



**COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC HEALTH
IMMUNIZATION PROGRAM
2008-2009 INFLUENZA CAMPAIGN REPORT
AUGUST 2009**

Background

During the winter months of 1990-1999, influenza caused an average of 36,000 deaths in the United States each year.¹ During influenza epidemics there is a twofold to fivefold increase in hospitalization rates in the elderly and persons with chronic medical conditions.² The elderly and very young children are at greater risk of serious illness and/or death. In 2003 influenza-related pediatric deaths became reportable in Los Angeles County (LAC). Since 2003 there has been at least one pediatric death and 22 pediatric intensive care cases occurring each influenza season, with as many as seven deaths reported during the 2005-2006 season and 48 intensive care cases during the 2003-2004 season.³ On average, 5% to 20% of the United States population becomes sick with influenza each year.⁴ The most effective way of preventing illness due to influenza is to get vaccinated.¹ To lessen the impact of influenza, the Advisory Committee on Immunization Practices (ACIP) recommends that persons at risk for complications due to influenza be vaccinated each year.¹ The California Health and Safety Code Section 104900 mandates that publicly funded vaccine be made available to these high-risk persons, with priority given to all persons 60 years of age and older.

Vaccination Recommendations for the 2008-2009 Influenza Season

- ACIP recommendations¹
 - Adults aged 50 years and older.
 - All children aged 6-59 months; if feasible, all children aged 6 months – 18 years.
 - Residents of nursing homes and other chronic care facilities.
 - All persons with chronic health conditions (e.g. cardiovascular disease, asthma, pulmonary disease).
 - All persons who required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases, renal dysfunction, hemoglobinopathies, or immunosuppression.
 - Children and adolescents receiving long-term aspirin therapy.
 - Pregnant women in their second or third trimester.
 - Health-care workers.
 - Household contacts of persons in high risk groups.
 - Close contacts of children aged 0-59 months.

- LAC Department of Public Health (DPH) recommendations
 - All LAC-DPH recommendations for the 2008-2009 Influenza Campaign were the same as ACIP recommendations.

Influenza Campaign

- Publicly funded influenza vaccine from the California Department of Public Health and vaccine purchased by LAC are distributed by the Los Angeles County Immunization Program (LACIP) to public clinics, community and free clinics, and private providers who agree to hold public clinics. All other healthcare providers must purchase vaccine directly from the vaccine manufacturer for their patients and these data are not available.

- In addition to injectable vaccine LAC distributed intranasal influenza vaccine. Intranasal vaccine is licensed for use only in healthy persons aged 2 to 49 years.
- Participating healthcare providers immunize high-risk persons either in their clinic or during outreach programs (i.e., non-healthcare settings).
- Vaccine availability, the number of high-risk patients served by the provider, and the number of doses of vaccine used by the provider in previous years determine the amount of influenza vaccine each healthcare provider receives from LACIP.

Methods

Collected Data

- Vaccine accountability forms are distributed to each healthcare provider administering publicly funded vaccine in order to collect the following information:
 - Healthcare provider name and locating information.
 - Whether vaccine was administered at the in-house clinic or as an outreach activity.
 - Date of vaccine administration.
 - Age and ethnicity of vaccine recipient for every dose administered.
- Accountability forms have the healthcare provider's name pre-printed on them before distribution.
- Accountability forms are submitted weekly by in-house clinics; outreach clinics submit accountability forms at the conclusion of the clinic.

Exclusion criteria

- The 2008-2009 Influenza Campaign began October 20, 2008. Providers continued to administer the influenza vaccine until the supply was depleted or the vaccine expired.
- Data for this report were collected through June 12, 2009.
- Accountability forms submitted by providers not directly supplied with vaccine by LACIP were excluded.

Data Analysis

- Number of doses administered at the influenza clinics, by race/ethnicity and age of the recipients.
- Number of doses administered by type of provider: Community Health Provider (community and free clinics and other private providers who agree to hold public vaccine clinics), Personal Health Center, and Public Health Center.
- Number of doses administered in each Service Planning Area (SPA).

Results

The results are grouped into three categories:

- I. Vaccine Administration – Overall Summary & Trends by Provider Type.
- II. Vaccine Administration – Demographic Stratified Summary & Trends.
- III. 2008-2009 Influenza Campaign Results.

I. Vaccine Administration – Overall Summary & Trends by Provider Type.

Table 1. Influenza vaccine doses administered, Los Angeles County, by provider type and campaign year.

Provider Type	Influenza Campaign Years									
	2004-2005		2005-2006		2006-2007		2007-2008		2008-2009	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Community Health Provider	20,199	(17.5)	43,215	(32.8)	41,038	(32.7)	53,189	(42.0)	45,854	(34.5)
							5,695 ¹		3,432 ¹	
Personal Health Center	1,698	(1.5)	8,496	(6.5)	10,614	(8.5)	5,821	(4.6)	6,422	(4.8)
							39 ¹		39 ¹	
Public Health Center ²	68,685	(59.6)	75,659	(57.5)	70,288	(56.0)	67,517	(53.4)	80,590	(60.7)
							598 ¹		5,544 ¹	
In-house	27,362		16,852		17,290		16,705		18,495	
							195 ¹		1,014 ¹	
Outreach	41,323		58,807		52,998		50,812		62,095	
							403 ¹		4,530 ¹	
Skilled Nursing Facility	20,499	(17.8)	0 ³	(0)	0 ³	(0)	0 ³	(0)	0 ³	(0)
Other ⁴	4,235	(3.7)	4,260	(3.2)	3,639	(2.9)	0	(0)	0	(0)
Total	115,316	(100)⁵	131,630	(100)⁵	125,579	(100)⁵	126,527	(100)⁵	132,866	(100)⁵

¹Intranasal vaccine doses administered.

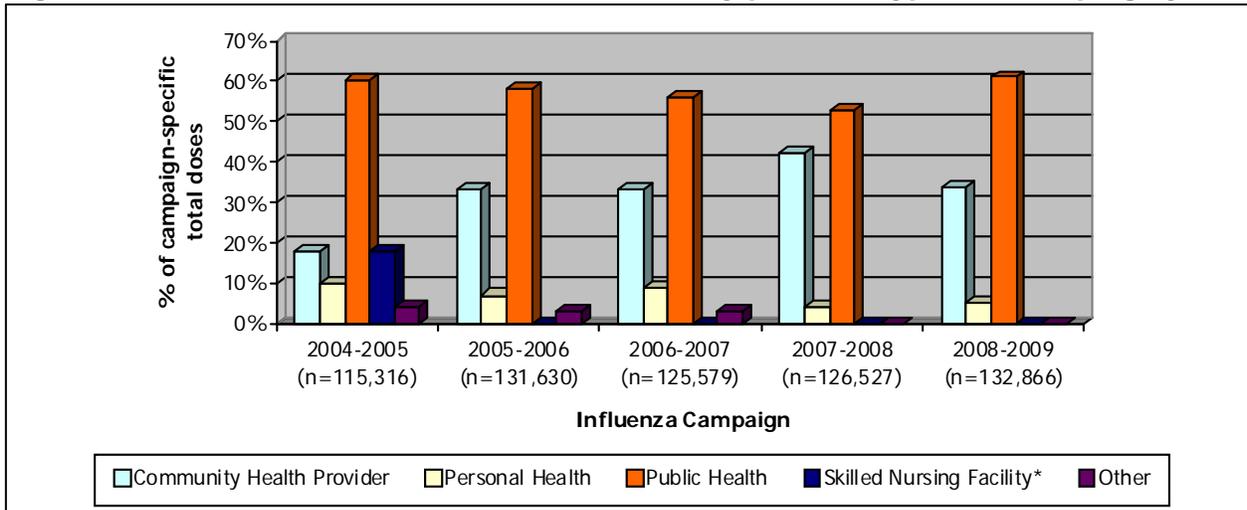
²Includes outreach clinics.

