

# California Pandemic Influenza Vaccine Prioritization



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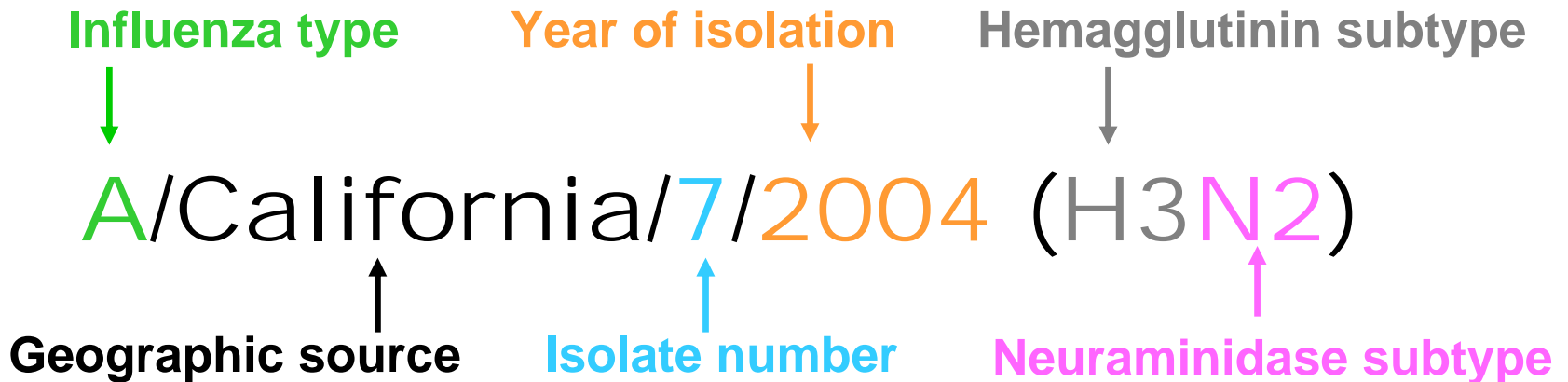
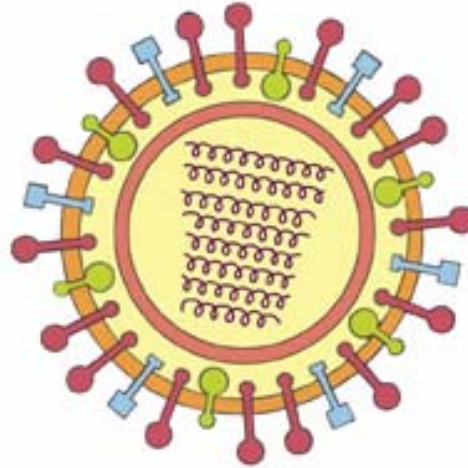
# Presentation Outline/Agenda

- Part I: California's Prioritization Process
  - Influenza Background
  - Problem Definition
  - Project Overview
  - Decision Analysis Scoring Tool (DAST) methodology
- Part II: Vaccine Prioritization Survey Orientation
  - Instructions (Sections A-C)
  - Questions and Answers

# Part I. California's Pandemic Influenza Vaccine Prioritization Process

# Influenza Virology

## Orthomyxoviruses



# Influenza Antigenic Changes

- Structure of surface proteins hemagglutinin (H) and neuraminidase (N) periodically change

## **Antigenic Drift**

***Minor change, same subtype***


























- Point mutations in gene
- May result in epidemic

## **Antigenic Shift**

***Major change, new subtype***

- Exchange of gene segment
- May result in pandemic

# Hemagglutinin Subtypes of Influenza A Virus

Subtype	Human	Swine	Horse	Bird
H1				
H2				
H3				
H4				
H5				
H6				
H7				
H8				
H9				
H10				
H11				
H12				
H13				
H14				
H15				

Adapted from Levine AJ. *Viruses*. 1992;165, with permission.

