



A brief review of Hawaii's successful and the nation's first statewide school-located influenza vaccination program over the past four influenza seasons, 2007-2011.

# Stop Flu at School Summary Report

3 May 2011

**Disease Outbreak Control Division  
Hawaii Department of Health**

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## Executive Summary

The State of Hawaii Department of Health (HDOH) has led the implementation of the statewide school-located influenza (flu) vaccination program (Hawaii's Stop Flu at School Program) since it was first introduced at the start of the traditional flu season in 2007. Through this highly successful program over 300,000 flu vaccinations have been administered to children and school faculty and staff during the past four flu seasons from 2007-2011 in over 300 public and private elementary and middle schools statewide. The program, which costs approximately \$1.83 million annually, was designed to make seasonal flu vaccination available free of charge at participating schools to students in grades K-8 (ages 5-13 years) with parental consent as well as school faculty and staff during normal school hours from October through December of a given flu season, with multiple clinics operating simultaneously using a standardized operating protocol and trained clinical staff. In the last two years, close to 50% of the target age group has been vaccinated against flu as a result.

The program's objectives have been two-fold:

The primary objective is to decrease flu disease and complications resulting from flu disease in schoolchildren. Studies have shown that preventing flu in this target population may reduce absenteeism rates in schools and may prevent flu transmission and illness in their families and community. These school-located vaccination clinics have created an accessible and convenient opportunity for a large population to receive flu vaccination.

Secondly, this program provides a framework or model for an emergency mass vaccination response, which was demonstrated during the 2009 H1N1 pandemic. In the event of a medical emergency, vaccination clinics may be set up at various locations and staffed by a network of interagency and volunteer personnel. The Stop Flu at School Program's vaccination clinics tests the State's surge capacity and the efficiencies of established plans and operating procedures; in addition, the program provides experience for clinic personnel with emergency management concepts.

This unique statewide flu vaccination program has been the result of a strong collaboration among multiple organizations and agencies working towards the unified goal of public health and disease prevention. It continues to be a large-scale operation that is inherently complex with numerous components and requirements. Over the past four years, Hawaii has been fortunate to have been able to utilize funds from primarily federal immunization grants and the generous financial support of private organizations, including vaccine manufacturers and a major healthcare foundation, as well as a small amount of state funds. While through strategic planning there are sufficient funds to carry the program through the fifth year (2011-12 flu season), the continued success and benefits to the public's health are in question with the lack of continued financial support including decreasing and restricted grant funds and minimal other resources.

This brief summary overview of Hawaii's Stop Flu at School program offers a compelling argument for the potential and direct benefits of this program for the public's health now and in the future. In the coming year, even as we in the Department of Health conduct the operations for this fifth year, it is our hope that we will identify sources of funding and a means to secure the longevity of this unique and critical program.

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## School Participation

Toward the end of preceding school year (i.e., for the 2011-12 flu season, April 2011), HDOH sends a letter to all public and private school principals requesting whether or not a school will opt to participate in the Stop Flu at School program. Schools must respond by the stated deadline to participate. The table below shows that approximately 90% of all schools in the state have participated in the program each of the past four years from 2007-2011.

**Table 1. Public and Private School Participation in the Stop Flu at School Program, 2007-2011**

	<b>2007-2008</b>	<b>2008-2009</b>	<b>2009-2010*</b>	<b>2010-2011</b>
<b>No. participated (%)</b>	340 (90)	337 (89)	342 (91)	331 (88)
<b>No. did not participate (%)</b>	37 (10)	42 (11)	33 (9)	44 (12)
<b>Total # of schools in Hawaii</b>	377	379	375	375

\*H1N1 Pandemic year

Once all school responses are collected, clinic dates are coordinated and scheduled during the summer for each participating school. Starting in the season of 2009-10, participating schools and their scheduled clinic dates have been posted on the HDOH Stop Flu at School website,

<http://www.flu.hawaii.gov/SFAS.html>.