³Publicly-funded vaccine was no longer provided to skilled nursing facilities starting the 2005-2006 Influenza Campaign.

⁴Includes prisons, fire departments, rehabilitation centers, churches, hospitals, and other non-Los Angeles County Health agencies.

⁵Percentages may not add up to 100 due to rounding approximation.

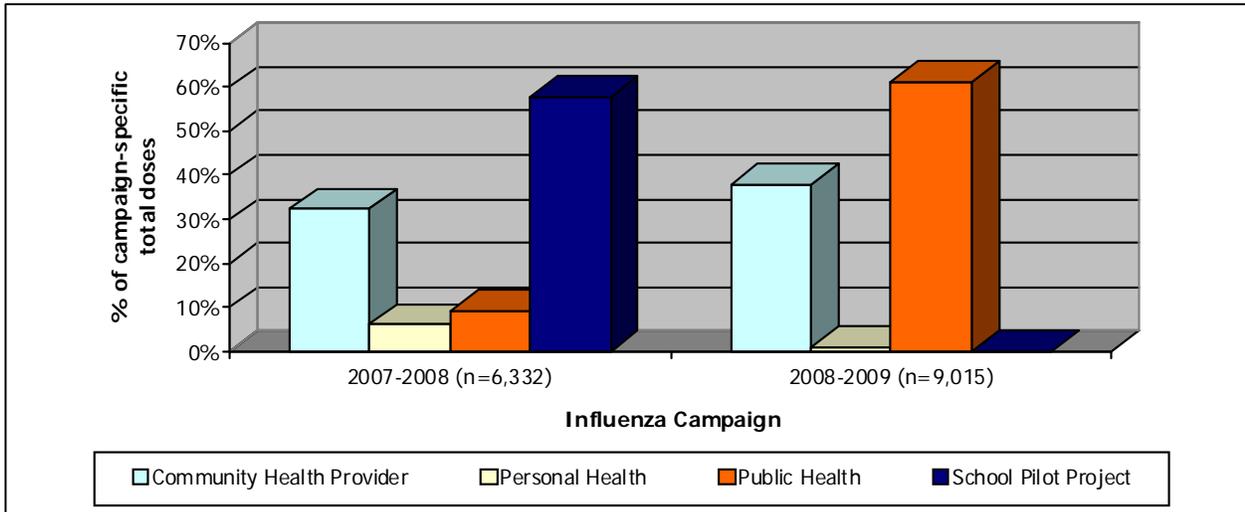
Figure 1a. Administration of influenza vaccine, by provider type and campaign year.



*Publicly-funded vaccine was no longer provided to skilled nursing facilities starting the 2005-2006 Influenza Campaign.

There was a modest increase in total doses administered during the 2008-2009 Influenza Campaign, compared to the 2007-2008 Influenza Campaign. Except for the 2004-2005 campaign, the total doses administered during the 2008-2009 campaign does not differ much from the previous campaigns. In all five campaigns Public Health providers administered the largest proportion of the vaccine (range: 53%-61%). The proportion of doses administered by Community Health providers during the 2007-2008 campaign was slightly higher than all other campaigns due to an intranasal vaccine school pilot project implemented that flu season.

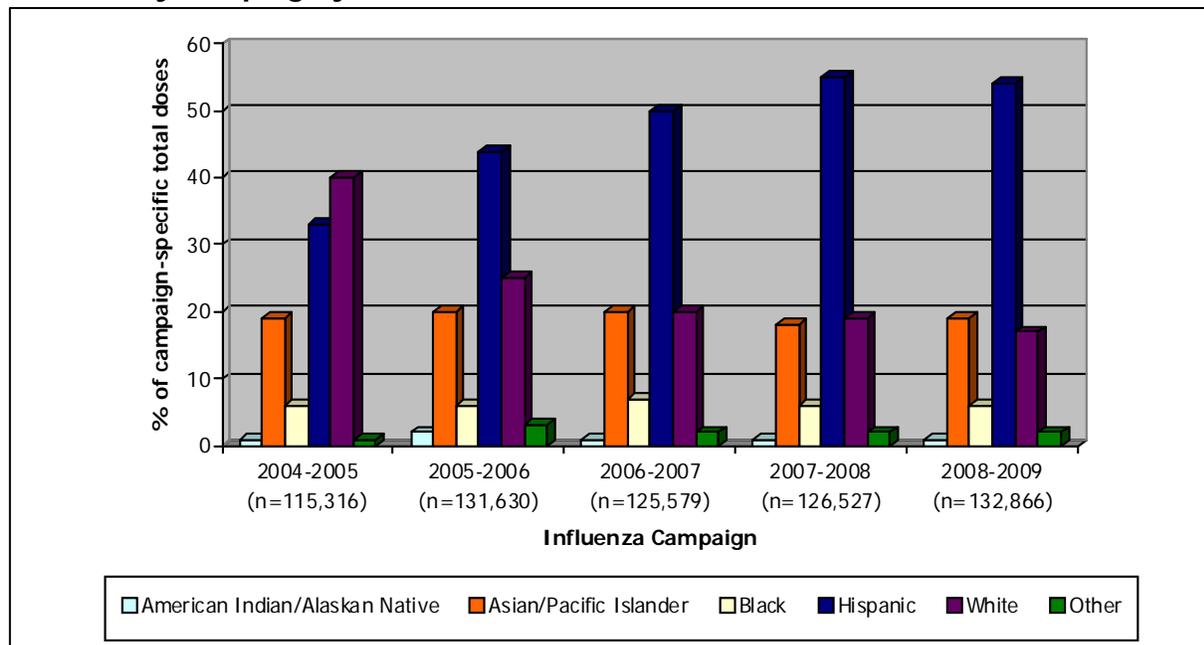
Figure 1b. Administration of intranasal influenza vaccine, by provider type and campaign year.



Over 9,000 doses of intranasal vaccine were administered during the 2008-2009 Influenza Campaign, an increase of 42% from the 2007-2008 campaign. The proportion of intranasal influenza vaccine administered by each provider type also changed considerably from the 2007-2008 campaign. With the absence of a school pilot project during the 2008-2009 campaign, the majority of doses were administered by Public Health (68%) and Community Health providers (38%).

