

INFLUENZA VACCINATION AMONG EMPLOYEES IN CALIFORNIA GENERAL ACUTE CARE HOSPITALS FOR THE 2008- 2009 RESPIRATORY SEASON

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EXECUTIVE SUMMARY

Influenza is a significant cause of morbidity and mortality, especially among vulnerable populations.¹ Healthcare personnel are an important source of transmission of the influenza virus in the health care setting. The most effective strategy for preventing influenza is annual vaccination. Vaccinating healthcare personnel is simple, safe, and cost effective; it reduces the risk of transmission to patients and other healthcare personnel and decreases absenteeism. Despite these compelling reasons for healthcare personnel vaccination, national vaccination percentages remain low, usually below 45%.^{1, 4} The Healthy People 2010 target for influenza vaccination in healthcare personnel is 60%.

In 2006, California became the first state to pass legislation mandating that general acute care hospitals implement influenza vaccination programs by offering free vaccine to all employees and requiring a signed declination for all refusals. Additionally, all general acute care hospitals are required to report on implementing Centers for Disease Control and Prevention (CDC) recommendations regarding influenza vaccination of healthcare personnel to the California Department of Public Health (CDPH).

Starting in 2009, CDPH required licensed California general acute care hospitals to submit influenza vaccination data via a paper-based passive surveillance system. Data elements included total number of hospital employees and non-employee healthcare personnel at the reporting hospital and total number of vaccinations and declinations. CDPH developed a retrospective quality control process in spring 2010 to identify and correct errors, identify data outliers, identify incomplete data, and follow up with hospitals for review and verification of these data. Analyses included the aggregate vaccination and declination percentages and hospital-specific mean vaccination and declination percentages for hospital employees.

As of 2009, 381 general acute care hospital licensees in California were required to report influenza vaccination data; hospitals had the option of reporting as a single hospital or under a multi-hospital license. For the 2008-2009 respiratory season (October – May), CDPH identified 387 reporting entities and received 330 (85.3%) influenza vaccination data collection forms on hospital employees. Large hospitals were more likely to report compared with small hospitals ($p < 0.05$). CDPH did not analyze data for non-employee healthcare personnel due to discrepancies in hospitals' interpretation of the definition of non-employee healthcare personnel.

The aggregate vaccination percentage among hospital employees was 55.0%, representing all hospital employees, regardless of hospital size. Hospital-specific vaccination percentages among hospital employees ranged from 14.4% to 100%, with a mean of 55.3%. Furthermore, 121 (40.7%) single hospitals met the Healthy People 2010 target of 60%. Small hospitals had

a significantly higher mean hospital-specific vaccination percentage among hospital employees compared with medium or large hospitals ($p < 0.05$). In pediatric hospitals, the mean hospital-specific employee vaccination percentage was significantly higher than in hospitals with mixed populations ($p < 0.05$). The aggregate declination percentage was 26.6%, representing all hospital employees, regardless of hospital size. Hospital-specific declination percentages among employees ranged from 0% to 64.3%, with a mean of 27.9%. In pediatric hospitals, the mean hospital-specific employee declination percentage was significantly lower than in hospitals with mixed populations ($p < 0.05$). The aggregate unknown vaccination status was 18.4%. Geographic analyses revealed some variation in vaccination and declination percentages by region.

General acute care hospitals that operated under a multi-hospital license had similar results to single hospitals. The aggregate and mean hospital-specific vaccination percentages were 55.4% and 56.7%, respectively. Furthermore, 11 (39.3%) multi-hospital licenses met the Healthy People 2010 target of 60%. The aggregate and mean hospital-specific declination percentages were 22.6% and 22.3%, respectively. The aggregate unknown vaccination status was 22.0%.

As with any new public health surveillance system, these data have limitations. Multiple versions of the data collection form were created and submitted. Additionally, there were significant misinterpretations of the definitions on the data collection forms, particularly for employees, non-employee healthcare personnel, and declinations. Reporting hospitals were unclear whether the definition for healthcare personnel included employees and non-employees or was exclusive of employees. Hospitals were also unclear who should be included in the non-employee healthcare personnel group. The definition of declination should have included only employees that refused to receive the vaccine. As a result, employees, non-employee healthcare personnel, declinations, and employees with unknown status may have been misclassified. Finally, incomplete data and the approximately 15% of reporting hospitals that did not submit data indicate that vaccination among employees may be underreported in California general acute care hospitals. Therefore, CDPH cannot determine how accurately these data represent influenza vaccination and declination percentages among employees in California hospitals in 2008-2009.

The findings presented in this report suggest that more work is needed to improve influenza vaccination among hospital employees and non-employee healthcare personnel in California general acute care hospitals. CDPH has worked with infection preventionists, employee and occupational health experts, physicians, and hospital representatives to identify targeted non-employee healthcare personnel groups with clear definitions to be included on future data collection forms. For the 2010-2011 respiratory season, CDPH developed and pilot tested in a subset of hospitals a standard data collection form with specific, standard definitions to ensure intended interpretation and implementation. Hospitals will be able to use future data to demonstrate compliance with the reporting mandate, monitor vaccination among hospital employees and non-employee healthcare personnel, identify high-risk groups for vaccination, and implement targeted interventions. Small hospitals and pediatric hospitals may offer insight on how to improve vaccination rates. Finally, based on the data presented here, CDPH cannot determine the affect of mandatory declinations on influenza vaccinations in

hospital employees. CDPH will continue to work with hospitals to identify barriers for collecting influenza vaccination data with the goal of improving influenza vaccination among all hospital employees and non-employee healthcare personnel in California general acute care hospitals.

INTRODUCTION

Infection with the influenza virus is a significant cause of morbidity and mortality, especially in the elderly, young children, and persons with underlying medical conditions.¹ Healthcare personnel are an important source of transmission of the influenza virus in the healthcare setting, especially given their high rate of asymptomatic infection and mild illness.²⁻⁴ Additionally, healthcare personnel often work while they are ill due to worker shortages, need for compensation, and dedication to their patients.²⁻⁴

The most effective strategy of influenza prevention is annual vaccination.^{1,2} Vaccine effectiveness varies by patient characteristics and the extent of match between the circulating and vaccine strains.¹ Vaccination is moderately effective for the elderly, infants, and persons who are immunocompromised, the same groups most at risk for complications from influenza and therefore with the most need for protection.^{1,4} In contrast, vaccination is highly effective in healthy, younger adults, which include many healthcare personnel; therefore, vaccination campaigns in this group can be simple, safe, and cost effective.⁴ Vaccination of healthcare personnel is recommended or endorsed by the Centers for Disease Control and Prevention (CDC) Advisory Committee for Immunization Practices,¹ the Society for Healthcare Epidemiology of America,² and the National Foundation for Infectious Diseases.⁵ The Healthy People 2010 target for influenza vaccination in healthcare personnel was 60%,⁶ and the proposed 2020 target is 90% (CDC, personal communication, June 15, 2010). Despite these compelling reasons for healthcare personnel vaccination, national percentages remain low, usually below 45%.¹

Three strategies have been identified to increase compliance among healthcare personnel with annual influenza vaccination: education combined with free and easily accessible vaccine, a mandatory signed declination statement acknowledging the benefits and risks of the vaccination, and mandatory vaccination with refusal enforced by respiratory masks, reassignment to non-patient care roles, or termination of employment.^{2,4,7} In combination, these strategies have been shown to be effective in increasing compliance among healthcare personnel with annual influenza vaccination.² Although mandatory declination has not been proven effective as a stand-alone strategy, it is a component of hepatitis B virus vaccination programs for healthcare personnel and has helped to improve vaccination percentages and decrease hepatitis B infections in healthcare personnel.²

BACKGROUND

In September 2006, California passed Senate Bill (SB) 739 and became the first state mandating general acute care hospitals to implement influenza vaccination programs that “offer onsite influenza vaccinations... to all hospital employees at no cost to the employee,” and require a signed declination for all refusals.⁸ Additionally, beginning January 1, 2008, all general acute care hospitals are required to report “on influenza vaccination of...healthcare personnel” to the California Department of Public Health (CDPH) annually within 30 days of the end of the influenza season, which is April 30.⁸ In turn, CDPH is required to post publically influenza vaccination and declination data within six months of the reporting deadline.

SB 739 also requires hospitals to submit data on implemented process measures to the National Healthcare Safety Network (NHSN) of the CDC. The CDPH Healthcare Associated Infections (HAI) Advisory Committee recommended that CDPH not require hospitals to report influenza vaccination data to NHSN because hospitals would have to enter data on individual healthcare workers in order to calculate influenza vaccination rates. Many hospitals use employee health management software for their influenza vaccination data, so use of NHSN would require either substituting NHSN for their existing software or double entry of employee-specific information. As an alternative, the Influenza Subcommittee of the HAI Advisory Committee developed forms for data collection to meet the intent of the legislation. While CDPH provided hospitals with these data collection forms to comply with the reporting mandate, a formal influenza vaccination surveillance system was not implemented until after CDPH established the Healthcare Associated Infections Program in December 2009. CDPH did not compile and analyze cumulative influenza vaccination and declination data until 2010.

The purpose of the influenza vaccination surveillance system is to collect and evaluate influenza vaccination data for hospital employees and non-employee healthcare personnel of general acute care hospitals in California. The data collected as part of this system are to be used by hospitals to ensure that all hospital employees and non-employee healthcare personnel are offered influenza vaccine and to identify high-risk groups and implement targeted education strategies, thereby improving the percentage of hospital employees and non-employee healthcare personnel that are vaccinated. These data are used by CDPH to hold hospitals accountable for compliance with the reporting mandate. CDPH will also use the data to assess the affect of mandatory declination on influenza vaccination percentages among hospital employees and non-employee healthcare personnel in California general acute care hospitals.

METHODS

For the 2008-2009 respiratory season (October – May), CDPH collected data via a paper-based passive surveillance system submitted to CDPH via fax or email. Hospitals submitted three different data collection forms; CDPH provided two forms during the 2008-2009 season while some hospitals used a form from the previous season. One form included total number of hospital employees and non-employee healthcare personnel, total number of vaccinations in these groups, total number of declinations in these groups, and the sum total of vaccinations and declinations. A second form, based on recommendations of the HAI Advisory Committee, distinguished full-time and part-time employment status for each of the employee and non-employee healthcare personnel groups. The form from the 2007-2008 respiratory season included total number of employees, total number of vaccinations, vaccination percentage, the sum total of vaccinations and declinations and the vaccination/declination percentage, but did not include non-employee personnel. Full-time and part-time data from the second form were combined for data analysis.

Definitions

CDPH defined a general acute care hospital as any healthcare facility in California licensed as a general acute care hospital by the CDPH Licensing and Certification Program, with active acute care beds in 2009. Hospitals could report as a single hospital or under a multi-hospital license and for this analysis, CDPH categorized hospitals into two groups based on reporting category. A single hospital was any hospital that operated under a single license or any hospital that was part of a multi-hospital license but chose to report as a single hospital. Single hospitals also included general acute care hospitals that operated jointly with a non-acute care facility (such as a skilled nursing facility or an acute psychiatric hospital) but reported influenza vaccination data as a single general acute care hospital. Hospitals that were licensed with one or more general acute care hospitals and reported combined influenza vaccination data for all hospitals under the license were considered multi-hospital licenses. CDPH analyzed these multi-hospital licensed hospitals separately from single licensed hospitals. Facilities that maintained a general acute care hospital license but did not have active acute care beds in 2009 were not considered to be subject to the reporting requirements. The data and results presented in this report represent licensed hospitals as of 2009. Hospitals listed may no longer operate under a single license or they may have closed since the end of the reporting period for these data. Additionally, new hospitals may have become licensed since these data were submitted and analyzed.

