

**ZUCKERBERG
SAN FRANCISCO GENERAL**
Hospital and Trauma Center

Critical Care Committee Report

October 2020

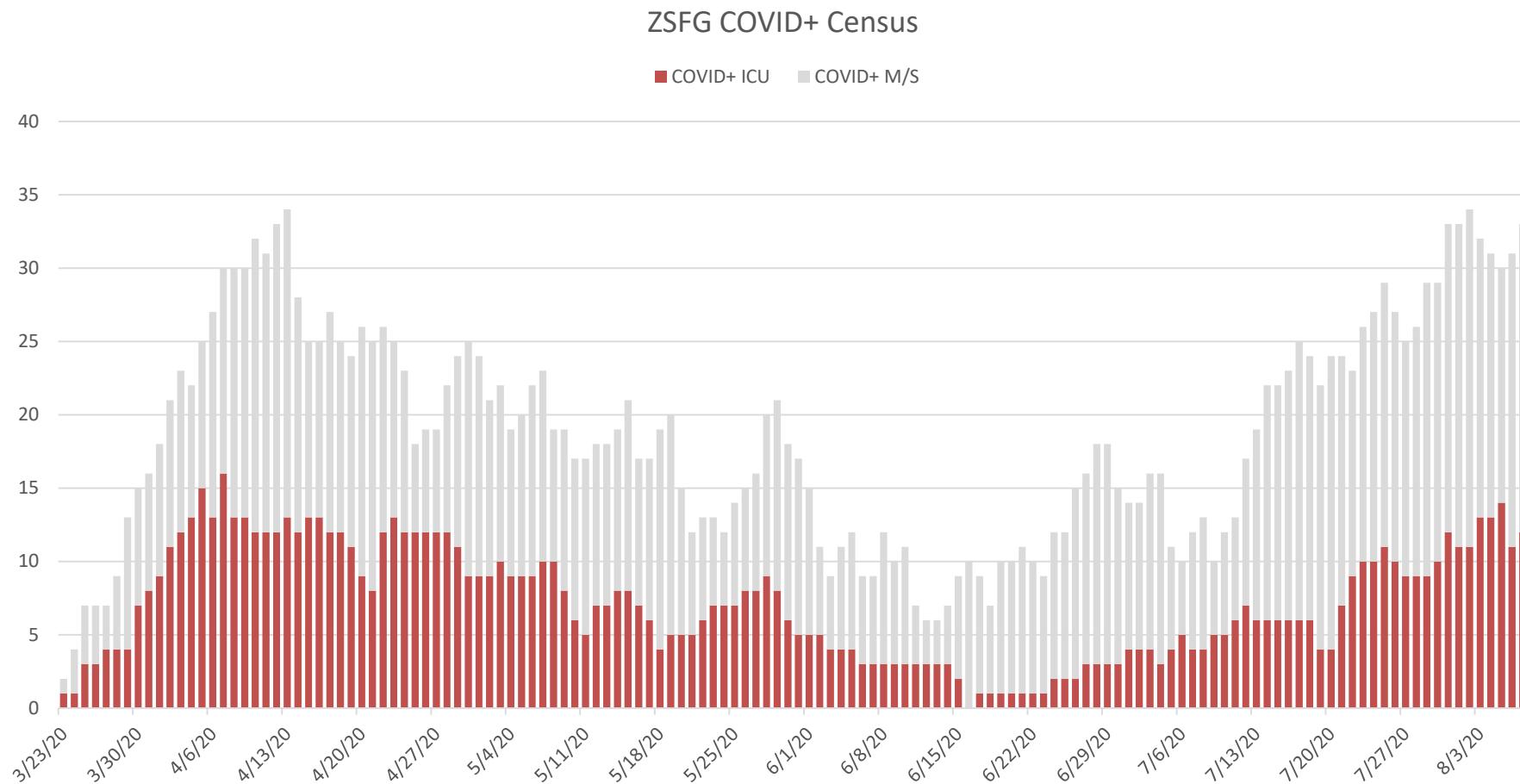
Antonio Gomez, MD - Director, Critical Care Services, ZSFG
Slides courtesy of Joy Capacillo, RN – ICU QI Coordinator



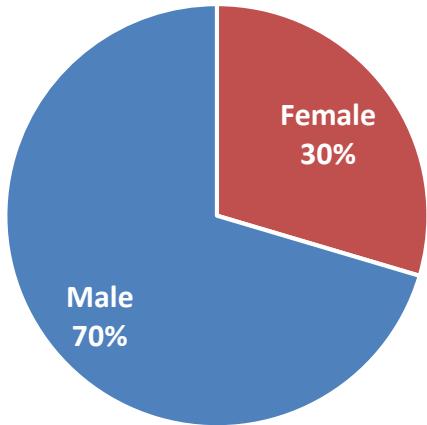
**San Francisco Department
of Public Health**

