

# Agenda

- Context
- Overview of observations
- Recommendations
- Discussion

# **CalPROTECT** (California Prison Roadmap for Targeting Efforts to Address the Ecosystem of COVID Transmission)

CalPROTECT is an initiative comprised of a multidisciplinary team of experts in public health, medicine and infectious disease, behavioral science, environmental engineering, and economics from **AMEND at UC San Francisco** and **UC Berkeley Schools of Public Health and Public Policy**.

On December 13 & 14, 2020, CalPROTECT visited the Substance Abuse and Treatment Facility, Corcoran State Prison (SATF-CSP) to evaluate ongoing transmission of COVID-19.

## 1. Purpose of this Assessment

Our goal is to describe and recommend policies that may protect and promote physical and mental health among people who are incarcerated, including the prevention and control of COVID-19.

For our team's December 2020 site visit to SATF, we were guided by the following questions:

- 1. What were characteristics of the 2020 COVID-19 outbreak at SATF-CSP?
  - a. What are the factors that contributed to the outbreak and/or its containment?
  - b. How did COVID-19 spread in different housing units?
  - c. What factors might contribute to mitigation of future outbreaks at SATF-CSP?
  - d. In which areas does SATF-CSP remain vulnerable to future COVID-19 outbreaks?
- 2. What lessons might be transferable to other settings, and how are these lessons translated to policy?

# 2. Methodology

#### Onsite Data Collection

- Interviews and conversations with key stakeholders (e.g., leadership staff, medical leadership, inmate councils)
- Group discussions (e.g., inmate councils)
- Space/place observation during facility visit
- Indoor air quality assessments
  - CO<sub>2</sub> and airflow

#### Public data sources

CDCR, Kings County Department of Public Health,
 California Government Open Data Portal, CCHS

# 3.1 Findings Outbreak Characterization

# **Overview of SATF Population and Outbreak**

Population	Size	Active Cases	Total Confirmed
	As	of January 19th, 2021	
Staff	1,555 (Q3)	74 (48 per 1000)	513 (330 per 1000)
Incarcerated (Capacity)	4,314 (3,424)	16 (3 per 1000)	3,004 (696 per 1000)

As of 1/19/2021:

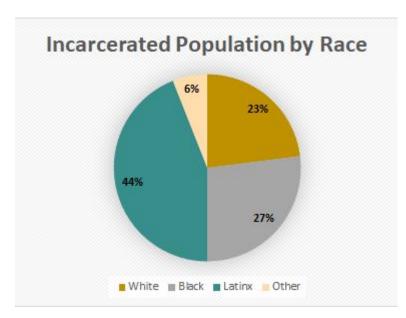
Active cases in CDCR = 37 per 1000

Confirmed cases in CDCR = 471 per 1000

## Demographic Breakdown of SATF Population

Risk Level	SATF	CDCR Facility Avg	
	As of October 2020		
High Risk I	5%	7%	
High Risk II	8%	10%	
Medium Risk	54%	34%	
Low Risk	33%	49%	

Notes:High risk selection criteria include i) diagnoses/conditions associated with current or future risk for adverse health event, ii) multiple higher level of care events in past 12 months, iii) prolonged medical bed stays, iv) patients on 10 or more medications, v) two or more high risk specialty consultations in past 6 months, vi) 65 years or older, vii) any comorbid medium risk diagnoses/conditions that may increase risks for future adverse health events; Chronic conditions constitute any that do not meet the selection criteria for high risk, including patients enrolled in mental health services delivery system and patients with permanent disabilities (ADA) affecting placement.

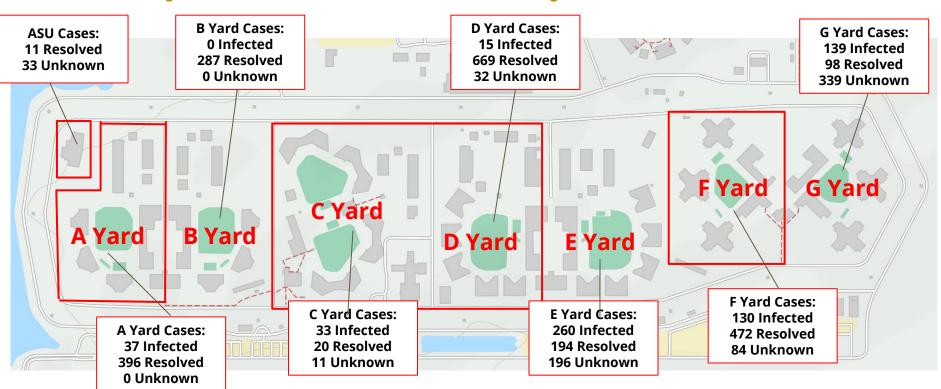


29% of population aged 50+

17.2% have at least one ADA-Classified Disability

CalPROTECT-8

# Landscape of Cases on Visit Day: Dec. 13th, 2020



- 1. All values as of December 13th, 2020
- 2. Bolded red squares indicate site visit and ventilation testing locations