The Influenza Subcommittee of the HAI Advisory Committee defined the fields on the data collection forms and instructions for completing the form included these definitions. These definitions were consistent on each of the three different versions of the data collection forms available for the 2008-2009 influenza season. A hospital employee was defined as any worker who collected his or her primary paycheck from the reporting hospital, whether or not he or she had patient contact. Examples provided on the form included administrative staff, dietary staff, and facilities management staff. Non-employee healthcare personnel were considered a mutually exclusive group from hospital employees and were defined according to CDC guidelines as “all paid and unpaid persons working in a healthcare setting who have the potential for exposure to infectious materials including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air...”⁹ A declination was defined as any person who declined to receive influenza vaccination at the reporting hospital either because he or she did not want to receive vaccination or because he or she had received the vaccine elsewhere. Outreach was defined as the total number of vaccinations administered by the reporting hospital plus the number of declinations received by the hospital divided by the total number of employees and non-employee healthcare personnel at the reporting hospital. Because SB 739 requires hospitals to offer influenza vaccination to all employees, the target for outreach at each hospital was 100%.

CDPH also obtained data on hospital demographics from external data sources, including bed size, rurality, patient population, and teaching status. CDPH determined bed size by evaluating data from the Licensing and Certification Program and categorized hospitals as small (4-80 beds), medium (81-199 beds), or large (200 beds or more) so that each represented one-third of California hospitals. We used the Rural Health Policy Council's

definition of a rural hospital as “a hospital located in an unincorporated place or census tract of 15,000 or less population according to the 1980 census.”¹⁰ CDPH defined pediatric hospitals as any hospital having “children’s hospital” in its name. We defined teaching hospitals according to the Association of American Medical Colleges¹¹ for undergraduate medical facilities and the Accreditation Council for Graduate Medical Education¹² for graduate medical facilities.

Quality Assurance

In 2010, CDPH implemented a retrospective quality assurance process to track and correct errors, identify data outliers, identify incomplete data, and follow up with hospitals for review and verification of data. We identified a 15% random sample of data collection forms for comparison between electronic data and data on the original form. To determine whether dual data entry was necessary, we calculated data entry error percentages for each data field on the form and for each form; an error percentage of at least 5% was an indicator for dual data entry. We made corrections on hard copy screen shots of the database; data were then corrected in the electronic database.

Analysis of all numeric variables included frequency, mean, median, minimum, maximum and quartile values. We considered hospitals with calculated vaccination percentage values in the 10th and 90th percentiles out-of-range. We contacted hospitals reporting data outside of the range to verify correct use of definitions and collection and reporting of vaccination data. CDPH identified and investigated data fields and records with incomplete data and contacted hospitals to collect incomplete data as available.

CDPH contacted a random sample of 25% of non-reporting hospitals to verify that the hospital did not submit a data collection form. Since many of these hospitals reported that they had submitted a form, we contacted all non-reporting hospitals to verify whether the hospital submitted a data collection form.

Exclusions

CDPH excluded all data on non-employee healthcare personnel and outreach from analysis. Many reporting hospitals misinterpreted the definition of healthcare personnel and did not understand whether non-employee healthcare personnel should have been combined with or kept separate from the data on employees. Many hospitals reported that they did not collect or collected only limited vaccination data on non-employee healthcare personnel. Additionally, a few hospitals rescinded their data when errors in their data collection method could not be corrected for the 2008-2009 reporting period. CDPH required hospitals to submit outreach data as a calculation on the data collection form; however, when CDPH calculated outreach as part of its analysis, we found many discrepancies between our calculations and the outreach data reported by hospitals. It was unclear whether hospitals made errors in the reported number of vaccinations, the reported number of declinations, or in the reported outreach as a sum of vaccinations and declinations.

Calculations

CDPH calculated aggregate vaccination percentages for all reporting hospitals as the sum total number of vaccinations for all employees divided by the sum total number of all employees in reporting hospitals. We calculated aggregate declination percentages for all reporting hospitals as the sum total number of declinations for all employees divided by the sum total number of all employees in reporting hospitals. We calculated the 95% confidence interval (CI) for the aggregate vaccination and declination percentages using the binomial distribution where the observed proportion of influenza vaccination among employees in California was used as an estimate of the true or expected proportion of influenza vaccination among employees:

$$p \pm \sqrt{\frac{p(1-p)}{n}}$$

We extrapolated aggregate unknown status by adding the aggregate vaccination percentage and the aggregate declination percentage and subtracting from 100. We calculated hospital-specific employee vaccination percentages as the number of vaccinations given to all employees in the hospital divided by the total number of employees in the hospital. We calculated hospital-specific employee declination percentages as the number of declinations received from all employees in the hospital divided by the total number of employees in the hospital. We did not calculate hospital-specific unknown percentages because these data were not included on the data collection form and therefore were not reported by California general acute care hospitals. Other calculations for employees included mean hospital-specific vaccination and declination percentages.

We compared differences in hospital demographics, described above, between reporting and non-reporting general acute care hospitals for statistical significance using a chi-square test or Fisher's exact test for small cell values. We compared mean hospital-specific vaccination and declination percentages between reporting and non-reporting hospitals among the demographic groups described above using the independent samples t-test and ANOVA. Differences between vaccination and declination percentages for single hospitals and multi-hospital licenses also were compared using a chi-square test and independent samples t-test. For all comparisons, we used a p-value of less than 0.05 to determine statistical significance. We conducted all analyses using SAS version 9.1 (SAS Institute; Cary, NC, USA).

Multi-Hospital Licenses

According to the CDPH Licensing and Certification Program, as of 2009, 45 consolidated licenses in California encompassed 97 hospitals. CDPH contacted all of these hospitals to determine if the hospital reported influenza vaccination data as a separate hospital or if the hospital combined its data with data from other hospitals under the same license. CDPH analyzed hospitals reporting under a multi-hospital license as a group separate from single hospitals. CDPH did not classify hospitals reporting under a multi-hospital license into demographic groups, i.e. rural or teaching, given diversity of facilities under the license.

Geographic Analysis

CDPH grouped California's 58 counties into nine regions used by the Public Policy Institute of California¹³ to examine influenza vaccination trends from a geographic perspective. The Far North region included Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Plumas, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, and Yuba counties. The Sacramento Metro region included El Dorado, Placer, Sacramento, and Yolo counties. The Sierras region included Alpine, Amador, Calaveras, Inyo, Mariposa, Mono, and Tuolumne counties. The Bay Area region included Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. The San Joaquin Valley region included Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties. The Central Coast region included Monterey, San Benito, San Luis Obispo, Santa Barbara, and Santa Cruz counties. The Inland Empire region included Riverside and San Bernardino counties. The South Coast region included Los Angeles, Orange, and Ventura counties. The San Diego region included Imperial and San Diego counties.

Pre- and Post-Season Surveys

In addition to influenza vaccination and declination data, CDPH collected a pre- and post-season survey via the Survey Monkey website regarding activities used to promote influenza vaccination in hospital employees and non-employee healthcare personnel. Survey questions included personnel targeted for the annual influenza vaccination program, types of employees included in the program, cost of the influenza vaccination, shifts during which influenza vaccination was offered, methods used to deliver influenza vaccination, strategies to promote influenza vaccination, use and requirement of education programs on influenza vaccination, required documentation of off-site influenza vaccination, and required signed declination statements for refusal of influenza vaccination. We compared hospitals that responded to the surveys based on vaccination percentages among employees. We considered hospitals with a vaccination percentage in the 75th percentile or higher (67.0%) as high vaccination and hospitals with a vaccination percentage in the 25th percentile or lower (46.6%) as low vaccination.

RESULTS

Overall Reporting Percentages, Single and Multi-Hospital Licenses

Figure 1 displays the total number of single and multi-hospital general acute care licenses in California as of 2009. There were 381 single- or multi-hospital licenses, 336 of which were single-hospital licenses and 45 of which were multi-hospital licenses. Of the 45 multi-hospital licenses, 11 facilities were identified as non-acute care or closed hospitals, and thus were excluded. Among the multi-hospital licenses, 21 hospitals operating under 15 licenses chose to be considered as single hospitals for submitting influenza vaccination data for the 2008-2009 season and 65 hospitals operating under 30 licenses chose to be considered as a group of hospitals. For data analysis purposes, we treated the 21 hospitals under a multi-hospital license that reported individually as single hospitals.

Table 1 displays the total number of influenza vaccination data collection forms received from single hospitals and hospitals operating under a multi-hospital license. The total number of influenza vaccination data collection forms received representing general acute care hospitals was 329. Of those, 299 (90.9%) were from single hospitals and 30 (9.1%) represented multi-hospital licenses. One single-hospital license that reported influenza vaccination data rescinded its data; one single-hospital license submitted a report but did not include data on hospital employees. We included these hospitals in the total number reported, but did not include them in the analysis of the vaccination and declination data; therefore, we analyzed influenza vaccination data from 297 single hospitals. CDPH did not receive data collection forms from 58 (16.2%) single hospitals for the 2008-2009 season. All hospitals operating under a multi-hospital license submitted a data collection form for the 2008-2009 season. However, one multi-hospital license that reported influenza vaccination data rescinded its data, and one multi-hospital license submitted a report but did not include data on hospital employees. Again, we included these hospitals in the total number reported, but did not include them in the analysis of the vaccination and declination data; therefore, we analyzed influenza vaccination data from 28 multi-hospital licenses.

Single Hospitals

Demographics

Of the 297 California hospitals designated as single hospitals for influenza vaccination reporting purposes, bed size ranged from 4 beds to 907 beds. As of 2009, California hospitals were evenly distributed among small (118, 33.1%), medium (118, 33.1%), and large (121, 33.9%) hospitals (Table 2). We designated 60 (17.0%) hospitals as rural, 12 (3.4%) hospitals were named as children's hospitals, and 43 (12.2%) hospitals were accredited as medical teaching facilities.

Among all demographic groups, more hospitals submitted a data collection form than did not submit a form. Small hospitals were more likely to report compared with medium and large hospitals; this difference was statistically significant. Large hospitals were more likely to report compared with small and medium hospitals; this difference also was statistically significant. Additionally, large hospitals were more likely to report compared with small hospitals ($p = 0.0016$). There were no statistically significant differences between reporting and non-reporting hospitals with respect to rurality, patient population, and teaching status.

Vaccinations

The total number of employees in the 297 reporting single hospitals in California was 403,756. The aggregate vaccination percentage among employees was 55.0% (95% confidence interval (CI) 54.9-55.2), which represents all employees from all reporting single hospitals, regardless of the size of the hospital (Table 3). Hospital-specific vaccination percentages among employees had a mean of 55.3% (standard deviation 14.3) and ranged from 14.4% to 100%. Furthermore, 121 (40.7%) single hospitals met the Healthy People 2010 target of 60% vaccination percentage. The first quartile for hospital-specific vaccination

percentages ranged from 14.4% to 45.0%; the second quartile ranged from 45.0% to 56.4%; the third quartile ranged from 56.4% to 65.7%; the fourth quartile ranged from 65.7% to 100.0%. Table 3 displays aggregate and mean vaccination percentages among employees of single hospitals by hospital demographic including bed size, rurality, patient population, and teaching status. Aggregate vaccination percentages were higher in small (56.3%) hospitals compared with medium (54.2%) and large (55.1%) hospitals, and rural (57.5%) hospitals, pediatric (66.4%) hospitals, and teaching (55.7%) hospitals. When we compared aggregate vaccination percentages with aggregate declination percentages, small hospitals had a higher vaccination percentage than medium or large hospitals ($p = 0.00$), and pediatric hospitals had a higher percentage than hospitals with mixed populations ($p = 0.00$). There were no statistically significant differences between aggregate vaccination and declination percentages among rural and urban hospitals or teaching and non-teaching hospitals. Mean hospital-specific vaccination percentages were higher in small hospitals (57.7%) compared with medium (52.6%) and large (55.6%) hospitals, and in pediatric hospitals (65.2%) compared with hospitals with mixed populations (54.9%); these differences were statistically significant. Mean hospital-specific vaccination percentages were higher in rural and teaching hospitals; however, these differences were not statistically significant.