ZSFG Inpatient COVID+ Daily Census

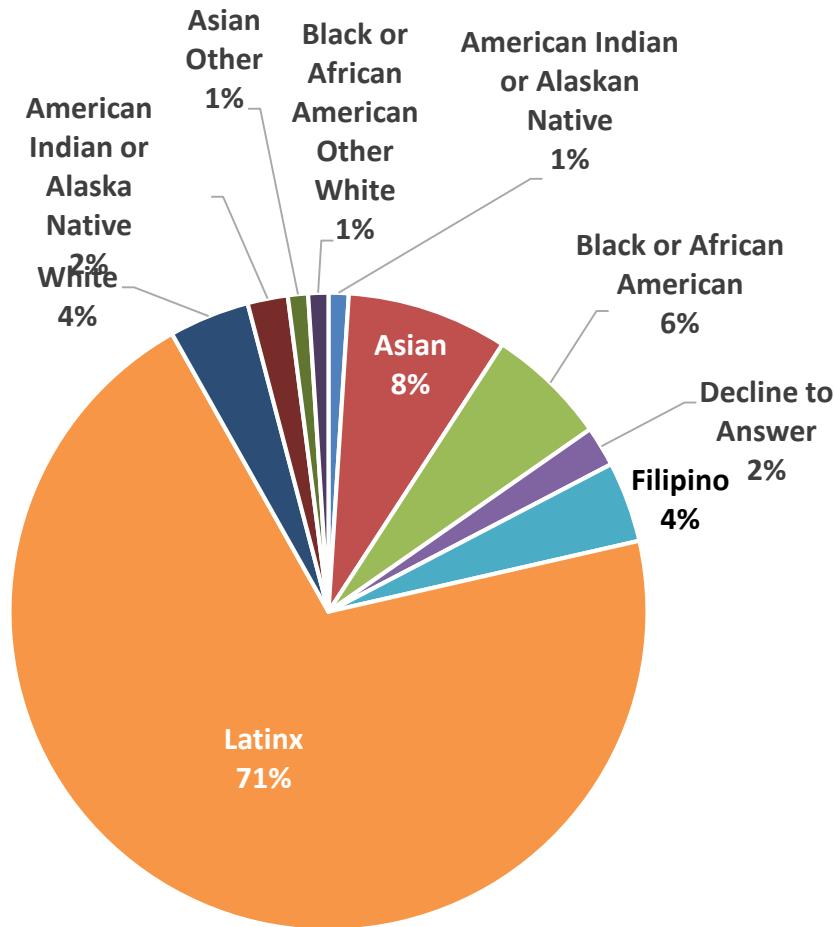
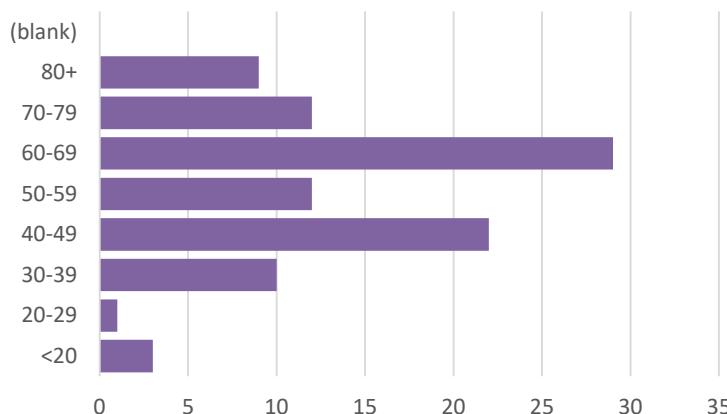
* Data obtained by reconciling information from HICS daily reports, ICU census logs, and run chart by G. Ortiz.



