Centralized Operations Team (COT) and its effectiveness in improving patient throughput as evidenced by decreasing boarding time

Cohort 25, Team 11

The Team

CS&E Participants
- Dr. Giuseppe Annunziata, MD
- Missam Merchant, MBA, BSN, RN, CCRN, PCCN, RN-BC, NE-BC
- Lisa Petrakis, MPH

Extended Team
- COT Team
- Staffing Assistants

Sponsors
- Nelson Tuazon
- Dr. Emily Volk, MD

Facilitator
- Janett Muñoz Guerrero, BS

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Aim Statement

- The aim of this project is to decrease the average bed requested to bed assigned time for University Hospital Emergency Department patients who are admitted to Medicine Teams E and F from 235 minutes to 190 minutes by April 5th, 2020.
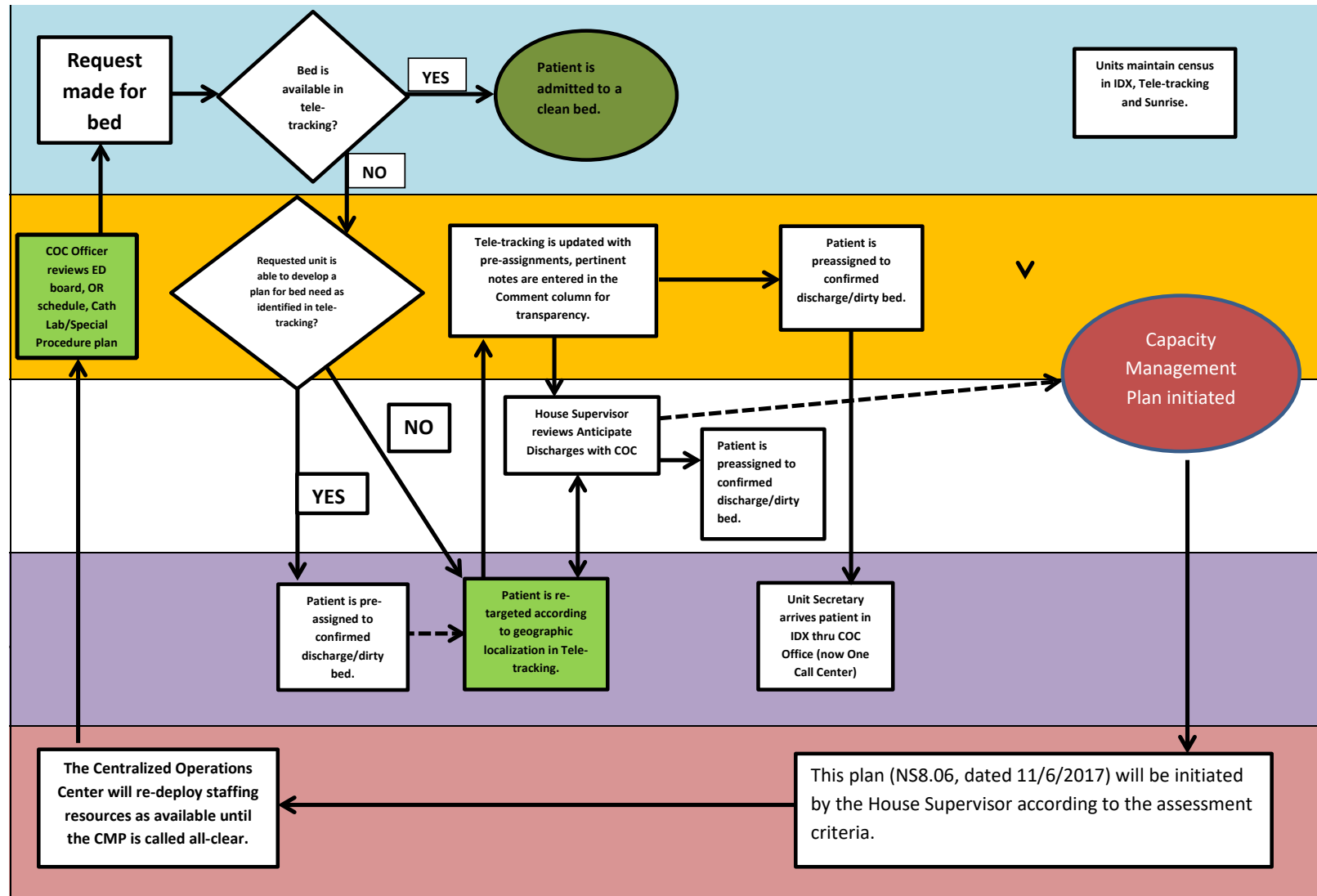
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Background

- The Centralized Operations Team (COT) was developed in 2018 to coordinate support services to improve patient flow and throughput.

