

**What Goes Around
Comes Around:
It's Flu Season Again!**

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Overview

- Background on how flu surveillance works in Oregon
- 2007-8 season in review
- Issues in testing, use of antivirals
- Vaccine Effectiveness Study
- Coming Attractions

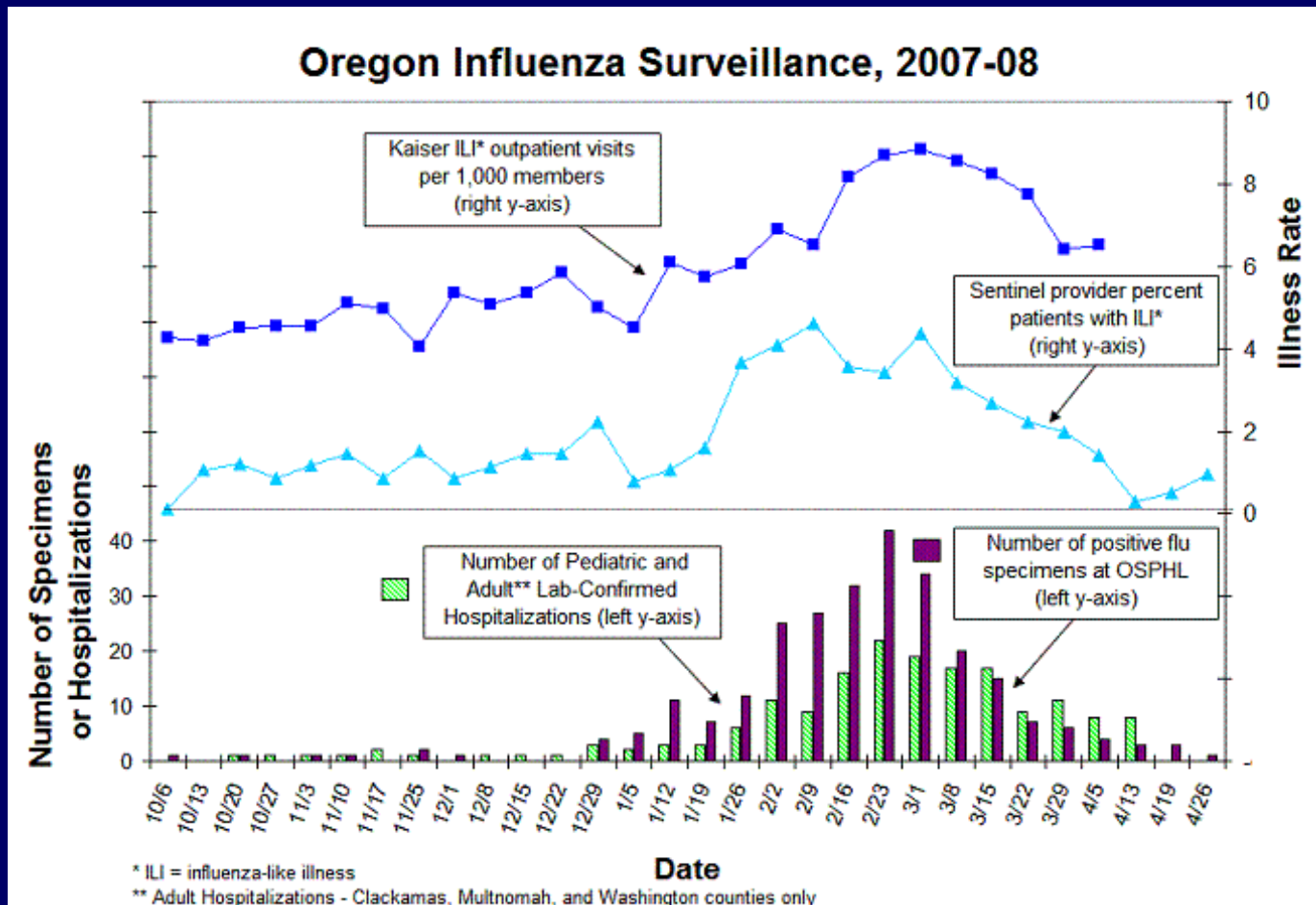
Background: Laboratory Surveillance in Oregon

- Oregon State Public Health Laboratory (OSPHL)
 - Conducts “rule out flu” and viral isolation
 - Types and subtypes by PCR for hemagglutinin, antigenic characterization at CDC
- Combined Oregon Laboratory Surveillance
 - Kaiser, Legacy, Providence and OSPHL
 - Provides weekly respiratory virus results

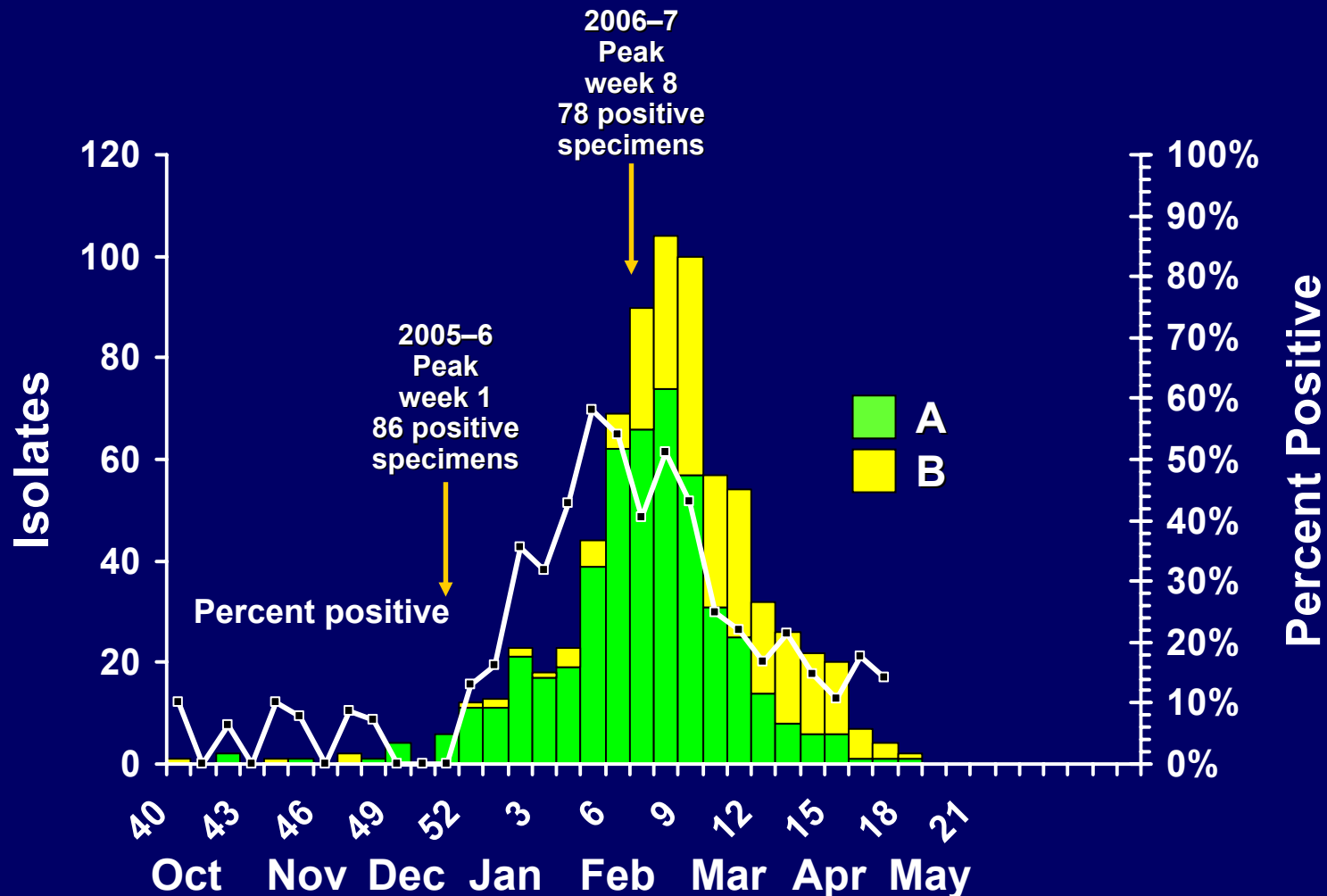
Background: Other Flu Surveillance Systems