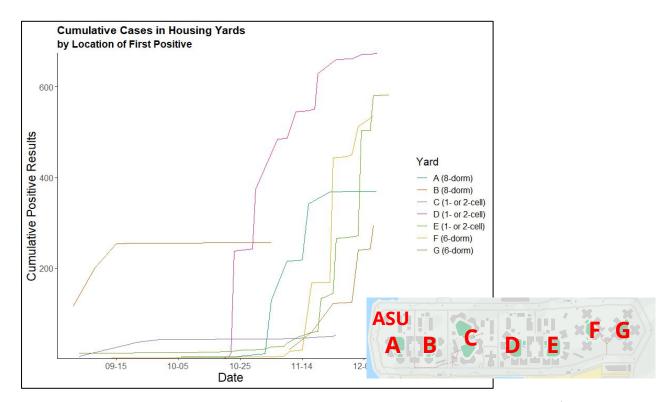
# COVID-19 was detected in nearly all housing units



# Cases increased across all housing types in fall

# This graph displays cumulative COVID-19 cases across housing units at SATF over time:

- "Stepwise" appearance due to periodic mass testing starting in late October
- Housing yard indicates location of first positive result, not where exposure occurred
- Many cases occurred in dedicated quarantine units/areas, where patients were moved
- Widespread testing began after outbreak was underway

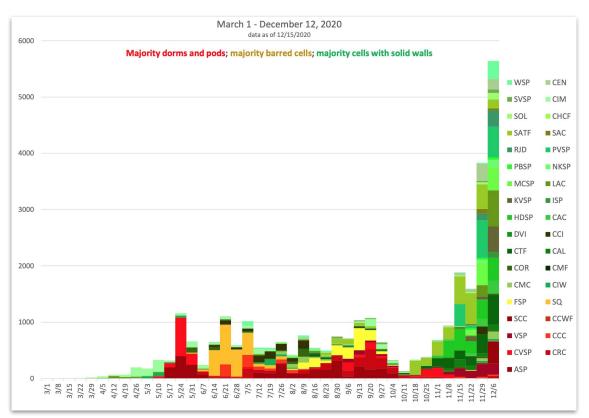


Cases by institution housing type changed significantly in

late fall

This graph displays CCHCS statewide COVID-19 Cases (N = 30,571) by institution and housing type

- Across CDCR, COVID-19
   outbreaks in summer 2020
   predominantly occurred in
   facilities that were mostly dorms
   and pods.
- However, this pattern has changed beginning in mid-October, with outbreaks occurring in facilities with majority solid-walled cells.
- This may be due to the onset of cooler weather and the use of recirculated, heated air.



Note: Figure provided to CalPROTECT by Dr. Heidi Bauer from CDCR (December 2020)

CalPROTECT-12

## View of risk by housing status, <u>Summer 2020</u>

Within jails and prisons, density in the form of close, prolonged contact is a critical risk factor for COVID-19 transmission, which is primarily influenced by *population density*, *shared air space*, and *unit type*. While all units pose some level of risk for COVID-19 transmission, particular types of units have higher transmission risk than others.



Single or double occupancy cells with solid doors which are located on solid-floor tiers



Single or double occupancy cells with grilled doors and windows, which are located on solid-floor tiers



Single or double occupancy cells with grilled doors and no windows, located on solid-floor tiers



Small dorms (<20 individuals)



Large dorms (>20 individuals)

Relative likelihood of onward COVID-19 transmission within the unit

Source: <u>CalPROTECT Evaluation of the</u>
<u>April-May 2020 COVID-19 Outbreak at</u>
California Men's Colony, July 2020

## View of risk by housing status, Fall 2020 - Winter 2021

The initial outbreak in Yard D, which has single and double occupancy cells with solid doors and allowed little time out of cells, suggests risk is more complicated...



