COVID-19 in California's Nursing Homes:

Factors Associated with Cases and Deaths

Cal Hospital Compare

Today's Agenda

- Project Overview
- Review study results
- Develop policy recommendations
- Open Forum


Ratings You Can Trust.
Cal Hospital Compare makes it easy to find and compare the quality of hospitals in California.
Compare Hospitals
Search by Zip Code, City, or Hospital Name
Cal Hospital Compare Announces 2020 Honor Rolls
Browse featured content
WHY YOU CAN TRUST OUR RATINGS

The Project Team

- Bruce Spurlock, Executive Director, Cal Hospital Compare
- Alex Stack, Director, Programs & Strategic Initiatives, Cal Hospital Compare
- Charlene Harrington, Professor Emerita, University of California, San Francisco
- Leslie Ross, Specialist, Institute for Health & Aging, University of California, San Francisco
- Mahil Senathirajah, Senior Director, IBM Watson Health
- Parker Lewis, Sr. Manager, IBM Watson Health
- Richelle Benevent, Senior Programmer/Analyst, IBM Watson Health
- Frank Yoon, Senior Statistician, IBM Watson Health

Advisory Committee

- Patient Advisors/ Advocates
- Health Plans/Payers
- Quality Improvement Organizations
- State Agencies
- Subject Matter Experts/ Researchers

Background & Objectives

- Project Goal: Understand the factors that contribute to SNF COVID cases and deaths, with a focus on disparities.

- Specific objectives include:
  - Identify the SNF-specific population and organizational factors that most explain variation in COVID cases/deaths, including race, in California
  - Identify and report specific SNFs that, based on the results of the analysis, are most at risk for COVID cases/deaths to support related policy and service delivery improvement initiatives
  - Create a set of recommendations for stakeholders to target and accelerate improvement in care, infection prevention and patient safety

Timeline

Aug. 14
Mtg #1

- Define committee goals & process
- Review components of study design
- Select study variables (outcome and explanatory)