ICU COVID-19 Cases: March 1st – August 18th

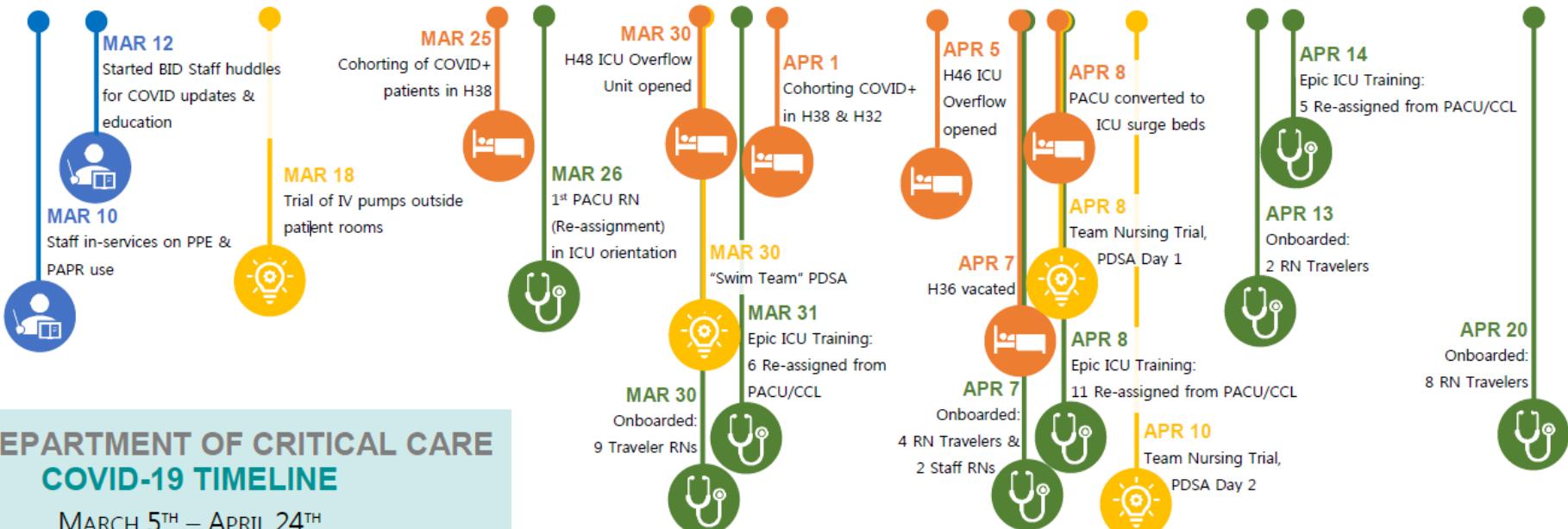
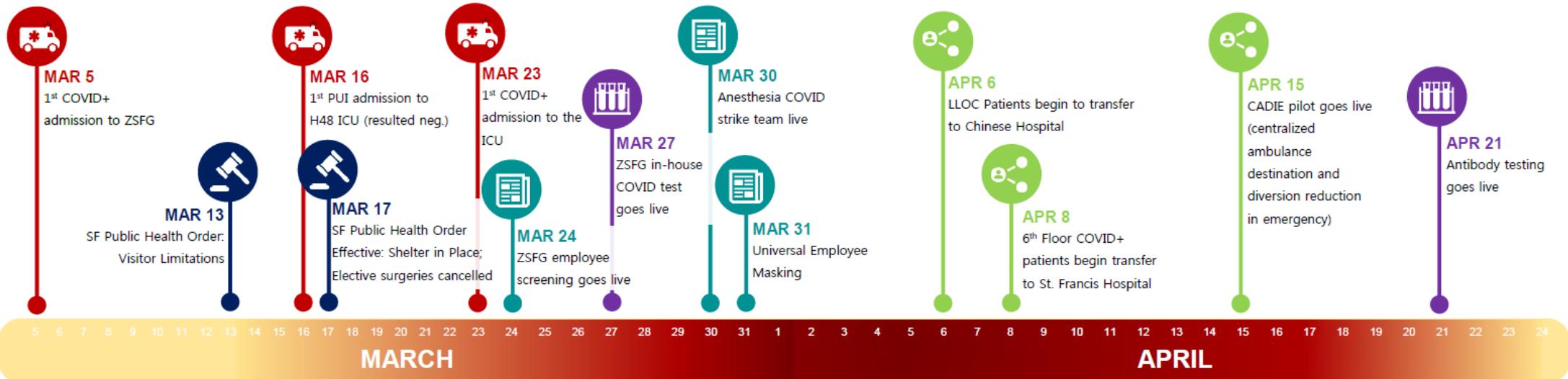