Declinations

In the 297 reporting single-license hospitals and their 403,756 employees, the aggregate declination percentage was 26.6% (95% CI 26.5-26.8), which represents all employees from all reporting hospitals regardless of the size of the hospital (Table 4). Hospital-specific declination percentages among employees had a mean of 27.9% (standard deviation 14.1) and ranged from 0% to 64.3%. The first quartile for hospital-specific declination percentages ranged from 0% to 19.0%; the second quartile ranged from 19.0% to 28.2%; the third quartile ranged from 28.2% to 36.5%; the fourth quartile ranged from 36.5% to 64.3%. Table 4 displays aggregate and mean hospital-specific declination percentages in employees of single-license hospitals by hospital demographic. Aggregate declination percentages were lower in medium (24.9%) hospitals compared with small (25.9%) and large (27.3%) hospitals, and in urban (26.5%) hospitals, pediatric hospitals (18.4%), and non-teaching (26.5%) hospitals. When we compared aggregate declination percentages with aggregate vaccination percentages, medium hospitals had a lower declination percentage than small or large hospitals ($p = 0.00$) and pediatric hospitals had a lower percentage than hospitals with mixed populations ($p = 0.00$). There were no statistically significant differences between aggregate declination and vaccination percentages among rural and urban hospitals or teaching and non-teaching hospitals. Mean hospital-specific declination percentages were lower in pediatric hospitals (19.1%) compared with hospitals with mixed populations (28.3%); this difference was statistically significant. Mean declination percentages were also lower in medium and rural hospitals; however, these differences were not statistically significant.

Unknown vaccination status

The aggregate unknown vaccination status, calculated as $100 - (55.0 \text{ (aggregate vaccination percentage)} + 26.6 \text{ (aggregate declination percentage)})$, was 18.4%.

Multi-Hospital Licenses

Thirty multi-hospital licensees encompassing 65 hospitals chose to be considered as a group for influenza vaccination reporting purposes (Figure 1). CDPH received 30 (100%) influenza vaccination data collection forms representing 65 hospitals operating under a multi-hospital license (Table 1).

The total number of employees in the 28 multi-hospital licenses included in this analysis was 85,744 (Table 5). The aggregate vaccination percentage among employees that reported under a multi-hospital license was 55.4% (95% CI 55.1-55.8). Mean hospital-specific vaccination percentages had a mean of 56.7% (standard deviation 13.4) and ranged from 25.1% to 95.2%. Furthermore, 11 (39.3%) multi-hospital licenses met the Healthy People 2010 target of 60% vaccination percentage. The first quartile for hospital-specific vaccination percentages under multi-hospital licenses ranged from 25.1% to 47.6%; the second quartile ranged from 47.6% to 57.9%; the third quartile ranged from 57.9% to 63.1%; the fourth quartile ranged from 63.1% to 95.2%. The aggregate declination percentage among employees in these hospitals was 22.6% (95% CI 22.3-22.8). Mean hospital-specific declination percentages had a mean of 22.3% (standard deviation 13.4) and ranged from 0% to 40.7%. The first quartile for hospital-specific declination percentages under multi-hospital licenses ranged from 0% to 10.4%; the second quartile ranged from 10.4% to 26.6%; the third quartile ranged from 26.6% to 32.3%; the fourth quartile ranged from 32.3% to 40.7%. The aggregate unknown vaccination status was 22.0%.

Single versus Multi-Hospital Licenses

The aggregate vaccination percentage for single hospitals was 55.0% compared with 55.4% in hospitals reporting under a multi-hospital license. This difference was statistically significant ($p = 0.036$). The difference between the mean hospital-specific vaccination percentage for single hospitals (55.3%) compared with hospitals reporting under a multi-hospital license (56.7%) was not statistically significant.

The aggregate declination percentage for single hospitals was 26.6% compared with 22.6% in hospitals reporting under a multi-hospital license. This difference was statistically significant ($p = 0.00$). The difference between the mean hospital-specific declination percentage for single hospitals (27.9%) compared with hospitals reporting under a multi-hospital license (22.3%) was statistically significant ($p = 0.044$).

The aggregate unknown percentage for single hospitals was 18.4% compared with 22.0% in hospitals reporting under a multi-hospital license. This difference was statistically significant ($p < 0.0001$).

Geographic Analysis

Table 6 displays the comparison of reporting and non-reporting single hospitals by region. There were no statistically significant differences in demographics between reporting and non-reporting single hospitals by region. We did not analyze hospital demographic by region

due to the small number of hospitals in each demographic category. We did not perform a similar analysis for multi-hospital licenses given that hospitals under the license may have been in various regions.

Vaccinations

Tables 7 and 8 display regional influenza vaccination percentages among employees in single, general acute care hospitals. Aggregate vaccination percentages in these regions ranged from 49.7% in the South Coast region to 69.6% in the Sierras region (Table 7). The Sierras region had the fewest number of employees of all California regions. Because the Sierras region had the highest aggregate vaccination percentage, we considered it the referent region and compared it with the aggregate vaccination percentage for each of the other eight regions. The difference between the aggregate vaccination percentages from the Far North, San Joaquin, Inland Empire, South Coast, and San Diego regions compared with the Sierras region was statistically significant. The mean hospital-specific vaccination percentages ranged from 48.5% in the South Coast region to 70.8% in the Sierras region (Table 8). We considered the mean hospital-specific vaccination percentage for the Sierras region the referent region and compared it with each of the other eight regional mean-hospital specific vaccination percentages; the difference between the San Diego and Sierras regions was statistically significant.

Declinations

Tables 9 and 10 display regional influenza declination percentages among employees in single, general acute care hospitals. Aggregate declination percentages in these regions ranged from 20.4% in the Sacramento Metro region to 36.2% in the Inland Empire region (Table 9). Because the Sacramento Metro region had the lowest aggregate declination percentage, we considered it the referent region and compared it with the aggregate declination percentage for each of the other eight regions. The difference between the aggregate declination percentages from the Far North, San Joaquin, Inland Empire, South Coast, and San Diego regions compared with the Sacramento Metro region was statistically significant. The mean hospital-specific declination percentages ranged from 20.4% in the Bay Area region to 36.6% in the Inland Empire region (Table 10). We considered the mean hospital-specific declination percentage for the Bay Area region the referent region and compared it with each of the other eight regional mean-hospital specific vaccination percentages; the difference between the Bay Area region compared with the Sierras, Central Coast, Sacramento Metro, San Joaquin, Far North, South Coast and Inland Empire regions was statistically significant.

Hospital-Specific Report Status and Vaccination and Declination Percentages

Tables 11 and 12 display influenza vaccination report status and hospital-specific employee influenza vaccination and declination percentages reported by single and multi-hospital license general acute care hospitals in California for the 2008-2009 respiratory season.

Pre- and Post-Season Surveys

Among all hospitals that responded to the pre-and post-season influenza vaccination program surveys, 171 hospitals responded to both surveys and 156 of these hospitals also submitted influenza vaccination data. There were 48 hospitals in the first quartile (less than or equal to 46.6%) and 37 hospitals in the third quartile (greater than or equal to 67.0%). Based on survey results, hospitals in the third quartile used several strategies in their influenza vaccination programs. Hospitals in the third quartile included all personnel, contractors, and volunteers in their programs. These hospitals also offered vaccine at no cost and provided vaccine during all work shifts. Hospitals in the third quartile used peer vaccination to deliver vaccine and used reminders to promote influenza vaccination. Hospitals in the third quartile conducted formal education programs on influenza and influenza vaccination. More hospitals in the third quartile required that employees provide documentation of vaccination status if they received vaccine off-site. Finally, although most of the hospitals in the third quartile required signed declination statements from employees refusing vaccination, 100% of hospitals in the third quartile required signed declination statements from employees refusing vaccination.

LIMITATIONS

As with any new public health surveillance system, these data have several limitations. These data are affected by self-report bias and issues surrounding data validity, data completeness, and misclassification bias.

Since CDPH collected the influenza vaccination data among hospital employees and non-employee healthcare personnel via a passive surveillance system, these data are subject to self-report bias. The accuracy of these data was dependent on what hospitals submitted. Additionally, hospitals with low vaccination percentages may have been less likely to report to CDPH and hospitals with high vaccination percentages more likely to report, skewing results to higher percentages.

There were many limitations with regards to data quality and completeness. First, hospitals submitted different versions of the reporting form. A number of hospitals submitted multiple forms, sometimes with conflicting data. Second, since the Healthcare Associated Infections Program was not staffed until 2010, CDPH had no system in place to receive the influenza data collection forms at the time of data collection and no database to manage the data electronically. Additionally, CDPH had no quality assurance process in place to review and correct data errors and allow hospitals to verify their data close to the time of submission. The quality assurance process took place retrospectively, resulting in less time to investigate and correct data errors. Although CDPH contacted all of the non-reporting hospitals to verify that no data collection form had been sent, many hospitals did not have the data or could not reconstruct the data for resubmission in 2010. As a result, data completeness was low for mandated reporting: only 85.1% of reporting general acute care hospitals submitted influenza vaccination data for the 2008-2009 season.

Some hospitals significantly misinterpreted the definitions on the data collection forms, particularly for employees, non-employee healthcare personnel, and declinations. The confusion with these definitions led hospitals to misclassify these groups in the data, since the groups may or may not have been counted as was intended on the data collection form. For example, it was unclear to reporting hospitals whether healthcare personnel included employees and non-employees or was exclusive of employees. It also was unclear who should be included in the non-employee healthcare personnel group, such as physicians, per-diem employees, and non-acute care employees; some hospitals may not have included these groups at all in their reports. The definition of declination should have included only employees that refused to receive the vaccine at the reporting hospital. However, due to a typographical error on the data collection form and a checkbox on the declination form, hospitals may have counted employees that received vaccine elsewhere both as vaccinated and as declined. Furthermore, many hospitals do not collect data on influenza vaccination status of non-employee healthcare personnel. Finally, approximately 18% of employees had an unknown vaccination status. Employees could have avoided reporting to employee health either because they did not want to be vaccinated and did not want to sign a declination, or because they were vaccinated elsewhere and did not view reporting as important. We cannot predict how this high rate of unknown vaccination status might have biased results.

DISCUSSION

The data and findings in this report provide a preliminary evaluation of the reporting requirement for influenza vaccination among employees in California general acute care hospitals. The results also indicate that methods for systematic data collection, data quality assurance, and improved reporting should be developed and implemented to help monitor influenza vaccination among hospital employees and non-employee healthcare personnel in California general acute care hospitals.