Sept. 1
Mtg #2

- Review & discuss study results
- Develop policy recommendations

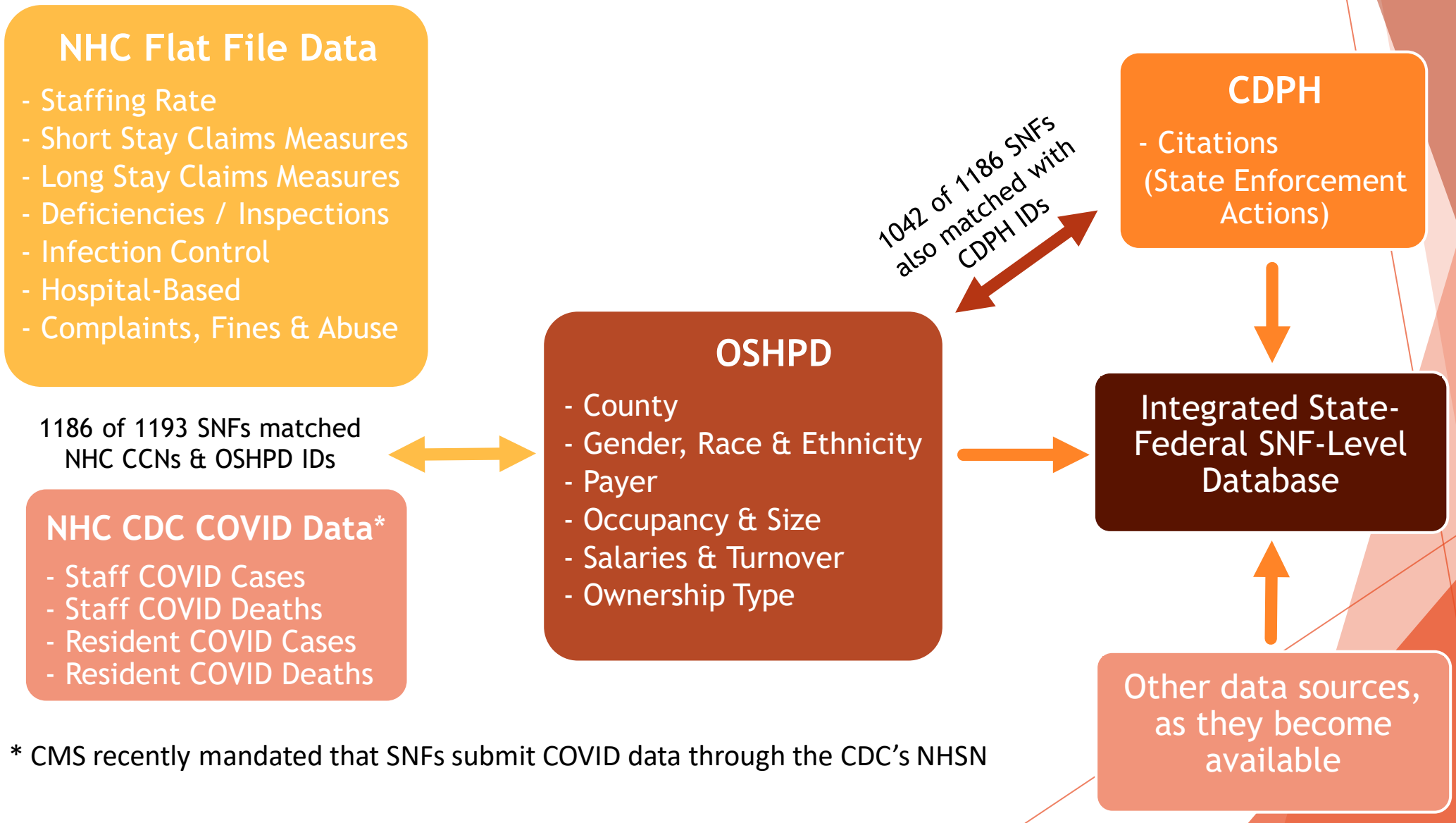
Sept. 22
Mtg #3

- Refine policy recommendations
- Provide feedback on communication materials & channels with a focus on actionability

Late Sept
Report with recommendations

- Create a set of recommendations for stakeholders to target and accelerate improvement in care, infection prevention and patient safety

The Data: Integrated State-Federal SNF-Level Data Database



* CMS recently mandated that SNFs submit COVID data through the CDC's NHSN

Data Source Description

Source	Dataset	Date Released	Date Obtained	Measurement Period
CA-Demographics	CA County Population Size	No Date Listed on Site	08/21/20	Current, as of 05/2020
CMS CASPER	Chain Facilities	07/2019	07/2019	Current, as of 07/2019
OSHPD	Licensed LTC Facilities List	07/02/20	07/07/20	Current, as of 06/30/20
	LTC Utilization File	06/18/20	07/21/20	CY 2019
	LTC Financial File	10/09/20	07/31/20	CY 2018
CDPH	Citations (State Enforcement Actions)	09/17/19	05/17/20	05/1998 – 06/2019
	Staffing Waivers	07/14/20	08/18/20	Current, as of 07/14/20
	Patient Needs Waivers	07/14/20	08/18/20	Current, as of 07/14/20
	Entity-Reported Incidents	07/2020	07/30/20	01/2003 – 07/2020
	Total Complaints	07/2020	07/30/20	01/2003 – 07/2020
	COVID County Rates	08/21/20	08/21/20	03/18/20 – 08/20/20
CMS Nursing Home Compare	COVID-19 Statistics	08/21/20	08/21/20	05/24/2020 – 08/09/20
	SNF Provider Information	07/29/20	08/04/20	Q4 2019
	SNF Penalties	07/29/20	08/04/20	06/2017 – 03/2020
	SNF Facility Deficiencies	07/29/20	08/04/20	06/2016 – 03/2020
	SNF Claims Measures	07/29/20	08/04/20	CY 2019