Age Distribution



What we did at ZSFG

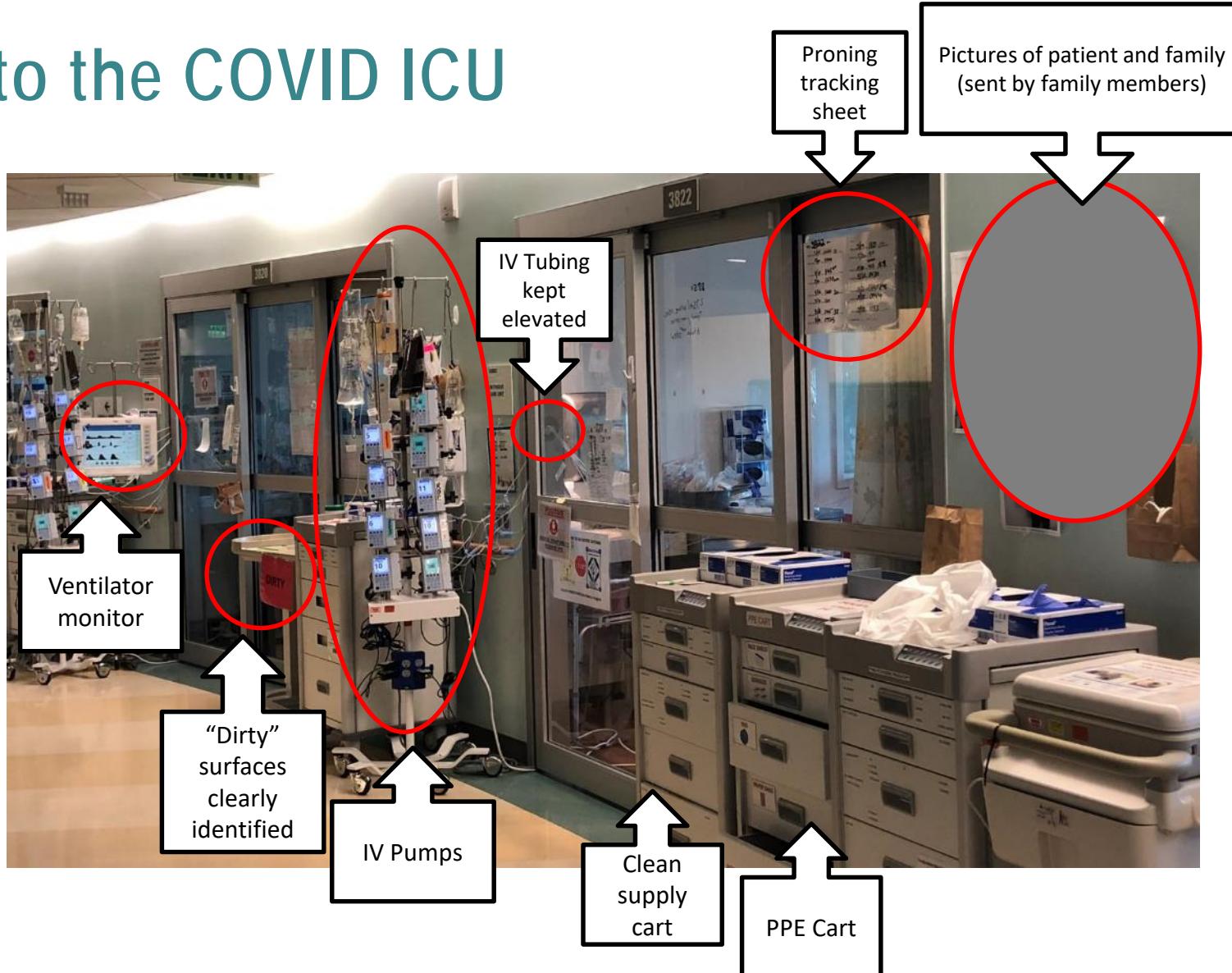
- Practical adaptations/innovations to limit spread of the virus and preserve PPE
- Evidence-based ARDS Management
- Daily Multidisciplinary meetings with ID and Infection Control Colleagues
- No therapies unsupported by high quality evidence
- Commitment to participation in clinical trials
- Major practice changes were rigorously vetted and debated by faculty prior to widespread implementation
- Increased RN, RT, and MD staffing