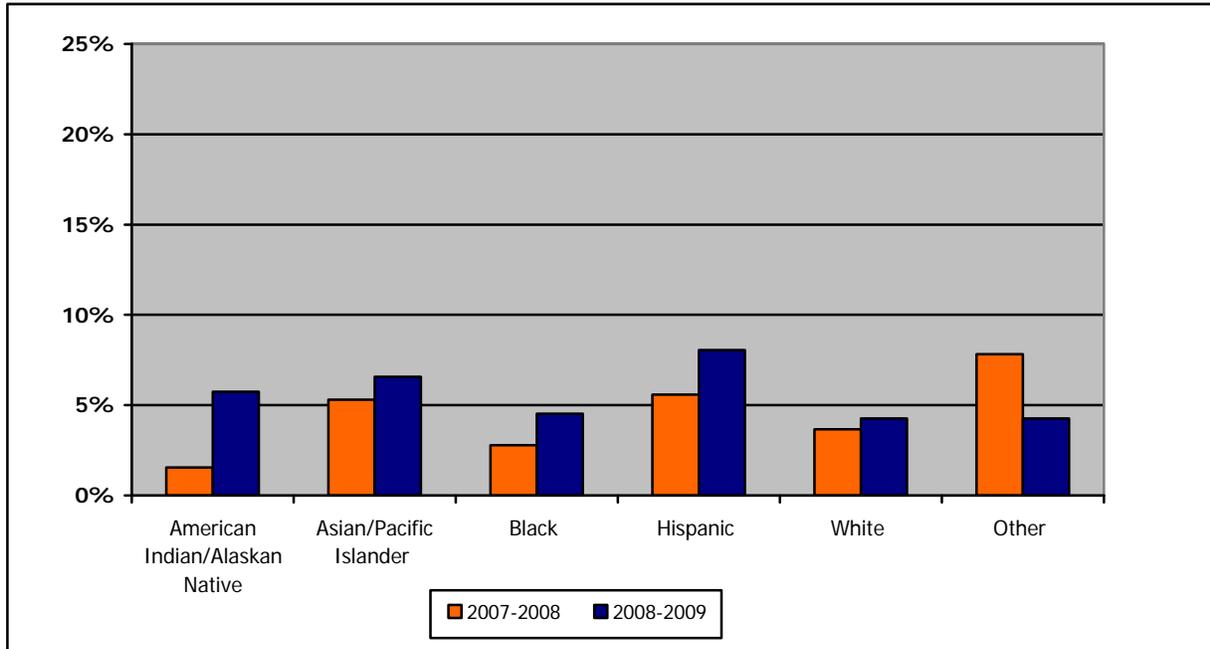
II. Vaccine Administration – Demographic Stratified Summary & Trends.

Figure 2a. Ethnic distribution of persons receiving publicly funded influenza vaccine, by campaign year.



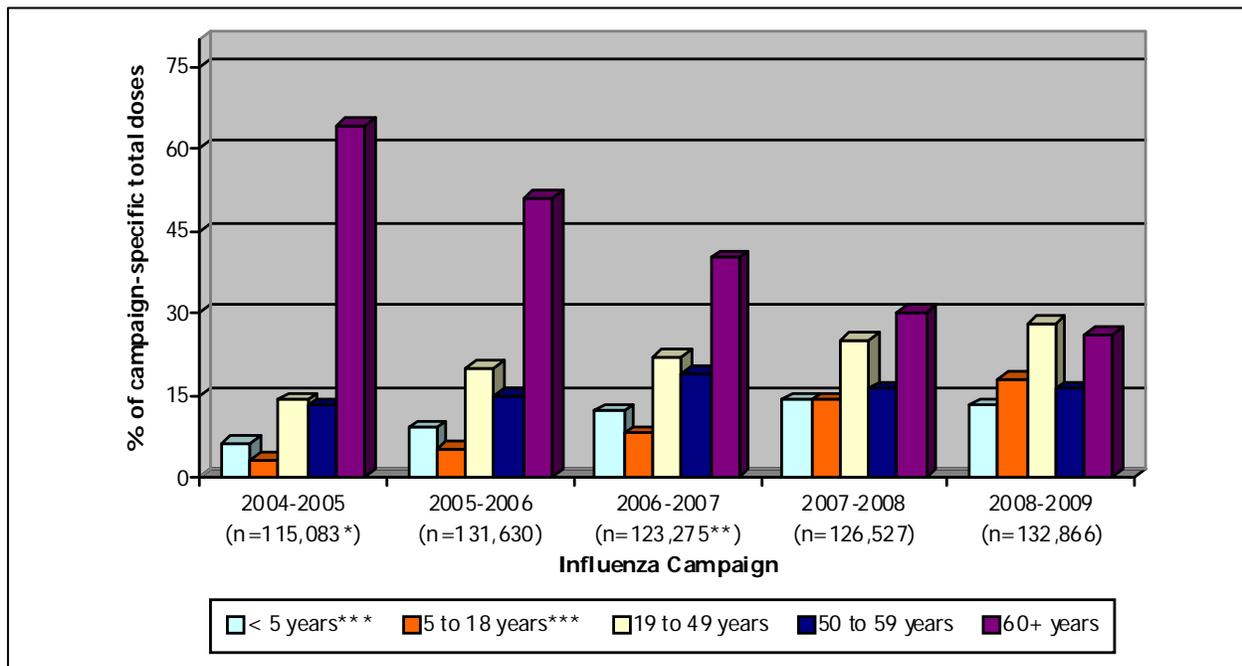
During the 2004-2005 Influenza Campaign, the largest proportion of the vaccine was administered to White clinic/outreach attendees (45,782 doses [40%]). During the 2004-2005 Influenza Campaign a vaccine shortage resulted in the administration of vaccine targeting persons at high risk for serious illness or death due to influenza. Consequently, a greater number of persons aged 60 years and older were vaccinated. In 2004, Whites made up 49% of the elderly population in LAC, which explains why they accounted for the largest proportion of persons vaccinated in 2004-2005. During the 2005-2006, 2006-2007, 2007-2008, and 2008-2009 campaigns, a larger proportion of the vaccine was administered to Hispanics (58,528 doses [44%], 61,204 [50%], 68,990 [55%], and 71,756 [54%], respectively), compared to Whites (32,802 doses [25%], 24,213 [20%], 23,481 [19%], and 22,660 [17%] respectively). Approximately the same proportions of influenza vaccine have been administered to Asian/Pacific Islanders (APIs) and Blacks in each campaign (18%-20% and 6%-7%, respectively).

Figure 2b. Proportion of intranasal influenza vaccine administered, by race/ethnicity and campaign year.



Although in the 2008-2009 campaign the proportion of intranasal vaccines of the total vaccines administered increased from the 2007-2008 campaign, the proportion remained below 10% for each race/ethnic group. In the 2008-2009 campaign, nearly 8% of Hispanics received intranasal vaccine. Over 6% of APIs received intranasal vaccine. Whites and persons classified as 'other' had the lowest proportion of persons receiving the influenza vaccine (both at 4.3%).

Figure 3a. Age distribution of persons receiving publicly funded influenza vaccine, by campaign year.