Considered Explanatory Variables

Domain	Variable Considered
Age	Percent of Residents - Less than 65 Years of Age Percent of Residents - 65-84 Years of Age* Percent of Residents - 85 and over Years of Age*
Citations/Fines/Complaints	Cited for abuse or neglect at high harm level or potential harm level Number of Fines Total Amount of Fines in Dollars Total Number of Complaints* Total Number of Incidents Any Fines*
County COVID	County-Level COVID cases per 100,000* County-Level COVID deaths per 100,000
Deficiencies/Incidents	Special Focus Facility Status Total Deficiencies* Number of Deficiencies, Categories F - L, Number of Deficiencies, Infection Control, Number of Clinical Care Deficiencies Number of Emergency Deficiencies Number of Other Deficiencies
Ownership	Facility Changed Ownership in Last 12 Months Indicator Licensee Type of Control (Investor / Non-Profit) Part of Chain Part of Chain by Licensee Type of Control (Investor / Non-Profit)*

* Variable used in model

Considered Explanatory Variables

Domain	Variable Considered
Ethnicity	Percent Residents – Hispanic*
	Percent of Residents - Non-Hispanic
	Percent of Residents - Unknown Ethnicity
Race	Percent of Residents - White
	Percent of Residents - African American*
	Percent Residents - Asian
	Percent of Residents - Other Race
Gender	Total Residents – Male*
	Total Residents – Female
	Percent of Residents – Male
	Percent of Residents – Female
Location	County
Financial	Nursing Salaries as a Percent of Net Revenue
	Net Income Divided By Net Revenue
	Waiver - Patient Needs - Submitted
	Waiver - Staffing - Submitted
Payer	Percent of Residents – Medicare*
	Percent of Residents - Medi-Cal*
	Percent of Residents - Managed Care
	Percent Residents - Other Payer
	Percent of Residents - Private or Self Pay*

* Variable used in model

Considered Explanatory Variables

Domain	Variable Considered
Quality	Percentage of short-stay residents who were rehospitalized after a nursing home admission*
	Percentage of short-stay residents who had an outpatient emergency department visit*
	Number of hospitalizations per 1000 long-stay resident days
	Number of outpatient emergency department visits per 1000 long-stay resident days
	Potentially Preventable Readmission Rate
Size	Resident Turnover (Admissions/Census As of 12/13/19)
	Total Number of Residents
	Licensed Beds*
	Occupancy Rate
SNF COVID Staff Shortage	Staffing shortage of Nursing Staff: registered nurse, licensed practical nurse, vocational nurse as reported by the provider
	Staffing shortage of Aides: certified nursing assistant, nurse aide, medication aide, and medication technician as reported by the provider
	PPE Shortage: One Week Supply
Staffing	Nursing Staff Turnover*
	Reported RN Staffing Hours per Resident per Day*
	Reported Total Nurse Staffing Hours per Resident per Day*
	Reported RN Staffing Hours per Resident per Day, greater than 0.75
	Reported Total Nurse Staffing Hours per Resident per Day, greater than 4.1

* Variable used in model

Summary of Discussion to Date

Considered factors that have historically resulted in poor resident outcomes & quality of care

- Race & ethnicity
- Low nurse staffing levels,
- Payer mix
- Ownership
- High number of citations and deficiencies, etc.

Proposed additional study variables

- Resident clinical characteristics
- Access to PPE
- Gender
- Age, etc.

Committee also asked the Project Team to consider the following

- Impact of research on policy recommendations
- Data accuracy

Examining Factors and Disparities Associated with COVID Cases and Deaths in California Long Term Care Facilities

Review Study Results

Additional Analytic Methods

- Exclusions:
  - COVID-19 designated facilities (21 SNFs from Southern CA and 1 SNF from Northern CA)
  - Pediatric only facilities (10 SNFs)
  - Following exclusions, n = 1,151 SNFs
- Data assessment
  - Discretized continuous explanatory variables to their quartiles
  - Data quality
    - 307 SNFs with missing outcomes or explanatory variables
    - SNFs with incomplete data did not present OSHPD financials
- Analytic sample size
  - May 24 n = 825 SNFs
  - Aug 9 n = 841 SNFs

Summary of Regression Models & Outcome Variables

As of May 24 (model 1)