- If patient boarding time and throughput can be improved, patients will experience fewer delays in bed assignments and discharge.

- The Centralized Operations Team and Power Through Initiative have been working simultaneously on improving patient throughput.
  - COT has focused on patient movement, prioritization and facilities communication to address hospital-wide throughput
  - Power Through has focused on patient discharge readiness.

- These initiatives have increased discharges by noon to 25%.

- The next step is to examine other interventions that focus on patient throughput, such as decreasing boarding time in the ED.
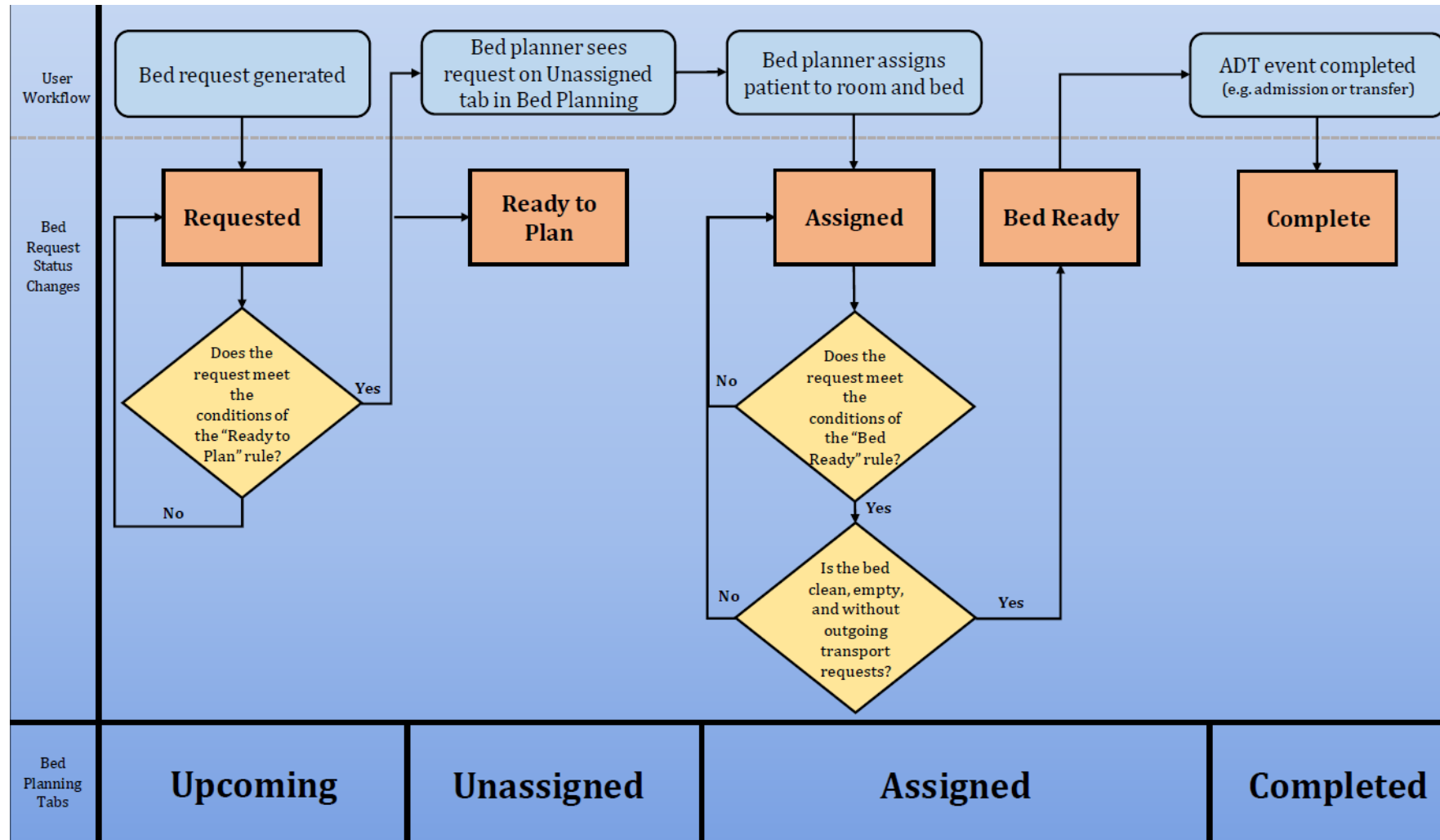
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Selected Process Analysis Tools