# Definition of an Influenza Pandemic

- Isolation from humans of a novel influenza A virus
- Little or no immunity in the population
- Demonstrated ability of the virus to replicate and cause disease
- Efficient person-to-person transmission

# Influenza Pandemics in the 20th Century

<b>Years</b>	<b>Flu</b>	<b>Virus</b>	<b>Mortality</b>
<b>1918-1919</b>	<b>“Spanish”</b>	<b>Type A (H1N1)</b>	<b>20 million worldwide 550,000 US</b>
<b>1957-1958</b>	<b>“Asian”</b>	<b>Type A (H2N2)</b>	<b>70,000 US</b>
<b>1968-1969</b>	<b>“Hong Kong”</b>	<b>Type A (H3N2)</b>	<b>34,000 US</b>

Glezen WP. *Epidemiol Rev.* 1996;18:65.

Centers for Disease Control and Prevention. Influenza Prevention and Control. Influenza. Available at:

<http://www.cdc.gov/ncidod/diseases/flu/fluinfo.htm>.

# Health Impact of Pandemic Influenza in California

<b>CDC Estimates of Percent of Population by a Pandemic of “Moderate” Severity*</b>	<b>Number Affected in California (Pop. 37,334,968)**</b>	
15% to 35% of pop. will become ill with flu	6 – 13	Million
8% to 19% of pop. will require out-patient visits	3 – 7	Million
0.7% to 1.5% of pop. will require hospitalization	244 – 568	Thousand
0.2% to 0.4% of pop. will die of flu-related causes	65 – 151	Thousand

\*Estimates from FluAid 2.0, CDC [www2.cdc.gov/od/fluid/default.htm](http://www2.cdc.gov/od/fluid/default.htm)

\*\*California Department of Finance Pop. Projections for 2006

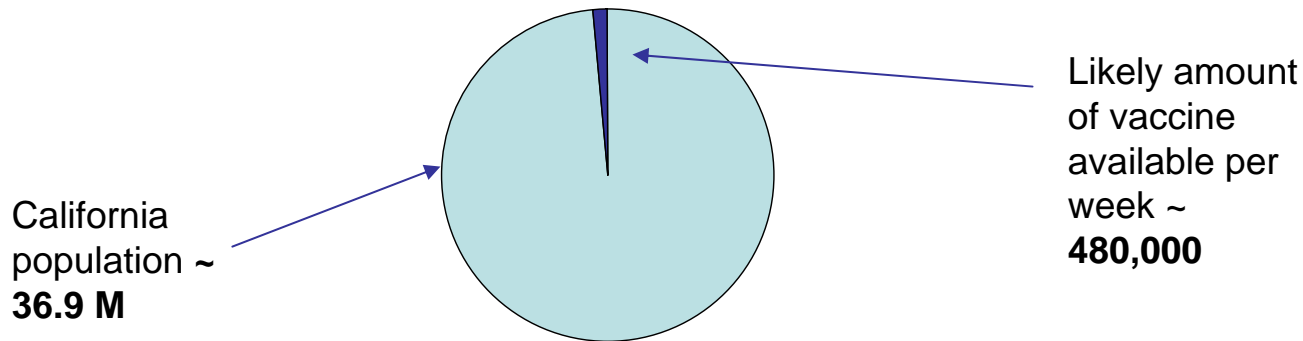
# Pandemic Influenza Intervention Measures

- Non-Medical Interventions
  - Respiratory hygiene
  - Masks
  - Hospital infection control
  - Isolation of ill persons
  - Quarantine of exposed persons
  - Community-based containment
- Medical Interventions
  - Antivirals
  - Vaccines

\*\*Vaccines will likely be the most effective measure to reduce direct health consequences (illness and death) during an influenza pandemic

# Problem: Limited Vaccine Supply

- **Pandemic vaccine may not arrive for 4 to 6 months *after* a novel strain is identified.**
  - Lengthy vaccine production process
  - Limited number of producers (only 3 – 4)
  - Unable to stockpile vaccine
  - Target population for vaccination will be entire California population
  - May require two doses of vaccine
- **Vaccine demand will far outstrip supply. It may take 77 weeks to obtain enough vaccine for California's entire population.**



# Problem Definition

## Central Question:

How will the California Department of Health Services allocate influenza vaccine amongst the California population during an influenza pandemic?

