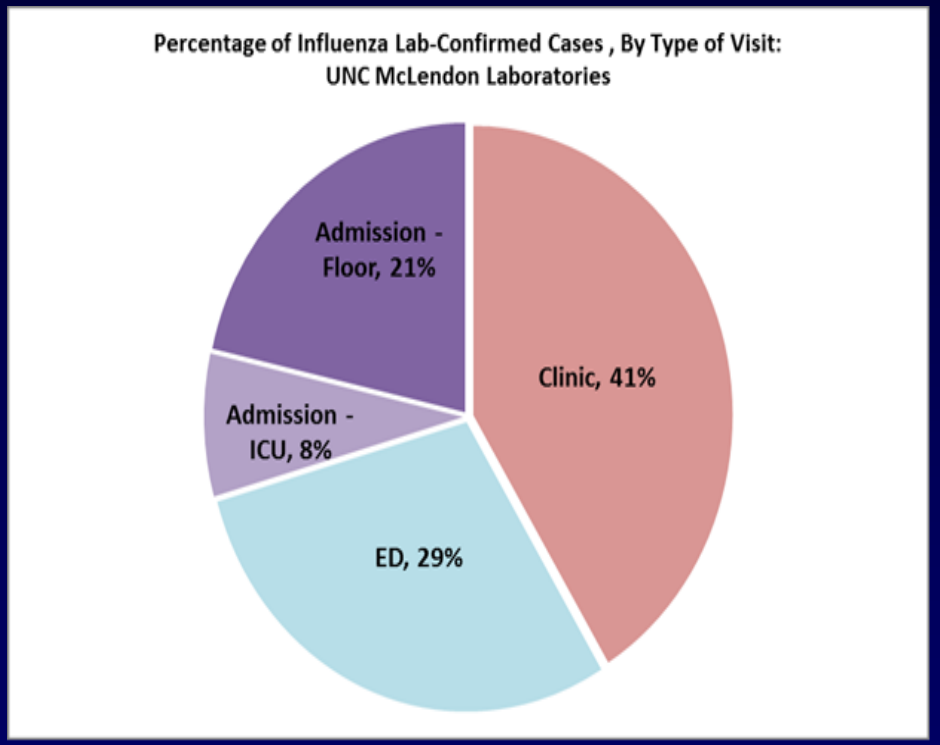

Weekly Influenza Laboratory Surveillance:
UNC McLendon Labs
Number of Positive Influenza A/B Tests
Number of Influenza Tests Ordered
0
10
20
30
40
50
60
70
80
90
100
0
50
100
150
200
250
300
9/14/2013
9/21/2013
9/28/2013
10/5/2013
10/12/2013
10/19/2013
10/26/2013
11/2/2013
11/9/2013
11/16/2013
11/23/2013
11/30/2013
12/7/2013
12/14/2013
12/21/2013
12/28/2013
1/4/2014
1/11/2014
1/18/2014
1/25/2014
2/1/2014
2/8/2014
2/15/2014
2/22/2014
3/1/2014
3/8/2014
3/15/2014
3/22/2014
3/29/2014
4/5/2014
4/12/2014
4/19/2014
4/26/2014
5/3/2014
5/10/2014
5/17/2014
Week Ending Date
Positive Influenza A (left axis)
Positive Influenza B (left axis)
Total Number of Tests Ordered (right axis)

INFLUENZA SURVEILLANCE, UNC HEALTH CARE, 22 May 2014

Virus Type	# Cumulative Positive Results	
	UNC McLendon Laboratories	NC State Laboratory of Public Health
A (not typed)	70	3
A/H1	0	0
A(H1N1) Pandemic	497	186
A/H3	6	9
B	93	14
Total	666	212