Single or double occupancy cells with solid doors which are located on solid-floor tiers



Single or double occupancy cells with grilled doors and windows, which are located on solid-floor tiers



Single or double occupancy cells with grilled doors and no windows, located on solid-floor tiers



Small dorms (<20 individuals)

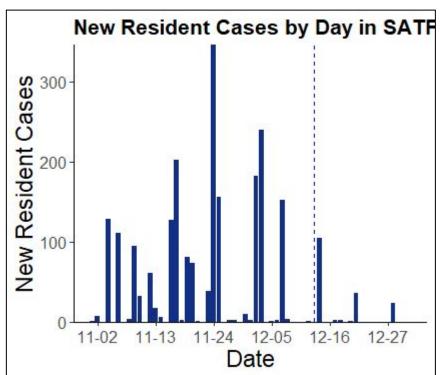


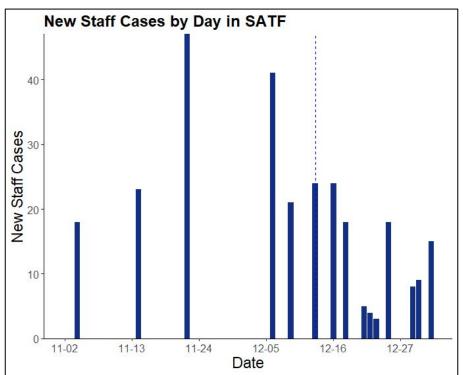
Large dorms (>20 individuals)

Relative likelihood of onward COVID-19 transmission within the unit

Source: <u>CalPROTECT Evaluation of the April-May 2020 COVID-19 Outbreak at California Men's Colony, July 2020</u>

## **Outbreak Characterization: Epi Curves**





NOTE: Date is of first positive test result

### **Notes on Outbreak Characterization**

There was a small outbreak in September but the situation turned much more dire in late October and peaked in early December - current case rate far below average but after 3,000+ inmates already had COVID-19

There is still a sizable population that has not yet had the virus but certain yards contain no uninfected inmates

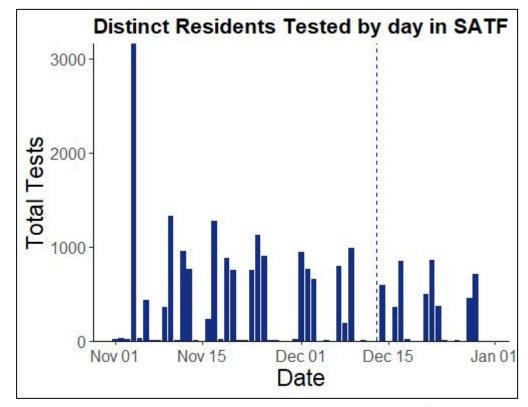
Note: The odd flat areas here are the result of several days without reporting information from Dec 4-6, Dec 10, Dec 12-14, Dec 16, Dec 25-27, Jan 2-4

The staff epi curve suggests that the timing of the most significant outbreak coincides with that of the inmates, with a peak at mid-December

# **Overview of Testing at SATF**

#### **Features of Testing Program:**

- Inmate testing began in June '20
- Rapid testing rolled out on 9/23/20
- Approximately 25 Sofia 2 tests/day and 5 BD Veritor tests/day
- Weekly testing of staff
- Limited rapid testing for clinical use
- Most of the data on right is RT-PCR Tests, which face significant turnaround time at SATF (3-4 days)

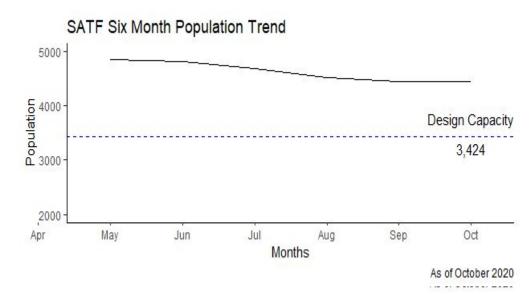


# 3.2 Findings Evaluation of Outbreak Mitigation and Control

# Gaps in adherence to recommended control measures limit effectiveness

Although CDC guidelines emphasize the public health importance of reducing population density, **decarceration occurred early on in the outbreak but not in recent months**.

- Population decreased from 4587 to 4450 before outbreak
- Staff interviews describe critical staffing & space shortages for an outbreak setting
- Ventilation may be designed for stated capacity, rather than current population.