ZSFG DEPARTMENT OF CRITICAL CARE COVID-19 TIMELINE

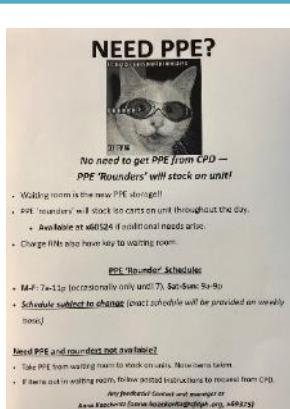
MARCH 5TH – APRIL 24TH

Welcome to the COVID ICU



PPE: Shortage, Storage & Distribution

Cause / Barrier	Action	Who	When / Status
Materials	National PPE shortage: <ul style="list-style-type: none"> - Developed methodology to track PPE usage ("burn") rates to help calculate forecasted needs - Collaborated with staff, ICU leadership, and IC to develop and communicate PPE conservation strategies 	Anna K.	March-May, Completed & ongoing
Methods	Lack of standard workflow to obtain and distribute PPE: <ul style="list-style-type: none"> - Developed PPE distribution plan in coordination with CPD - PDSA "PPE Rounders" in coordination with CPD and assistance of redeployed ZSFG staff 	Anna K.	March, ongoing
Materials	Staff unable to access/obtain PPE efficiently (Isolation carts not available from CPD) <ul style="list-style-type: none"> - Acquired and deployed standardized PPE storage units/carts 	Anna K.	March – June, Completed & ongoing



Left to right: 1) Flyer w/instructions on PPE rounders. 2) PCA rounding in ICU distributing PPE in designated carts. 3) Anna K. in "satellite" CPD PPE storage room on 3rd floor.



Top to bottom: Shows various iterations of PPE storage in the ICU.