- Sentinel Provider ILI Surveillance
 - 19 providers/clinics participating in 2007-8, 90% reporting regularly, (average 14 provider reports each week)
 - Weekly reports of percentage of patients with ILI symptoms
- Hospitalized patients
 - Laboratory-confirmed patients only
 - Pediatric since 2003-4, adults started 2005-6
- Kaiser syndromic surveillance
 - Percentage of patients with ILI seen in ED, outpatient, or hospitalized

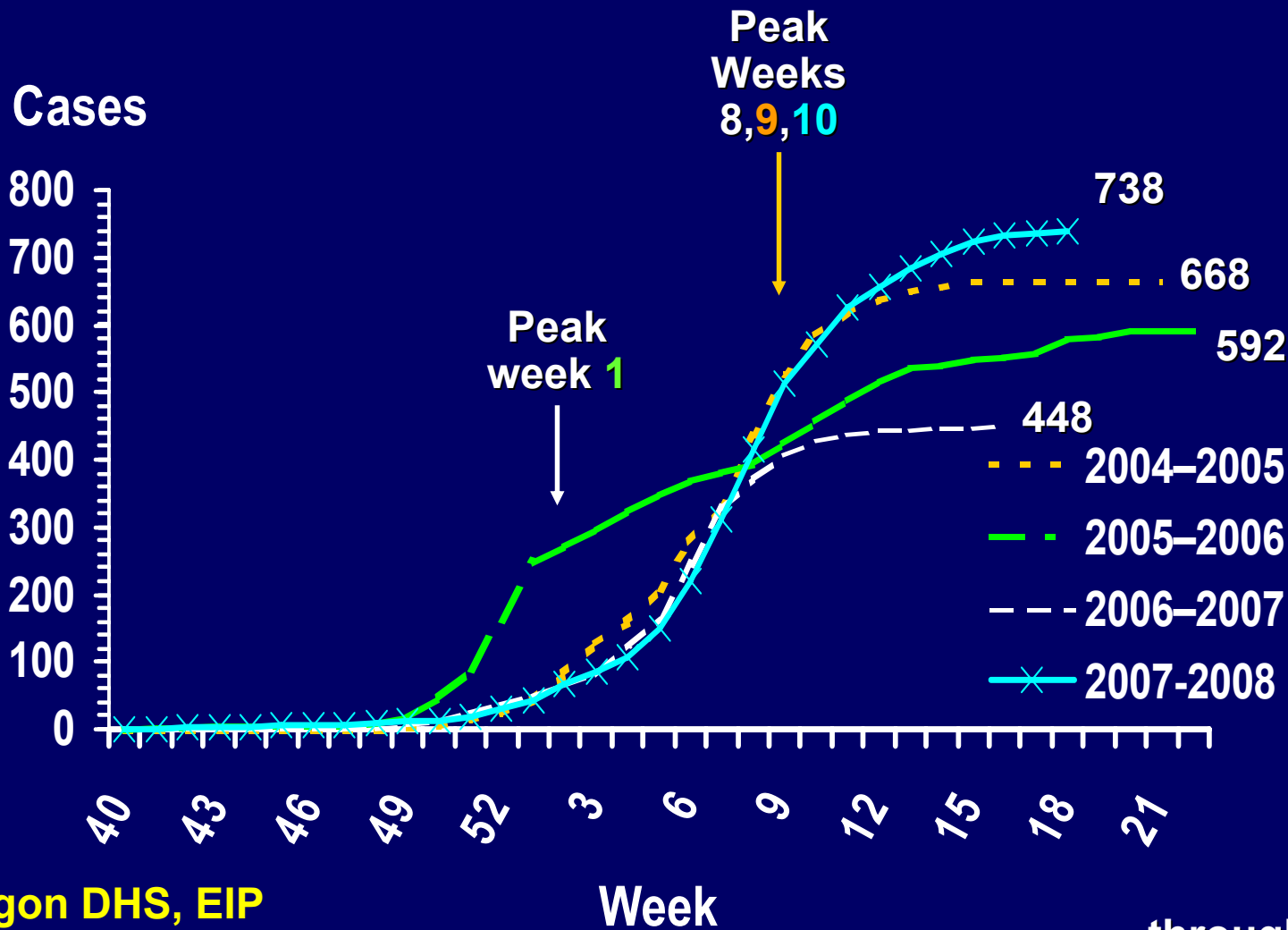
Influenza Surveillance in Oregon 2007-08



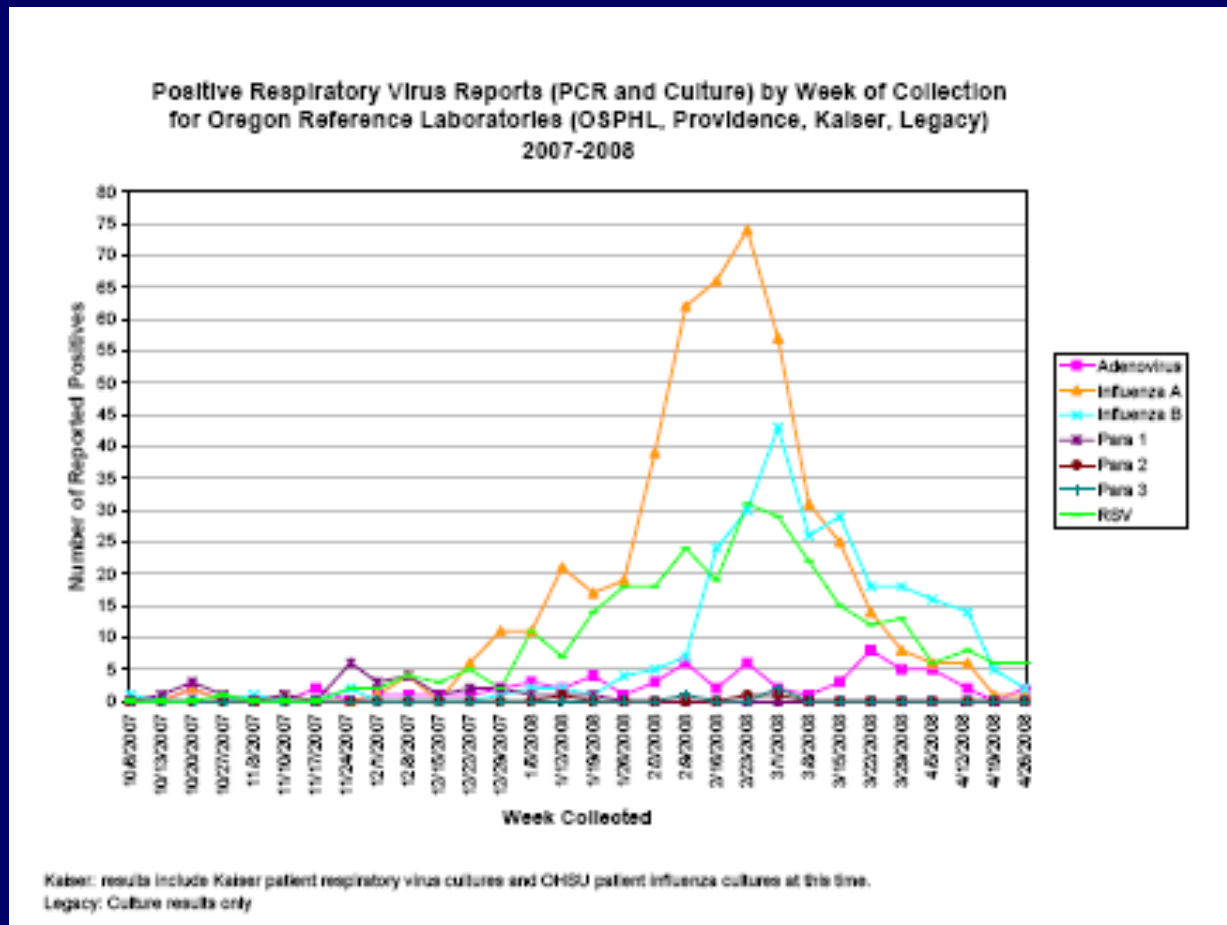
Lab-Confirmed Influenza by Week Oregon Reference Labs, 2007-8