- Cumulative resident **case rate** per 1,000
- Cumulative resident **death rate** per 1,000

As of Aug 9 (model 2)

- Cumulative resident **case rate** per 1,000
- Cumulative resident **death rate** per 1,000

Change between May 24 & Aug 9 (model 3)

- Change in resident cumulative **case rate** per 1,000
- Change in resident cumulative **death rate** per 1,000

Study Results

Category	Factors	Case Rate Ratio*			Death Rate Ratio*		
		May 24	Aug 9	May 24 - Aug 9	May 24	Aug 9	May 24 - Aug 9
External	County level case rate**	2.02	1.33		3.45	2.37	
Facility	Facility size (beds)	2.14	1.55			1.97	
	Fines		0.79				
	For profit ownership - non-chain For profit ownership - chain	5.56 4.53					
	Medicare residents				2.37		0.53
	Short stay residents re-hospitalized after a nursing home admission					1.46	
Staffing	Nursing turnover		1.30				
	RN staffing		0.55			0.54	
	Total staffing	0.51					
Resident	Age: 65-84 Age: Older than 85		1.42 1.50		0.46	1.45	
	Black/African American	2.46	1.40	0.48	3.01		0.36
	Latinx		1.57				
	Males		1.47	2.66	0.35		3.80

*$p \leq 0.10$
** County level case rate reference group: bottom 3 quartiles

Notes

- Trying to make the connection between cases and deaths is challenging. Or rather understanding how the different variables associated with case rate and death rate relate to each other. This might be a limitation of this project due to limited to more detailed databases.
  - Resident level information, such as medical diagnosis, needs, etc.
  - Specifics at the nursing home level concerning detailed operations.
  - Other data limitations include lack of current data on testing, PPE, and staffing.
- As with the general population there are factors that can prevent the virus which are not necessarily the same for preventing death. For example, while mask wearing decreases the likelihood of disease, once infected mask wearing probably bears minimally on whether one dies from the coronavirus.
- Based on the results of this study, there are points of inflection that nursing homes can focus on to minimize the risks to residents associated with a pandemic or disaster.

Accelerating Quality Improvement

Develop Policy Recommendations

Proposed Recommendation Categories

- Future Studies
- Data Enhancements
- Facility Size and Design
- Staffing Related
- Facility Ownership
- Testing/Infection Prevention

Future Studies

- Qualitative studies examining the impact of high-priority potential explanatory variables where public data or well described measures do not exist.
- Case studies of "at-risk" facilities with few or no COVID cases AND "low-risk" facilities with outbreaks to determine potentially modifiable factors, practices, infrastructure or other features.
- Perform a formal data validation study in a sample of facility data submissions for the new NHSN COVID platform.
- Evaluate excess deaths of CA nursing home residents during the pandemic and quantify the types of non-COVID excess deaths.
- Perform mix-method studies to better understand factors that contribute to increased infections and deaths in certain vulnerable populations.
- Quantify the impact of policy changes on infection and death rates.

Data Enhancements

- CDPH should create a one-stop Nursing Home information dashboard, updated at least weekly, with data available to the public by download or API.
  - Data should include:
    - Number of residents, COVID-19 resident (and staff) cases and deaths
    - PPE shortages
    - Staffing hprd from the Payroll Based Journal(PBJ) data files, staffing waivers
    - Weekly testing results, deficiencies, complaints and emergencies
- Revise the OSHPD SNF financial reports to require nursing homes to report the number of resident days separately for MediCal managed care, MediCal FFS, Medicare managed care, Medicare FFS, and private health plans.
- DHCS should require all MediCal health plans to report the total number of MediCal resident days in each Nursing Home annually.
- OSHPD should replace the SNF utilization survey with the CMS Minimum Data Set (MDS) quarterly to summarize the total number of residents by:
  - Demographics, resident conditions, medical conditions, limitations in ADLs, nursing care needs and therapy needs.
  - Race and ethnicity data should be reported as a combined single category