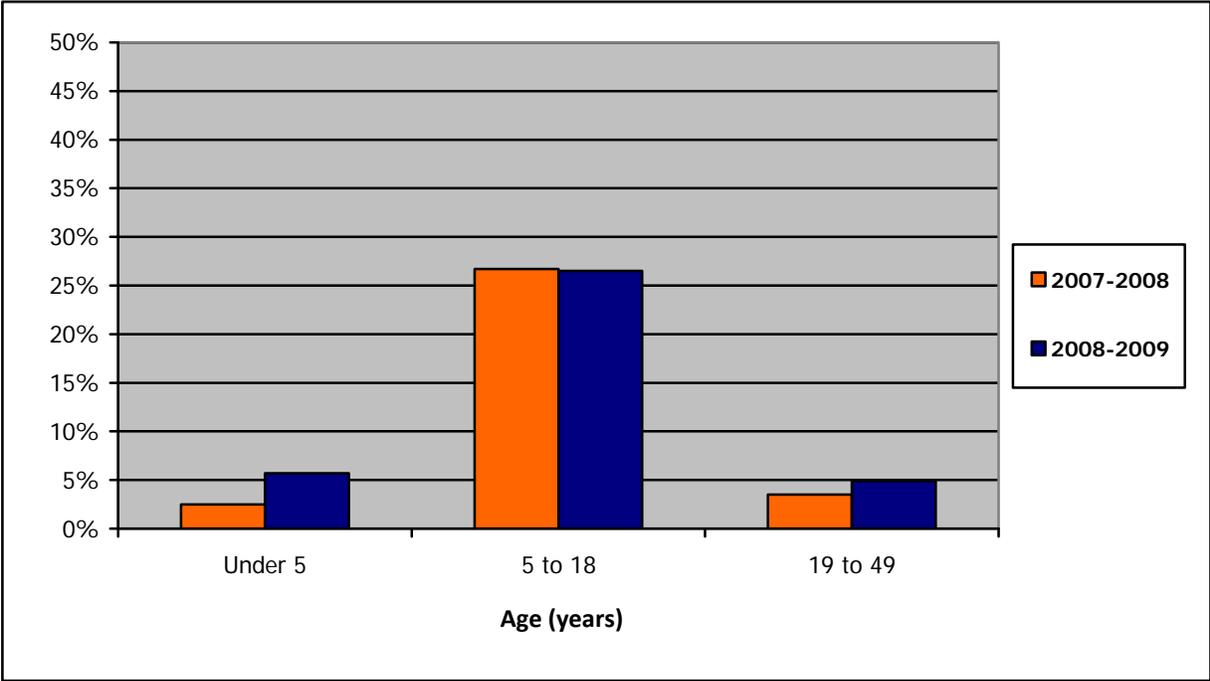
*Due to the use of a previous campaign year's vaccine accountability form by 6 providers, the vaccine usage in persons aged 2-18 years for these providers cannot be separated into the appropriate age categories and were not included in this figure. These providers administered 233 doses of influenza vaccine to persons aged 2-18 years.

**Because standard age categories were not collected by 3 providers, vaccine usage in persons aged 0-18 years for these providers cannot be separated into the appropriate age categories and were not included in this figure. These providers administered 2,304 doses of influenza vaccine to persons aged 0-18 years.

***For the 2004-2005 and 2005-2006 influenza campaigns the "<5 years" category was changed to "<6 years" and the "5 to 18 year" category was changed to "6 to 18 years."

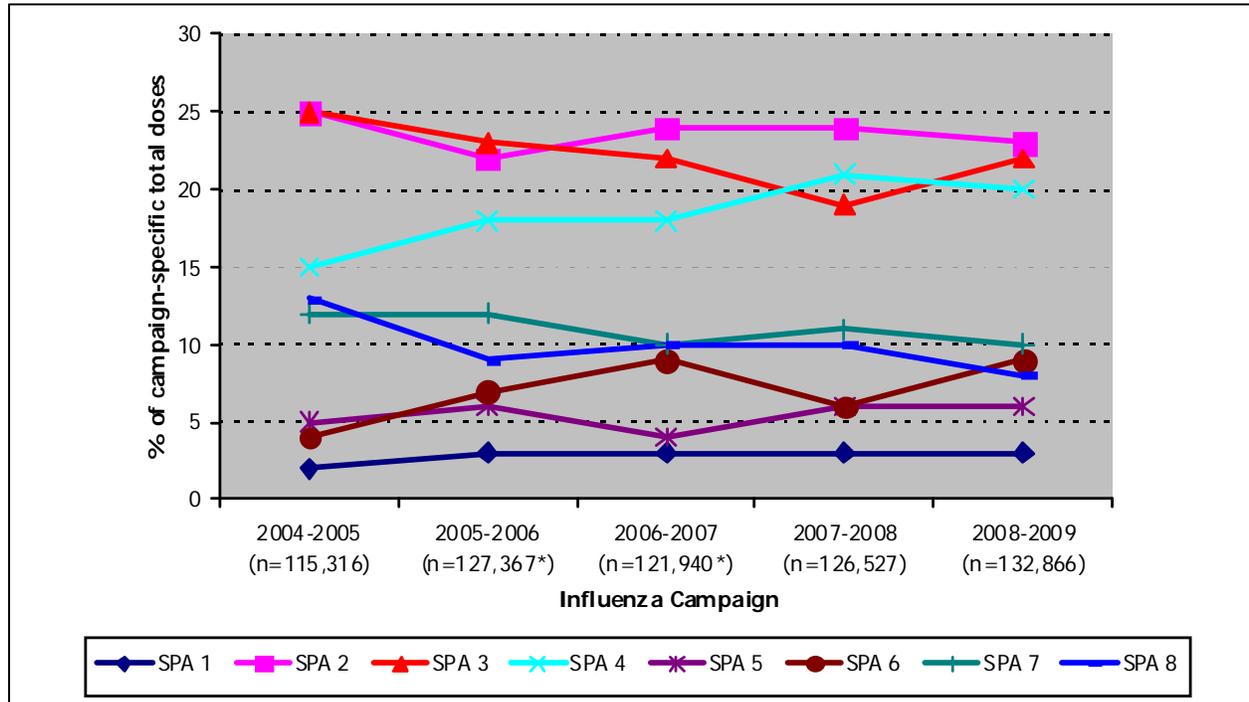
In all five campaigns, the majority of the vaccine was administered to persons 50 years of age and older, as recommended by ACIP. However, the proportion administered to persons 60 years of age and older has decreased each year, from 64% (73,688 doses) in the 2004-2005 campaign to 26% (33,918 doses) in the 2008-2009 campaign. The increase in the proportion of vaccine administered to persons aged 5 to 18 years was due to the school pilot project in the 2007-2008 campaign and an increased effort to improve vaccination levels in this age group during the 2008-2009 campaign. The large proportion of influenza vaccine administered to persons 60+ during the 2004-2005 campaign resulted from the modification of ACIP recommendations in response to a vaccine shortage.

Figure 3b. Proportion of intranasal influenza vaccine administered, by age group and campaign year.



Intranasal influenza vaccine is licensed for use in persons aged 2 years to 49 years of age. Nearly 27% of persons in the 5 to 18 year age group received intranasal vaccine during both campaigns. There were slight increases in the proportion of persons in the other two age groups receiving intranasal vaccine, comparing the 2008-2009 campaign to the 2007-2008 campaign.