- Flowchart
  - Provided a big picture overview of the boarding process and helped identify potential problem areas
- Brainstorming
  - Identified the problems staff regularly encountered within the boarding process
- Affinity sort & Fishbone
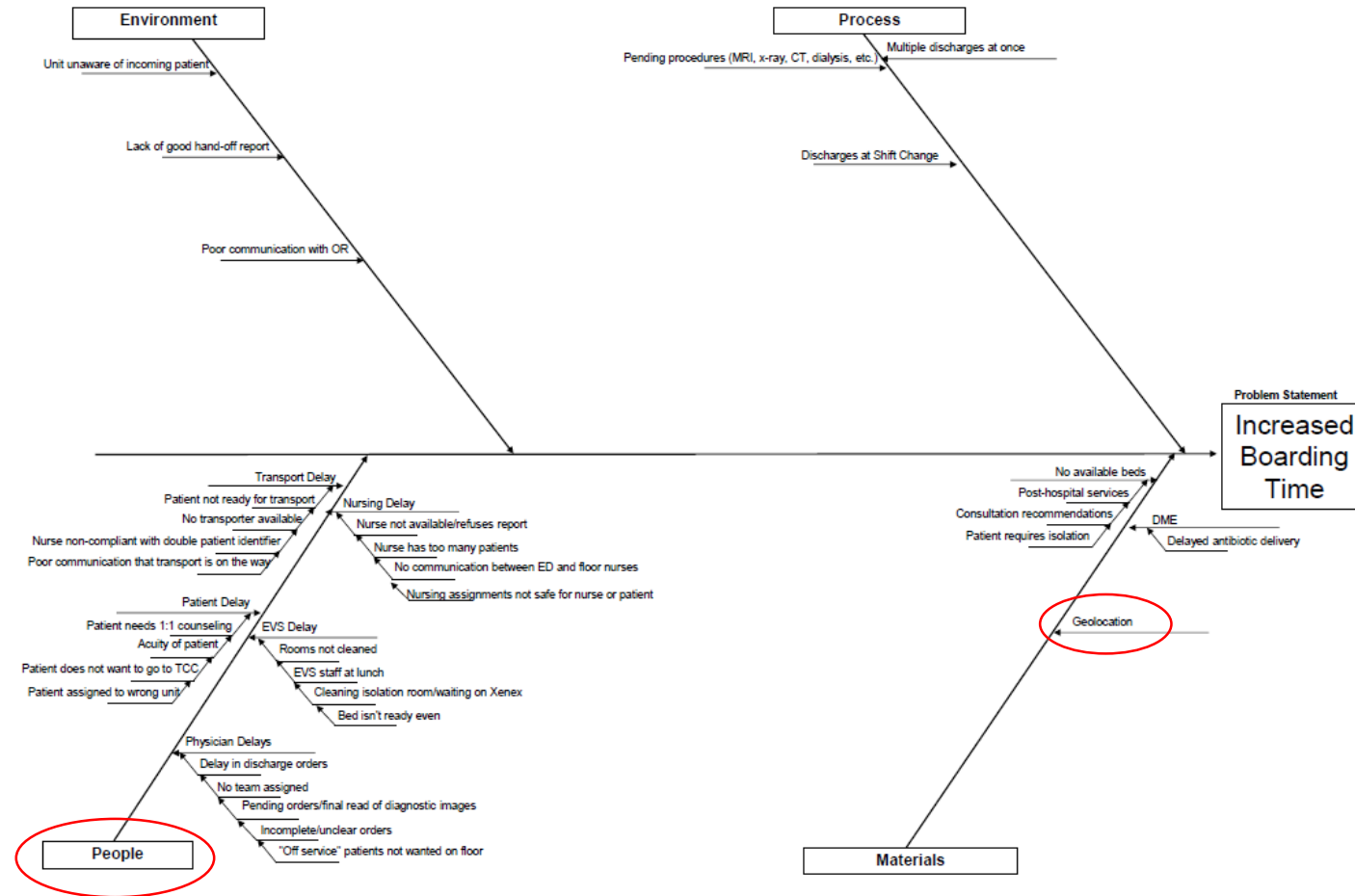 - Grouped the identified problems under themes that could be used to create interventions

