



# Shoo the Flu: Assessing program characteristics and socioeconomic conditions

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# Learning Objectives

1. Describe ways to characterize socioeconomic position for individuals, households and neighborhoods
2. To understand how area-based socioeconomic measures (ABSM) can be used to characterize program participants in assessing service delivery
3. To understand how ABSM can be used to support and ensure equitable program access

# Overview

- Background
- Methods
- Key Findings
- Conclusions & Programmatic Implications
- Q & A

# Background



# Shoo the Flu Overview

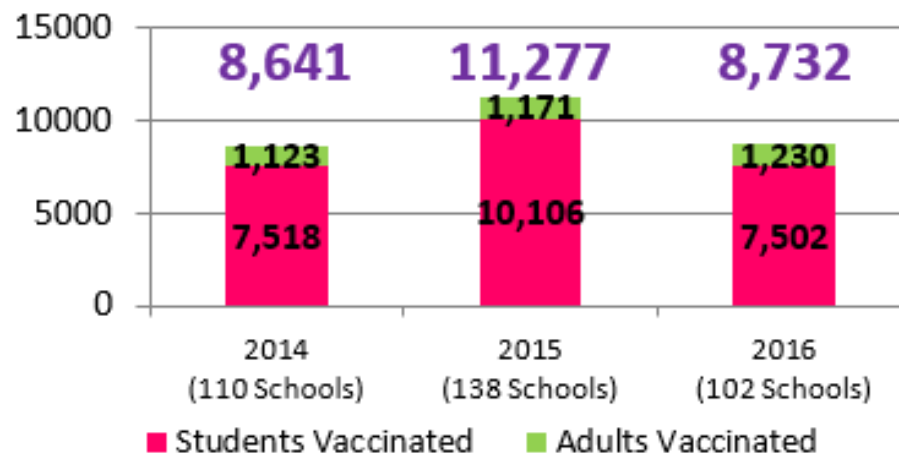
- School-located influenza vaccination program to demonstrate that vaccinating school aged children is effective in limiting community-level transmission
- Includes a clinical impact study and process evaluation
- Now in 4th year, goal is to build sustainable, community-based reimbursement model to provide annual flu vaccine delivery in Oakland area schools
- Partnership of:
  - Alameda County Public Health Department (ACPHD)
  - Oakland Unified School District (OUSD)
  - California Department of Public Health (CDPH)
  - UC Berkeley School of Public Health (UCB)
  - With funding from the Page Family Foundation



# Shoo the Flu Program Overview

- Parents/guardians fill out consent 2-3 weeks ahead of clinics
- Clinics held at school sites during school hours
- Up to 7 clinics per day over 5-6 weeks
- Vaccine provided to students, staff and volunteers
- Clinics staffed by: ACPHD and OUSD staff, contracted nursing staff, volunteers (nursing schools, high school students, MRC)