## Background:

- November 2005, the U.S. Department of Health and Human Services (HHS) released the national pandemic influenza plan
- HHS issued broad-based priority recommendations for vaccines and anti-virals
- To date, no published state prioritization plan is based on an analytically rigorous methodology
- HHS plan advises state and local health departments to develop more specific prioritization plans that:
  - Specifically define priority groups
  - Identify occupational categories and sub-categories within each broad priority designation
  - Select implementation strategies to deliver and dispense vaccine to priority groups

# Prioritization Project Overview

## Principles and Intervention Goals

- To develop a ***systematic, justifiable, flexible, adaptable, and transparent*** influenza vaccine prioritization plan that will:
  1. Minimize health consequences
  2. Minimize social disruption
  3. Minimize economic consequences

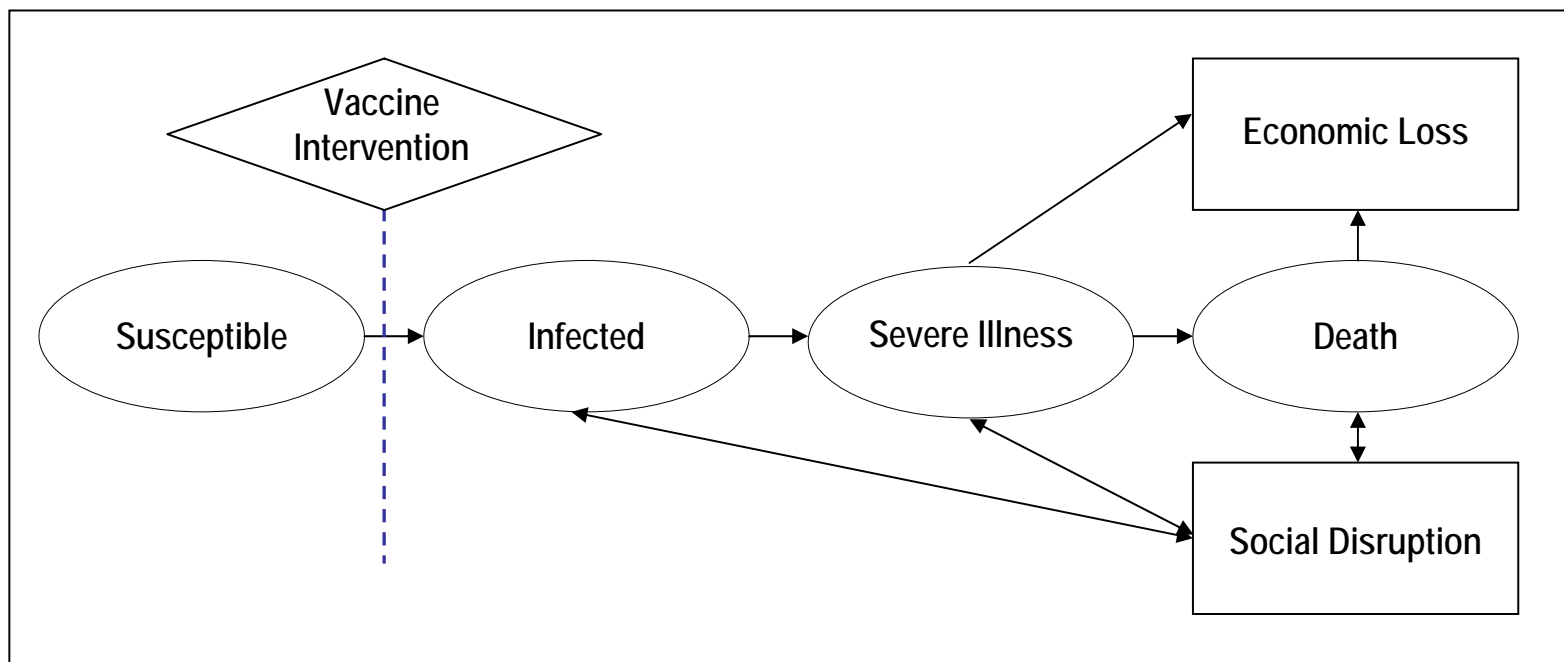
## Participating Organizations

- California Department of Health Services, Immunization Branch (IZ)
- Joint Advisory Committee on Pandemic Influenza Vaccine and Antiviral Prioritization (A subgroup of the State JAC)
- UC Berkeley Center for Infectious Disease Preparedness (UCBCIDP)