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Patient Placement Process Map

Bed Request Process Map

Brainstorming

Fishbone Analysis

Environment
- Unit unaware of incoming patient
- Lack of good hand-off report
- Poor communication with OR

Process
- Pending procedures (MRI, x-ray, CT, dialysis, etc.)
- Multiple discharges at once
- Discharges at Shift Change

Problem Statement

Increased Boarding Time

People

Transport Delay
- Patient not ready for transport
- No transporter available
- Nurse non-compliant with double patient identifier
- Poor communication that transport is on the way

Nursing Delay
- Nurse not available/refuses report
- Nurse has too many patients
- No communication between ED and floor nurses
- Nursing assignments not safe for nurse or patient

Patient Delay
- Patient needs 1:1 counseling
- Acuity of patient
- Patient does not want to go to TCC
- Patient assigned to wrong unit

EVS Delay
- Rooms not cleaned
- EVS staff at lunch
- Cleaning isolation room/waiting on Xenex
- Bed isn't ready even

Physician Delays
- Delay in discharge orders
- No team assigned
- Pending orders/final read of diagnostic images
- Incomplete/unclear orders
- "Off service" patients not wanted on floor

- No available beds
- Post-hospital services
- Consultation recommendations
- Patient requires isolation
- DME
- Delayed antibiotic delivery
- Geolocation

Materials

Data Collection Plan

Type of Measure	Measure	Data Elements	Data Category		Data Source	Data Frequency	Data Steward
			New/Existing	Manual/Automated			
Outcome Measure	Boarding Time in ED	• Date/Time of Bed Requested • Date/Time of Bed Requested	Existing	Automated	ED Management Data TeleTracking	Daily	Lisa
Process Measure	BR→BA→BO Times	• Date/Time of BR • Date/Time of BA • Date/Time of BO • Bed Location • Floor • Team	Existing	Automated	TeleTracking	Daily	Sam
	Number of Floors Teams are on	• Team • Num. of patients • Num. of floors • Num. of patients on each floor	Existing	Automated	Census - Inpatient Units Bed Orders	Daily	Sam, Lisa
Balance Measure	DBN	• Date/Time of Discharge Order • Date/Time of Discharge • LOS	Existing	Automated	Midas LOS and Discharge Order Data	Weekly	Lisa

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Stakeholder Analysis

Power (vertical axis) / **Interest** (horizontal axis)

Top-left quadrant:
Patients
Patient's Families

Top-right quadrant:
Other support
(EMR/IT, Security, Quality, Facilities, etc.)

Bottom-left quadrant:
Executive Leadership
Hospitalist Leadership
Triad Leaders
Nursing Directors

Bottom-right quadrant:
Providers
Nurses
Technicians
Transporters
EVS
Registration
Care Coordination

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Interventions

- We focused on two interventions
  - Geolocalization of patients
    - Teams E and F will have all patients placed on two floors, Med7 and Med9. Decreasing the number of floors that patients are on will help doctors with rounding, facilitate discharges, and increase bed availability in the long run.
  - Expansion of Staffing Assistant position
    - Staffing Assistants will take on an "Air Traffic Control" approach to patient throughput. They will be trained to more effectively monitor patient throughput, identify where the backups are occurring, and step in to ensure that problems are solved efficiently