Lab-Confirmed Influenza Oregon Reference Labs, 2004–2008



Respiratory Virus Surveillance Oregon Reference Laboratories, 2007-8



Circulating Influenza Viruses U.S., 2007–2008

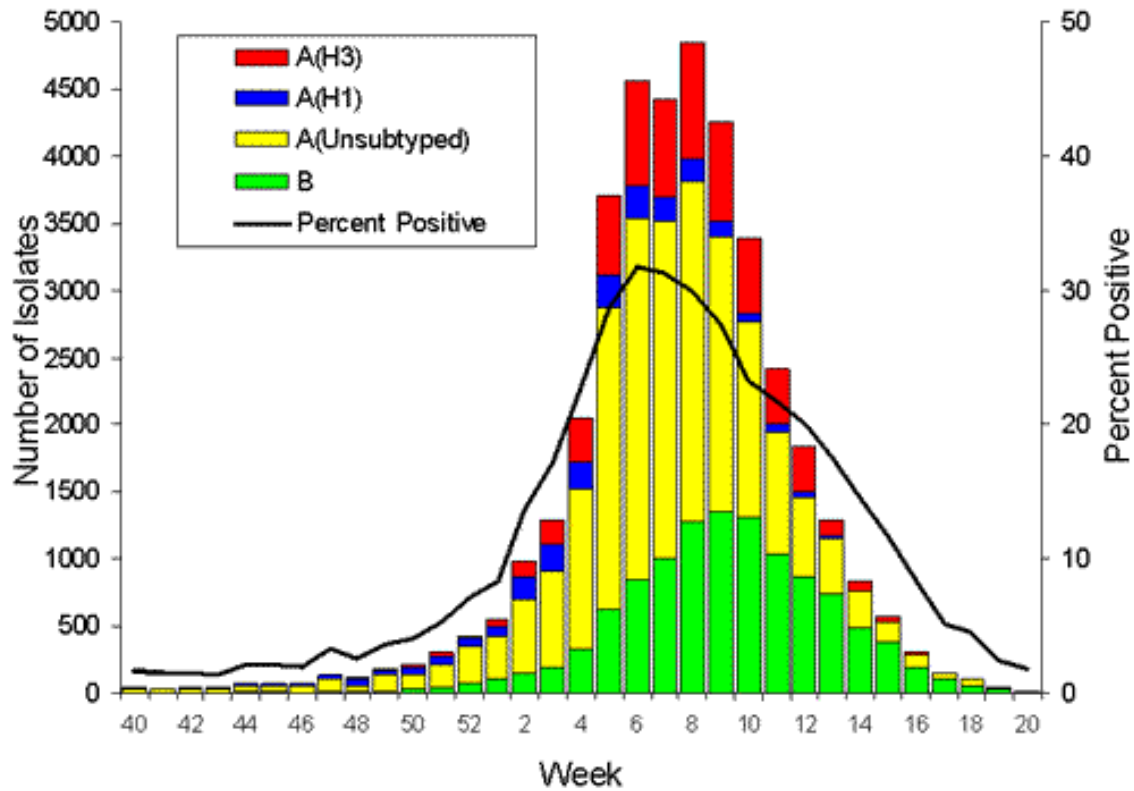
Overall: 71% A, 29% B

- of the A isolates, 74% H3N2

Proportion of isolates matching vaccine strains

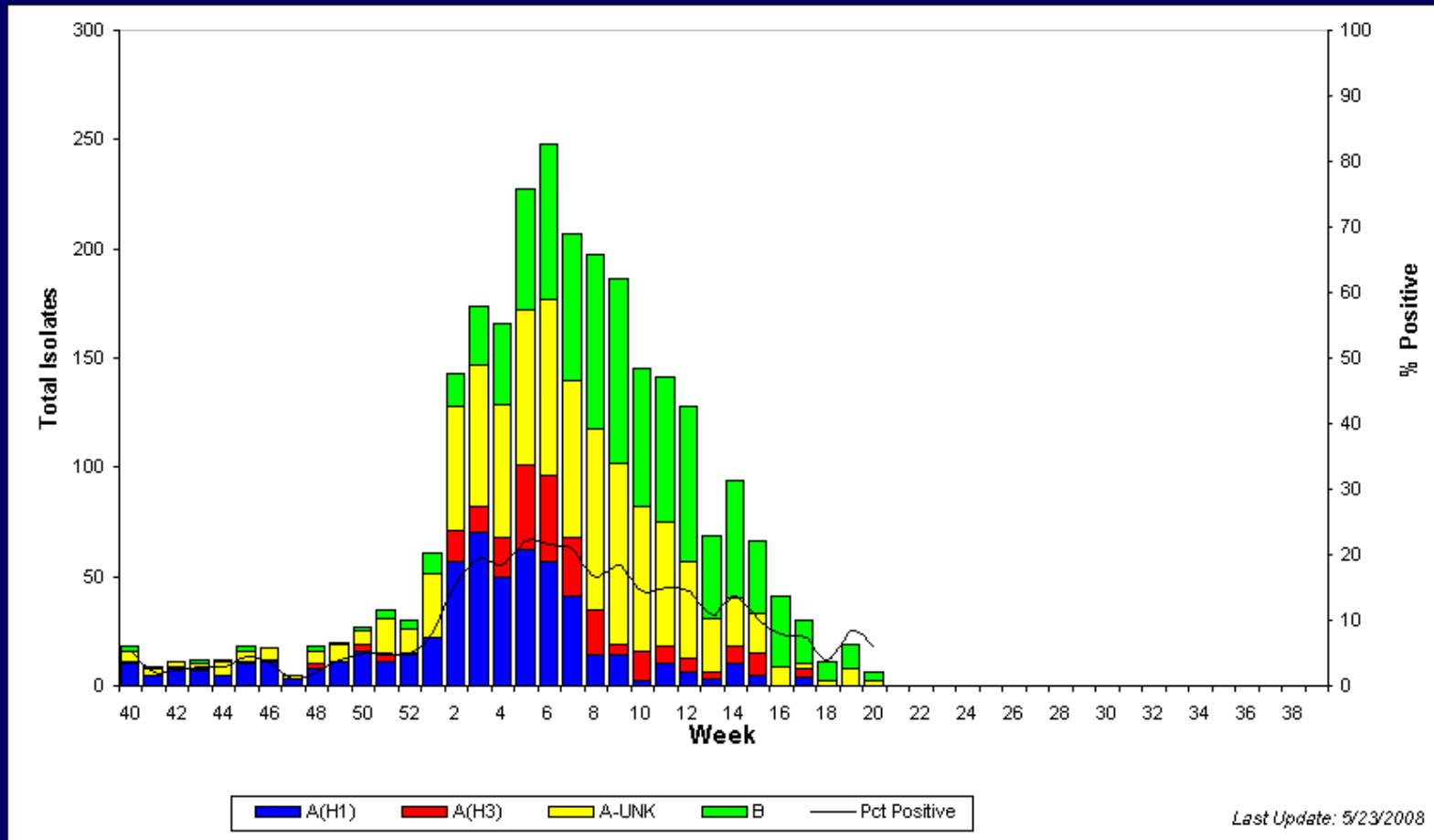
- A (H3N2): 59 (21%) of 280
- A (H1N1): 267 (68%) of 395
- B: 8 (3%) of 272