# Prioritization Project Assumptions

- Availability of an effective vaccine will be limited
- Higher priority groups will be vaccinated first
- Primary goal of intervention is to minimize health consequences (illness and death)

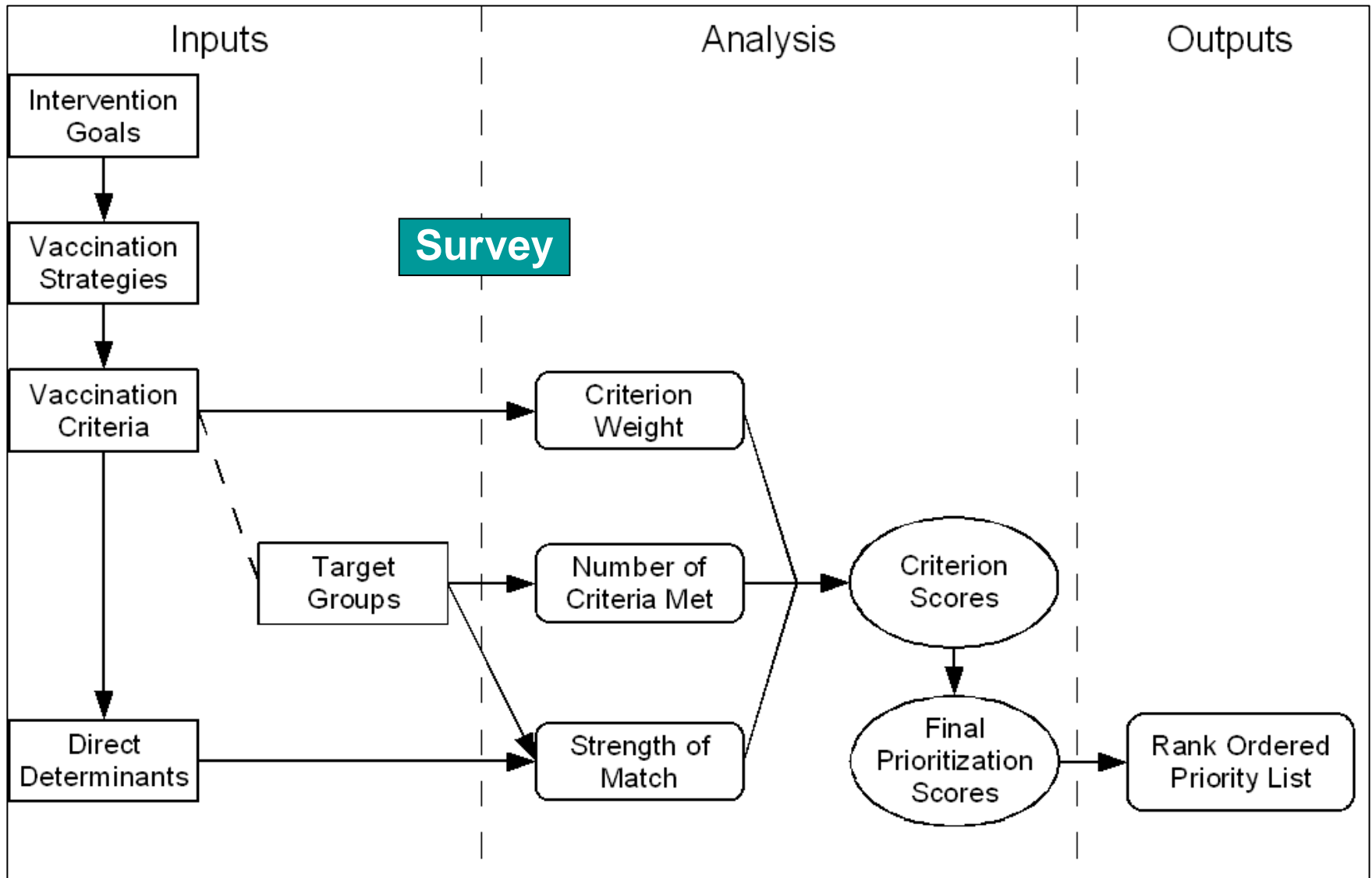
## Pandemic Influenza Transmission Model