Note: While crucial for mitigating outbreaks, rated capacity is simply the number of inmates intended to be housed in the facility according to the BJS and does not have a meaningful public health interpretation

Measures/Most Relevant Guidance	Current State		
Transfer Guidance:  Minimize interactions between incarcerated/detained persons living in different housing units, to prevent transmission from one unit to another.	Within-facility transfer policies at present do not include an evaluation of the location-specific risk for transmission of the areas in question. All but essential transfers were frozen on 3/23/20, and all transfers prohibited from 11/23/20.  No restrictions on staff movement, cohorting, or changes to vanpooling policies at present.		
Personal protective equipment (PPE): Ensure all individuals with risk of infection have correct PPE available, are properly trained to use it, and are adherent to guidelines.	Early distribution of masks; good compliance observed, but some feedback on fatigue. Interviews indicate a desire for further education.		
Testing procedures:  Testing is recommended for all close contacts; periodic testing for staff and cohorts should be considered. Encourage collaboration with local health authorities for planning.	Testing turnaround for staff around 2d, for residents around 3-4d, which hamper mitigation. At present, only use rapid tests for symptomatic patients, not for exposures or screening; additionally, rapid testing only available to residents at present.  Testing for symptomatic patients was slow in the initial outbreak phase, which dramatically delayed the response.		

Measures/Most Relevant Guidance	Current State  Widespread movement of residents, prolonged testing turnaround time, and delayed outbreak recognition accelerated COVID-19 spread between housing units.		
Quarantine/ isolation procedures: Individuals with symptoms should be			
isolated as soon as recognized, and movement kept to a minimum. Established hierarchy of quarantine space for multiple individuals.	Concerns about the movement of residents in isolation or quarantine seeding outbreaks in other parts of the prison, likely due to some combination of <b>poor air exchange, recirculation, and unbalanced ventilation/pressurization,</b> and shared staff between isolation/ quarantine area and housing units without cases in these yards.		
	Quarantine and isolation units exist within housing yards. Inmates testing positive are rehoused in dedicated isolation unit, with cell and pod-mates in quarantine. Uninfected, "High Risk Medical patients" as defined by CDCR, were removed from dorm style living and rehoused in 2 person cells.		
Physical mitigation measures  Implement distancing strategies, regardless of symptoms, and minimize mixing of individuals from different housing units. If group activities detained, other activities to support mental health should occur.	Residents are now nearly all housed based on uninfected/resolved/infected status. <b>Delays from testing and ventilation issues may have contributed to spread</b> in spite of this. Since resolved patients are nearly all housed together, they could be given more privileges with little risk (such as more yard, return to jobs, etc). Dorms faced nearly 100% spread, making it difficult to implement recommended quarantine/isolation guidance within these buildings.		

support mental health should occur.

### **Strengths and Vulnerabilities Related to COVID-19 Control**

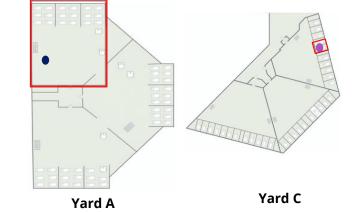
Key Strengths	Key Vulnerabilities
Dedicated medical and custody staff and leadership	<ul> <li>Medical staff shortages increased fatigue, required adjustment of services provided, and led to more staff movement throughout facility</li> </ul>
<ul> <li>Engaged inmate council willing to model and support vaccination rollout</li> </ul>	<ul> <li>Although formal sharing of staff across institutions was discontinued in response to COVID-19, staff interviews suggest it may have continued with Corcoran SP</li> </ul>
<ul> <li>Virtual video visits to promote morale and</li> </ul>	<ul> <li>Long testing turnaround times (3-4 days) and limited use of rapid tests delayed decisions, thereby limiting effective response and mitigation</li> </ul>
<ul><li>well-being of patients starting in November '20</li><li>Masking compliance was</li></ul>	<ul> <li>By following well-intentioned, central office guidelines about movement of residents throughout the facility for quarantine and medical isolation, healthcare staff noted that frequent movement may have driven spread</li> </ul>
well-noted	<ul> <li>Aspects of outbreak managed separately for the three groups (medical/custody/residents), rather than as a coordinated effort.</li> </ul>
	<ul> <li>Data collection systems are slow and require a large amount of time from medical staff</li> </ul>
	Ventilation and air recirculation