These findings make clear that a single, standardized data collection form is needed to ensure uniform reporting and the form should be pilot tested for reliability and validity. Additionally, standard definitions for employee and non-employee healthcare personnel are required. These groups should be clearly defined, with examples provided on the data collection form to ensure that hospitals understand which employees and healthcare personnel should be included in their data. Declinations also should be clearly defined.

Despite mandated reporting, influenza vaccination data was incomplete – only 85.1% of all reporting general acute care hospitals submitted influenza vaccination data for the 2008-2009 season. A high rate of unknown vaccination status among reporting hospitals also affects the completeness of the data. Simple data collection and reporting tools are needed to improve hospital compliance with the reporting mandate. Additionally, CDPH should work with hospitals to identify barriers that prevent them from reporting and help resolve information and resource needs.

The lack of standard definitions and a standard data collection form, along with the lack of a well-developed real-time quality assurance process, made it difficult to determine the accuracy of the influenza vaccination percentages among employees in California general

acute care hospitals. The true percentage of employee vaccination may be either higher or lower than 55%. Use of standard definitions and data collection methods in future years will help elucidate true vaccination percentages in hospital employees and non-employee healthcare personnel in California general acute care hospitals. A quality assurance process with systematic, real-time data verification will help improve data quality. Standard methods also will allow for comparability of vaccination data over several years, indicating whether vaccination percentages among California hospital employees and non-employee healthcare personnel are improving.

Approximately 55% of employees in reporting California general acute care hospitals were vaccinated. While this percentage does not meet the Healthy People 2010 target of 60% vaccination among healthcare personnel,⁶ this percentage is slightly higher than percentages published in other studies.^{3, 15} Additionally, 121 (40.7%) single hospitals and 11 (39.3%) multi-hospital licenses met the Healthy People 2010 target of 60%. The proposed Healthy People 2020 target for influenza vaccination among healthcare personnel is 90%. These data and data collected in future years will help identify barriers to vaccination and significantly improve the influenza vaccination percentage among California hospital employees and non-employee healthcare personnel.

Large hospitals were more likely to report than small hospitals operating under a single license. Large hospitals may have multiple departments with personnel that use administrative databases to collect and track influenza vaccination data among employees. Conversely, small hospitals may have fewer personnel resources to track influenza vaccination among employees; influenza vaccination tracking may be under the purview of one person that is responsible for multiple job functions in infection control and employee health, making reporting difficult. Additionally, small hospitals may not have administrative databases that allow for easy data collection and management. Although small hospitals were less likely to report influenza vaccination data, small hospitals that did report had significantly higher vaccination rates than medium or large hospitals. Smaller hospitals may have fewer employees to vaccinate, resulting in increased influenza vaccination percentages. Pediatric hospitals also had significantly higher vaccination percentages and lower declination percentages compared with hospitals with mixed populations and were the only hospitals that met the Healthy People 2010 target of at least 60% vaccination. Because infants and young children are at increased risk for complications from influenza, pediatric hospitals may be more aggressive in their influenza vaccination programs. Identifying vaccination strategies used by pediatric hospitals may provide guidance to less successful hospitals. Data collected from hospitals in the pre- and post-season surveys did not include information on hospital demographics; therefore, data were not partitioned to evaluate strategies that may have been used by pediatric hospitals to promote influenza vaccination among hospital employees. In future years, pre- and post-season surveys should include data on hospital demographics to capture this information.

A comparison of the vaccination and declination percentages and unknown vaccination status between single hospitals and hospitals reporting under multi-hospital licenses showed a statistically significant difference in aggregate percentages. This was likely due to the difference in sample size between the single and multi-hospital licenses and that we

calculated the aggregate percentages by dividing the sum total of vaccinations or declinations by the sum total of employees; therefore, comparing the aggregate percentages for single hospitals and hospitals reporting under a multi-hospital license may not accurately evaluate these data. Mean hospital-specific vaccination and declination percentages should be used instead to compare these groups. There were statistically significant differences between single hospitals and multi-hospital licenses among mean hospital-specific declination percentages. Given that multi-hospital licenses had a statistically significant lower mean hospital-specific declination percentage than single hospitals, multi-hospital licenses may be more adept at convincing staff to be vaccinated. Analyses from future years will shed more light on the differences in influenza vaccination and declination percentages among single hospitals and multi-hospital licenses.

These data show regional differences in both vaccination and declination percentages among hospitals. Regions with low numbers of hospital employees had a higher percentage of vaccinations, whereas metropolitan areas had a lower percentage of declinations. Public health departments and infection preventionists might work with hospitals on a regional level to identify and eliminate barriers to vaccination. Additionally, hospitals in similar regions with similar demographics should work with regional public health and infection prevention professionals to identify best practices for improving vaccination among hospitals employees and non-employee healthcare personnel.

Collecting influenza vaccination data among non-employee healthcare personnel presents a challenge. Hospital employee health services are generally responsible for both providing influenza vaccine to employees and for collecting data on employee influenza vaccination status. Non-employee healthcare personnel, including registry and contract personnel, are often employed or supervised by groups outside the hospital and are usually not the responsibility of hospital employee health services. Of 50 academic medical centers participating in a recent study of healthcare personnel influenza vaccination, only 34 vaccination programs included attending physicians, 16 included visiting physicians, 17 included medical students, 23 included agency nursing staff, 13 included nursing students, and 27 included volunteers.³ A statewide surveillance system cannot collect data that hospitals do not collect. CDC recommends that “facilities that employ healthcare personnel should provide vaccine to workers by using approaches that have been demonstrated to be effective in increasing vaccination coverage.”¹ However, these recommendations fail to recognize that non-employee healthcare personnel are generally not provided vaccine by facilities at all. Many hospitals report legal barriers to collecting vaccination information from non-employee healthcare personnel, but should consider including this requirement when updating agreements with registry and contract agencies.

Few studies have examined whether mandatory declination increases vaccination compliance among healthcare workers. Published results show that use of declination statements paired with other strategies can increase influenza vaccination among healthcare workers.^{14, 16} Because of the issues with misclassification of declinations, this analysis alone should not be used to assess the affect of mandatory declination on influenza vaccination of hospital employees and non-employee healthcare personnel in California. Influenza

vaccination data collected in future years will provide additional information regarding the affect of mandatory declination in California among healthcare personnel.

Approximately 18% of employees had an unknown vaccination status, which was lower than that published in a recent national study;³ however, few other comparisons are available. This finding could be explained by many possibilities. Employees may have been vaccinated elsewhere and not counted by the reporting hospital, indicating misclassification. Medical exemptions may not have been reviewed and then counted as declinations. Additionally, pregnancy or an immunocompromised state was considered a medical exemption in some instances. Finally, employees may not have been vaccinated, which represents a significant gap in protection for these healthcare personnel and demonstrates the need for education. Hospitals with high unknown vaccination status percentages should implement measures to reduce this rate to better assess the effectiveness of their vaccination programs.

This evaluation did not focus on methods and strategies to improve influenza vaccination among employees. However, the pre- and post-season survey comparisons for hospitals with high and low vaccination percentages indicate that there are strategies hospitals with low vaccination percentages can use to more effectively promote influenza vaccination among hospital employees and non-employee healthcare personnel. Successful vaccination programs include targeting all personnel and all types of employees and using many delivery methods for vaccination. As seen in other studies, offering free, accessible vaccine is one of three proven strategies that increase influenza vaccination among healthcare personnel. Hospitals with high vaccination percentages also used reminders and education programs. Documentation of offsite vaccination and mandatory signed declination are two other strategies that hospitals with a low vaccination percentage could consider adding to their influenza vaccination programs.

Hospitals should use the data collected by this system to ensure that all employees are offered influenza vaccine, identify groups of hospital employees and non-employee healthcare personnel at highest risk for developing and transmitting influenza infection, eliminate barriers to vaccination, and implement targeted educational strategies. Best practices should be identified that will help improve influenza vaccination among hospital employees and non-employee healthcare personnel in California general acute care hospitals. CDPH should use these data to hold hospitals accountable for their compliance with the reporting mandate and to begin to assess mandatory declination of influenza vaccination among hospital employees and non-employee healthcare personnel in California general acute care hospitals. This report should encourage all hospitals to continue and re-energize vaccination campaigns as many healthcare workers remain unvaccinated and pose a risk to themselves and their patients.

RECOMMENDATIONS

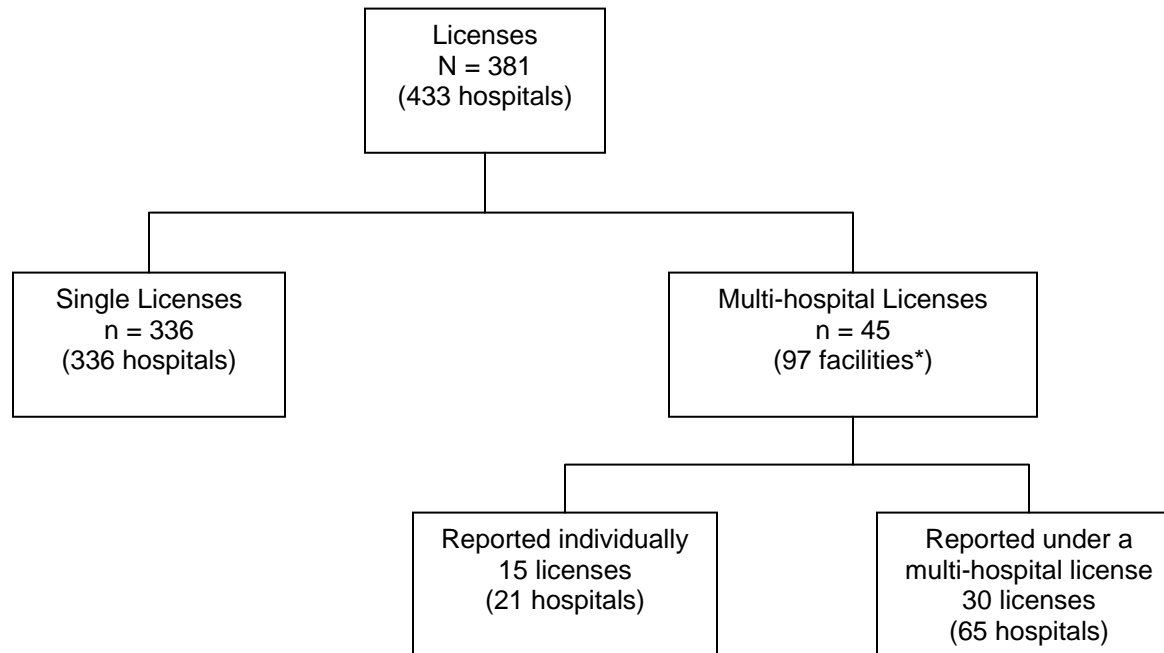
Given the limitations with the 2008-2009 data, CDPH has already implemented changes in the influenza vaccination surveillance system in California general acute care hospitals. CDPH identified a group of infection preventionists, employee and occupational health experts, physicians, and hospital representatives to identify targeted non-employee

healthcare personnel groups with clear definitions to be included on future data collection forms. For the 2010-2011 respiratory season, CDPH developed a standard data collection form with specific, standard definitions and pilot tested it in a subset of hospitals to ensure intended interpretation and implementation.

In addition, implementing the following recommendations could improve collection and reporting of influenza vaccination data and increase influenza vaccination percentages among hospital employees and non-employee healthcare personnel in California general acute care hospitals.