# Prioritization Project Summary

- **Tool:** Decision Analysis Scoring Tool (DAST)
- **Purpose:** Decision support aid to assist CDHS in prioritizing target groups for influenza vaccine
- **Description:**
  - Decision making tool that simultaneously analyzes multiple goals, criteria and alternatives to develop an optimal prioritization scheme
  - Centered on a self-administered survey that enables experts to assess the following:
    - Importance of different vaccination criteria in prioritizing populations for vaccine
    - How well target groups meet the vaccination criteria
    - Allocates points to target groups based on expert input
- **Outcome:** Rank-ordered list of target groups

# DAST Methodology



# DAST Methodology

- DAST methodology is comprised of four stages

**Stage 1.** Identify and define DAST inputs

**Stage 2.** Develop and administer DAST survey

**Stage 3.** Analyze DAST results and develop priority list

**Stage 4.** Recommend implementation strategy

## Stage 1. Identify and Define DAST Inputs

# Select Vaccination Strategies

### Egalitarian

Aims to restore equality for persons in need of medical care.

#### *Principles*

- Save no one
- Medical need
- General need
- Queuing
- Random selection

### Utilitarian

Aims to create the greatest good for the greatest number of people.

#### *Principles*

- Probability of medical success
- Immediate usefulness
- Conserve resources
- Caretaker role
- Social value

Source: Winslow, Gerald. *Triage and Justice*. Berkeley: University of California Press, 1982.

## Stage 1. Identify and Define DAST Inputs

# Evaluate Vaccination Strategies

The approaches were interpreted within the context of a pandemic and then evaluated against the following five tests:

1. Does it meet intervention goals?
2. Is it just?
3. Is it legal?
4. Is it politically feasible?
5. Is it practical to implement given the emergency circumstance?

**Four of ten vaccination strategies passed the five tests:**

- Rationing by medical and prevention needs
- Rationing by probability of successful immunization
- Rationing to those who perform an essential emergency response role
- Rationing to those who perform an essential community role

## Stage 1. Identify and Define DAST Inputs

# Develop Vaccination Criteria

### Vaccination Strategy

### Vaccination Criteria

Rationing by medical and prevention needs

- Risk of complication
- Risk of transmission
- Risk of infection

Rationing by probability of successful immunization

- Vaccine effectiveness

Rationing to those who perform essential emergency response role

- Provides DIRECT pandemic emergency response service
- Provides SUPPORT pandemic emergency response service

Rationing to those who performs essential community role

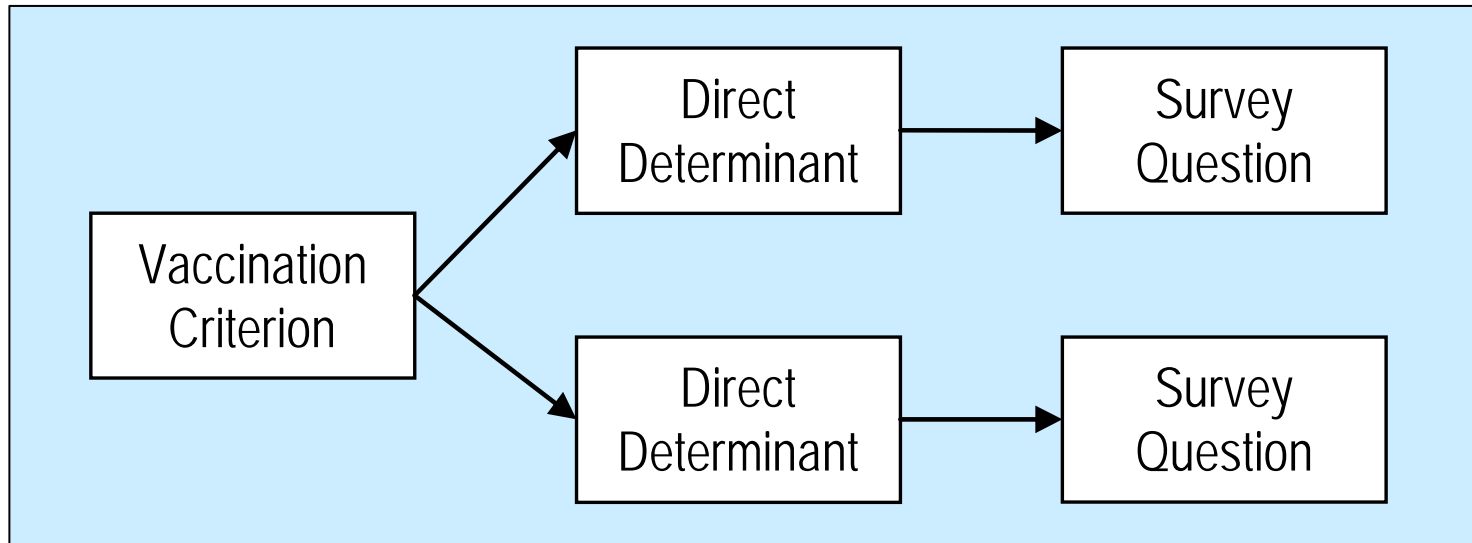
- Provides CRITICAL infrastructure service