## Student Participation

With the start of the school year, vaccination consent packets are sent, with the assistance of school staff, home to parents of students in participating schools. Public media campaigns to increase parental awareness and remind parents of the consent deadline are conducted.

HDOH recognizes that some parents would still prefer to have their children vaccinated by their healthcare provider, but for the many parents who would like to have their children protected against flu but face various challenges to do so, this program offers a convenient and safe opportunity and therefore ensures against any missed opportunity to protect the public's health. In four years, HDOH has achieved the goal of vaccinating almost 50% of the target age group, ages 5-13 years. Yearly participation data for this group is shown in Table 2.

**Table 2. Total Participation of Students Ages 5-13 Years in Hawaii's Stop Flu at School Program, 2007-2011**

	2007-2008	2008-2009	2009-2010*	2010-2011
<b>No. of students in target group who participated (%)</b>	60,760 (44)	60,172 (44)	68,056 (49)	66,230 (48)
<b>State population of target group</b>	137,590	136,936	138,261	139,091

\*H1N1 Pandemic year

Some schools, especially in rural areas, include a small number of children outside the target group (grades K-8, ages 5-13 years). Table 3 demonstrates the participation of all students in the program.

**Table 3. Total Student Participation in Hawaii's Stop Flu at School Program, 2007-2011**

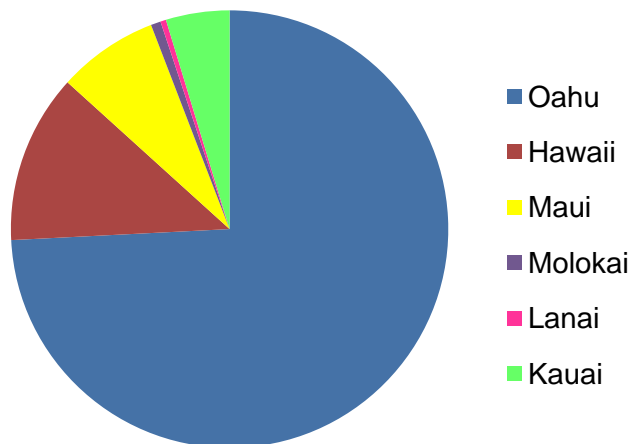
	2007-2008	2008-2009	2009-2010*	2010-2011
<b>No. of students who participated (%)</b>	63,153 (43)	62,355 (44)	71,392 (49)	68,924 (46)
<b>Total official school enrollments</b>	146,777	142,603	147,103	148,967

\*H1N1 Pandemic year

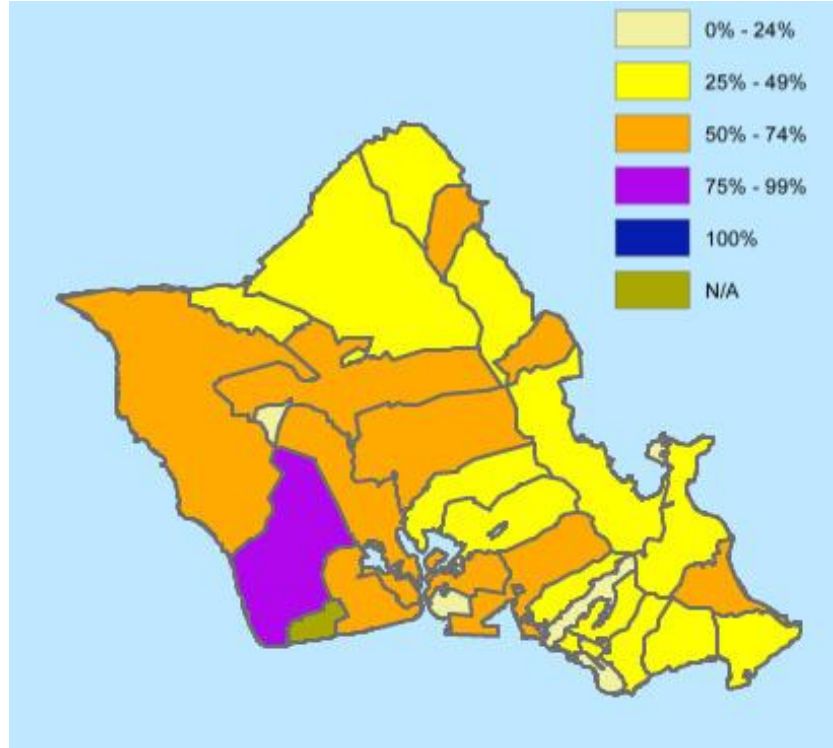
Vaccination coverage has varied by island comparable to its proportion of the state's population (Figure 1).