Limiting Spread & PPE Conservation

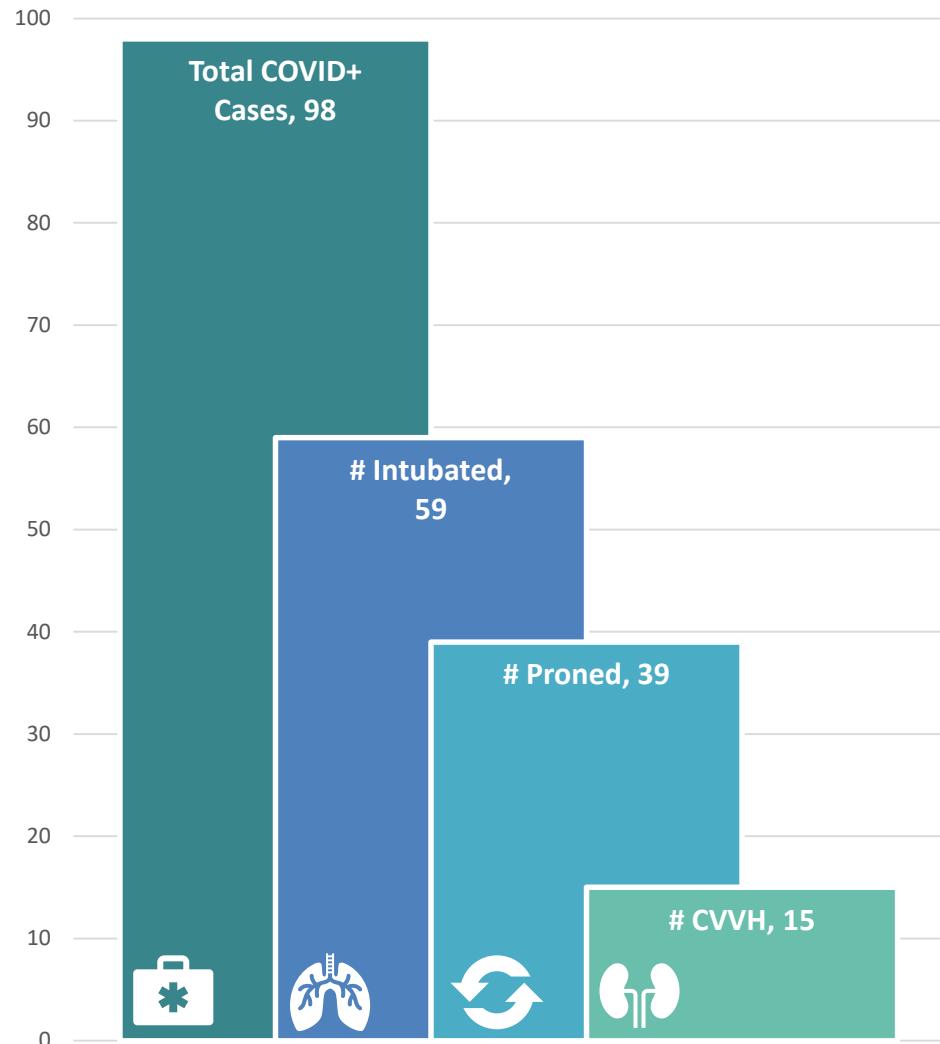
Swim Teams



IV Poles outside room



ICU COVID-19 Cases: March 1st – August 18th

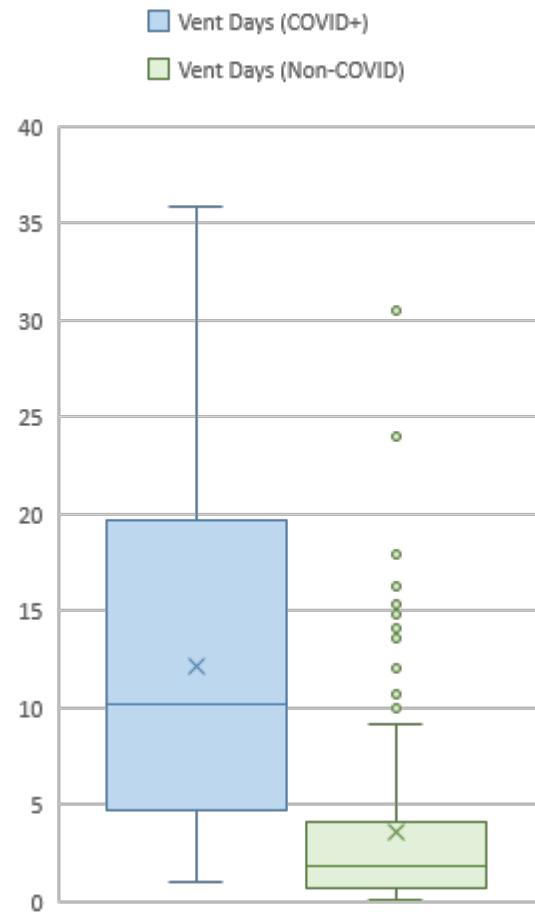


ICU – Level Therapies	Patients – no./total no (%)
Invasive mechanical ventilation	59/98 (60.20%)
Prone positioning	39/98 (39.80%)
Neuromuscular blockade	43/98 (43.88%)
Inhaled pulmonary vasodilators	21/98 (21.49%)
Vasopressors	63/98 (64.29%)
Continuous Renal Replacement Therapy	15/98 (15.31%)