U.S. WHO/NREVSS Collaborating Laboratories National Summary, 2007-08



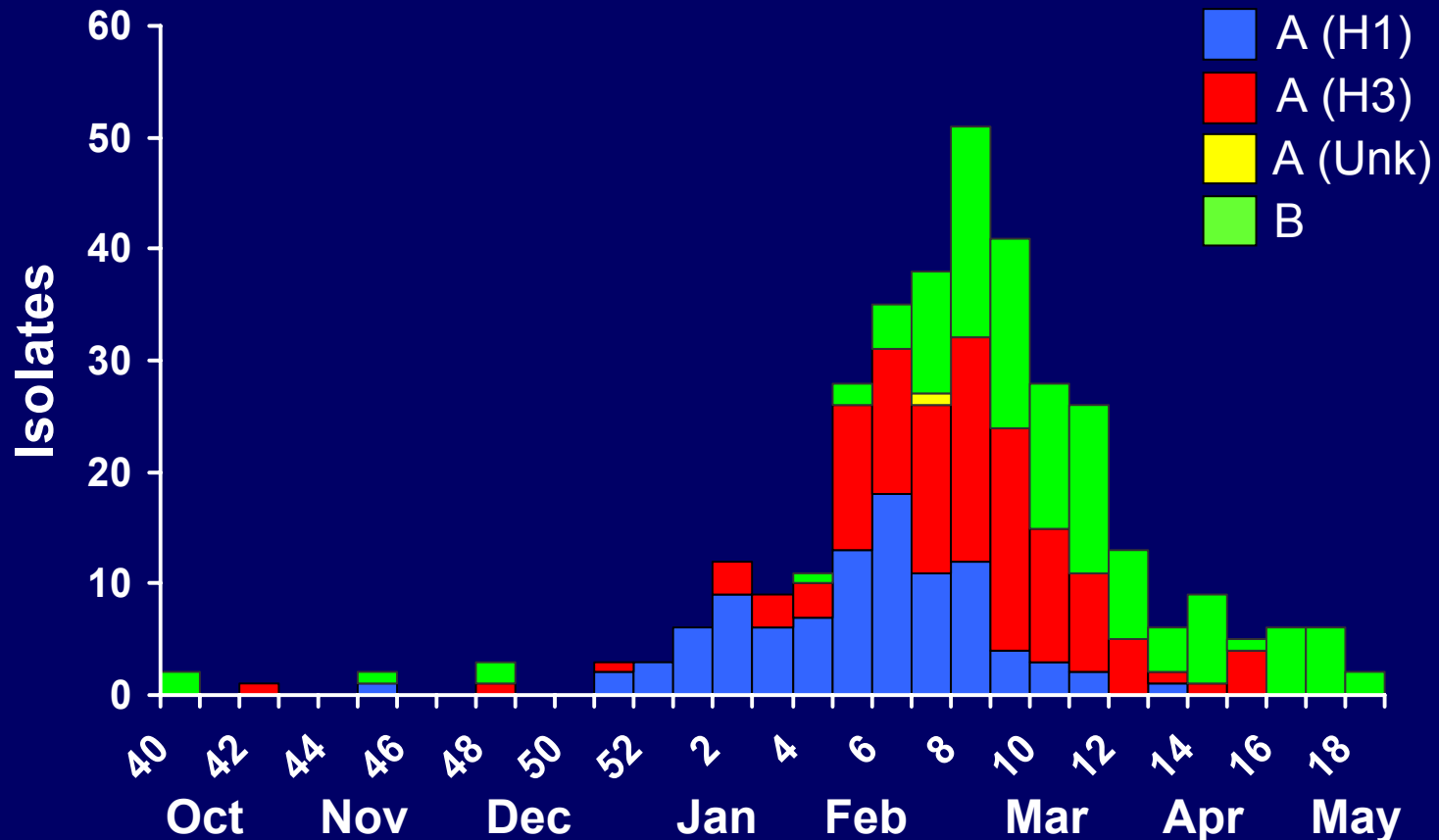
Influenza A (H1) viruses predominated early, until week 4 when A (H3) viruses were isolated more frequently. From week 13 (March 23) through Week 20 (May 17), B viruses predominated.

Influenza Isolates from the Pacific Region WHO/NREVSS Collaborating Laboratories



Mountain and Pacific Regions only two in US where H1 viruses predominated

Influenza Isolate Subtypes by Week—OSPHL, 2007–2008



Influenza Hospitalization Rates*

Age Groups

	< 6 mo	6-23 mo	2-4 yr	5-17 yr	18-49 yr	50-64 yr	≥ 65 yr
2003-04	299.4	114.5	39.3	8.4	—	—	—
2004-05	132.3	35.7	16.0	5.9	—	—	—
2005-06	130.6	40.3	16.8	5.5	3.6	7.8	43.0
2006-07	87.7	32.5	10.3	3.4	2.5	4.4	16.2
2007-08	167.5	43.7	17.9	5.6	7.2	14.7	73.2