Coverage has also varied by zip code. The following figures (Figures 2-5) demonstrate the distribution of the 2010-11 participating target age group students throughout the state by zip code of residence. Note that those zip codes which have no participating students are marked as N/A.

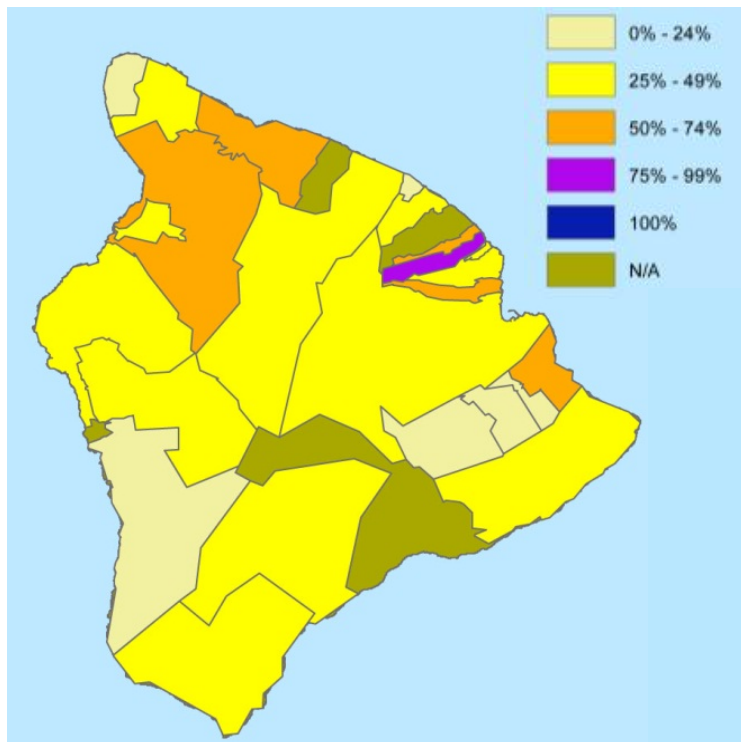
**Figure 1. Proportion of All Vaccinated Students (n=68,924) by Island in the 2010-11 Stop Flu at School Program**



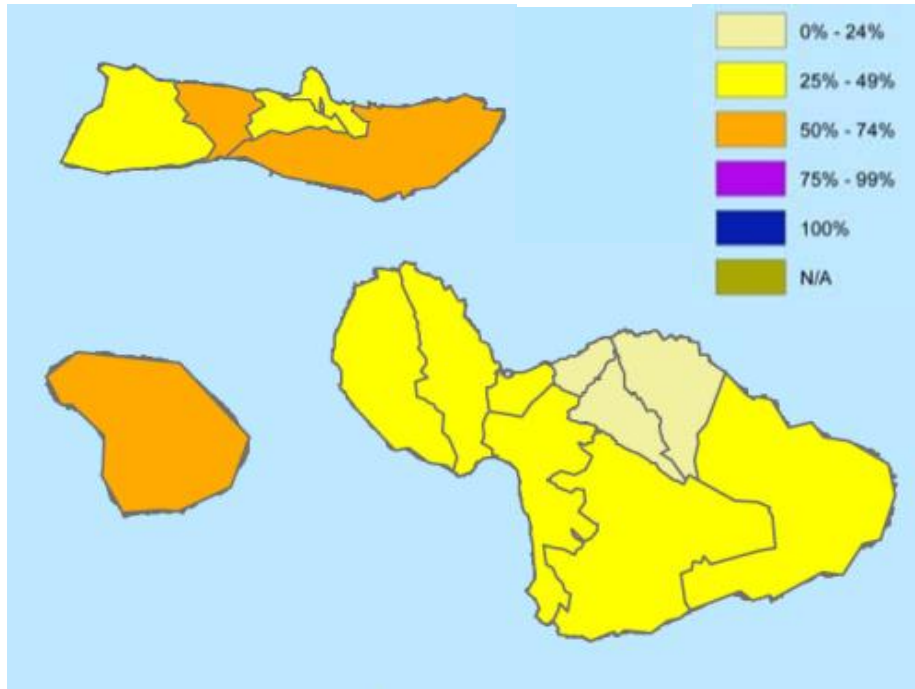
**Figure 2. Proportion of Stop Flu at School Participating Students, Ages 5-13 Years, by Zip Code – Oahu, 2010-11**