## Vaccinations 2014-2016



# 2016 Student Participation

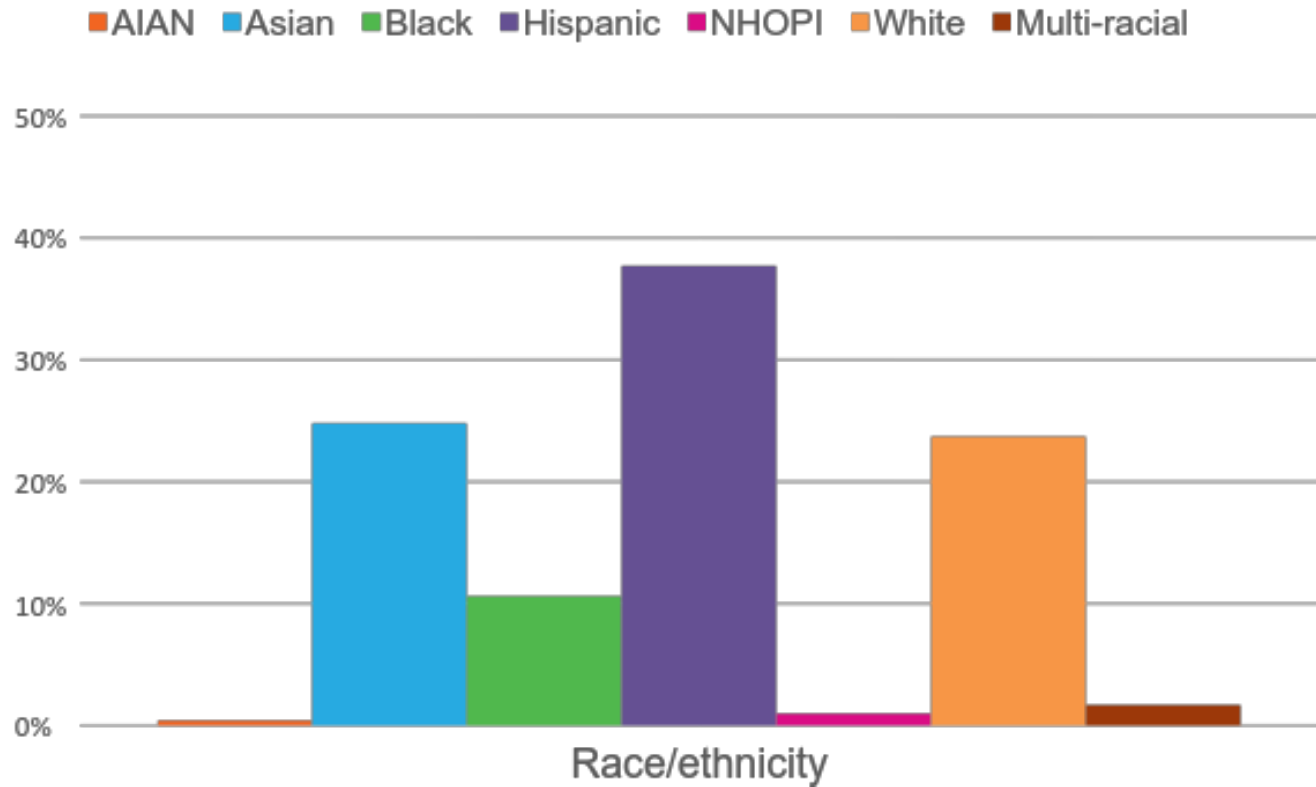
	Public elementary	Pre-school (Head Start)	Charter	Private	All Schools
Mean Participation	20.0%	25.4%	18.6%	24.8%	20.7%
Range	5.4% - 47.3%	21.4% - 29.4%	5.4% - 48.9%	7.5% - 54.4%	5.4% - 54.4%