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Driver Diagram

Goal	Primary Drivers Main drivers identified in our diagnostic journey that influences our goal	Interventions Actions, processes, or interventions that may lead to a positive effect on the associated driver	Measure Metric for the associated interventions	Responsible Individuals responsible and anticipated deadline
To decrease the average boarding time in the University Hospital Emergency Department from 483 minutes to 400 minutes by April 1st, 2019.	Lack of Beds	Implement geolocalization for Teams E & F Reliability Score: 3	Boarding time for patients assigned to Teams E & F	COT Team, Sam
			Percent of patients correctly assigned to teams E & F floors (Med7 and Med9)	COT Team, Sam
	Lack of consistency in tracking of patients and reports/orders/requests between bed requested and bed assigned	Develop TeleTracking SOP for Staffing Assistant positions Reliability Score: 2		Sam
		Deliver training session for Staffing Assistants on TeleTracking SOP Reliability Score: 1	Percent of individuals trained Percent of trained individuals who feel that the training improved their job/job performance	Sam
		Hire and train additional Night supervisor Reliability Score: 2	Percent of trained individuals who feel that the training improved their job/job performance	Sam

Implementation

- Implementation began on December 16, 2019
- Staffing Assistants were trained in geolocalization and in throughput tracking starting December 16, 2019

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All Data – Baseline Time Distribution

Distribution: Phase=Baseline All Individual Data (Teams E & F)

BR to BA Time (min)
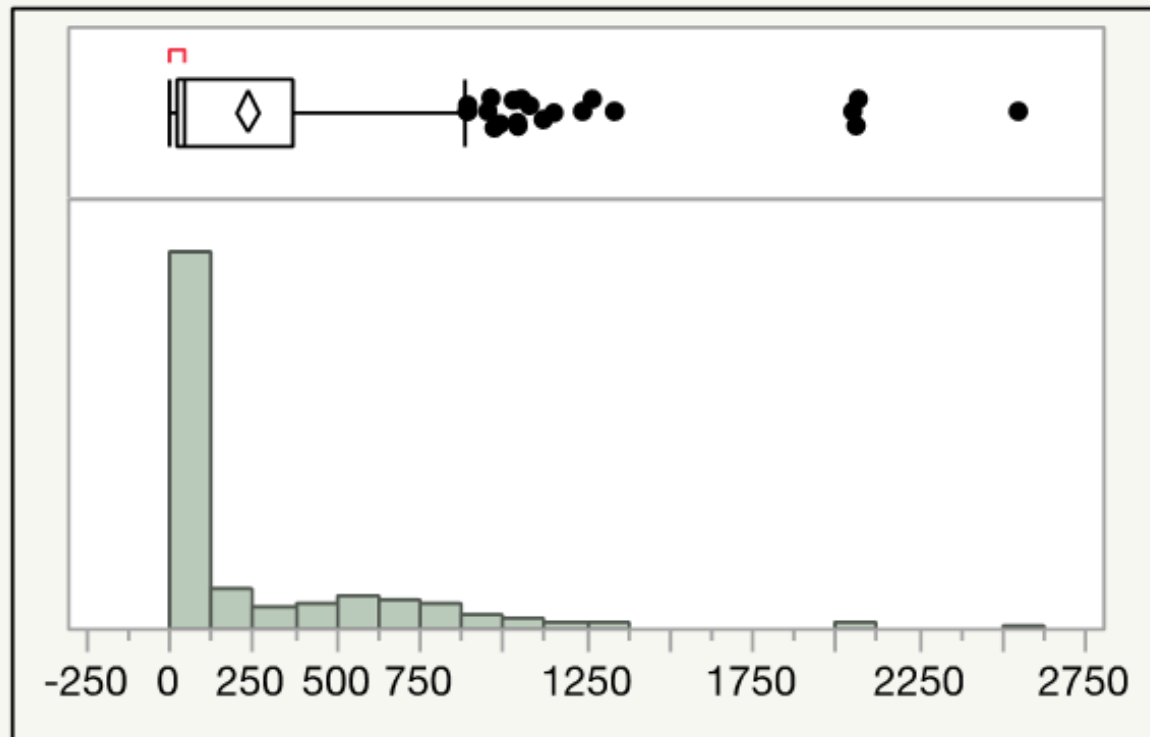
Quantiles

100.0%	maximum	2552
99.5%		2118
97.5%		1104
90.0%		782
75.0%	quartile	368
50.0%	median	49
25.0%	quartile	17
10.0%		9
2.5%		4
0.5%		1
0.0%	minimum	1