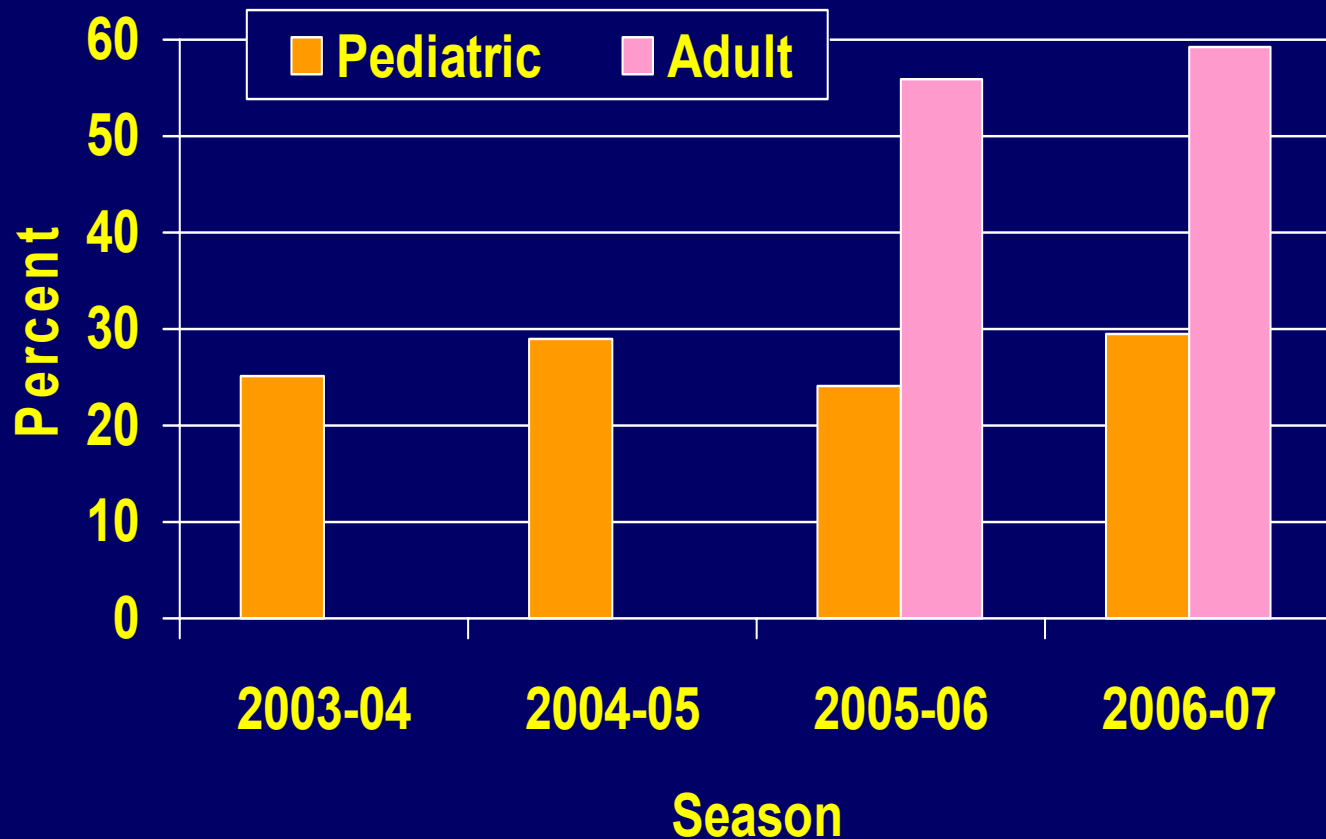
*per 100,000

Data as of 12 May 2008

Influenza Hospitalization Rates Oregon EIP

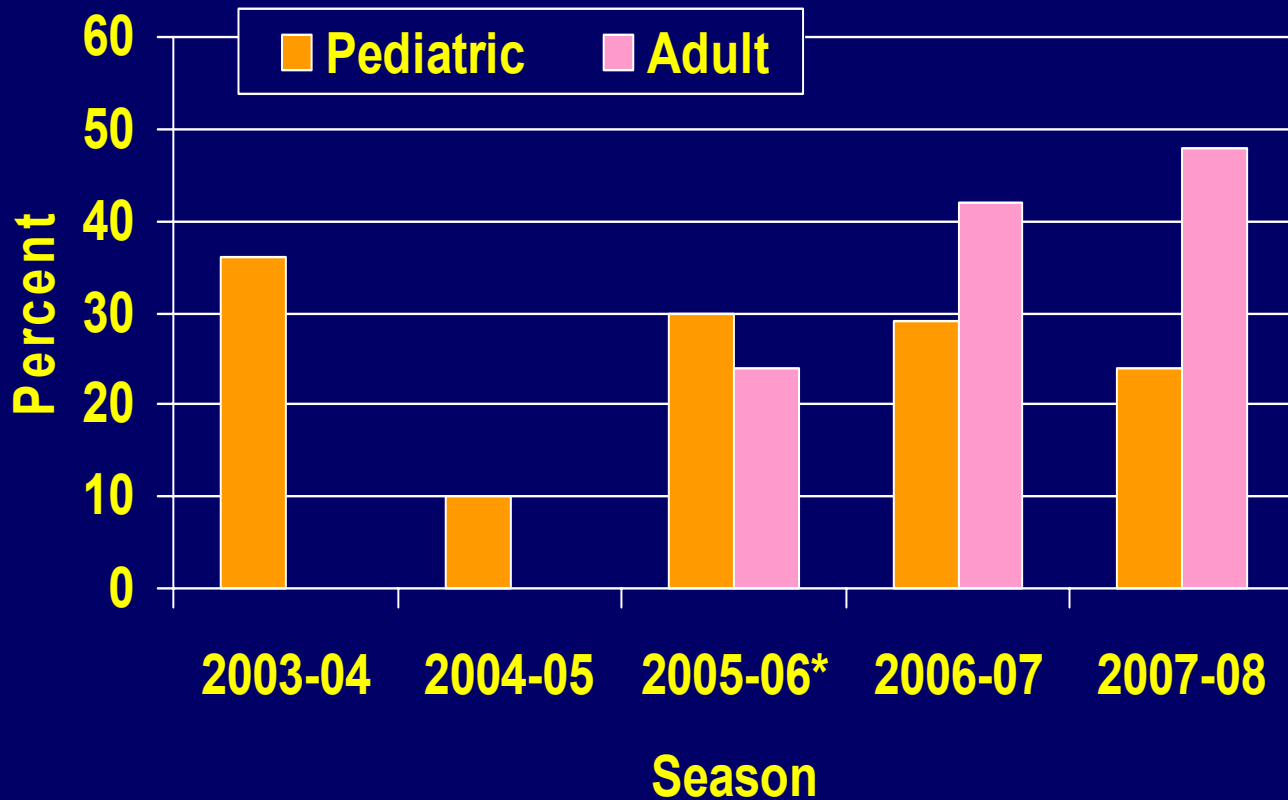
Age Groups	Rate per 100,000								
	<4	5-9	10-17	18-39	40-49	50-59	60-69	70-79	80+
2003-04	59.7	7.5	2.9	-	-	-	-	-	-
2004-05	8.3	9.4	4.1	-	-	-	-	-	-
2005-06	22.0	5.6	3.5	1.8	5.0	3.0	11.1	26.6	56.7
2006-07	23.0	3.8	2.4	1.6	3.3	6.9	6.8	20.0	29.3
2007-08	18.4	1.9	4.1	3.5	5.0	9.5	12.8	35.0	66.5