Year	% participants VFC eligible*
2014	57%
2015	52%
2016	49%

\*Medi-Cal, uninsured, and Alaskan Native/ Native American students



## Race/Ethnicity 2016 StF Student Participants

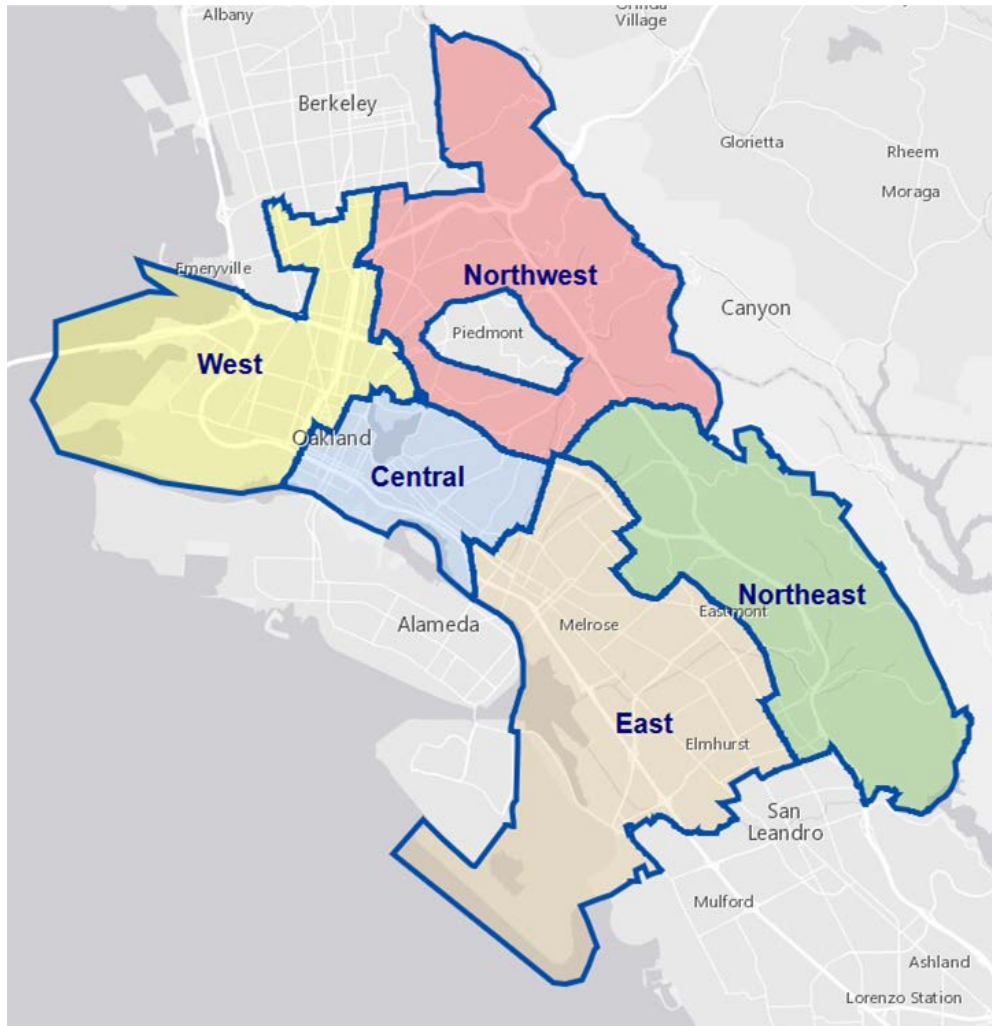


Language, consent forms	%
English	73
Spanish	21
Asian	6
Arabic	<1





# Geographic regions served



School Region	N	Average Participation
Central	12	24.9%
East	38	17.2%
Northeast	18	17.2%
Northwest*	19	32.2%
West	12	16.9%

\* Piedmont schools included in Northwest region



# Background – Social Determinants of Health (SDH)

- SDH: The social structures and economic systems that include social and physical environments and health services
  - Affect a wide range of health risks and outcomes
- Play a central role in describing, explaining & addressing health disparities

# Rationale – ABSM analyses

- Most health system data lack SDH measures
- One approach: operationalize population-level social determinants using aggregate information about clients' residential area
- These area-based socioeconomic measures (ABSM) have been calculated for various geographic units, including U.S. Census block groups, tracts, and ZIP codes

# Objectives – ABSM analyses

- Identify and develop area-based socioeconomic measures (ABSMs) from recent U.S. Census tables
  - Single and multiple-component
- Incorporate ABSMs in StF consent form data
- Assess relationship among ABSM and StF student and school characteristics

# Methods



# Data sources

- 2016 StF flu vaccine consent forms
- American Community Survey (ACS)
  - Ongoing statistical survey by the U.S. Census Bureau
  - Monthly samples of individuals
  - Individual ACS responses aggregated into estimates at many geographic summary levels
  - Gathers information on ancestry, educational attainment, income, language proficiency, migration, disability, employment, and housing characteristics

# Data sources

- ACS, cont.
  - Accessed the **2015 ACS, 5 year data tables** (2011-2015) for ZIP Code Tabulation Areas (ZCTA)
    - ZCTAs: polygons drawn around ZIP Code service areas
    - Only 5 year data tables are available for ZCTAs
- Other data sources
  - City of Oakland geography (Melissa Data)
  - National Bureau of Economic Research
  - OUSD: total student counts by ZIP code for each school (fall 2015 data)

# Sample Selection

- **Individual-level analysis:** 2016 StF consent forms, N=7,498
- **School-level analysis:** Participating schools with  $\geq 30$  students, N=76
- **ACS:** initial files, Census SEP estimates measured at the ZCTA level for almost all\* ZIP codes in California n=1,694

\*Excluded ~4% of CA ZIPs with population <100 residents.