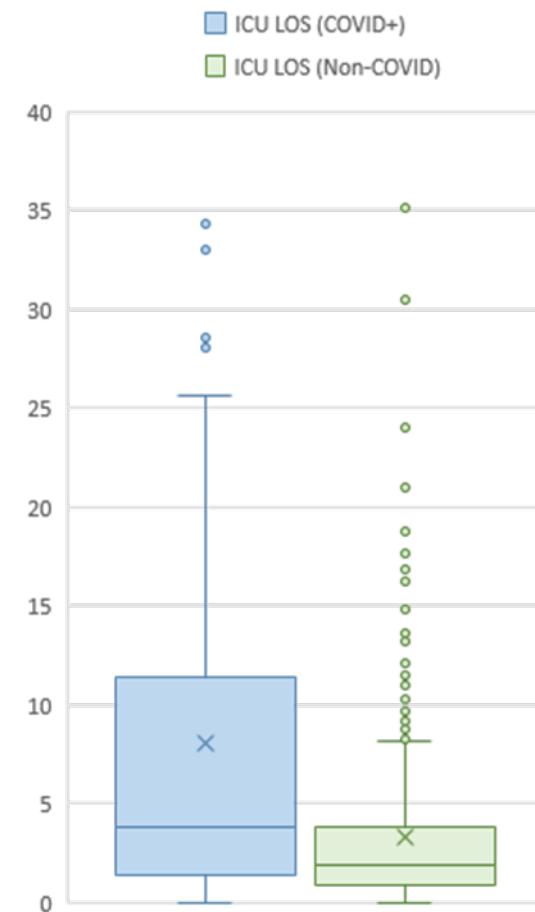


ICU COVID-19 Cases: March 1st – May 20th

MECHANICAL VENT DAYS

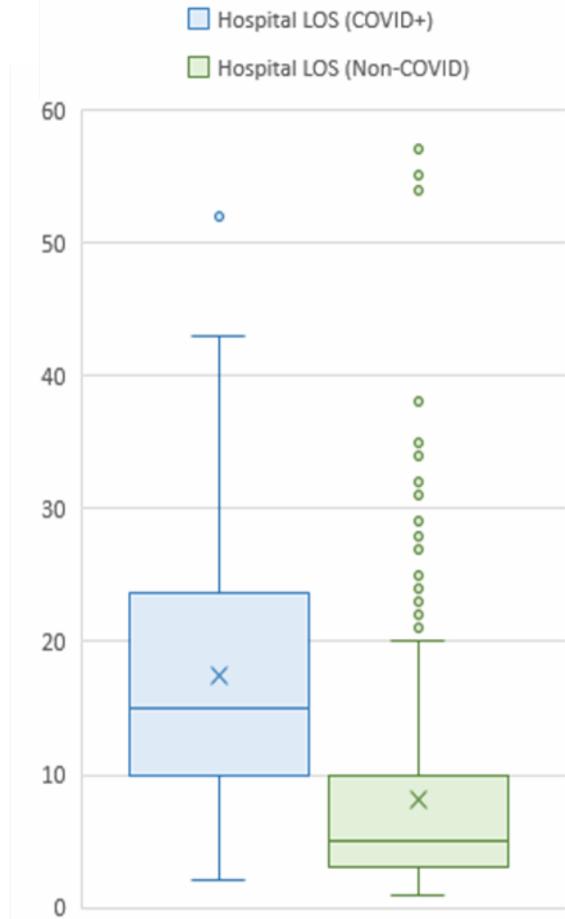


ICU LOS (Days)



Zuckerberg San Francisco General
Hospital and Trauma Center

Hospital LOS



ICU Therapies & Clinical Outcomes

COVID+ patients who had an ICU stay between March 1 st Through July 7 th	
ICU – Level Therapies	Patients – no./total no (%)
Invasive mechanical ventilation	38/63 (60.32%)
Prone positioning	26/63 (41.27%)
Neuromuscular blockade	28/63 (44.44%)
Inhaled pulmonary vasodilators	15/63 (23.81%)
Vasopressors	44/63 (69.84%)
Continuous Renal Replacement Therapy	12/63 (19.05%)
Outcomes	
Duration of mechanical ventilation (MV)*	
MV Days (average)	17.0
MV Days (IQR)	17.6 (5.8 – 23.4)
Length of stay – ICU [†]	
In ICU (average)	11.2
In ICU (IQR)	14.0 (1.4 – 15.4)
Length of stay – Hospital [‡]	
In hospital (average)	20.3
In hospital (IQR)	15 (10 – 25)
Died in hospital	8/63 (12.70%)
Discharged from hospital	48/63 (76.19%)
Discharged to Home	33/63 (52.38%)
Discharge to outside hospital	5/63 (7.94%)
Discharged to SNF/LTC/LTAC	8/63 (12.70%)

* Data shown for patients who are no longer on mechanical ventilation as of 7/7/20 (n=35)

† Data shown for patients who have been discharged out of the ICU as of 7/7/20 (n=60)

‡ Data shown for patients who have been discharged from the hospital as of 7/7/20 (n=56)

ICU COVID+ Patient Outcomes (as of 7/7/20)

8 Patients died in the hospital

- 6 in the ICU
- 1 in M/S
- 1 at UCSF

Mortality in Critically Ill Adults with Coronavirus Disease 2019 (published reports)

Auld, S., et al. (Crit Care Med, May 2020) Atlanta, GA **30.9%** (67/217)

Bhatraju, P., et al. (NEJM, May 2020) Seattle, WA **50%** (12/24)

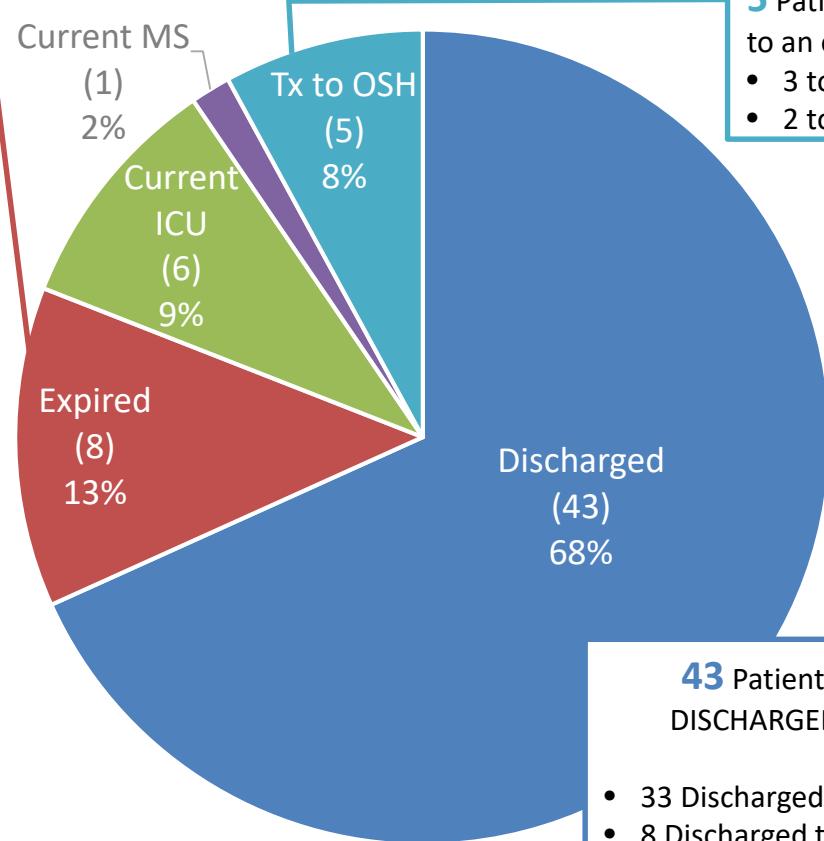
Richardson, S., et al (JAMA, April 2020) New York City Area **88.1%** (282/320)
*Reflect only patients who received MV