# **3.3 Findings Environmental Observations**

Air changes were estimated using measured CO2 levels

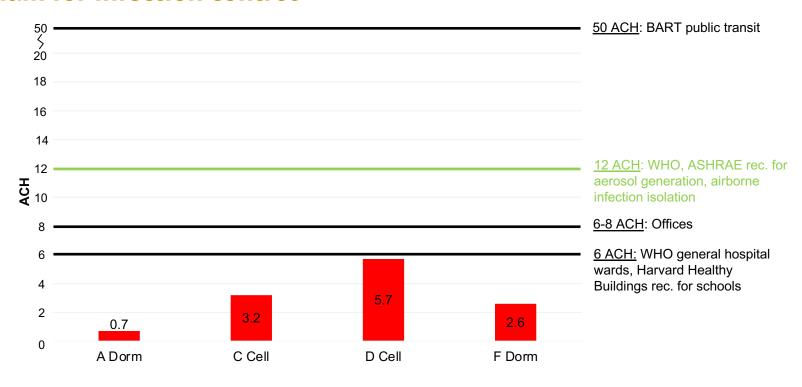
in four buildings at SATF

Yard	Room Type	Observed Occupants	Air Changes per Hour (ACH)
Α	Dorm	48	0.7
С	Cell	2	3.2
D	Cell	2	5.7
F	Dorm	6	2.6





# Air change rates in four SATF buildings are lower than recommended minimum for infection control



**Measurements for SATF Yards** 

#### **Other Environmental Observations**

#### Movement of infected patients to rooms with poorly functioning ventilation systems

- Inoperative exhausts and variable air velocities measured in cells indicate unbalanced system
- Unintended pressurization differences between rooms promote the escape of virus laden air from enclosed cells or spaces

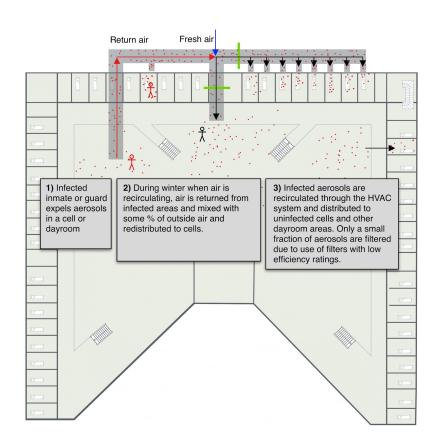
#### Use of filters below minimum efficiency ratings

- MERV 13 (or higher) recommended by CDC and ASHRAE for viral capture
- MERV 8,10 used at SATF

#### Lack of routine maintenance compromising overall indoor air quality

- Need for filter replacements indicated by:
  - Accumulation of dirt/debris around vents
  - Inmates use hair nets to block black smoke and dust from coming from supply
- Uncomfortable/uncontrolled flows suggest need for damper replacement & rebalancing

#### Potential infection scenario: air recirculation in cell blocks





Infected droplets,  $> 5~\mu m$  in size, settle on floors and surfaces quickly, but aerosols can travel in air currents potentially for hours.



Infected aerosols, <5 µm in size, can travel in air currents within a room, and remain suspended in air for hours.



Air filter. At SATF, filter MERV 8 and MERV 10 filters are used. A MERV 10 or less filter has no effect on particulates in the 0.3 -  $1~\mu m$ 



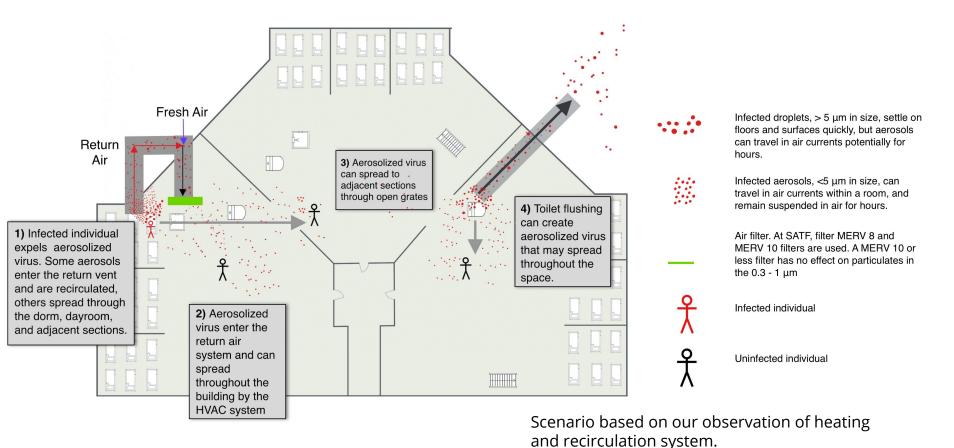
Infected individual



Uninfected individual

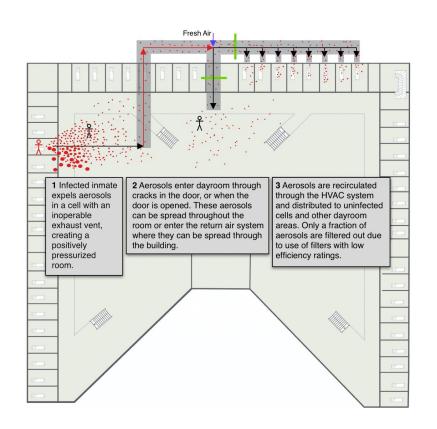
Scenario based on our observation of heating and recirculation system.