## Stage 1. Identify and Define DAST Inputs

# Identify Direct Determinants

### Description/Definition

- Each criterion is broken down into direct determinants
- Direct determinants were translated into survey questions
- Survey questions test how well each target group fulfills the criterion.



## Stage 1. Identify and Define DAST Inputs

# Identify Target Groups

- Target groups were chosen based on likelihood of meeting **one or more** of the DAST criteria
- The target groups identified were based on
  - Health-related characteristics
  - Professional roles
- In total, **73 target groups** were identified and included within the DAST survey

# Vaccine Prioritization Survey Overview

## Survey Description

- Self administered survey questionnaire
- Sampling frame: Pandemic Influenza Preparedness Planning and Response Experts in California

## Survey Objectives

- To determine relative importance of the identified criteria
- To determine how well each target group meets the relevant vaccination criteria
- To determine which target groups should be prioritized for vaccine

# Calculating Final Prioritization Scores

- Final Prioritization Score based on the following:
  - Weight of the criteria
  - Strength of match with each criterion
  - Number of criteria met
- Target group's criterion scores summed across 7 criteria
- **Example:** Police Protection/Law Enforcement Industry received final prioritization score of 22.22 points

Criteria	Criterion Scores
1. Risk of Complication	0.00000
2. Risk of Transmission	3.68851
3. Risk of Infection	4.13636
4. Vaccine Effectiveness	4.39091
5. Provides Direct Emergency Response Service	3.26537
6. Provides Support Emergency Response Service	3.01293
7. Provides Essential Community Service	3.72960
<b>Final Prioritization score</b>	<b>22.22368</b>

# Prioritization Project Next Steps

- Convene Regional Meetings to administer survey
- Analyze survey results and produce rank-ordered priority list
- Compare results to national and other state priority recommendations
- Complete and recommend implementation strategies based on priority list
- Incorporate priority recommendations into CDHS Pandemic Influenza Preparedness and Response Plan
- Implement prioritization recommendations at State and local levels

# CDHS Survey Participant Roles and Responsibilities

- Provide input and expertise to prioritize populations in California for influenza vaccine
- Inform partners and stakeholders in your jurisdiction on the need for pandemic influenza vaccine prioritization
- Identify and estimate number of target group members within your agency/jurisdiction who will be prioritized for vaccine
- Identify locations in your jurisdiction for vaccine/antiviral dispensing
- Track target groups after vaccination for follow-up (second dose, adverse events, vaccine efficacy)

# Contact Information

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**CIDP Pandemic Influenza Project Website:**

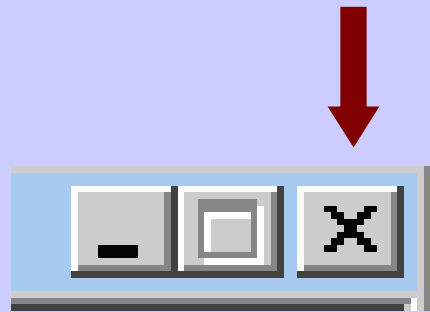
[http://www.idready.org/pandemic\\_influenza/](http://www.idready.org/pandemic_influenza/)

**CDHS Pandemic Influenza Response Plan Website:**

<http://dhs.ca.gov/ds/dcdc/dcdcindex.htm>

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