Received Influenza Vaccine in Current Season, Hospitalized Patients, US

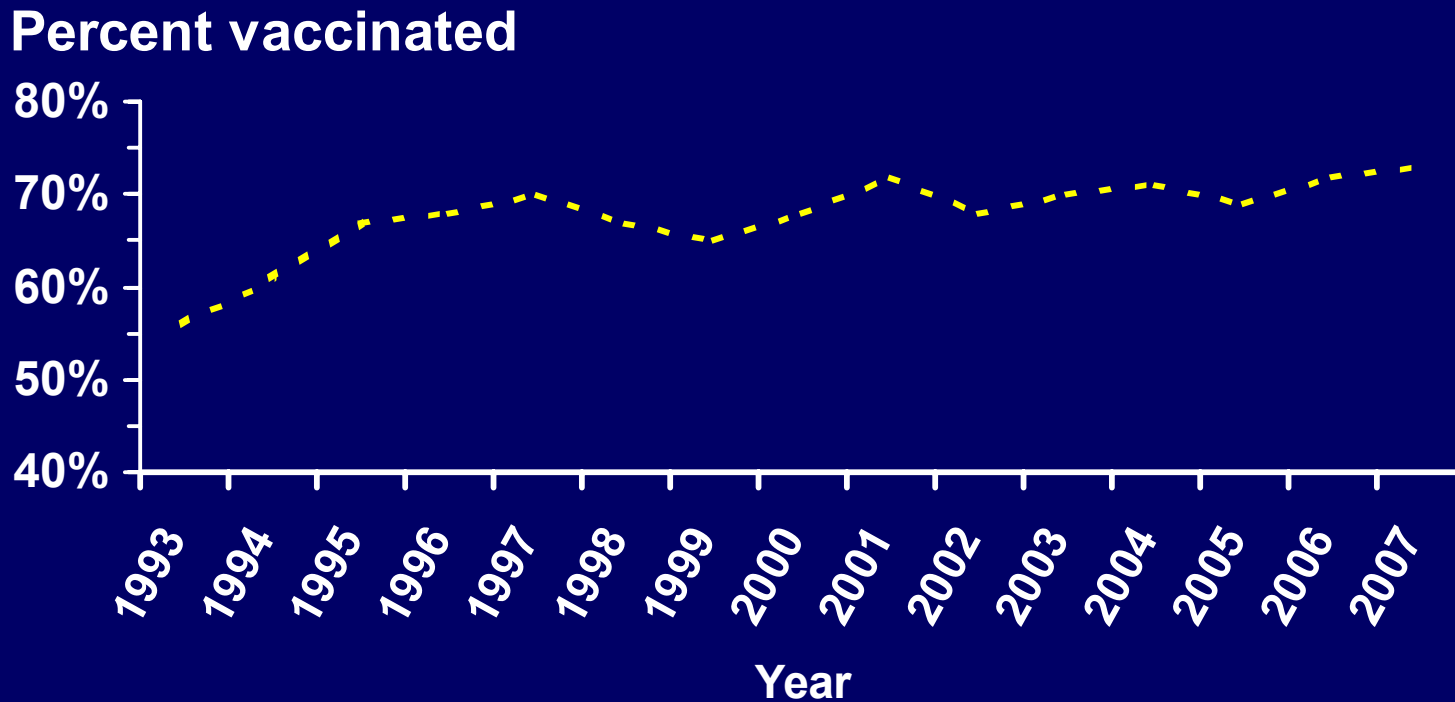


Received Influenza Vaccine* in Current Season, Oregon

EIP Hospitalization Data



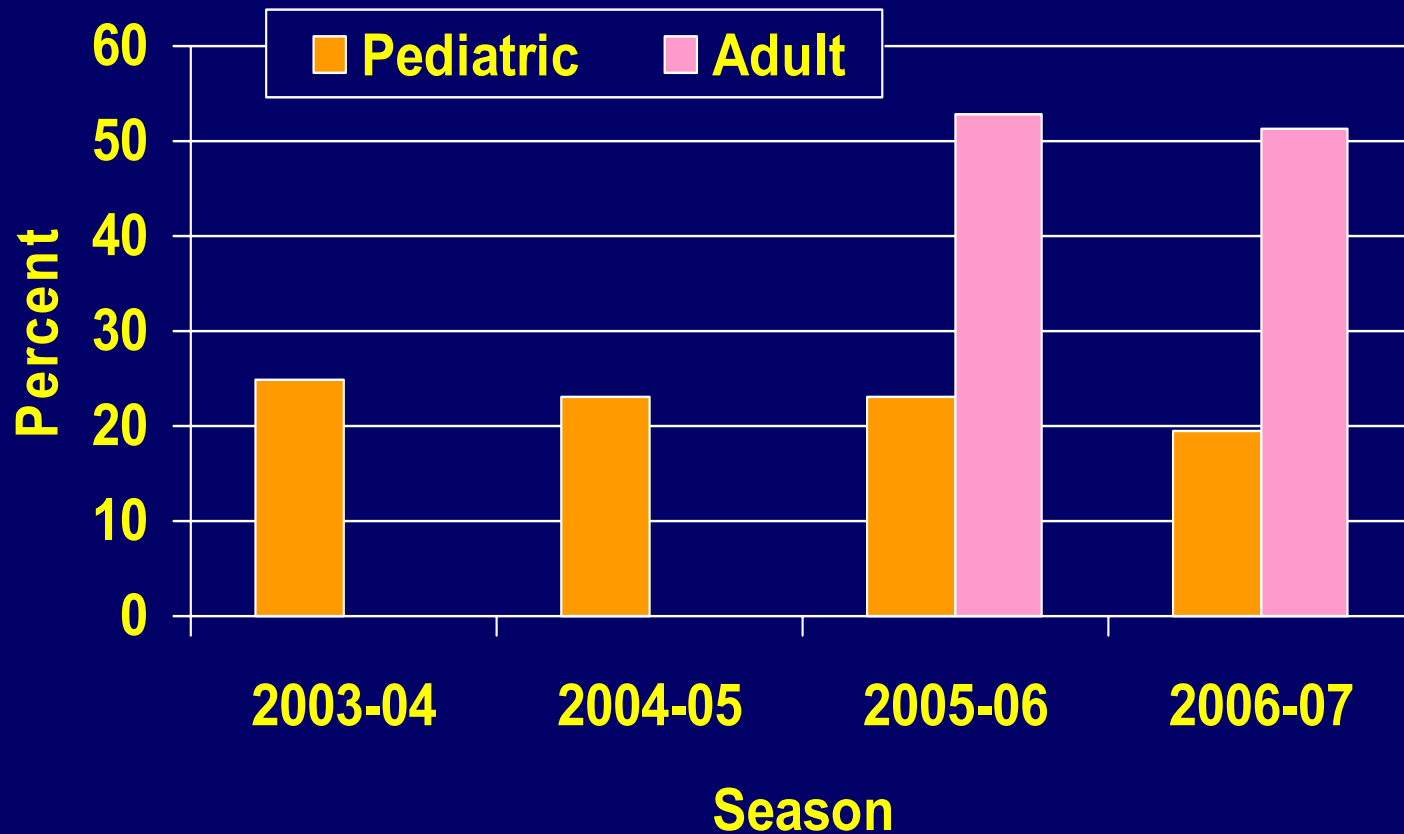
Percent vaccinated Persons ≥ 65 years of age Oregon, 1993–2007 BRFSS



Percent vaccinated 6-23 months, 6-59 months Oregon, Immunization Registry

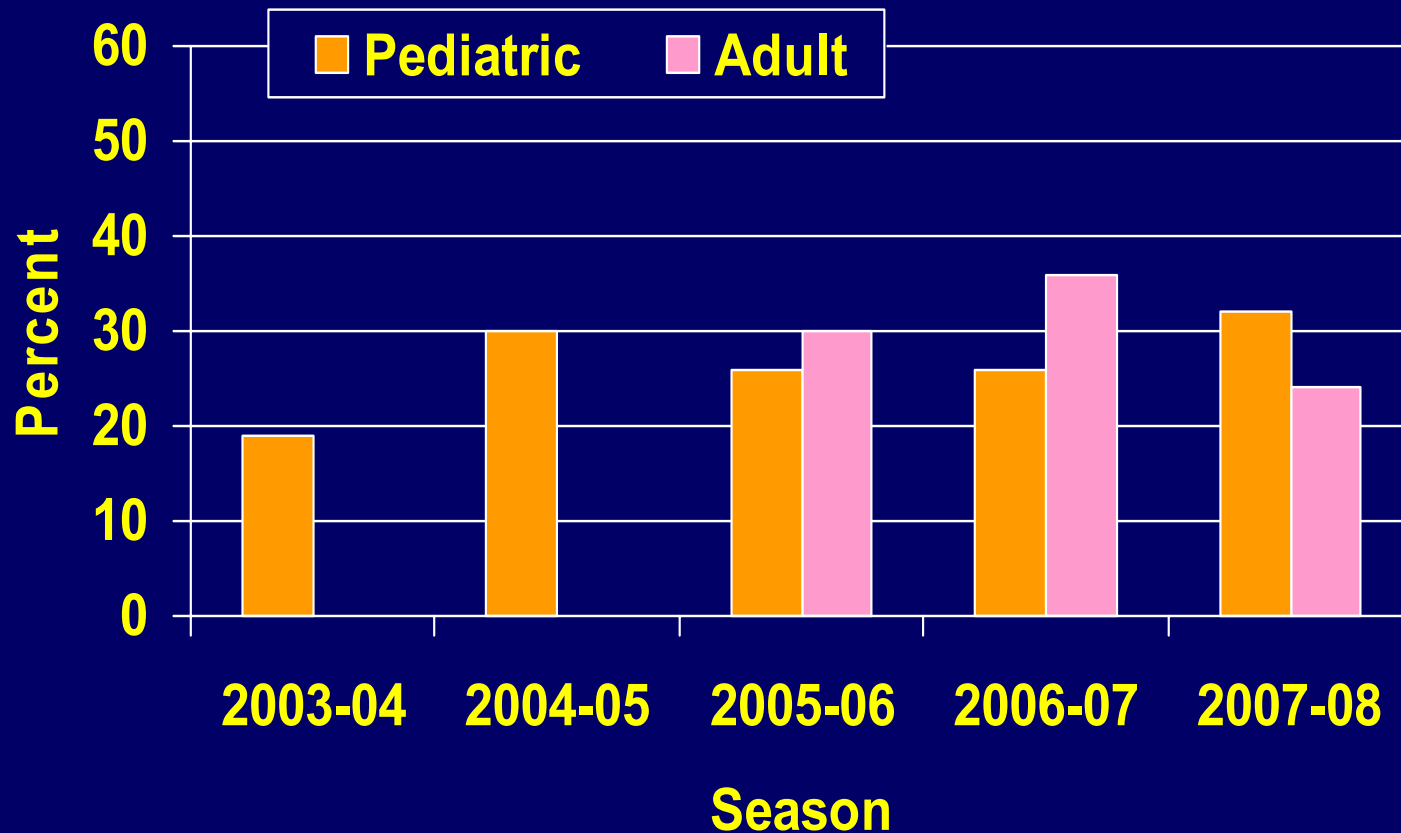
	6-23 months	24-59 months	6-23 months	24-59 months
	Full Vx	Full Vx	Partial Vx	Partial Vx
2004-05	~18%	N/A	~35%	N/A
2005-06	~35%	N/A	~42%	N/A
2006-07	~29%	~18%	~43%	~21%
2007-08	12%		15%	