**Figure 3. Proportion of Stop Flu at School Participating Students, Ages 5-13 Years, by Zip Code – Island of Hawaii, 2010-11**

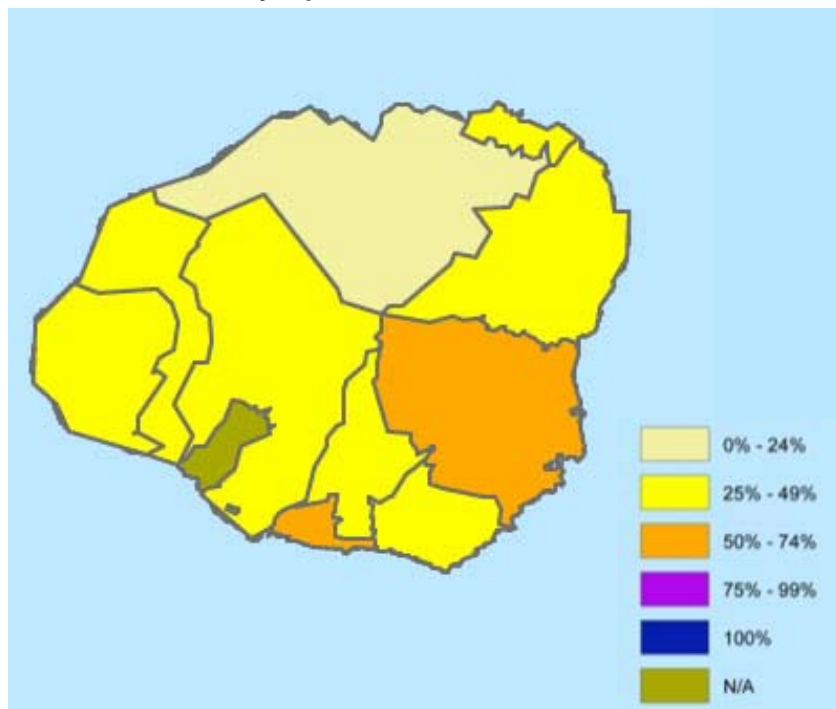


**Figure 4. Proportion of Stop Flu at School Participating Students, Ages 5-13 Years, by Zip Code – Maui, Lanai, and Molokai, 2010-11**



Not to scale

**Figure 5. Proportion of Stop Flu at School Participating Students, Ages 5-13 Years, by Zip Code – Kauai, 2010-11**



\*Niihau students participated in Kauai; however, no census data available for Niihau to demonstrate proportion of target age group vaccinated.

To understand who our program is reaching and where, starting in the 2008-2009 season, HDOH requested parents to indicate their insurer. According to these data (Table 4), the majority of students have private health insurance while almost one-third are QUEST-Medicaid insured or have no insurance.