- CDPH should work with hospitals to identify barriers to reporting and develop simple reporting methods to eliminate those barriers.
- CDPH should develop and implement a quality assurance process with data verification.
- CDPH should continue collecting influenza data to assess the affect of mandatory declination on influenza vaccination percentages among hospital employees and non-employee healthcare personnel.
- CDPH should work with CDC and other stakeholders to develop a method for hospitals to report aggregate employee and non-employee healthcare personnel influenza vaccination data via NHSN.
- Hospitals should identify barriers to vaccination and develop methods to eliminate those barriers.
- Hospitals should develop a system to account for the vaccination status of all registry and contract personnel.
- Hospitals should better characterize vaccination and declination percentages among hospital employees to minimize unknown vaccination percentages.
- Hospitals should evaluate their influenza vaccination programs to identify best practices and strategies that enhance vaccination among hospital employees and non-employee healthcare personnel.

Figure 1. Categorization of general acute care hospitals by license status and influenza vaccination report status, California, 2008-2009.



*Note: 11 facilities were excluded from the group of multi-hospital licenses because they were not acute care hospitals. Therefore, the general acute care hospitals under those licenses were included in the analysis as reporting individually.

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 1. Employee influenza vaccination response percentages for single and multi-hospital-license general acute care hospitals, California, 2008-2009.

	Total n	Reporting n (%)	Non-reporting n (%)
Single hospitals	357	299* (83.8)	58 (16.2)
Multi-hospital licenses	30	30 [‡] (100)	0

*One hospital rescinded its data; one hospital submitted a report but did not include data on hospital employees.

[‡]One hospital rescinded its data; one hospital submitted a report but did not include data on hospital employees.

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 2. Demographics of single, general acute care hospitals (n=357) by reporting and non-reporting hospitals for employee influenza vaccination, California 2008-2009.

	Total	Reporting n (%)	Non-reporting n (%)	p-value [‡]
Bed size				
Small (4-80)	118 (33.1)	90 (76.3)	28 (23.7)	0.0071*
Medium (81-199)	118 (33.1)	98 (83.1)	20 (16.9)	0.80
Large (200+)	121 (33.9)	111 (91.7)	10 (8.3)	0.0034*
Rural	60 (16.8)	52 (86.7)	8 (13.3)	0.54
Urban	297 (83.2)	248 (83.5)	49 (16.5)	
Pediatric	12 (3.4)	10 (83.3)	2 (16.7)	1.0
Mixed	345 (96.6)	290 (84.1)	55 (15.9)	
Teaching	43 (12.0)	40 (93.0)	3 (7.0)	0.12
Non-teaching	314 (87.9)	260 (82.8)	54 (17.2)	

[‡]p-value was obtained using a chi-square test

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 3. Employee influenza vaccination percentages in single, general acute care hospitals (n=297) by hospital demographic, California 2008-2009.

	Number of employees	Aggregate % (95% confidence interval)	Mean hospital-specific % ± standard deviation	p-value[‡]
Single hospitals	403756	55.0 (54.9-55.2)	55.3 ± 14.3	--
Bed size				
Small (4-80)	31738	56.3 (55.8-56.8)	57.7 ± 14.9	0.046*
Medium (81-202)	88414	54.2 (53.9-54.6)	52.6 ± 15.5	
Large (203+)	283604	55.1 (55.0-55.3)	55.6 ± 12.3	
Rural	19244	57.5 (56.8-58.2)	57.6 ± 14.1	0.19
Urban	382994	54.9 (54.8-55.1)	54.7 ± 14.4	
Pediatric	16799	66.4 (65.7-67.1)	65.2 ± 6.5	0.025*
Mixed	385439	54.5 (54.4-54.7)	54.9 ± 14.4	
Teaching	125763	55.7 (55.4-56.0)	57.4 ± 13.0	0.32
Non-teaching	276475	54.7 (54.6-54.9)	54.9 ± 14.6	

[‡]p-value was obtained using ANOVA for hospital-specific percentages

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 4. Employee influenza declination percentages in single, general acute care hospitals (n=297) by hospital demographic, California 2008-2009.

	Number of employees	Aggregate % (95% confidence interval)	Mean hospital-specific % ± standard deviation	p-value [‡]
Single hospitals	403756	26.6 (26.5-26.8)	27.9 ± 14.1	--
Bed size				
Small (4-80)	31738	25.9 (25.4-26.3)	27.5 ± 14.8	0.69
Medium (81-199)	88414	24.9 (24.6-25.2)	27.3 ± 14.8	
Large (200+)	283604	27.3 (27.1-27.4)	28.9 ± 13.1	
Rural	19244	28.0 (27.3-28.6)	27.1 ± 13.7	0.69
Urban	382994	26.5 (26.4-26.7)	28.0 ± 14.3	
Pediatric	16799	18.4 (17.8-18.9)	19.1 ± 8.8	0.044*
Mixed	385439	26.9 (26.8-27.1)	28.3 ± 14.2	
Teaching	125763	26.9 (26.6-27.1)	27.9 ± 11.7	1.0
Non-teaching	276475	26.5 (26.3-26.6)	27.9 ± 14.5	

[‡]p-value was obtained using ANOVA for hospital-specific percentages

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 5. Employee influenza vaccination and declination percentages in multi-hospital license, general acute care hospitals (n=28), California 2008-2009.

	Number of employees	Aggregate % (95% confidence interval)	Mean hospital-specific % ± standard deviation
Vaccinations	85744	55.4 (55.1-55.8)	56.7 ± 13.4
Declinations	85744	22.6 (22.3-22.8)	22.3 ± 13.4

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 6. Comparison of reporting and non-reporting single, general acute care hospitals (n=357) by region for employee influenza vaccination, California 2008-2009.

	Total	Reporting n (%)	Non-reporting n (%)	p-value[‡]
Far North	33	27 (81.8)	6 (18.2)	0.75
Sacramento Metro	16	16 (100)	0	0.085
Sierras	7	5 (71.4)	2 (28.9)	0.32
Bay Area	55	46 (83.6)	9 (16.4)	0.98
San Joaquin Valley	43	37 (86.1)	6 (14.0)	0.66
Central Coast	17	16 (94.1)	1 (5.9)	0.33
Inland Empire	32	27 (84.4)	5 (15.6)	0.92
South Coast	132	107 (81.1)	25 (18.9)	0.29
San Diego	22	18 (81.8)	4 (18.2)	0.77

[‡]p-value was obtained using a chi-square test

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 7. Aggregate employee influenza vaccination percentages in single, general acute care hospitals (n=297) by region, California 2008-2009.

	Number of employees	Aggregate % (95% confidence interval)	p-value[‡]
Single hospitals	403756	55.0 (54.9-55.2)	--
Sierras	2523	69.6 (67.8-71.4)	Referent
San Diego	31437	65.2 (64.7-65.7)	0.0010*
Central Coast	14179	61.7 (60.9-62.5)	0.11
Inland Empire	26291	59.3 (58.7-59.9)	0.00*
Far North	11329	58.2 (57.3-59.1)	0.00*
Sacramento Metro	27544	58.0 (57.4-58.6)	0.37
Bay Area	83769	57.4 (57.0-57.7)	0.13
San Joaquin Valley	42076	55.4 (54.9-55.9)	0.00*
South Coast	164608	49.7 (49.4-49.9)	0.00*

[‡]p-value was obtained using a chi-square test

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 8. Mean hospital-specific employee influenza vaccination percentages in single, general acute care hospitals (n=297) by region, California 2008-2009.

	Number of employees	Mean hospital-specific % ± standard deviation	p-value [‡]
Single hospitals	403756	55.3 ± 14.3	--
Sierras	2523	70.8 ± 9.4	Referent
San Diego	31437	64.4 ± 7.7	0.00040*
Sacramento Metro	27544	60.1 ± 7.5	0.83
Central Coast	14179	60.1 ± 14.1	0.21
Far North	11329	59.6 ± 12.0	0.86
Bay Area	83769	58.5 ± 13.87	0.30
San Joaquin Valley	42076	57.0 ± 11.4	0.66
Inland Empire	26291	55.3 ± 16.9	0.61
South Coast	164608	48.5 ± 14.5	0.086

[‡]p-value was obtained using ANOVA

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 9. Aggregate employee influenza declination percentages in single, general acute care hospitals (n=297) by region, California 2008-2009.

	Number of employees	Aggregate % (95% confidence interval)	p-value[‡]
Single hospitals	403756	26.6 (26.5-26.8)	--
Sacramento Metro	27544	20.4 (19.9-20.9)	Referent
Bay Area	83769	20.8 (20.5-21.0)	0.108
Central Coast	14179	22.5 (21.8-23.2)	0.14
Sierras	2523	23.4 (21.7-25.0)	0.37
Far North	11329	24.8 (24.1-25.6)	0.00*
San Joaquin Valley	42076	25.6 (25.2-26.0)	0.00*
San Diego	31437	25.7 (25.3-26.2)	0.00*
South Coast	164608	30.1 (29.9-30.3)	0.00*
Inland Empire	26291	36.2 (35.6-36.8)	0.00*

[‡]p-value was obtained using a chi-square test

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 10. Mean hospital-specific employee influenza declination percentages in single, general acute care hospitals (n=297) by region, California 2008-2009.

	Number of employees	Mean hospital-specific % ± standard deviation	p-value [‡]
Single hospitals	403756	27.9 ± 14.1	--
Bay Area	83769	20.4 ± 11.5	Referent
Sierras	2523	21.2 ± 8.7	0.0096*
Central Coast	14179	23.6 ± 10.3	0.019*
Sacramento Metro	27544	25.1 ± 13.1	0.0025*
San Joaquin Valley	42076	25.9 ± 11.9	0.038*
Far North	11329	26.8 ± 12.3	<0.0001*
San Diego	31437	26.9 ± 9.5	0.11
South Coast	164608	31.6 ± 15.6	0.016*
Inland Empire	26291	36.6 ± 15.2	0.0019*

[‡]p-value was obtained using ANOVA

*p<0.05 was considered statistically significant

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010.

Table 11. Employee influenza vaccination report status and hospital-specific employee influenza vaccination and declination percentages reported by single, general acute care hospitals, California, 2008-2009.