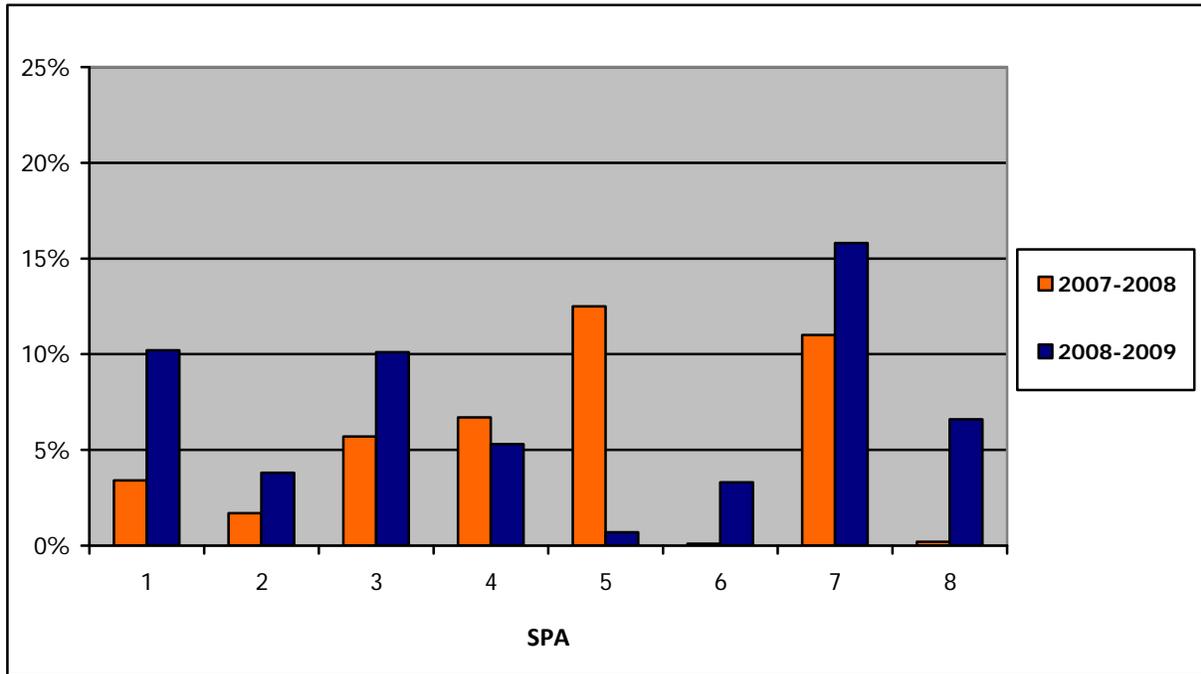
Figure 4a. Proportion of total influenza vaccine administered in each SPA, by campaign year.



*Total doses for 2005-2006 and 2006-2007 do not include non-Los Angeles County Health Departments.

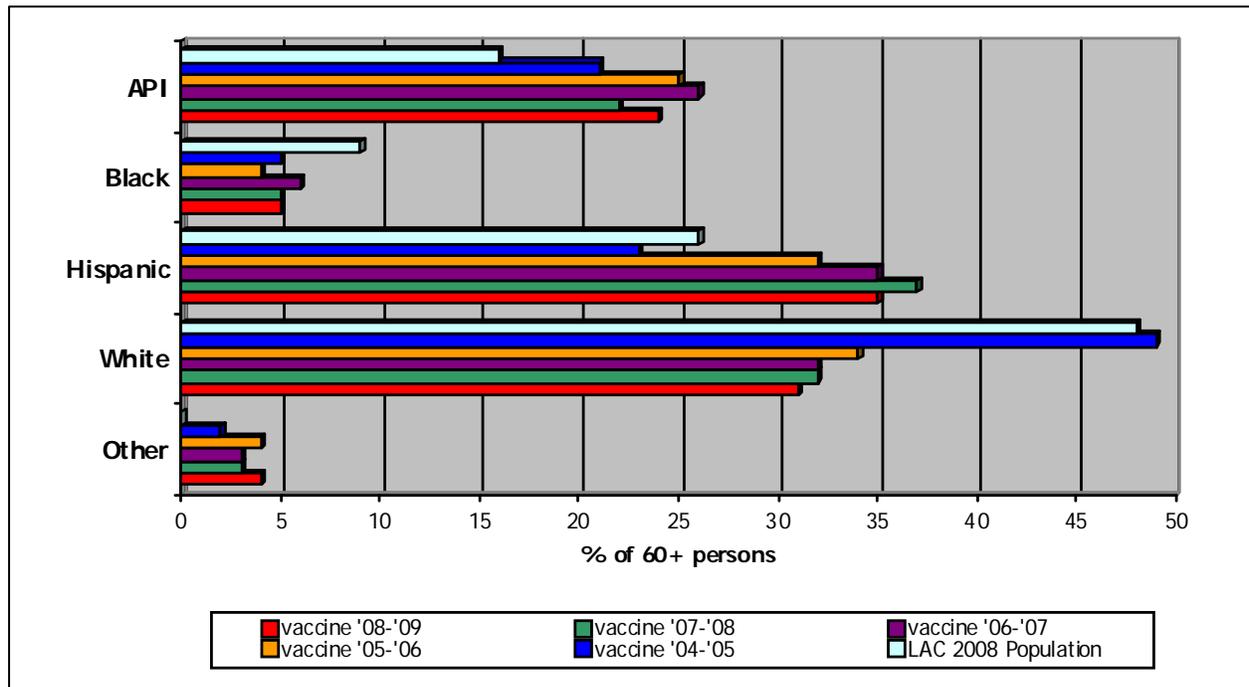
The amount of vaccine administered in each SPA is determined by the location of the provider administering the vaccine, not the residence of the vaccine recipients. For SPA 1 the proportion of the total influenza vaccine administered has remained approximately the same for each campaign year. SPAs 3 and 6 experienced increases in their proportion of the total influenza vaccine administered during the 2008-2009 campaign compared to the 2007-2008 campaign (19% to 22% and 6% to 9%, respectively). SPAs 2, 4, 7, and 8 experienced slight decreases in their proportion of the total influenza vaccine administered during the 2008-2009 campaign compared to the 2007-2008 campaign (24% to 23%, 21% to 20%, 11% to 10%, and 10% to 8%, respectively). There was no change in SPA 5 comparing the 2008-2009 campaign to the 2007-2008 campaign.

Figure 4b. Proportion of intranasal influenza vaccine administered, by SPA and campaign year.