Wang, Y., et al (Am J Resp Crit Care Med, June 2020) Wuhan, China **38.7%** (133/344)

Grasselli, G., et al (JAMA, April 2020) Lombardy, Italy **26%** (405/1581)

RECOVERY Collaborative Group (NEJM July 2020) United Kingdom **41%** UC MV
29% Dex MV

ZSFG COVID ICU San Francisco, CA **22% Ventilated**
16% Total



5 Patients transferred to an outside hospital:

- 3 to St. Francis
- 2 to Kaiser

43 Patients have been DISCHARGED from ZSFG:

- 33 Discharged to Home
- 8 Discharged to a SNF or LTAC
- 2 Discharged to a DPH Hotel

ZSFG ICU COVID Provider Staffing Plan (March-June)

Critical Care COVID/ High probability PUI census surge	Critical Care COVID Teams	Countermeasures
0-2	Absorbed onto current teams	None
3-10	COVID Team A	2 attendings, 2 senior residents, 2 anesthesia residents
11-20	COVID Teams A + B, Anesthesia Rapid Strike	4 attendings, 4 residents, 1 PCCM fellow, 1 CRNA
21-30	COVID Teams A + B + C, Anesthesia Rapid Strike	6 attendings, 6 senior residents, 1 PCCM fellow, 1 CRNA
>30	COVID Teams A + B + C, Anesthesia Rapid Strike and Flex	8 attendings 6 senior residents, 1 PCCM fellow, 1 CRNA

ZSFG MICU COVID Provider Staffing Plan (August -)

Combined Census	COVID+/PUI Census	Attending	Fellows	Resident	Intern
0-16	0-2	1 MICU Attending 0 COVID Attending	1-2 MICU Fellows -In house AM -In house/home call PM	4 IM R3s	4-5 R1
0-16	3-10	1 MICU Attending 2 COVID Attending (AM/PM)	1-2 MICU Fellows	4 IM R3s	4-5 R1
17-24	3-10	1 MICU Attending 2 COVID Attending ⁺ (AM/PM)	1-2 MICU Fellows	4 IM R3s	4-5 R1
17-24	11-20 (2-4 COVID+ on MICU)	1 MICU Attending 4 COVID Attendings ⁺ (2 AM/2 PM)	1-2 MICU Fellows *	4 IM R3s *	4-5 R1 *
>24	>20	1 MICU Attending 6 COVID Attendings ⁺ (3 AM/3 PM)	1-2 MICU Fellows *	4 IM R3s *	4-5 R1 *

⁺ Attendings are providing direct patient care for >10 COVID patients, or resident combined census >16.

*Medicine and anesthesia residents and fellows may become available as clinics and ORs close down.

Faculty available

- 16 standing MICU faculty
 - 12 PCCM primary; 4 affiliated (DEM, LBC, HIV, Anes)
 - 2 not doing COVID care = 14 available
 - 6 Asst Prof
 - 5 Assoc Prof
 - 3 Full Prof
- 14 additional faculty have been emergency credentialed as of 8/10
 - 11 Instructors
 - 2 Asst prof
 - 1 Full prof

Acknowledgments

- ICU RNs
- Respiratory Therapy
- Pharmacy
- Residents
- Faculty
- Infection Control and ID teams
- ZSFG Hospital Administration
- Laboratory Medicine Faculty and Staff
- Ultrasound Faculty and Staff
- Swift action of DPH and Mayor Breed