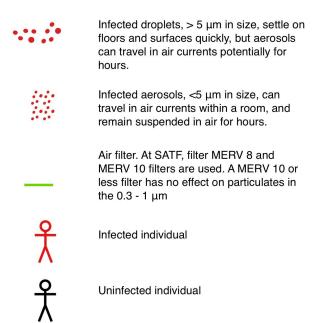
#### Potential infection scenario: air recirculation in dormitory buildings



CalPROTECT-28

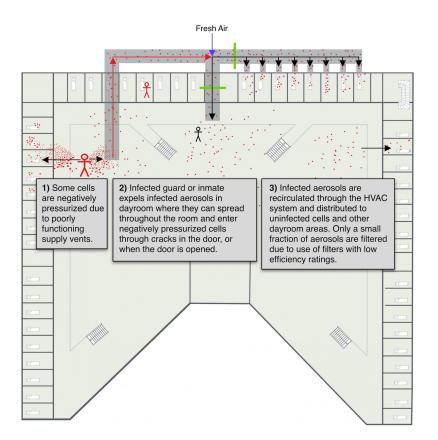
# Potential infection scenario: inoperative exhaust vent in cells, positively pressurized cell





Scenario based on our observation of inoperable exhaust vents in D Yard cells.

# Potential infection scenario: inoperative supply in cells, negatively pressurized cells





Infected droplets,  $> 5 \mu m$  in size, settle on floors and surfaces quickly, but aerosols can travel in air currents potentially for hours.



Infected aerosols,  $<5 \mu m$  in size, can travel in air currents within a room, and remain suspended in air for hours.



Air filter. At SATF, filter MERV 8 and MERV 10 filters are used. A MERV 10 or less filter has no effect on particulates in the 0.3 -  $1~\mu m$ 



Infected individual



Uninfected individual

Scenario based on our observation of inoperable supply vents in D Yard cells.

CalPROTECT-30

# Common strategies to reduce indoor air concentrations of virus and inhalation dose have NOT been available at SATF

"The dose makes the poison"

Dose=Concentration x Respiration rate x Time in infected space x Fraction deposited in lungs

- Concentration: properly functioning ventilation systems, supplementary air cleaners/single zone filters
- Respiration rate: Separation of high respiration activities to outdoors versus sedentary activities indoors
- Time in infected space: Ventilating the space while occupants are away from room

# At current occupancy levels it is impossible to control infection in dorms

Yard	Room Type	Observed Occupants	Measured Air Changes per Hour (ACH)	to Meet WHO Standards
Α	Dorm	48	0.7	3
С	Cell	2	3.2	1
D	Cell	2	5.7	1
F	Dorm	6	2.6	1

Note: Above chart shows occupancy reduction needed to meet WHO minimum standard for containing airborne infections. Chart shows the effect of reducing occupancy alone. However, a mix of interventions including ventilation maintenance, addition of air cleaning units, UVGI can be used to provide additional air changes to meet standards

Calprotect-32

#### **Recommendations overview**

- 1. Decarcerate: Occupancy reduction is the single most effective method to prevent and reduce COVID-19 transmission.

  All further recommendations are dependent on the implementation of effective decarceration.
- 2. Ventilate: Urgently hire an HVAC specialist to evaluate and rebalance SATF's ventilation system; Install supplemental air cleaners and open building windows to reduce airborne transmission.
- 3. Test smartly: Scale up testing for early detection and reduce testing turnaround time to 24 hours or less. Testing approach may differ for institutions that have an outbreak vs. without an outbreak
- 4. Prepare: Improve outbreak/emergency planning, communication, and response through surge planning, testing plans and strengthened data systems.
- 5. Communicate: Develop and disseminate plans to create stable community cohorts that include medical staff, custody staff, and residents.
- 6. Foster Wellness: Continue to promote a culture of health and wellness that encourages learning and participation in public health measures (vaccination, masking, physical distancing).