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
ADVENTIST HEALTH SYSTEMS	Report	56.1	41.0
AGNEWS STATE HOSPITAL	No Report	.	.
AHMC ANAHEIM REGIONAL MEDICAL CENTER	Report	38.1	61.9
ALAMEDA HOSPITAL	Report	18.2	5.5
ALHAMBRA HOSPITAL MEDICAL CENTER	No Report	.	.
ANAHEIM GENERAL HOSPITAL	No Report	.	.
ANTELOPE VALLEY HOSPITAL	Report	52.6	29.0
ARROWHEAD REGIONAL MEDICAL CENTER*	Report	.	.
ARROYO GRANDE COMMUNITY HOSPITAL	Report	67.0	28.6
BAKERSFIELD HEART HOSPITAL	Report	73.9	13.7
BAKERSFIELD MEMORIAL HOSPITAL	Report	53.4	16.6
BALLARD REHABILITATION HOSPITAL	Report	81.0	12.7
BANNER LASSEN MEDICAL CENTER	Report	69.3	23.2
BARLOW RESPIRATORY HOSPITAL	Report	51.6	35.4
BARSTOW COMMUNITY HOSPITAL	Report	54.2	45.8
BARTON MEMORIAL HOSPITAL	Report	62.7	47.3
BEAR VALLEY COMMUNITY HOSPITAL	Report	68.8	26.3
BELLFLOWER MEDICAL CENTER	Report	38.1	7.3
BEVERLY HOSPITAL	Report	40.4	56.1

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
BIGGS GRIDLEY MEMORIAL HOSPITAL	No Report	.	.
BROTMAN MEDICAL CENTER	Report	35.2	18.4
CALIFORNIA HOSPITAL MEDICAL CENTER - LOS ANGELES	Report	42.5	44.3
CALIFORNIA MEDICAL FACILITY	No Report	.	.
CALIFORNIA MENS COLONY	No Report	.	.
CALIFORNIA PACIFIC MEDICAL CENTER - ST. LUKE'S CAMPUS	Report	46.6	39.6
CASA COLINA HOSPITAL FOR REHABILITATIVE MEDICINE	Report	36.0	64.0
CATALINA ISLAND MEDICAL CENTER	Report	69.4	25.8
CEDARS-SINAI MEDICAL CENTER	Report	46.6	28.1
CENTINELA HOSPITAL MEDICAL CENTER	Report	35.9	52.7
CENTRAL VALLEY GENERAL HOSPITAL	Report	63.0	36.1
CENTURY CITY DOCTORS HOSPITAL	No Report	.	.
CHAPMAN MEDICAL CENTER	Report	58.9	37.1
CHILDREN'S HOSPITAL AT MISSION	Report	72.5	24.8
CHILDREN'S HOSPITAL CENTRAL CALIFORNIA	Report	62.9	14.9
CHILDREN'S HOSPITAL OF ORANGE COUNTY	Report	75.7	19.4
CHILDREN'S RECOVERY CENTER OF NORTHERN CALIFORNIA	Report	57.9	18.9
CHILDRENS HOSPITAL AND RESEARCH CENTER AT OAKLAND	Report	72.0	17.2
CHILDRENS HOSPITAL OF LOS ANGELES	Report	60.4	12.3
CHINESE HOSPITAL	No Report	.	.
CHINO VALLEY MEDICAL CENTER	No Report	.	.
CITY OF HOPE HELFORD CLINICAL RESEARCH HOSPITAL	Report	55.0	32.8

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
CLOVIS COMMUNITY MEDICAL CENTER	Report	59.3	40.6
COALINGA REGIONAL MEDICAL CENTER	Report	49.8	16.3
COAST PLAZA HOSPITAL	Report	37.7	51.0
COASTAL COMMUNITIES HOSPITAL	Report	41.7	58.3
COLLEGE HOSPITAL COSTA MESA	Report	43.0	0.0
COLORADO RIVER MEDICAL CENTER	Report	33.6	8.8
COLUSA REGIONAL MEDICAL CENTER	Report	76.5	18.2
COMMUNITY AND MISSION HOSPITAL OF HUNTINGTON PARK	No Report	.	.
COMMUNITY HOSPITAL OF LONG BEACH	Report	37.5	21.7
COMMUNITY HOSPITAL OF SAN BERNARDINO	Report	39.8	59.5
COMMUNITY HOSPITAL OF THE MONTEREY PENINSULA	Report	69.1	7.0
COMMUNITY MEMORIAL HOSPITAL - SAN BUENAVENTURA	Report	52.1	18.2
COMMUNITY REGIONAL MEDICAL CENTER	Report	62.4	36.4
CONTRA COSTA REGIONAL MEDICAL CENTER	Report	43.8	22.8
CORCORAN DISTRICT HOSPITAL	No Report	.	.
DAMERON HOSPITAL	Report	52.9	23.1
DELANO REGIONAL MEDICAL CENTER	No Report	.	.
DESERT REGIONAL MEDICAL CENTER	Report	76.3	23.6
DESERT VALLEY HOSPITAL	Report	55.4	46.0
DOCTORS HOSPITAL OF MANTECA	Report	69.4	29.5
DOCTORS HOSPITAL OF WEST COVINA, INC.	Report	53.8	44.9
DOCTORS MEDICAL CENTER	Report	62.2	33.1

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
DOCTORS MEDICAL CENTER - SAN PABLO	Report	37.3	28.5
DOWNEY REGIONAL MEDICAL CENTER	Report	68.0	21.3
EARL & LORAIN MILLER CHILDREN'S HOSPITAL	Report	66.0	30.3
EAST LOS ANGELES DOCTORS HOSPITAL	No Report	.	.
EAST VALLEY HOSPITAL MEDICAL CENTER	No Report	.	.
EASTERN PLUMAS HEALTH CARE	Report	63.4	36.6
EISENHOWER MEDICAL CENTER	Report	44.4	38.1
EL CAMINO HOSPITAL	Report	60.4	39.5
EL CAMINO HOSPITAL LOS GATOS	Report	58.8	0.0
EL CENTRO REGIONAL MEDICAL CENTER	Report	78.1	24.1
EMANUEL MEDICAL CENTER INC.	Report	64.2	27.6
ENCINO HOSPITAL MEDICAL CENTER	Report	46.5	49.9
FAIRCHILD MEDICAL CENTER	Report	65.2	32.2
FAIRVIEW DEVELOPMENTAL CENTER	No Report	.	.
FALLBROOK HOSPITAL DISTRICT	Report	69.5	28.7
FEATHER RIVER HOSPITAL	Report	51.8	24.2
FOOTHILL PRESBYTERIAN HOSPITAL - JOHNSTON MEMORIAL	Report	77.7	0.0
FRANK R. HOWARD MEMORIAL HOSPITAL	Report	63.9	31.1
FRENCH HOSPITAL MEDICAL CENTER	Report	78.3	20.7
FRESNO HEART AND SURGICAL HOSPITAL	Report	66.8	32.9
FRESNO SURGICAL HOSPITAL	Report	51.2	46.0
GARDEN GROVE HOSPITAL AND MEDICAL CENTER	Report	44.7	38.7

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
GARFIELD MEDICAL CENTER	Report	83.5	0.0
GEORGE L. MEE MEMORIAL HOSPITAL	Report	46.8	17.7
GLENDALE ADVENTIST MEDICAL CENTER	Report	40.9	43.7
GLENDALE MEMORIAL HOSPITAL AND HEALTH CENTER	Report	61.0	36.2
GLENN MEDICAL CENTER	Report	64.3	35.7
GOLETA VALLEY COTTAGE HOSPITAL	Report	71.8	27.9
GOOD SAMARITAN HOSPITAL - LOS ANGELES	Report	49.6	32.8
GOOD SAMARITAN HOSPITAL - BAKERSFIELD	No Report	.	.
GREATER EL MONTE COMMUNITY HOSPITAL	Report	29.7	25.9
GROSSMONT HOSPITAL	Report	64.8	30.6
HAZEL HAWKINS MEMORIAL HOSPITAL	Report	85.5	23.9
HEALDSBURG DISTRICT HOSPITAL	Report	43.6	30.9
HEALTHBRIDGE CHILDREN'S HOSPITAL - ORANGE	Report	60.3	25.0
HEALTHSOUTH BAKERSFIELD REHABILITATION HOSPITAL	Report	53.8	37.3
HEALTHSOUTH TUSTIN REHABILITATION HOSPITAL	No Report	.	.
HEMET VALLEY MEDICAL CENTER	Report	38.2	58.0
HENRY MAYO NEWHALL MEMORIAL HOSPITAL	Report	60.2	17.3
HI-DESERT MEDICAL CENTER	No Report	.	.
HOAG HOSPITAL IRVINE	No Report	.	.
HOAG MEMORIAL HOSPITAL PRESBYTERIAN	Report	43.5	41.4
HOLLYWOOD COMMUNITY HOSPITAL OF HOLLYWOOD	Report	37.2	56.7
HOLLYWOOD PRESBYTERIAN MEDICAL CENTER	Report	33.3	20.9

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
HUNTINGTON BEACH HOSPITAL	Report	60.0	34.5
HUNTINGTON MEMORIAL HOSPITAL	No Report	.	.
JEROLD PHELPS COMMUNITY HOSPITAL	Report	35.7	64.3
JOHN C. FREMONT HEALTHCARE DISTRICT	Report	71.1	27.1
JOHN D KLARICH MEMORIAL HOSPITAL, CSP - CORCORAN	Report	56.5	11.7
JOHN F. KENNEDY MEMORIAL HOSPITAL	Report	64.6	33.8
JOHN MUIR MEDICAL CENTER - WALNUT CREEK CAMPUS	Report	50.6	19.8
JOHN MUIR MEDICAL CENTER - CONCORD CAMPUS	Report	56.9	21.4
KAISER FOUND. HOSPITAL & REHAB. CENTER - VALLEJO	Report	49.7	20.1
KAISER FOUNDATION HOSPITAL - PANORAMA	Report	65.7	28.3
KAISER FOUNDATION HOSPITAL - ANTIOCH	Report	76.0	24.0
KAISER FOUNDATION HOSPITAL - BALDWIN PARK	Report	68.0	31.3
KAISER FOUNDATION HOSPITAL - REDWOOD CITY	Report	69.0	17.2
KAISER FOUNDATION HOSPITAL - SAN DIEGO	Report	70.5	24.0
KAISER FOUNDATION HOSPITAL - SAN FRANCISCO	Report	45.0	5.1
KAISER FOUNDATION HOSPITAL - SAN RAFAEL	Report	59.6	18.5
KAISER FOUNDATION HOSPITAL – SANTA ROSA	Report	74.7	24.8
KAISER FOUNDATION HOSPITAL – SOUTH BAY	Report	60.9	31.4
KAISER FOUNDATION HOSPITAL – SOUTH SAN FRANCISCO	Report	70.3	13.3
KAISER FOUNDATION HOSPITAL - FRESNO	Report	39.5	18.6
KAISER FOUNDATION HOSPITAL FONTANA	Report	70.6	26.4
KAISER FOUNDATION HOSPITAL SUNSET	Report	62.7	36.9

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
KAISER FOUNDATION HOSPITAL, RIVERSIDE	No Report	.	.
KAISER FOUNDATION HOSPITAL, WOODLAND HILLS	Report	68.0	31.3
KAISER FOUNDATION HOSPITAL - DOWNEY	No Report	.	.
KAISER FOUNDATION HOSPITAL - MORENO VALLEY	No Report	.	.
KAISER FOUNDATION HOSPITAL - SACRAMENTO/ROSEVILLE	Report	59.0	10.5
KAISER FOUNDATION HOSPITAL - SACRAMENTO/ROSEVILLE	Report	46.7	8.4
KAISER FOUNDATION HOSPITAL - SAN JOSE	Report	62.5	23.2
KAISER FOUNDATION HOSPITAL – SANTA CLARA	No Report	.	.
KAISER FOUNDATION HOSPITAL – SOUTH SACRAMENTO	Report	53.4	19.3
KAISER FOUNDATION HOSPITAL - WALNUT CREEK	Report	77.2	17.8
KAISER FOUNDATION HOSPITAL - WEST LA	Report	55.6	44.4
KAWEAH DELTA MEDICAL CENTER	Report	52.4	10.6
KENTFIELD REHABILITATION & SPECIALTY HOSPITAL	No Report	.	.
KERN MEDICAL CENTER	Report	87.2	20.7
KERN VALLEY HEALTHCARE DISTRICT	Report	51.3	27.0
KINDRED HOSPITAL - LA MIRADA	No Report	.	.
KINDRED HOSPITAL - LOS ANGELES	Report	31.6	43.6
KINDRED HOSPITAL – SACRAMENTO	Report	53.1	36.9
KINDRED HOSPITAL - SAN DIEGO	Report	53.0	25.1
KINDRED HOSPITAL - SAN FRANCISCO BAY AREA	Report	41.3	11.2
KINDRED HOSPITAL - SAN GABRIEL VALLEY	No Report	.	.
KINDRED HOSPITAL - SANTA ANA	No Report	.	.