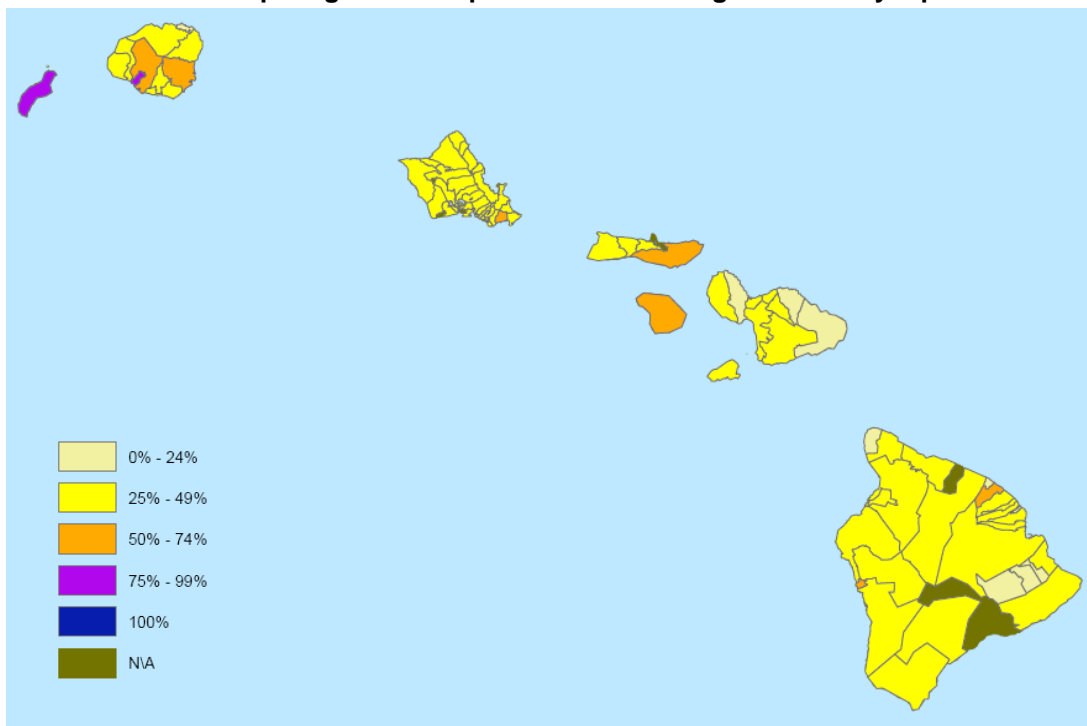
**Table 4. Insurance Type for All Participating Students in the Hawaii Stop Flu at School Program, 2008-2011**

HEALTH INSURANCE TYPE	% of Total Vaccinated per Flu Season		
	2008-2009	2009-2010	2010-2011
Champus/Tricare	8.6	9.5	9.7
HMAA	1.7	2.8	2.7
HMSA	31.7	33.9	33.0
Kaiser	8.5	10.2	10.1
Summerlin*	0.5	1.2	0.1
UH (UHA)	1.8	1.4	1.6
Other	12.2	7.2	6.8
MedQuest (includes Aloha Care, HMSA, Kaiser)	30.8	31.0	31.7
No insurance	1.5	1.6	1.7
Not sure/blank	2.6	1.4	2.5

\*Includes some with MedQuest coverage but data not distinguished from those with regular insurance.

Comparing vaccinated Quest-Medicaid insured children in the program with data for the target age group from the State Medicaid Division, Department of Human Services, on average 37% of all Quest-Medicaid insured children in the state are vaccinated against flu through the Stop Flu at School program each year. In 2010-11, the program has generally succeeded in reaching at least 25-49% of these children in most areas with greater proportions of this group's participation observed in some of the rural areas of the state (Figure 6).

**Figure 6. Quest-Medicaid Insured Children, Ages 5-13 Years, in Hawaii, 2010-2011: Proportion of Those Participating in the Stop Flu at School Program to All by Zip Code**





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## Faculty/Staff Participation

In addition to offering flu vaccine to the schoolchildren, school faculty and staff are offered the same opportunity. Participation by this group has remained stable at 43-44% (Table 5) over the past four years.