Received Influenza Antivirals During Hospitalization, US



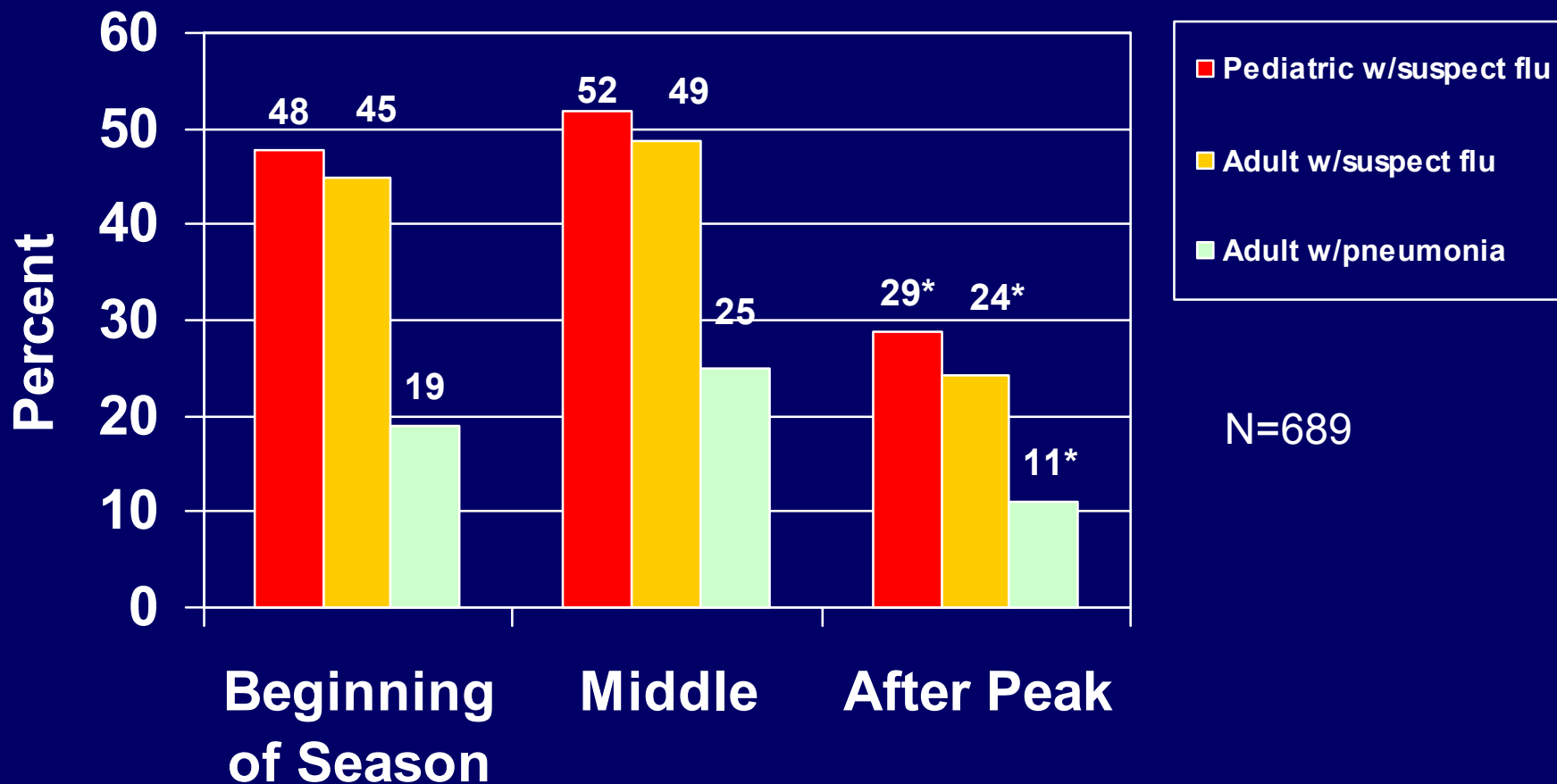
Received Influenza Antivirals* During Hospitalization, Oregon

EIP Hospitalization Data



EIP ED Survey, 2006-7

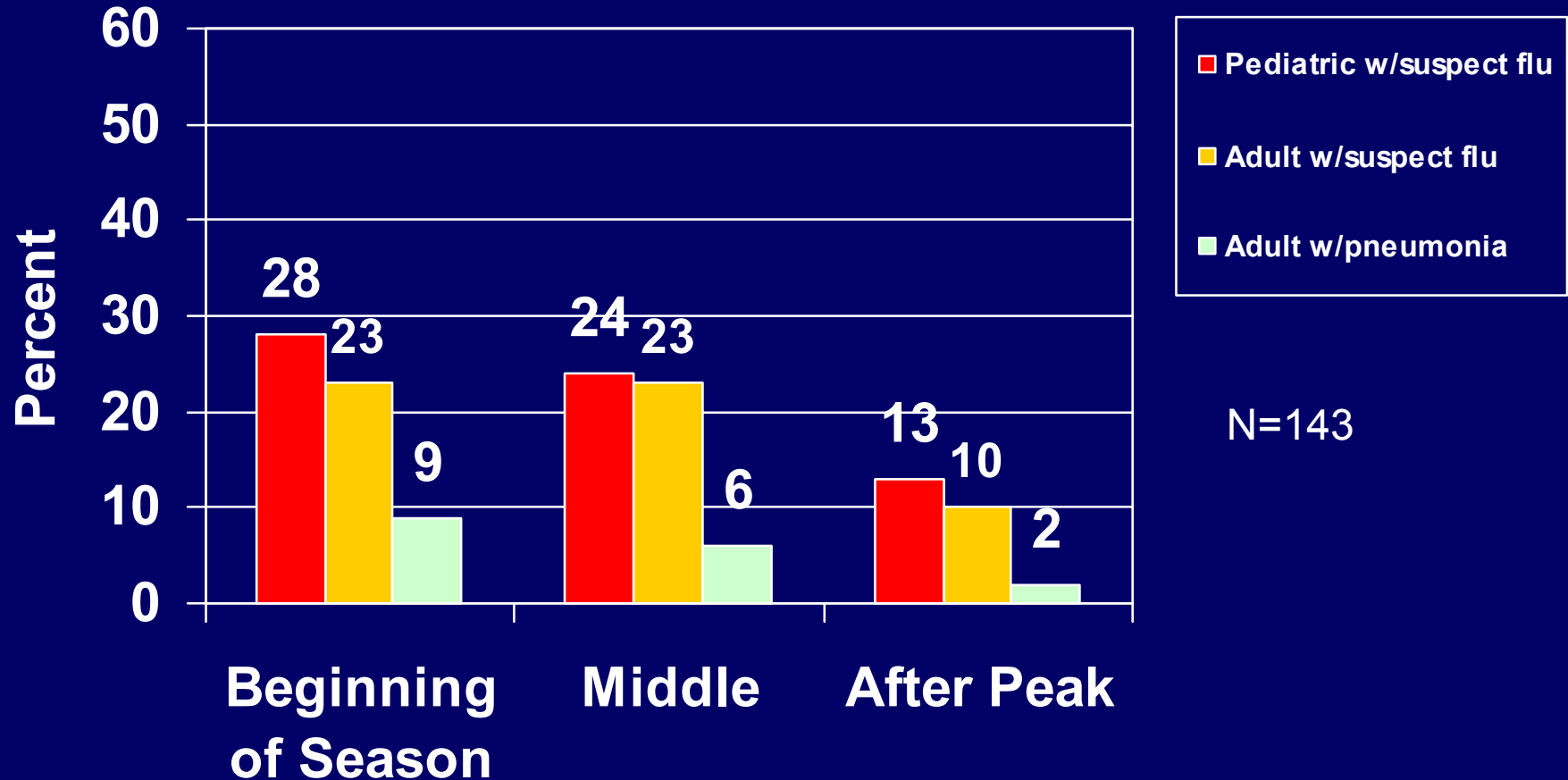
Would “usually” order a rapid test for the following type of patient:



* Statistically significant decrease from mid-season ($p < 0.05$)