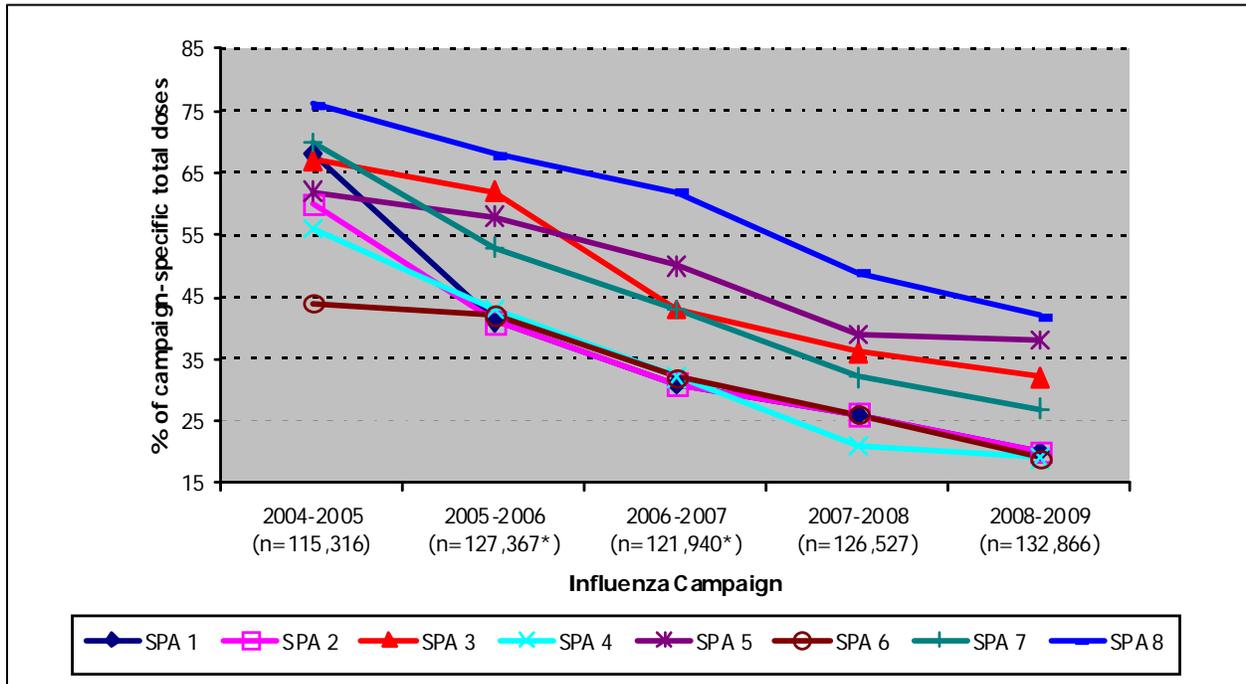
During the 2008-2009 campaign, SPA 7 had the largest proportion of their vaccine recipients receiving intranasal vaccine (16%). The majority of the SPAs increased the proportion of intranasal vaccine being administered to their vaccine recipients. Only SPAs 4 and 5 experienced decreases in the 2008-2009 campaign, compared to the 2007-2008 campaign (7% to 5% and 12% to 1%, respectively). The drop in SPA 5 is probably due to the absence of the school pilot project. However, the project benefitted both SPAs 5 and 7 during the 2007-2008 campaign yet SPA 7 did not experience a similar decrease.

Figure 5. Los Angeles County 60+ population and vaccine administered in persons 60 years and older, by race and campaign year.



In persons 60 years of age or older, there was a decrease in the proportion of vaccine administered to Hispanics (to 35% [11,931 doses]) and to Whites (to 31% [10,640 doses]) in the 2008-2009 campaign compared to the 2007-2008 campaign. Slight increases were observed in APIs (to 24% [8,255 doses]) and Others (to 4% [1,254 doses]). There was no change observed in Blacks. The racial distribution of vaccine administered to persons 60 years of age and older differed from the racial distribution of the 2008 LAC population.

Figure 6. Percentage of total influenza vaccine administered to persons 60 years and older, by SPA and campaign year.

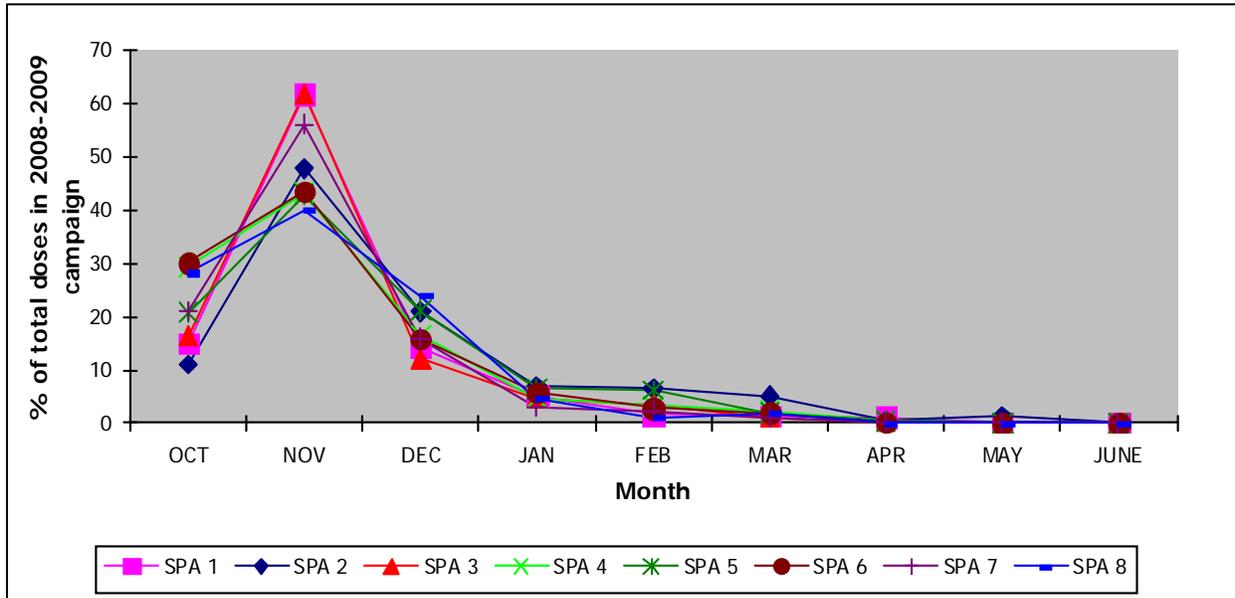


*Total doses for 2005-2006 and 2006-2007 do not include non-Los Angeles County Health Departments.

Since the 2004-2005 campaign, the proportion of influenza vaccine distributed to persons 60+ has decreased in each SPA with each successive campaign. The largest absolute decreases during the 2008-2009 campaign occurred in SPA 6 (26% [2,106 doses] in the 2007-2008 campaign to 19% [2,333 doses] in the 2008-2009 campaign) and SPA 8 (49% [5,977 doses] in the 2007-2008 campaign to 42% [4,496 doses] in the 2008-2009 campaign). However, except for SPAs 4 and 5, all other SPAs also experienced decreases ranging from 4 to 6 percentage points.