**Table 5. Total Participation of School Faculty and Staff in Hawaii's Stop Flu at School Program, 2007-2011**

	<b>2007-2008</b>	<b>2008-2009</b>	<b>2009-2010*</b>	<b>2010-2011</b>
<b>No. of faculty/staff who participated (%)</b>	9,306 (43)	9,365 (44)	9,940 (44)	9,544 (43)
<b>Faculty total counts</b>	21,625	21,102	22,541	22,224

\*H1N1 Pandemic year

## Fiscal Expenditures

In the first year of the program, there were many unknowns. A pilot program conducted in 2006-2007 in three Oahu schools provided a starting point; however, expanding from three schools on one island to over 330 on all islands was an immense undertaking. With the overall objective to vaccinate at least 50% of the target age group, 5-13 years, in the state, expenditures for the first year were based on that estimated number plus a cushion. Additionally, many resources (e.g. coolers and cold packs for vaccines, medical emergency kits) were acquired in the first year that could then be maintained and used in future years and therefore were onetime costs necessary to start the program. The 2009-2010 season, however, stretched resources as the H1N1 pandemic increased demand. As the 2010-2011 season approached, it was unclear whether that increased demand would continue or would wane.

Excluding the first year, the average annual cost of the program has been \$1.83 million: \$1.16 million for vaccines (both injectable and nasal spray) and \$675,000 for operations. Note that vaccine costs charged by manufacturers may vary from year to year.

**Table 6. Annual Expenditures for Hawaii Stop Flu at School Program, 2007-2011**

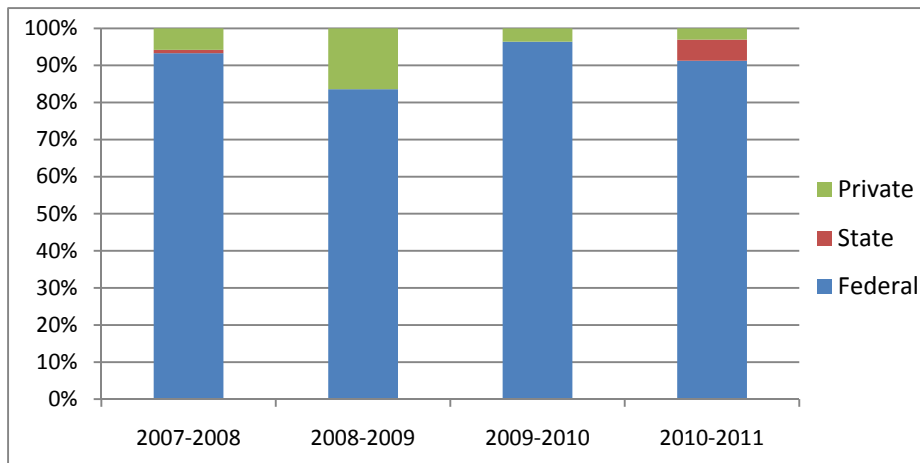
Expenditure type	Expenditure per Flu Season			
	2007-2008	2008-2009	2009-2010*	2010-2011
<b>Vaccines</b>	\$ 1,858,995.13	\$ 1,289,440.51	\$ 949,809.91	\$ 1,234,776.56
~ Doses secured	141,260	103,300	93,200	113,400
<b>Operations<sup>†</sup></b>	\$ 1,475,700.74	\$ 559,556.72	\$ 718,884.59	\$ 746,744.65
<b>TOTAL</b>	\$ 3,334,695.87	\$ 1,848,996.82	\$ 1,668,694.50	\$ 1,981,521.21

\*H1N1 Pandemic year

<sup>†</sup>Includes medical supplies; contracting for clinic staff, data entry, support staff, drivers; print materials; clinic training; public health campaigns; translation services; medical supply disposal; etc.