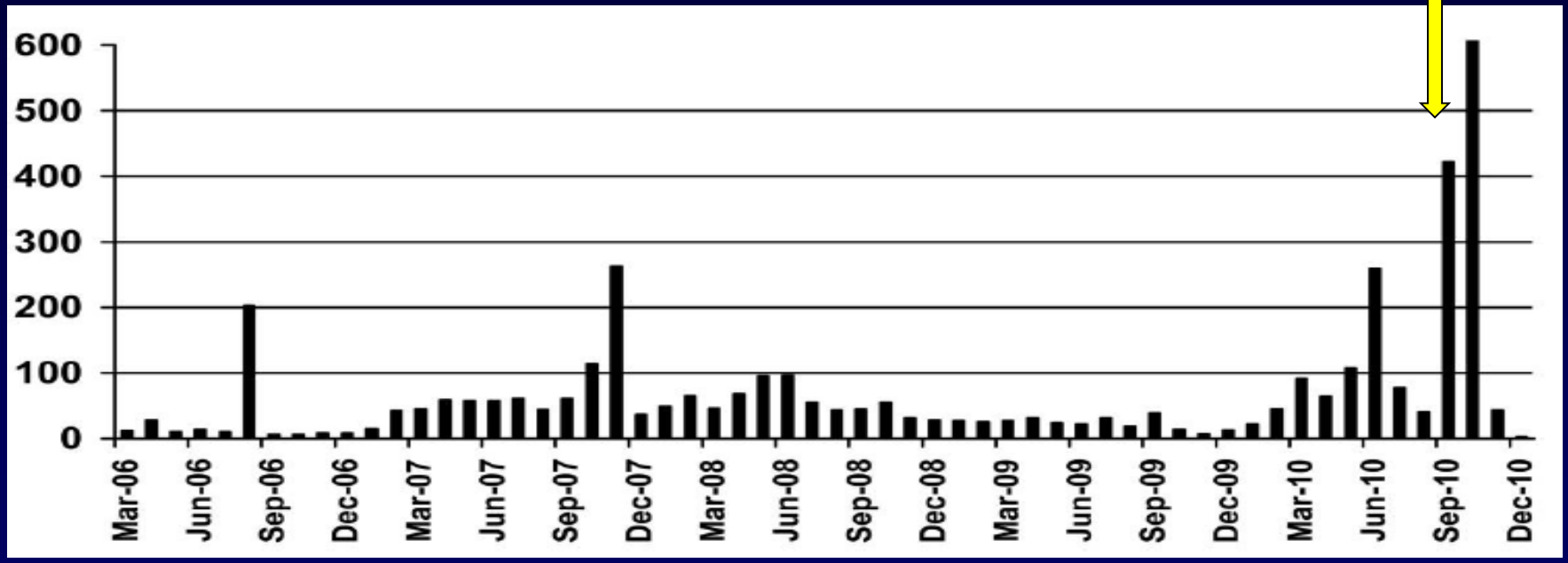
INFLUENZA SURVEILLANCE, UNC HEALTH CARE





Deaths = 12; ages 5-17 (2), 25-49 (7), 50-64 (1), 65+ (2) – A/H1N1 (8), B (2) A/H3 (1), NT (1)