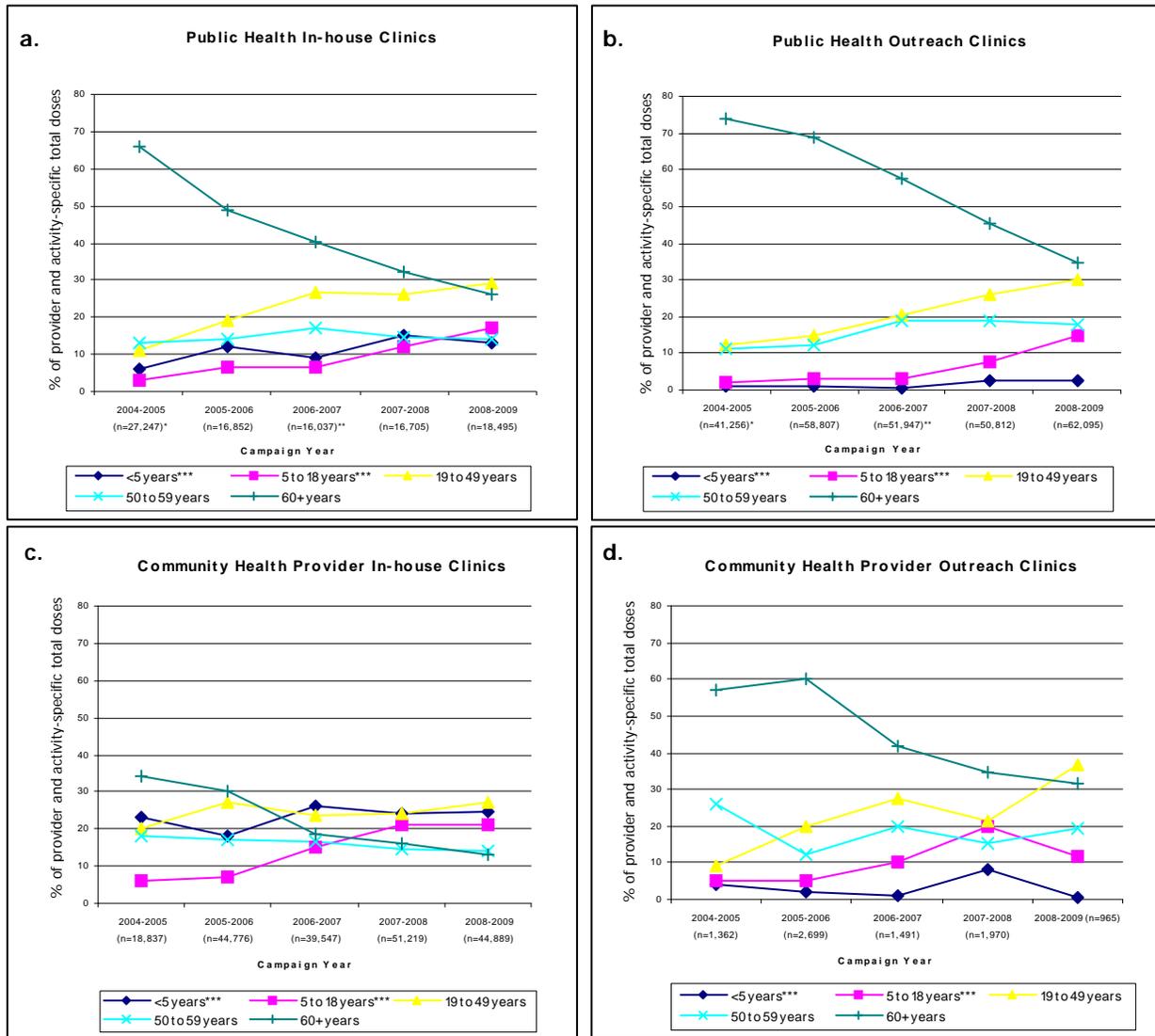
III. 2008-2009 Influenza Campaign Results

Figure 7. Influenza vaccine administration each month, by SPA.



During the 2008-2009 campaign, all of the SPAs administered the largest proportion of vaccine doses in November. The majority of vaccine doses were administered during the first two months of the campaign.

Figure 8. Age distribution of persons receiving influenza vaccine from public health and community health providers, by outreach and in-house clinics.



*Due to the use of a previous campaign year's vaccine accountability form by 4 providers, the vaccine usage in persons aged 2-18 years for these providers cannot be separated into the appropriate age categories and were not included in this graph. These providers administered 182 doses of influenza vaccine to persons aged 2-18 years. Of these 182 doses, 115 doses were administered during in-house clinics and 67 doses were administered during outreach clinics.

**Because standard age categories were not collected by 3 providers, vaccine usage in persons aged 0-18 years for these providers cannot be separated into the appropriate age categories and were not included in this figure. These providers administered 2,304 doses of influenza vaccine to persons aged 0-18 years. Of these 2,304 doses, 1,253 doses were administered during in-house clinics and 1,051 doses were administered during outreach clinics.

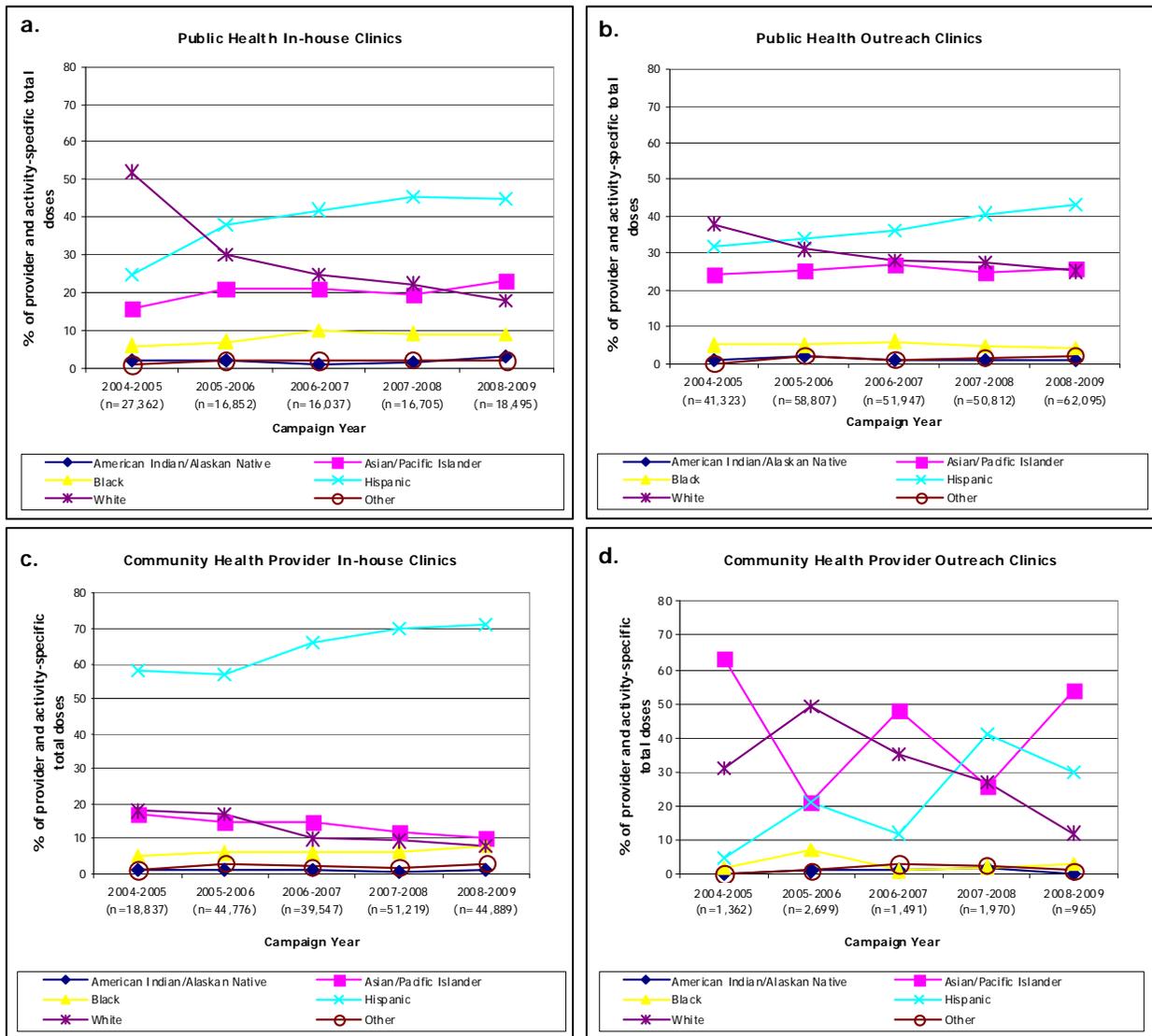
***For the 2004-2005 and 2005-2006 influenza campaigns the "<5 years" category was changed to "<6 years" and the "5 to 18 year" category was changed to "6 to 18 years."