Facility Size and Design

- In the short term, nursing homes should reduce the number of residents within large facilities as well as increasing the number of residents living in single or private rooms.
  - Cohorting COVID-19 cases should be a priority in separate areas of the facility
  - Increase the open space for social distancing and targeted visitation
- Develop a statewide taskforce to create a feasible, evidence-based plan to redesign nursing homes that reduces the size of facilities, creates more open space suitable for a pandemic and develop single rooms for residents.
- Create a collaborative learning program among CA SNFs to share effective practices given the current facility size and design to prevent infections and reduce spread

Staffing Related

- Develop a pathway for nursing homes to increase their staffing levels to evidence-based levels over the next 12 months.
  - The minimum level is 0.75 RN hours per resident day (hprd), 0.55 LPN hrpd, and 2.8 CNA hprd for total nursing of 4.1 hprd
- Require nursing homes to meet federal requirements that state “The facility must have sufficient nursing staff with the appropriate competencies and skills sets to provide nursing and related services to assure resident safety and attain or maintain the highest practicable physical, mental, and psychosocial well-being of each resident, as determined by resident assessments and individual plans of care and considering the number, acuity and diagnoses of the facility's resident population in accordance with the facility assessment…” (See 42 C.F.R. § 483.70(e), November 28, 2017).
- Eliminate workforce shortage and patient acuity waivers for nursing homes over the next 12 months.
- CDPH should obtain nursing home Payroll Based Journal (PBJ) data submitted to CMS to monitor and enforce nursing home staffing requirements.
- Require nursing homes to reduce average annual nursing turnover rates to 25% within 2 years.
- Promote skill enhancement (provide opportunities for staff to obtain related certifications, training, & other professional development), especially related to infection prevention.
- Increase direct care wages and benefits by giving MediCal incentive and wage pass through payments

Facility Ownership

- OSHPD should increase the annual financial disclosure of nursing homes by requiring a consolidated financial report for all related party organizations and entities including management, property, and parent companies.
- Consider financial controls on cost centers for each nursing home company rather than only cost controls on the Medi-Cal expenditures.
  - Create a targeted Medical Loss Ratio (MLR) threshold for all SNF payers
- Strengthen regulatory oversight, especially in “at-risk” facilities, to ensure that all nursing homes meet minimum federal nursing home standards for quality including infection control, sanitation, and emergency requirements.

Testing and Infection Prevention

- Distribute vaccines to residents and staff residing in “at-risk” facilities first.
- Rather than investigating outbreaks in facilities retrospectively, CDPH should enhance oversight for "at-risk" facilities based on a new understanding of factors associated with COVID-19 infections and death.
  - Oversight can include targeted educational, operational and infection prevention support and monitoring "at-risk" facilities to prevent outbreaks
- Strengthen training protocols to ensure that all nursing home staff are knowledgeable about infection control, sanitation, and emergency requirements.
  - Trainings are at least annual, culturally sensitive, etc.
  - Require the designated Infection Preventionist to be CIC Certified
- All facilities should be following CDPH testing guidelines for testing staff weekly.
- CDPH should evaluate and report other healthcare associate infections (HAIs) (e.g. C. diff, CAUTI, etc.) in CA SNFs similar to what exists in the hospital community

What is an "At-risk" facility?

Use the factors in the models that were significant and had a strong influence on infections and deaths.

Identify each facility the top quartile of SNFs in each factor - presence in the top quartile of one becomes one "signal"