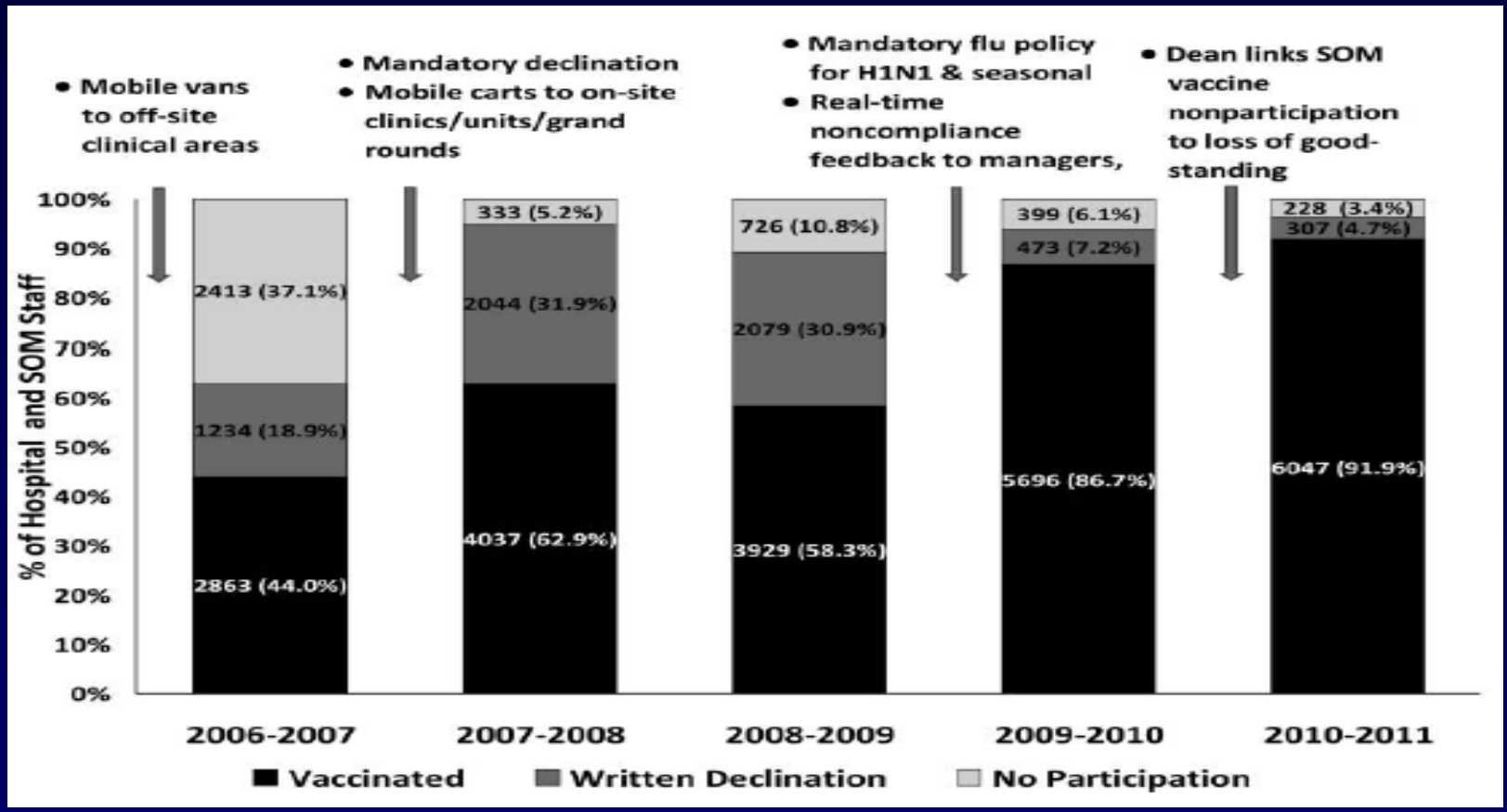
UNC HEALTH CARE EXPERIENCE WITH REQUIRING Tdap FOR HCP



Policy notifications: April 2006, Tdap offered to all current HCP and required of all new HCP; March 2010, letter sent to current HCP notifying them of Tdap requirement; Sept. 2010, letter send to current UNC HCP notifying them that noncompliance by Nov. 2 would result in furlough

Weber DJ, et al. Infect Control Hosp Epidemiol 2012;33:81-83

INFLUENZA VACCINE COVERAGE, UC IRVINE, 2006-2011



Quan K, et al. ICHE 2012;33:63

CHALLENGES/ISSUES FOR THE FUTURE IN PREVENTING HEALTHCARE-ASSOCIATED INFLUENZA

- Implementing vaccination as a condition of employment
  - Push back from unions and EEOC
  - Questions regarding effectiveness of HCP immunization (e.g., Cochrane review)
- Achieving ≥90% coverage without "mandates"
- Improving coverage of the following groups:
  - Students/trainees/volunteers
  - HCP in nursing homes and assisted living
  - Contract workers
- Assessing HCP vaccine coverage outside of hospitals (e.g., nursing homes, students)
- Should non-vaccinated HCP wear a mask while in clinical areas
- Should HCP ≥65 years of age receive high titer vaccine
- Should HCP preferentially receive quadrivalent vaccines

THANK YOU!!

Edward Jenner, 1749-1823