Public Health and Community Health outreach clinics administered 47% (63,060 doses) of the influenza vaccine provided during the 2008-2009 campaign (Figures 8b and 8d). Public Health in-house (Figure 8a) and Community Health in-house and outreach clinics (Figures 8c and 8d) administered the largest proportion of their vaccine to persons age 19 to 49 years (5,445 doses [29%], 12,113 doses [27%], and 352 doses [37%], respectively). Public Health outreach

clinics (Figure 8b) administered the largest proportion of their vaccine to persons 60 years of age or older (21,581 doses [35%]).

When comparing the 2007-2008 and 2008-2009 campaigns, the age distribution of persons receiving vaccine in Public Health outreach clinics remained the same. The age distribution of persons receiving vaccine during Public Health in-house clinics, Community Health in-house clinics, and Community Health outreach clinics changed slightly from the 2007-2008 campaign to the 2008-2009 campaign. There was a decrease in the proportion of vaccine administered to persons 60+ in all in-house and outreach clinics.

Figure 9. Ethnic distribution of persons receiving influenza vaccine from public health and community health providers, by outreach and in-house clinics.



Comparing the 2007-2008 and 2008-2009 campaigns, there was not much change in the ethnic distribution of persons receiving vaccine in Public Health in-house clinics (Figure 9a), Public Health outreach clinics (Figure 9b), and Community Health in-house clinics (Figure 9c). The largest changes in ethnic distribution occurred in Community Health outreach clinics (Figure

9d). Whites experienced a decrease in vaccine received during all clinics, the largest decrease occurring in Community Health outreach clinics (to 12% [116 doses]). There was little change in the proportion of Hispanics and APIs receiving influenza vaccine at clinics with the exception of Community Health outreach clinics. The proportion of Hispanics receiving vaccine dropped to 30% [290 doses] while APIs increased to 54% [521 doses] at Community Health outreach clinics. There was little change in the proportion of Blacks and AI/AN receiving vaccine in each clinic type.

Although Hispanics made up the largest proportion of the race/ethnic populations receiving influenza for most clinics during the 2008-2009 campaign, Hispanic vaccine recipients made up a much larger proportion of the population receiving influenza vaccine at Community Health in-house clinics (71% [31,871 doses], Figure 9c) than at Public Health clinics (in-house:45% [8,323 doses], Figure 9a; outreach: 43% [26,701 doses], Figure 9b). Predominantly Whites, Hispanics, and APIs received influenza vaccine at Public Health outreach clinics (15,524 doses [25%], 26,701 doses [43%], and 16,145 doses [26%], respectively) and at Public Health in-house clinics (3,329 doses [18%], 8,323 doses [45%], and 4,254 doses [23%], respectively). Only a small number of individuals (n=965) received vaccines at Community Health outreach clinics. Blacks and AI/ANs received the smallest proportions of vaccine administered during all outreach and in-house clinics.

Discussion

Summary

- Public Health outreach clinics administered the largest proportion of publicly-funded influenza vaccine to the LAC population over the last five campaigns.
- Over the past five influenza seasons, the age distributions of persons receiving publicly funded vaccine through the influenza campaign has been consistent. The majority of the vaccine was administered to persons 60 years of age and older. However, this percentage has been decreasing yearly in every SPA. During the 2007-2008 campaign the increase in the proportion administered to persons aged 5 to 18 years was primarily due to the school pilot project.
- According to the most recent LA Health Survey data 71.3% of persons 65 years of age or older reported receiving the influenza vaccine in the last 12 months. The most recent LA Health Survey was administered to a sample of the LAC 2007 population. We are unable to estimate what proportion of these persons received publicly-funded vaccine.
- In each campaign, the majority of the influenza vaccine was administered to Whites and Hispanics and the smallest proportion to Blacks and AI/ANs. Part of the reason Blacks and AI/ANs receive a smaller proportion of the vaccine is that they make up the smallest proportions of the total LAC population (8.7% and 0.3%, respectively). However, special efforts to reach the AI/AN and Black communities are still needed. For the past few influenza campaigns APIs have been the third largest group to receive vaccine. The racial distributions of persons receiving publicly funded vaccine through the influenza campaign have been somewhat consistent over the past five influenza seasons.

Limitations

- It is difficult to assess to what extent the annual influenza campaign reached its target population.
 - Age and race information is not maintained in the same manner at all clinic sites.
 - Information on chronic conditions is not currently collected. This makes it impossible to know whether the persons under 60 years of age receiving publicly-funded vaccine actually have a chronic condition listed in the ACIP recommendations.

- Information on vaccine usage during the influenza campaigns cannot be used to determine influenza vaccine coverage levels for LAC.
 - Currently, there are no reliable means for determining how many seniors or persons with chronic conditions receive non-publicly funded influenza vaccine from their primary medical doctor.

References

¹ Centers for Disease Control and Prevention. *Prevention and Control of Influenza. Recommendations From the Advisory Committee on Immunization Practices (ACIP), 2008.* MMWR 2008; 57(No. RR-7).

² Centers for Disease Control and Prevention. *Surveillance for Influenza - United States, 1994-95, 1995-96, and 1996-97 Seasons.* MMWR 2000; 49(No. SS-3): 13-28.

³ Acute Communicable Disease Control, LACPH. Influenza Surveillance. Available at: http://www.publichealth.lacounty.gov/acd/Flu_Sea_Surveillance.htm. Last accessed 8/7/2009 at 11:00am PDT (Annual report for the 2008-2009 influenza season currently not available).

⁴ Centers for Disease Control and Prevention. Influenza (Flu). Available at: <http://www.cdc.gov/flu/keyfacts.htm>. Last accessed 7/16/2009 at 2:05pm PDT.