  CAIPROTECT-34

# Strategy #1: Occupancy reduction is the single most effective method to prevent and reduce COVID-19 transmission.

**Why is this strategy important?** Both population density and overcrowding influence the feasibility and effectiveness of every preparation, prevention, and management recommendation from CDC. Specifically:

- SATF experienced a rapidly spreading, large-scale outbreak despite have a high proportion of single and double occupancy cells with solid doors and walls
- SATF is already well over design capacity which is in itself too crowded to ensure safe quarantine and isolation and protection of medically vulnerable residents given observed outbreaks in most units.
- The rate of onward SARS-CoV-2 transmission is directly related to the number of people exposed.
- Emergent evidence from other facilities suggests that other prevention and control methods may reduce transmission but ultimately are insufficient to fully control spread without decarceration.

**Specific steps and tactics to implement this strategy:** Urgently decarcerate the SATF and CDCR population through releases (not high-risk transfers) with support for re-entry. This may involve collaboration with local university dorms, hotels, etc. for quarantine prior to release, and coordination with community partners for reentry support.

Several subsequent recommendations rely on decarceration for successful implementation and management.

# Strategy #2: Urgently hire an HVAC specialist to evaluate and rebalance SATF's ventilation system and prevent/reduce airborne transmission.

**Why is this strategy important?** COVID-19 attack rates across SATF housing units are so high that transmission through close contact *alone* is highly unlikely.

Specific steps and tactics to implement this strategy (recognizing that expert support is URGENTLY needed):

- Maximize outdoor air and avoid recirculation in HVAC systems. If recirculation is unavoidable, increase filter ratings to MERV 13+
- Hire external ventilation specialists to rebalance HVAC system
- Establish an updated understanding of relative room pressure relationships and areas vulnerable to infiltration/exfiltration of infected aerosols
- Introduce natural ventilation where possible (e.g., guard quarters in front of cell blocks)
- Separate isolation/quarantine into different buildings to avoid contamination of fresh air intakes
- Install lids on toilet seats to reduce any potential transmission through infected fecal aerosols, especially in dorms
- Instate a regular ventilation maintenance schedule including rebalancing, filter changes, damper replacements and duct cleaning

# Strategy #3: Scale up testing for early detection and reduce testing turnaround time (TAT) to 24 hours or less.

**Why is this strategy important?** Lab turnaround times >24 hours create immense vulnerabilities given the lack of safe spaces for quarantine, isolation, and protection of medically vulnerable residents. On *average*, an infected patient is able to transmit the virus for 2d prior to the onset of symptoms, followed by another 5d from the onset of symptoms with most transmission likely occurring at the beginning of this time frame. A 3.5d TAT means that isolation is commencing well after a person is most infectious. Ultimately, this meant that SATF identified the outbreak and implemented mass screening too late.

#### Specific steps and tactics to implement this strategy:

- Immediately undertake an analysis of bottlenecks and potential solutions to reduce testing TAT to <24 hours (e.g., more staff).
- Make quarantine and medical isolation decisions based on PCR tests with a 24-hour turnaround time or rapid antigen testing. Notably, speed of reporting can be more important than test sensitivity when screening asymptomatic individuals (<u>Larremore, 2021</u>)
- If bottlenecks persist, prioritize increasing testing frequency in housing units/yards with expanding outbreaks (at the expense of those without)
- Use rapid tests more frequently for people with known exposures and/or high-risk activities (kitchen workers, staff working in units with active infections, etc.) who are not currently isolated.
- Expand close contact definition for testing from roommate to fellow residents in shared air spaces (e.g., 47 rather than 8 close contacts in A yard) to avoid missing new infections.

# Strategy #4: Improve outbreak/emergency planning, communication, and response.

**Why is this strategy important?** Well-intentioned movement of residents as part of outbreak control efforts likely inadvertently spread SARS-CoV-2 throughout and between housing units. Transmission was likely accelerated by the use of recirculated air. Unlike in the summer, celled housing may carry comparable risks to dormitory housing when coupled with the onset of winter necessitating the use of unfiltered, recirculated heated air.

#### Specific steps and tactics to implement this strategy:

- **Conduct surge planning to identify locations** to house a significant proportion of the population in separate medical isolation and quarantine beds should an outbreak occur
  - o Identify high medical risk patients to support releases, well-planned transfers, isolation and quarantine.
  - Assess of housing types, capacity, resident health risk, ventilation and other relevant characteristics to inform selection of isolation and quarantine areas
- Use rapid testing for screening of staff and residents to support decision making and case detection.
- Prepare outdoor facilities with adequate air exchange for testing and treatment with low transmission risk.
- Establish a data collection system that allows for automation and reduces the demand on medical staff for data entry activities.
- Prioritize full-site outbreak planning that identifies site-specific risks and vulnerabilities and coordination across all groups at risk (medical, correctional, residential).