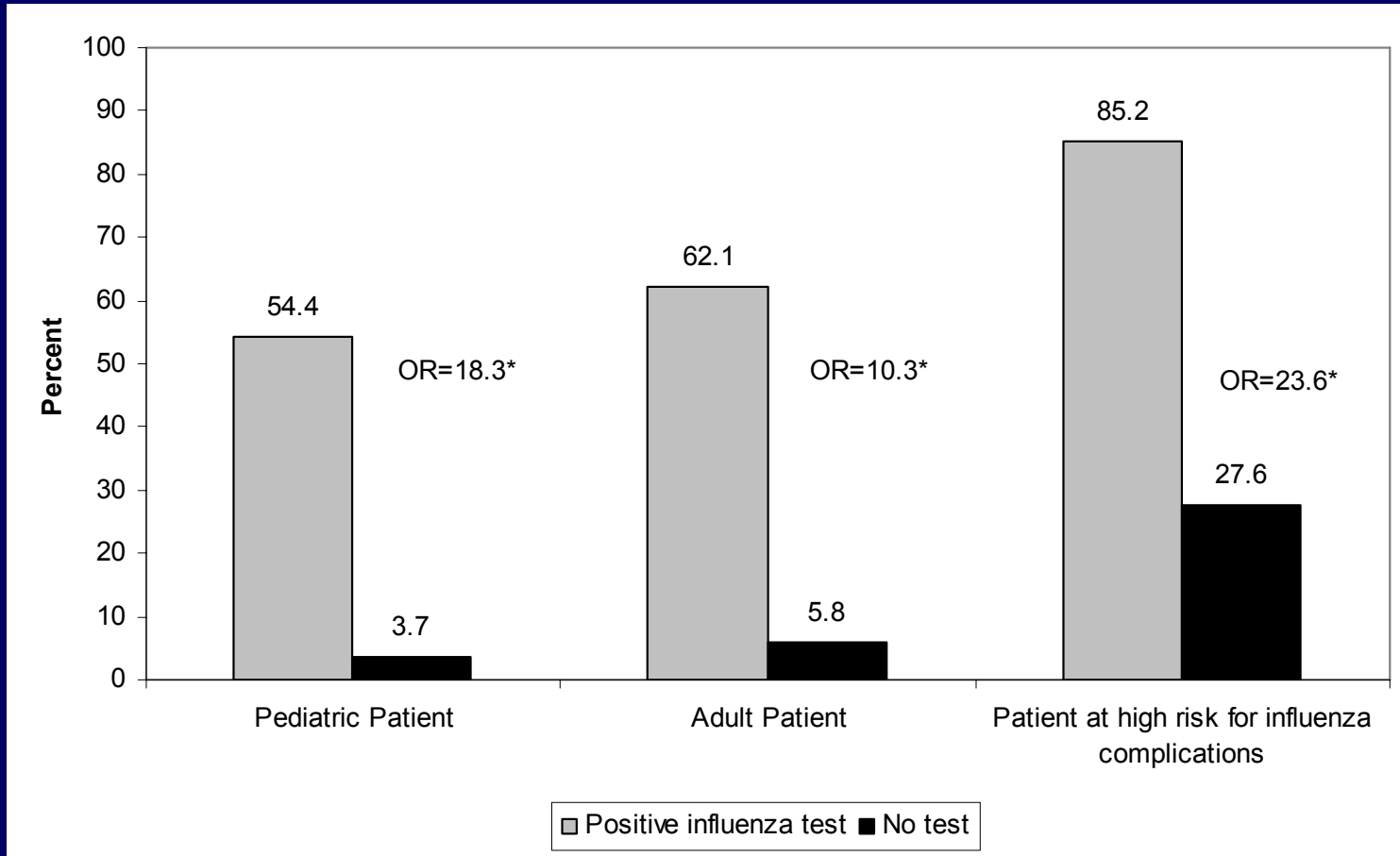
Oregon ED Survey, 2006-7

Would “usually” order a rapid test for the following type of patient:



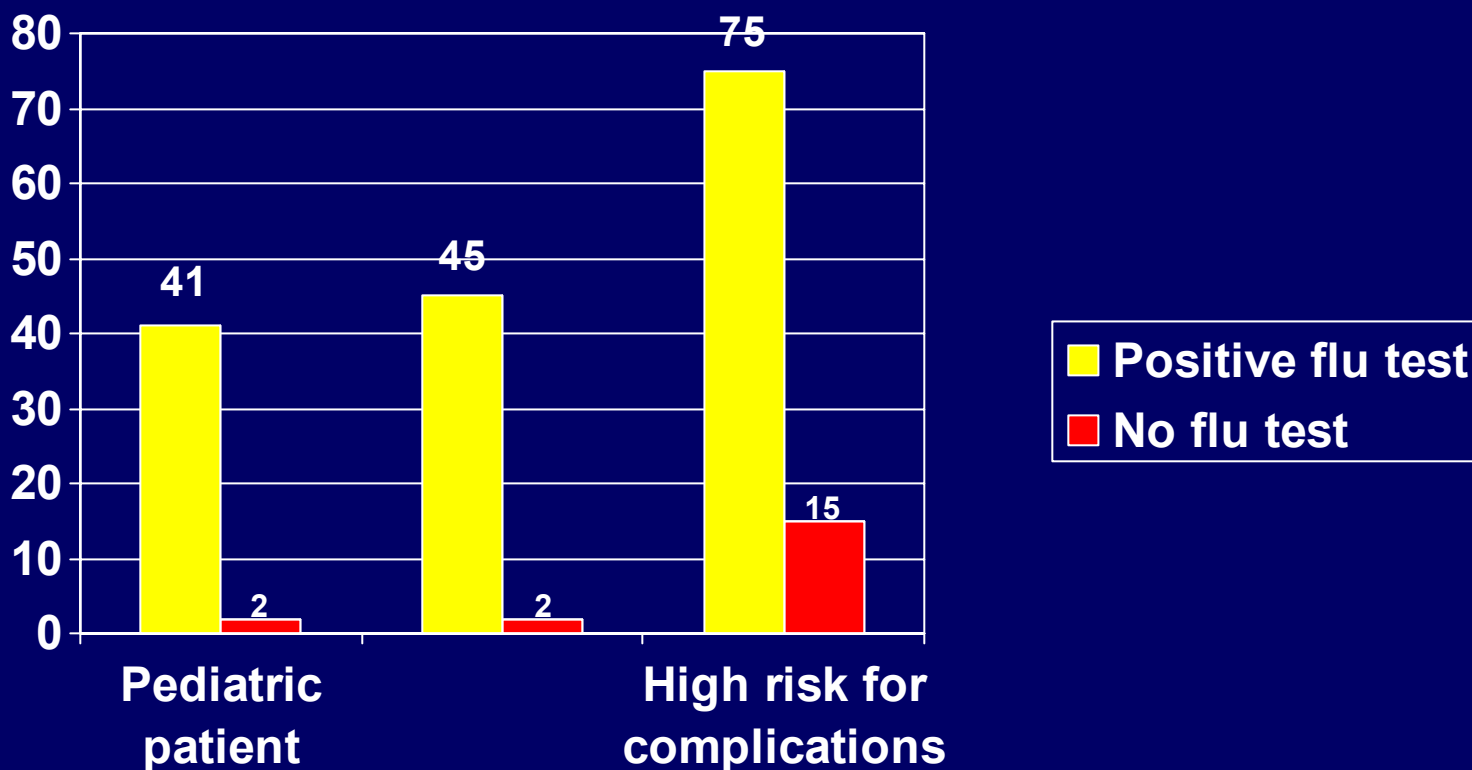
EIP ED Survey, 2006-7

Percent who would "usually" prescribe antivirals to patients presenting within 48 hours of ILI onset



OR ED Survey, 2006-7

Percent who would "usually" prescribe antivirals to patients presenting within 48 hours of ILI onset



Summary—Laboratory and Provider Surveys

- Rapid flu tests widely available, both nationally and in OR
- Clinicians who test for flu more likely to prescribe antivirals
- Oregon clinicians less likely to test (and prescribe antivirals) than rest of country

Vaccine Effectiveness in Preventing Hospitalizations in Children 6-23 Mos

- ACIP recommended annual influenza vaccine for all children aged 6-23 months based on burden of disease in this age group
- Hospitalization rates in this age group similar to those among the elderly
- No past studies of effectiveness of trivalent inactivated vaccine in preventing lab-confirmed hospitalizations in this group

Immunization Status

- Children were considered immunized 14 days after receipt of each dose of TIV
- 2006 ACIP definition
 - 2 doses in current season: if first season being vaccinated
 - 1 dose in current season: if had 1 or more doses last season
- 2007 ACIP definition
 - 2 doses in current season: if first season, or if had 1 dose in last season
 - 1 dose in current season: if had 2 doses in a single prior season

Effectiveness of TIV in Preventing Hospitalization among Children aged 6-23 mo, 2005-06 & 2006-07

Definition of Vx Status	Confounders Adjusted for	Fully Immunized			Partially Immunized		
		VE	p	95% CI	VE	p	95% CI
2006 ACIP Recs	None	67%	0.001	36% to 83%	38%	0.139	-17% to 67%
	Asthma/CLD	72%	<0.001	43% to 86%	30%	0.299	-37% to 64%
	Low birthweight	64%	0.003	30% to 82%	34%	0.212	-27% to 66%
	Asmtha + low birthwt	71%	0.001	39% to 86%	28%	0.356	-43% to 63%
2007 ACIP Recs	None	74%	<0.001	44% to 88%	39%	0.099	-10% to 66%
	Asthma/CLD	77%	<0.001	49% to 90%	34%	0.176	-21% to 64%
	Low birthweight	72%	0.001	39% to 87%	35%	0.189	-22% to 63%
	Asmtha + low birthwt	77%	0.001	47% to 90%	30%	0.267	-31% to 62%

What's Next for EIP Influenza Activity

- Finish up pediatric study
 - Finish up 3rd season of data, look at data up to age 59 months
- Adult vaccine effectiveness
 - Many previous studies of TIV, but only 1 study looking at lab-confirmed hospitalizations in pts 50-64 yrs, none in > 65
 - Focus on community-dwelling elderly, try to do extreme elderly

What's Next for EIP Influenza Activity

- Closer look at etiology of influenza-associated pneumonia cases (MRSA co-infections)
- Efficacy of antivirals in preventing severe sequelae
- Push to increase testing and use of antivirals

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