Increasing number of "signals" indicates a higher risk

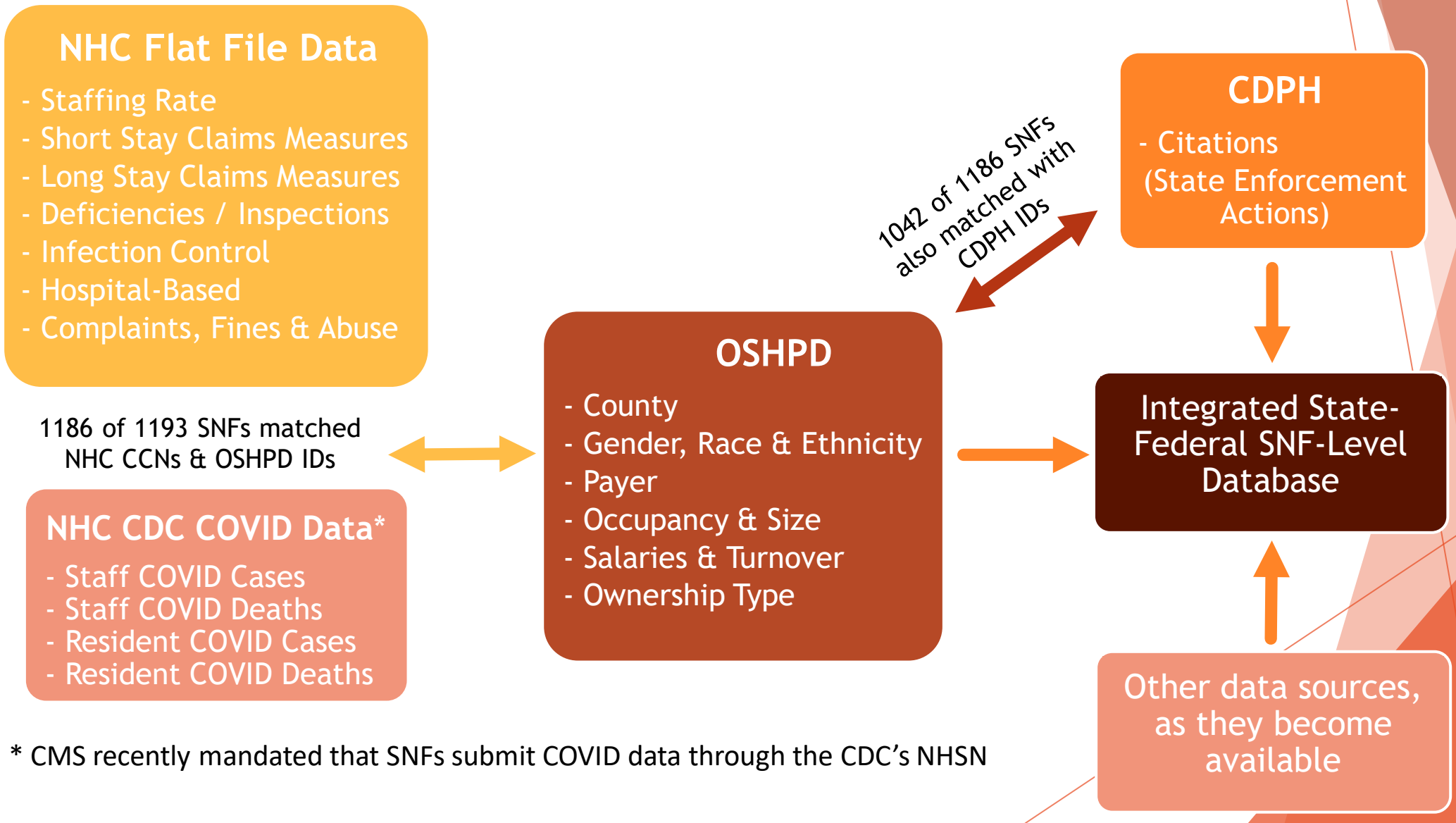
Construct a list of facilities with the greatest number of "signals"

Open Forum

Thank you!