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
KINDRED HOSPITAL BREA	Report	27.3	60.7
KINDRED HOSPITAL MODESTO	No Report	.	.
KINDRED HOSPITAL ONTARIO	Report	59.2	35.8
KINDRED HOSPITAL WESTMINSTER	Report	21.3	1.8
KINGSBURG MEDICAL CENTER	No Report	.	.
LA PALMA INTERCOMMUNITY HOSPITAL	Report	54.0	38.1
LAC+USC MEDICAL CENTER	Report	19.0	0.0
LAC/HARBOR-UCLA MEDICAL CENTER	Report	38.5	33.4
LAC/RANCHO LOS AMIGOS NATIONAL REHABILITATION CTR	Report	44.8	48.0
LAGUNA HONDA HOSPITAL & REHABILITATION CENTER	Report	72.1	19.0
LAKEWOOD REGIONAL MEDICAL CENTER	No Report	.	.
LANCASTER COMMUNITY HOSPITAL	Report	42.0	27.1
LANTERMAN DEVELOPMENTAL CENTER	Report	32.3	38.7
LOMPOC VALLEY MEDICAL CENTER	Report	55.2	12.2
LONG BEACH MEMORIAL MEDICAL CENTER	Report	58.9	33.0
LOS ALAMITOS MEDICAL CENTER	Report	59.2	27.8
LOS ANGELES COUNTY OLIVE VIEW-UCLA MEDICAL CENTER	No Report	.	.
LOS ANGELES METROPOLITAN MEDICAL CENTER	Report	26.6	53.0
LUCILE SALTER PACKARD CHILDREN'S HOSP AT STANFORD	Report	67.1	27.9
MAD RIVER COMMUNITY HOSPITAL	Report	42.0	19.8
MADERA COMMUNITY HOSPITAL*	Report	.	.
MAMMOTH HOSPITAL	Report	57.7	8.2

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
MARIAN MEDICAL CENTER	Report	63.8	25.4
MARIN GENERAL HOSPITAL	Report	92.1	39.8
MARINA DEL REY HOSPITAL	Report	17.1	10.2
MARK TWAIN ST. JOSEPH'S HOSPITAL (4RH)	No Report	.	.
MARSHALL MEDICAL CENTER (1-RH)	Report	68.1	23.9
MAYERS MEMORIAL HOSPITAL	No Report	.	.
MEMORIAL HOSPITAL LOS BANOS	Report	65.7	24.4
MEMORIAL HOSPITAL OF GARDENA	Report	51.9	0.0
MEMORIAL MEDICAL CENTER	Report	42.6	25.0
MENDOCINO COAST DISTRICT HOSPITAL	No Report	.	.
MENIFEE VALLEY MEDICAL CENTER	Report	34.7	48.7
MENLO PARK SURGICAL HOSPITAL	Report	65.6	34.4
MERCY GENERAL HOSPITAL	Report	68.8	29.4
MERCY HOSPITAL OF FOLSOM	Report	65.6	34.4
MERCY MEDICAL CENTER MERCED - COMMUNITY CAMPUS	Report	44.7	18.1
MERCY MEDICAL CENTER MT. SHASTA	Report	69.3	30.7
MERCY MEDICAL CENTER REDDING	Report	58.3	18.9
MERCY SAN JUAN MEDICAL CENTER	Report	54.0	43.4
METHODIST HOSPITAL OF SACRAMENTO	Report	64.4	28.8
METHODIST HOSPITAL OF SOUTHERN CALIFORNIA	Report	51.4	41.5
MIRACLE MILE MEDICAL CENTER	No Report	.	.
MISSION COMMUNITY HOSPITAL - PANORAMA CAMPUS	Report	57.1	41.8

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
MISSION HOSPITAL LAGUNA BEACH	No Report	.	.
MISSION HOSPITAL REGIONAL MEDICAL CENTER	Report	71.9	6.4
MODOC MEDICAL CENTER	Report	36.0	49.3
MONROVIA MEMORIAL HOSPITAL	No Report	.	.
MONTCLAIR HOSPITAL MEDICAL CENTER	No Report	.	.
MONTEREY PARK HOSPITAL	Report	39.1	0.0
MOTION PICTURE & TELEVISION HOSPITAL	Report	68.5	8.6
MOUNTAINS COMMUNITY HOSPITAL	Report	34.1	52.7
NATIVIDAD MEDICAL CENTER	Report	39.5	11.1
NEWPORT SPECIALTY HOSPITAL	No Report	.	.
NORTHERN CALIFORNIA REHABILITATION HOSPITAL	Report	55.4	0.0
NORTHERN INYO HOSPITAL	Report	83.1	16.9
NORTHRIDGE HOSPITAL MEDICAL CENTER	Report	51.3	44.6
NOVATO COMMUNITY HOSPITAL	Report	78.0	23.5
O'CONNOR HOSPITAL	Report	68.1	30.5
OAK VALLEY HOSPITAL DISTRICT (2-RH)	Report	35.1	0.0
OJAI VALLEY COMMUNITY HOSPITAL	Report	65.1	34.9
OLYMPIA MEDICAL CENTER	Report	62.5	25.4
ORANGE COAST MEMORIAL MEDICAL CENTER	Report	50.2	36.3
OROVILLE HOSPITAL	No Report	.	.
PACIFIC ALLIANCE MEDICAL CENTER	Report	46.7	46.6
PACIFIC HOSPITAL OF LONG BEACH	Report	48.3	51.7

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
PACIFICA HOSPITAL OF THE VALLEY	Report	40.2	19.5
PALM DRIVE HOSPITAL	Report	38.5	0.0
PALO VERDE HOSPITAL	Report	52.4	39.2
PALOMAR MEDICAL CENTER	Report	56.4	32.1
PARADISE VALLEY HOSPITAL	Report	48.7	51.3
PARKVIEW COMMUNITY HOSPITAL MEDICAL CENTER	Report	54.5	34.0
PATIENTS' HOSPITAL OF REDDING	Report	70.7	29.3
PETALUMA VALLEY HOSPITAL	Report	42.2	20.2
PIONEERS MEMORIAL HEALTHCARE DISTRICT	Report	57.7	21.1
PLACENTIA LINDA HOSPITAL	Report	55.9	28.2
PLUMAS DISTRICT HOSPITAL	Report	73.6	12.7
POMERADO HOSPITAL	Report	56.4	32.2
POMONA VALLEY HOSPITAL MEDICAL CENTER	Report	46.0	40.1
PORTERVILLE DEVELOPMENTAL CENTER	No Report	.	.
PRESBYTERIAN INTERCOMMUNITY HOSPITAL	Report	43.9	36.2
PROMISE HOSP OF EAST LOS ANGELES-EAST L.A. CAMPUS	Report	26.0	27.6
PROMISE HOSPITAL OF SAN DIEGO	No Report	.	.
PROVIDENCE HOLY CROSS MEDICAL CENTER	Report	48.1	25.0
PROVIDENCE LITTLE COMPANY OF MARY MEDICAL CENTER SAN PEDRO	Report	43.7	31.0
PROVIDENCE LITTLE COMPANY OF MARY MEDICAL CENTER TORRANCE	Report	45.5	22.1
PROVIDENCE SAINT JOSEPH MEDICAL CENTER	Report	42.1	13.4
PROVIDENCE TARZANA MEDICAL CENTER	Report	45.2	37.9

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
QUEEN OF THE VALLEY MEDICAL CENTER	Report	47.2	29.7
RADY CHILDREN'S HOSPITAL - SAN DIEGO	No Report	.	.
RANCHO SPECIALTY HOSPITAL	Report	100.0	0.0
REDLANDS COMMUNITY HOSPITAL	Report	66.8	29.8
REDWOOD MEMORIAL HOSPITAL	Report	77.1	7.3
REGIONAL MEDICAL CENTER OF SAN JOSE	Report	53.9	21.4
RIDGECREST REGIONAL HOSPITAL	Report	57.2	14.9
RIVERSIDE COMMUNITY HOSPITAL	Report	68.6	29.1
RIVERSIDE COUNTY REGIONAL MEDICAL CENTER	Report	66.7	33.0
RONALD REAGAN UCLA MEDICAL CENTER	No Report	.	.
SAINT AGNES MEDICAL CENTER	Report	47.5	45.9
SAINT FRANCIS MEDICAL CENTER	Report	32.7	21.7
SAINT FRANCIS MEMORIAL HOSPITAL	Report	57.7	34.2
SAINT JOHN'S HEALTH CENTER	Report	31.6	8.0
SAINT LOUISE REGIONAL HOSPITAL	Report	62.5	36.5
SAINT VINCENT MEDICAL CENTER	Report	51.1	48.6
SALINAS VALLEY MEMORIAL HOSPITAL	Report	67.0	33.0
SAN ANTONIO COMMUNITY HOSPITAL	Report	54.5	41.7
SAN DIMAS COMMUNITY HOSPITAL	Report	61.6	18.7
SAN FRANCISCO GENERAL HOSPITAL	Report	57.1	8.2
SAN GABRIEL VALLEY MEDICAL CENTER	Report	14.4	8.4
SAN GORGONIO MEMORIAL HOSPITAL	Report	45.0	48.8

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
SAN JOAQUIN COMMUNITY HOSPITAL	Report	46.4	17.0
SAN JOAQUIN GENERAL HOSPITAL	Report	67.5	28.5
SAN JOAQUIN VALLEY REHABILITATION HOSPITAL	Report	41.9	48.4
SAN MATEO MEDICAL CENTER	Report	56.2	22.9
SANTA BARBARA COTTAGE HOSPITAL	Report	59.4	29.2
SANTA CLARA VALLEY MEDICAL CENTER	Report	41.3	31.7
SANTA MONICA - UCLA MEDICAL CENTER AND ORTHOPAEDIC HOSPITAL	Report	50.6	43.3
SANTA ROSA MEMORIAL HOSPITAL	Report	53.2	18.6
SANTA YNEZ VALLEY COTTAGE HOSPITAL	Report	54.0	43.7
SCRIPPS GREEN HOSPITAL	Report	64.2	23.2
SCRIPPS MEMORIAL HOSPITAL - ENCINITAS	Report	68.1	31.4
SCRIPPS MEMORIAL HOSPITAL - LA JOLLA	Report	61.1	0.0
SCRIPPS MERCY HOSPITAL	No Report	.	.
SCRIPPS MERCY HOSPITAL CHULA VISTA	No Report	.	.
SENECA HEALTHCARE DISTRICT	No Report	.	.
SEQUOIA HOSPITAL	Report	71.3	28.2
SETON MEDICAL CENTER	No Report	.	.
SHARP CHULA VISTA MEDICAL CENTER	Report	66.5	24.2
SHARP CORONADO HOSPITAL AND HEALTHCARE CENTER	Report	67.0	25.0
SHARP MARY BIRCH HOSPITAL FOR WOMEN AND NEWBORNS	Report	68.0	29.9
SHARP MEMORIAL HOSPITAL	Report	64.3	26.9
SHASTA REGIONAL MEDICAL CENTER	Report	63.8	29.4