- Measures: StF consent forms
  - School type
  - Student demographics: Gender, age, race/ethnicity
  - Grade
  - Form's language
  - Residential ZIP code
  - Health insurance providers
  - Vaccination date & funding
  - Vaccination history (2014 & 2015)

- Measures: ACS
  - Identified 6 ‘domains’ within the construct socioeconomic position
    - Education
    - Poverty
    - Occupation
    - Housing
    - Public assistance
    - Unemployment
  - For each domain, multiple ACS tables and indicators identified

# Methods – SDI construction

Constructed one multi-item **Socioeconomic position Distress Index (SDI)**

Domain	Measure
Educational attainment	% adults aged 25 or older who do not have a HS degree
Poverty	% pop living below 100% of the federal poverty level
Public assistance/SNAP	% households receiving public assistance or food stamps (SNAP)
Unemployment	Unemployment rate, civilian pop aged 16+
Occupational status	% civilian pop aged 16+ employed in management, business, science, arts (reversed measure)
Housing crowdedness	% of renter-occupied housing units with crowded conditions (>1 person per room)

Using almost all CA ZIP codes we calculated the SDI and categorized it into deciles

– Range: **1** (low distress) to **10** (high distress)

# Methods – Data management

- Downloaded 24 U.S. Census ACS data tables for California ZCTAs (~1700)
  - Prioritized about 20 ABSM for further analysis
  - ABSM categorized, as needed
- Draft ABSM merged with StF consent data set

# Key Findings



About 30% of students resided in ZIP codes ranked in the top 2 deciles (#9 & #10) for socioeconomic distress.

Characteristic	N	%
<b>SEP Distress Index (SDI) deciles</b>		
1 Lowest distress	2,000	<b>26.8</b>
2	59	0.8
3	66	0.9
4	1,339	17.9
5	105	1.4
6	30	0.4
7	652	8.7
8	994	13.3
9	1,662	<b>22.2</b>
10 Highest distress	564	<b>7.5</b>

About a quarter of the 2016 StF student sample resided in ZIP codes that had **very low levels** of socioeconomic distress.



Characteristic	%	SDI decile, mean
<b>Region</b>		
Central	21	6.94
East	30	<b>8.51</b>
Northeast	9	5.29
Northwest	33	<b>2.29</b>
West	8	4.62

The Northwest region had the **lowest** and the East region the **highest** SEP distress.

Characteristic	%	SDI decile, mean
<b>School type</b>		
Catholic	6	4.28
Charter	22	<b>7.21</b>
Head Start	<1	8.35
Oakland USD	55	6.03
Private	10	2.83
Piedmont USD	7	<b>1.16</b>

Students from Piedmont USD resided in areas with the **lowest** SEP distress. Among the larger school types, Charter schools had the **highest** SEP distress.



Students in transitional kindergarten through 5<sup>th</sup> grade had higher SEP distress than those in middle and high school.

Characteristic	%	SDI decile, mean
<b>Grade</b>		
Pre-school	<1	8.17
Transitional K	3	5.91
Kindergarten	13	5.84
1-5	74	5.64
6-8	9	4.53
9-12	1	3.20
<b>Gender</b>		
Female	51	5.68
Male	49	5.42

SDI did not differ substantively between boys and girls.





Students with English consents had the **lowest** and Spanish consent forms had the **highest** SEP distress.

But all students with non-English consents came from areas with high socioeconomic distress.