Appendix

The Data: Integrated State-Federal SNF-Level Data Database



* CMS recently mandated that SNFs submit COVID data through the CDC's NHSN

Data Source Description

Source	Dataset	Date Released	Date Obtained	Measurement Period
CA-Demographics	CA County Population Size	No Date Listed on Site	08/21/20	Current, as of 05/2020
CMS CASPER	Chain Facilities	07/2019	07/2019	Current, as of 07/2019
OSHPD	Licensed LTC Facilities List	07/02/20	07/07/20	Current, as of 06/30/20
	LTC Utilization File	06/18/20	07/21/20	CY 2019
	LTC Financial File	10/09/20	07/31/20	CY 2018
CDPH	Citations (State Enforcement Actions)	09/17/19	05/17/20	05/1998 – 06/2019
	Staffing Waivers	07/14/20	08/18/20	Current, as of 07/14/20
	Patient Needs Waivers	07/14/20	08/18/20	Current, as of 07/14/20
	Entity-Reported Incidents	07/2020	07/30/20	01/2003 – 07/2020
	Total Complaints	07/2020	07/30/20	01/2003 – 07/2020
	COVID County Rates	08/21/20	08/21/20	03/18/20 – 08/20/20
CMS Nursing Home Compare	COVID-19 Statistics	08/21/20	08/21/20	05/24/2020 – 08/09/20
	SNF Provider Information	07/29/20	08/04/20	Q4 2019
	SNF Penalties	07/29/20	08/04/20	06/2017 – 03/2020
	SNF Facility Deficiencies	07/29/20	08/04/20	06/2016 – 03/2020
	SNF Claims Measures	07/29/20	08/04/20	CY 2019

Considered Explanatory Variables

Domain	Variable Considered
Age	Percent of Residents - Less than 65 Years of Age Percent of Residents - 65-84 Years of Age* Percent of Residents - 85 and over Years of Age*
Citations/Fines/Complaints	Cited for abuse or neglect at high harm level or potential harm level Number of Fines Total Amount of Fines in Dollars Total Number of Complaints* Total Number of Incidents Any Fines*
County COVID	County-Level COVID cases per 100,000* County-Level COVID deaths per 100,000
Deficiencies/Incidents	Special Focus Facility Status Total Deficiencies* Number of Deficiencies, Categories F - L, Number of Deficiencies, Infection Control, Number of Clinical Care Deficiencies Number of Emergency Deficiencies Number of Other Deficiencies
Ownership	Facility Changed Ownership in Last 12 Months Indicator Licensee Type of Control (Investor / Non-Profit) Part of Chain Part of Chain by Licensee Type of Control (Investor / Non-Profit)*

* Variable used in model

Considered Explanatory Variables

Domain	Variable Considered
Ethnicity	Percent Residents – Hispanic*
	Percent of Residents - Non-Hispanic
	Percent of Residents - Unknown Ethnicity
Race	Percent of Residents - White
	Percent of Residents - African American*
	Percent Residents - Asian
	Percent of Residents - Other Race
Gender	Total Residents – Male*
	Total Residents – Female
	Percent of Residents – Male
	Percent of Residents – Female
Location	County
Financial	Nursing Salaries as a Percent of Net Revenue
	Net Income Divided By Net Revenue
	Waiver - Patient Needs - Submitted
	Waiver - Staffing - Submitted
Payer	Percent of Residents – Medicare*
	Percent of Residents - Medi-Cal*
	Percent of Residents - Managed Care
	Percent Residents - Other Payer
	Percent of Residents - Private or Self Pay*

* Variable used in model

Considered Explanatory Variables

Domain	Variable Considered
Quality	Percentage of short-stay residents who were rehospitalized after a nursing home admission*
	Percentage of short-stay residents who had an outpatient emergency department visit*
	Number of hospitalizations per 1000 long-stay resident days
	Number of outpatient emergency department visits per 1000 long-stay resident days
	Potentially Preventable Readmission Rate
Size	Resident Turnover (Admissions/Census As of 12/13/19)
	Total Number of Residents
	Licensed Beds*
	Occupancy Rate
SNF COVID Staff Shortage	Staffing shortage of Nursing Staff: registered nurse, licensed practical nurse, vocational nurse as reported by the provider
	Staffing shortage of Aides: certified nursing assistant, nurse aide, medication aide, and medication technician as reported by the provider
	PPE Shortage: One Week Supply
Staffing	Nursing Staff Turnover*
	Reported RN Staffing Hours per Resident per Day*
	Reported Total Nurse Staffing Hours per Resident per Day*
	Reported RN Staffing Hours per Resident per Day, greater than 0.75
	Reported Total Nurse Staffing Hours per Resident per Day, greater than 4.1

* Variable used in model