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
SHERMAN OAKS HOSPITAL	Report	39.3	29.1
SHRINERS HOSPITALS FOR CHILDREN	No Report	.	.
SHRINERS HOSPITALS FOR CHILDREN NORTHERN CALIF.	Report	57.4	0.0
SIERRA KINGS DISTRICT HOSPITAL	Report	36.4	7.5
SIERRA NEVADA MEMORIAL HOSPITAL	Report	63.1	28.5
SIERRA VIEW DISTRICT HOSPITAL	Report	76.5	17.2
SIERRA VISTA REGIONAL MEDICAL CENTER	Report	54.7	11.1
SILVER LAKE MEDICAL CENTER	Report	45.7	52.1
SIMI VALLEY HOSPITAL & HEALTH CARE SERVICES	No Report	.	.
SONOMA DEVELOPMENTAL CENTER	Report	48.5	0.0
SONOMA VALLEY HOSPITAL	No Report	.	.
SONORA REGIONAL MEDICAL CENTER	Report	67.5	29.7
SOUTHERN INYO HOSPITAL	No Report	.	.
ST BERNARDINE MEDICAL CENTER	Report	59.5	40.5
ST ELIZABETH COMMUNITY HOSPITAL	Report	65.5	31.3
ST JOHN'S PLEASANT VALLEY HOSPITAL	Report	38.4	29.0
ST JOHN'S REGIONAL MEDICAL CENTER	Report	45.4	26.8
ST ROSE HOSPITAL	Report	72.7	11.8
ST. HELENA HOSPITAL	No Report	.	.
ST. HELENA HOSPITAL – CLEARLAKE	Report	61.0	24.2
ST. JOSEPH HOSPITAL	Report	66.2	17.2
ST. JOSEPH HOSPITAL	Report	28.8	32.1

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
ST. JOSEPH'S MEDICAL CENTER OF STOCKTON	Report	54.0	19.3
ST. JUDE MEDICAL CENTER	Report	61.7	25.3
ST. MARY MEDICAL CENTER	Report	45.9	54.1
ST. MARY MEDICAL CENTER	Report	66.6	29.4
ST. MARY'S MEDICAL CENTER	Report	67.0	31.0
STANFORD HOSPITAL	Report	61.6	26.7
STANISLAUS SURGICAL HOSPITAL	Report	59.5	38.5
SURPRISE VALLEY COMMUNITY HOSPITAL	Report	45.6	25.3
SUTTER AMADOR HOSPITAL	Report	74.7	24.2
SUTTER AUBURN FAITH HOSPITAL	Report	61.0	35.0
SUTTER COAST HOSPITAL	Report	64.3	20.8
SUTTER DAVIS HOSPITAL	Report	50.9	16.0
SUTTER DELTA MEDICAL CENTER	Report	56.3	21.1
SUTTER LAKESIDE HOSPITAL	Report	37.0	23.2
SUTTER MATERNITY & SURGERY CENTER OF SANTA CRUZ	Report	41.3	27.4
SUTTER MEDICAL CENTER OF SANTA ROSA	Report	61.7	0.0
SUTTER ROSEVILLE MEDICAL CENTER	Report	57.1	31.0
SUTTER SOLANO MEDICAL CENTER	Report	58.5	0.0
SUTTER SURGICAL HOSPITAL - NORTH VALLEY	No Report	.	.
SUTTER TRACY COMMUNITY HOSPITAL	Report	59.3	23.3
TAHOE FOREST HOSPITAL	Report	48.4	23.4
TEHACHAPI HOSPITAL	Report	65.2	34.8

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
TEMPLE COMMUNITY HOSPITAL	Report	39.1	45.6
THOUSAND OAKS SURGICAL HOSPITAL	Report	85.2	32.4
TORRANCE MEMORIAL MEDICAL CENTER	Report	58.5	41.2
TRI-CITY MEDICAL CENTER	Report	68.2	31.8
TRI-CITY REGIONAL MEDICAL CENTER	Report	51.3	42.7
TRINITY HOSPITAL	Report	67.5	32.5
TULARE DISTRICT HOSPITAL	Report	64.9	35.1
TWIN CITIES COMMUNITY HOSPITAL	Report	70.7	19.8
UKIAH VALLEY MEDICAL CENTER/HOSPITAL DRIVE	Report	54.6	35.0
UNIVERSITY OF CALIFORNIA DAVIS MEDICAL CENTER	Report	65.0	14.7
UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER	Report	64.9	33.4
USC KENNETH NORRIS JR. CANCER HOSPITAL	Report	48.3	42.4
USC UNIVERSITY HOSPITAL	Report	49.7	44.5
VALLEY PRESBYTERIAN HOSPITAL	Report	43.0	40.4
VALLEYCARE MEDICAL CENTER	No Report	.	.
VERDUGO HILLS HOSPITAL	Report	53.2	33.9
VIBRA HOSPITAL OF SAN DIEGO	Report	76.4	22.4
VICTOR VALLEY COMMUNITY HOSPITAL	Report	32.7	28.8
VISTA HOSPITAL OF SAN GABRIEL VALLEY	Report	30.6	37.1
VISTA HOSPITAL OF RIVERSIDE	Report	35.5	57.4
VISTA HOSPITAL OF SOUTH BAY	Report	20.1	36.5
WASHINGTON HOSPITAL	Report	69.2	0.0

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
WATSONVILLE COMMUNITY HOSPITAL	Report	37.5	39.1
WEST ANAHEIM MEDICAL CENTER	No Report	.	.
WEST HILLS HOSPITAL & MEDICAL CENTER	No Report	.	.
WESTERN MEDICAL CENTER ANAHEIM	Report	31.6	17.1
WESTERN MEDICAL CENTER SANTA ANA	Report	46.5	50.7
WHITE MEMORIAL MEDICAL CENTER	Report	42.1	57.9
WHITTIER HOSPITAL MEDICAL CENTER	Report	66.4	0.0
WOODLAND MEMORIAL HOSPITAL	Report	74.4	22.9

*One hospital rescinded its data; one hospital submitted a report but did not include data on hospital employees.

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010

Table 12. Employee influenza vaccination report status and hospital-specific employee influenza vaccination and declination percentages reported by multi-hospital license, general acute care hospitals, California, 2008-2009.

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
ALAMEDA COUNTY MEDICAL CENTER Alameda County Medical Center Fairmont Campus	Report	57.3	0.0
ALTA LOS ANGELES HOSPITALS, INC. [‡] Los Angeles Community Hospital Norwalk Community Hospital	Report	.	.
ALVARADO HOSPITAL, LLC Alvarado Hospital – 6645 Alvarado Rd San Diego Alvarado Hospital – 6655 Alvarado Rd San Diego	Report	61.9	38.1
CATHOLIC HEALTHCARE WEST Dominican Hospital – Frederick St Dominican Hospital – Soquel Dr	Report	66.1	27.2
CATHOLIC HEALTHCARE WEST – Bakersfield Mercy Hospital Mercy Southwest Hospital	Report	95.2	30.3
CITRUS VALLEY MEDICAL CENTER, INC. Citrus Valley Medical Center IC Campus – Covina Citrus Valley Medical Center QV Campus – West Covina	Report	55.4	30.2
COUNTY OF VENTURA Ventura County Medical Center Ventura County Medical Center – Santa Paul Hospital	Report	33.2	9.1
EDEN MEDICAL CENTER Eden Medical Center San Leandro Hospital	Report	61.6	18.9

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
ENLOE MEDICAL CENTER Enloe Medical Center – Cohasset Enloe Medical Center – Esplanade Enloe Rehabilitation Center	Report	44.9	21.9
FOUNTAIN VALLEY REGIONAL HOSPITAL & MED CENTER Fountain Valley Regional Hospital and Med Center – Euclid Fountain Valley Regional Hospital and Med Center – Warner Ave	Report	25.1	19.2
GOOD SAMARITAN HOSPITAL, LP – San Jose Good Samaritan Hospital Mission Oaks Hospital	Report	44.4	7.4
KAISER FOUNDATION HOSPITAL - ORANGE COUNTY Kaiser Foundation Hospital Anaheim Kaiser Foundation Hospital Irvine	Report	55.7	40.7
KAISER FOUNDATION HOSPITALS – Hayward/Fremont [†] Kaiser Foundation Hospital Hayward/Fremont Kaiser Foundation Hospital Fremont	Report	.	.
KAISER FOUNDATION HOSPITALS – Manteca/Modesto Kaiser Foundation Hospital Manteca Kaiser Foundation Hospital Modesto	Report	64.3	34.2
KAISER FOUNDATION HOSPITALS – East Bay Kaiser Foundation Hospital Oakland/Richmond Kaiser Foundation Hospital Richmond	Report	58.6	0.0
LODI MEMORIAL HOSPITAL ASSOCIATION, INC. Lodi Memorial Hospital – West Lodi Memorial Hospital	Report	68.2	0.0

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
LOMA LINDA UNIVERSITY MEDICAL CENTER, INC. Loma Linda University Medical Center Loma Linda University Medical Center East Campus Hospital Loma Linda University Heart and Surgical Hospital	Report	49.8	27.2
LOS ROBLES REGIONAL MEDICAL CENTER Los Robles Hospital and Medical Center Los Robles Hospital and Medical Center East Campus	Report	71.3	35.6
MILLS-PENINSULA HEALTH SERVICES Mills Health Center Peninsula Medical Center	Report	61.4	26.7
NORTHBAY MEDICAL CENTER Northbay Medical Center Northbay Vacavalley Hospital	Report	69.5	30.2
REGENTS OF THE UNIVERSITY OF CALIFORNIA UCSF Medical Center UCSF Medical Center at Mount Zion	Report	58.5	26.5
SADDLEBACK MEMORIAL MEDICAL CENTER Saddleback Memorial Medical Center Saddleback Memorial Medical Center – San Clemente	Report	48.5	34.8
SAN RAMON REGIONAL MEDICAL CENTER, INC. San Ramon Regional Medical Center San Ramon Regional Medical Center South Building	Report	60.4	26.0
SUTTER EAST BAY HOSPITALS Alta Bates Summit Medical Center – Alta Bates Campus Alta Bates Summit Medical Center – Herrick Campus Alta Bates Summit Medical Center – Summit Campus Summit St Alta Bates Summit Medical Center – Summit Campus Hawthorne Ave	Report	46.7	7.9

HOSPITAL NAME	2008-2009 REPORT SUBMITTED	EMPLOYEE INFLUENZA VACCINATION PERCENTAGE	EMPLOYEE INFLUENZA DECLINATION PERCENTAGE
SUTTER HEALTH SACRAMENTO SIERRA REGION Sutter Memorial Hospital Sutter General Hospital	Report	57.4	28.4
SUTTER WEST BAY HOSPITALS California Pacific Medical Center – West Campus California Pacific Medical Center – Davies Campus California Pacific Medical Center – Pacific Campus	Report	44.7	39.2
THE FREMONT-RIDEOUT HEALTH GROUP Fremont Medical Center Rideout Memorial Hospital	Report	56.1	0.0
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA (UCSD) University of California, San Diego Medical Center UCSD – La Jolla, John M. and Sally B. Thornton Hospital	Report	70.7	12.9
UHS-CORONA, INC. Corona Regional Medical Center – Magnolia Ave Corona Regional Medical Center – South Main St	Report	59.3	40.4
UNIVERSAL HEALTH SERVICES OF RANCHO SPRINGS, INC. Southwest Healthcare System – Murrieta Southwest Healthcare System – Wildomar	Report	41.7	11.7

[†]One hospital rescinded its data; one hospital submitted a report but did not include data on hospital employees.

Source: Influenza Vaccination among Employees in California General Acute Care Hospitals for the 2008-2009 Respiratory Season, California Department of Public Health, September 2010

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