Funding has primarily been secured through federal grants (including Immunizations, American Recovery and Reinvestment Act - ARRA, and public health preparedness) through the U.S. Centers for Disease Control and Prevention, although some private funds had been secured from the Hawaii Medical Service Association as well as Sanofi Pasteur and MedImmune and a very small amount of state general funds (Figure 7; note that in 2008-2009 and 2010-2011 state funds were utilized but actual proportion was <0.1%).

**Figure 7. Annual Source of Funding for Hawaii Stop Flu at School Program, 2007-2011**

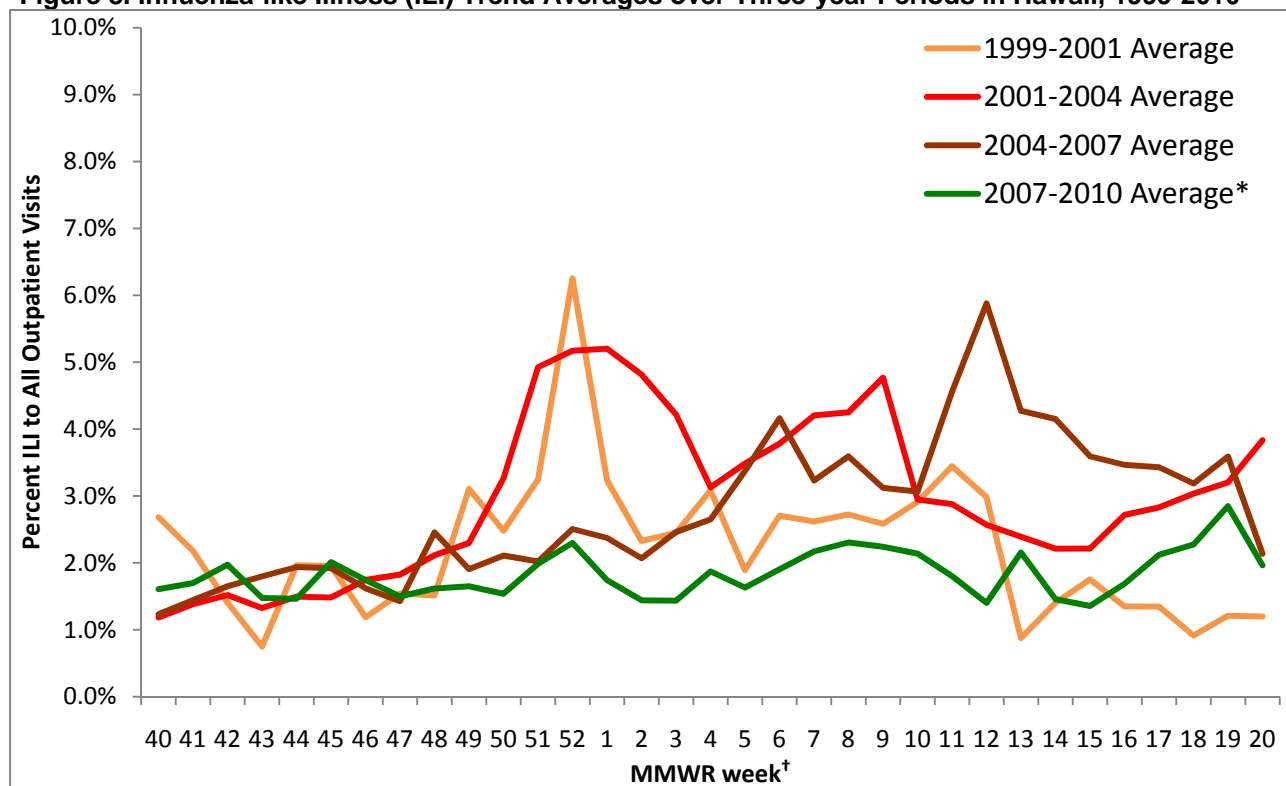


Unfortunately, with decreasing federal funding and increasing restrictions on its use as well as diminished or absent state resources (including diminished staff), other funding sources will be needed if this program is to continue beyond 2011-2012.