Characteristic	%	SDI decile, mean
<b>Language</b>		
English	73	<b>4.51</b>
Spanish	21	<b>8.58</b>
Asian	6	7.59
Chinese	5	7.57
Vietnamese	1	7.66
Arabic	<1	7.59



Hispanic students resided in areas with the highest socioeconomic distress.

Other students of color had modestly higher SDI relative to white students.

Characteristic	%	SDI decile, mean
Race/ethnicity		
AIAN	<1	5.87
Asian	25	5.14
NH Black	11	5.89
Hispanic	38	<b>7.70</b>
NHOPI	1	5.82
NH White	24	<b>2.42</b>
Multi-racial	2	5.08



Students without health insurance and those insured by Medi-Cal both resided in much more socioeconomically distressed areas than insured students who were not enrolled in Medi-Cal.

Characteristic	%	SDI decile, mean
<b>Health insurance</b>		
No	6	7.35
Yes	94	5.48
<b>Medi-Cal</b>		
Insured, no Medi-Cal	52	<b>3.49</b>
Insured, yes Medi-Cal	48	<b>7.67</b>



Among Hispanic and Asian/NHOPI students, socio-economic distress scores varied by the language of the consent form

Characteristic	SDI decile, mean	
Hispanics in StF	7.70	
English consent form		6.62
Spanish consent form		8.58
Asian/NHOPI in StF	5.17	
English consent form		4.42
Asian language consent form		7.59

# StF participants were comparable in areal socioeconomic distress to students who did *not* participate

ZIP codes for all students at OUSD elementary schools (n=55) accessed for fall 2015

Characteristic	N	SDI decile, mean
Participation in StF		
Yes		6.9
No		7.0

# School-level analysis: StF consent records and SDI

- Of the 100 schools in the 2016 consent form data set, 76 schools had  $\geq 30$  StF participants
  - Threshold needed to generate school-level summary measures from student-level data
- Developed school SDI index by calculating the mean StF student SDI decile

- Descriptive results, schools (N=76)
  - Most were OUSD (62%) and Charter (21%)
  - School enrollment and StF participation

Measure	Mean	Median	Range
Total student enrollment	391.7	370.0	138 – 875
StF student participants	93.3	70.0	30 – 345
StF Coverage	23.4%	20.0%	6.0% - 54.0%



# School enrollment, StF coverage & SEP Distress Index

Higher school SEP distress associated with lower StF vaccination coverage

	Student Enrollment	StF Coverage	SEP Distress
Student Enrollment	1		
StF Coverage	0.010	1	
SEP Distress, decile	0.004	-0.66	1



# Conclusions & Programmatic Implications



# Limitations

- Low school participation rates could be due to students getting vaccinated elsewhere
- A ZIP code is not a neighborhood and is a relatively large area compared to a census tract
- Many other available ABSM were not included

# Conclusions

- Students vaccinated through StF varied significantly in terms of their residential area's socioeconomic characteristics
  - Areal SEP varied by students' school region, school type, grade, consent form language, race/ethnicity & insurance status
- StF participants' SEP distress levels were comparable to those who did not participate in the program
- At the school-level, StF coverage rates varied inversely with SEP distress

# Conclusions

Including place-based measures when describing ‘service populations’ is an important step toward addressing systemic or structural factors affecting individual health status

- The question of interventions is still an issue, i.e. what do we do about health disparities associated with ABSM

# Programmatic implications

- Inform where to direct resources / priorities for targeted intervention
- Identify populations that we are not reaching
- Help make decisions about expansion or contraction
- Inform how to balance maximizing coverage with program equity
- Inform areas for additional research

# Questions?



This presentation was developed based on the following abstracts:

1. Shoo the Flu influenza clinics and students' socioeconomic characteristics: A school-level assessment

–Authors: Casey Wright, Hannah Warren, April Pace & David Fine

2. Shoo the Flu: Student background, program characteristics and socioeconomic conditions

–Authors: Samantha Feld, Kate Holbrook, Aleta Rattanasith, Amy Pine & David Fine

# Thank you!

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