Strategy #5: Develop and disseminate plans to create stable community cohorts that include medical staff, custody staff, and residents.

**Why is this strategy important?** Use of cohorts reduces risk of transmission within facilities, facilitates more effective contact tracing and testing programs, and limits need for within-facility movement.

#### Specific steps and tactics to implement this strategy:

- Create stable community cohorts that include medical staff, custody staff, and residents with movement restricted to those areas. The cohort should include housing units, activity units, kitchens, etc., and allocates an adequate number of staff to support both standard and outbreak activities.
- Prohibit vanpooling and carpooling, particularly with staff from neighboring correctional facilities. Subsidize transportation costs for staff to avoid vanpooling (and use rapid tests on these individuals weekly).
- Restrict within-facility movement of high-risk residents unless absolutely necessary, and only in cases where facility can confirm they are being moved into housing with closed cells and no shared or recirculated air. Utilize daily rapid testing for staff and residents who cross cohorts.

Cohorting of close contacts of a case should only be practiced when there are no other options. Individual isolation is always preferable, and may be facilitated through decarceration or depopulation.

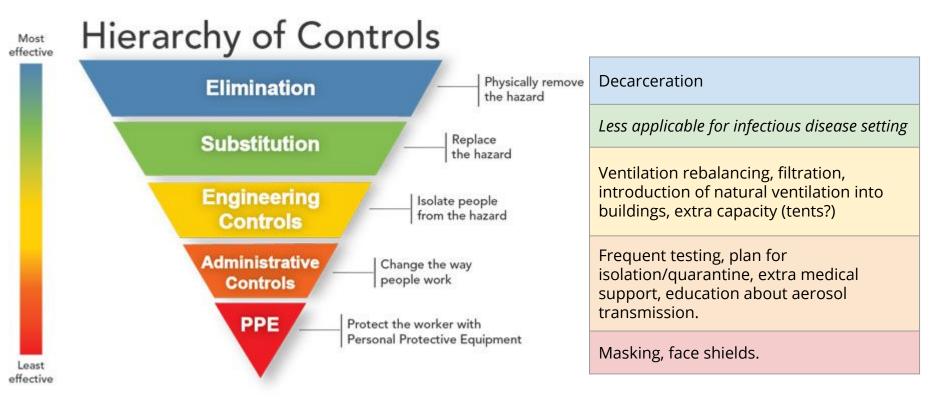
# Strategy #6: Continue to promote a culture that encourages learning, participation in public health measures, and promotes health and wellness.

**Why is this strategy important?** Promoting mental health and social well-being is an essential function of healthcare in the prison system, and should be considered both within outbreak response situations, with reintroduction of activities in non-mass-outbreak situations.

#### Specific steps and tactics to implement this strategy:

- Increase yard time for residents who have recovered from illness and those who have been vaccinated. Within cohorts, allocate yard time instead of strictly limiting ability to go outside.
- Continue to offer video visitations to improve inmate and family mental health, in addition to other activities to promote mental and social health within each setting.
- Strengthen education and and dissemination of information for staff and residents around COVID-19 transmission, proper social distancing and mitigation efforts, importance of early reporting of symptoms, and vaccination FAQ. Additionally, develop plans for clearly disseminating new evidence and new guidance appropriate for the facility.
- Collect patient and staff questions about vaccination safety, answer and disseminate responses as FAQs
- Financial and other incentives can support staff morale, particularly when surge capacity needed.
- Offer COVID-19 specific sick days in addition to regular time to address staff concerns around vaccination

### **Further Consideration for Implementing Recommendations**



# **Acknowledgments**

Ms. Theresa Cisneros, SATF Chief Deputy Warden Receiver Mr. Clark Kelso

Mr. Jason Collins, SATF Associate Warden Dr. Joseph Bick

Mr. Raul Morales, SATF Associate Warden Ms. Jackie Clark

Mr. Bob Edwards, SATF CEO Ms. Chakriya Srey

Mr. Wayne Motle, SATF Chief Engineer Dr. Amy Lerman

SATF inmate councils Ms. Karalyn Lacey

SATF Medical and Custody leadership

And all others involved in coordinating the visit and providing information for the report.