## Potential Impact on Influenza Disease in Hawaii

One of the major objectives of the Stop Flu at School program has been to decrease flu disease and complications resulting from flu disease, not just in schoolchildren but also indirectly in our community, since schoolchildren are a major source of community illnesses. Although much work still remains to determine whether and how the program has impacted flu disease in our state, and the data are complicated by multiple confounding factors, not the least of which are the unpredictable nature of flu and the variable severity of disease from year to year, we examined the average flu-like illness trend for three year periods starting with the first three years of the program and going back to 1999, the earliest such data available in our flu surveillance system (Figure 8). Flu-like illness does not represent confirmed flu illness, only a syndrome of fever plus cough or sore throat, but it is generally considered representative of flu illness in a community. The data therefore suggest that there has been less flu disease in the state during 2007-2010 compared with the previous periods. Although other factors have likely played a role and additional data including those from the following years will be required to better describe what is currently observed, the Stop Flu at School program may have at least contributed to this decrease.

**Figure 8. Influenza-like Illness (ILI) Trend Averages over Three-year Periods in Hawaii, 1999-2010**



\*Covers the first three years of the Stop Flu at School program, statewide school-located flu vaccination program targeting children in grades K-8, ages 5-13 years, in participating public and private schools

†MMWR stands for "Morbidity and Mortality Weekly Report," conventionally used by the Centers for Disease Control and Prevention (CDC). The weeks of a flu season are often referred to by their respective MMWR week. Week 40 coincides with the beginning of the traditional Northern Hemisphere flu season, early October; week 1 corresponds to early January; and week 20 corresponds with mid-late May, the end of the traditional Northern Hemisphere flu season surveillance period.

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## Contribution to the Response to the 2009 H1N1 Pandemic

Because of the experience gained through the years of planning and conducting the Stop Flu at School program, Hawaii was able to quickly establish a similar overall process and clinic operations to administer the H1N1 pandemic vaccine. Operational funding and vaccines were provided by the U.S. Centers for Disease Control and Prevention, the former through the Public Health Emergency Response grant. Given experience in receiving vaccine shipments in previous years (i.e., late and divided in multiple shipments) and the unclear production times of the new vaccine, clinics were planned to be held starting at least one month after the scheduled start of when vaccines would be shipped to states (i.e., clinics to start in mid-November with vaccine shipments proposed by the federal government to start in early to mid-October). In this way, Hawaii, unlike other states, successfully and efficiently conducted every school H1N1 vaccine clinic as scheduled without needing to cancel and reschedule because of lack of vaccine or supplies.

Through the school H1N1 vaccination program, 327 public and private schools participated to enable the vaccination of 55,573 students and 10,212 school faculty and staff across the state from mid-November 2009 through mid-January 2010.

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## Acknowledgments

This program would not be possible without the strong collaboration of the Department of Health with multiple partners around the state, especially the schools represented by the Department of Education, the Hawaii Association of Independent Schools, and the Hawaii Catholic Schools. HDOH would also like to acknowledge the following (in alphabetical order) for their participation and support:

- Community Volunteers
- Hawaii Chapter, American Academy of Family Physicians
- Hawaii Chapter, American Academy of Pediatrics
- Hawaii Medical Service Association
- Hawaii Pacific University, College of Nursing and Health Sciences
- Kaiser Foundation Health Plan
- Maui Community College, School of Nursing
- University of Hawaii at Hilo, Baccalaureate Nursing Program
- University of Hawaii at Hilo, School of Pharmacy
- University of Hawaii at Manoa, School of Nursing and Dental Hygiene
- U.S. Department of Defense Joint Public Health Emergency Working Group
- Volunteers of Hawaii's Medical Reserve Corps Units

HDOH also recognizes the continuous funding support of the U.S. Centers for Disease Control and Prevention as well as the one time funding support of HMSA, Sanofi Pasteur, and MedImmune.