Summary Statistics

Mean	235
Std Dev	367
Std Err Mean	19
Upper 95% Mean	272
Lower 95% Mean	198
N	380

All Data – Intervention Time Distribution

Distribution: Phase=Intervention
All Individual Data (Teams E & F)

BR to BA Time (min)
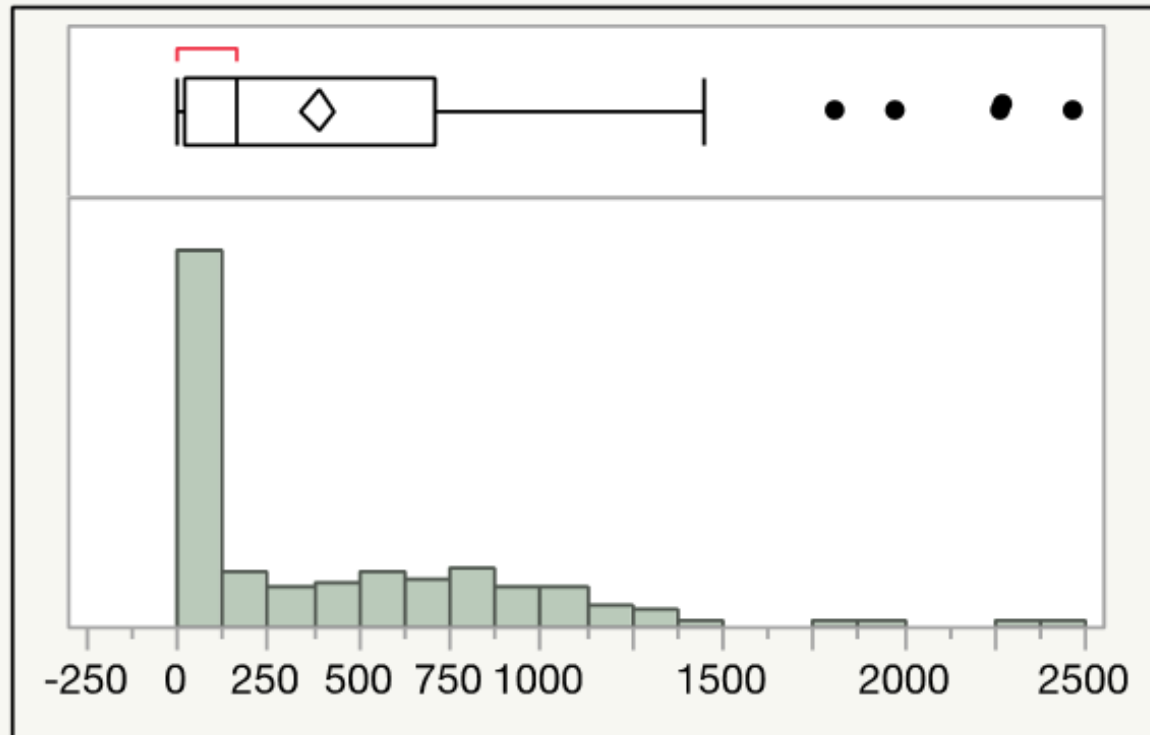
Quantiles

100.0%	maximum	2468
99.5%		2319
97.5%		1282
90.0%		1033
75.0%	quartile	707
50.0%	median	164
25.0%	quartile	23
10.0%		10
2.5%		5
0.5%		2
0.0%	minimum	2

Summary Statistics

Mean	386
Std Dev	449
Std Err Mean	24
Upper 95% Mean	433
Lower 95% Mean	339
N	353

All Data – SPC Chart

SPC XBar Chart: Daily Average of BR to BA Time (min) [All Data Teams E & F]
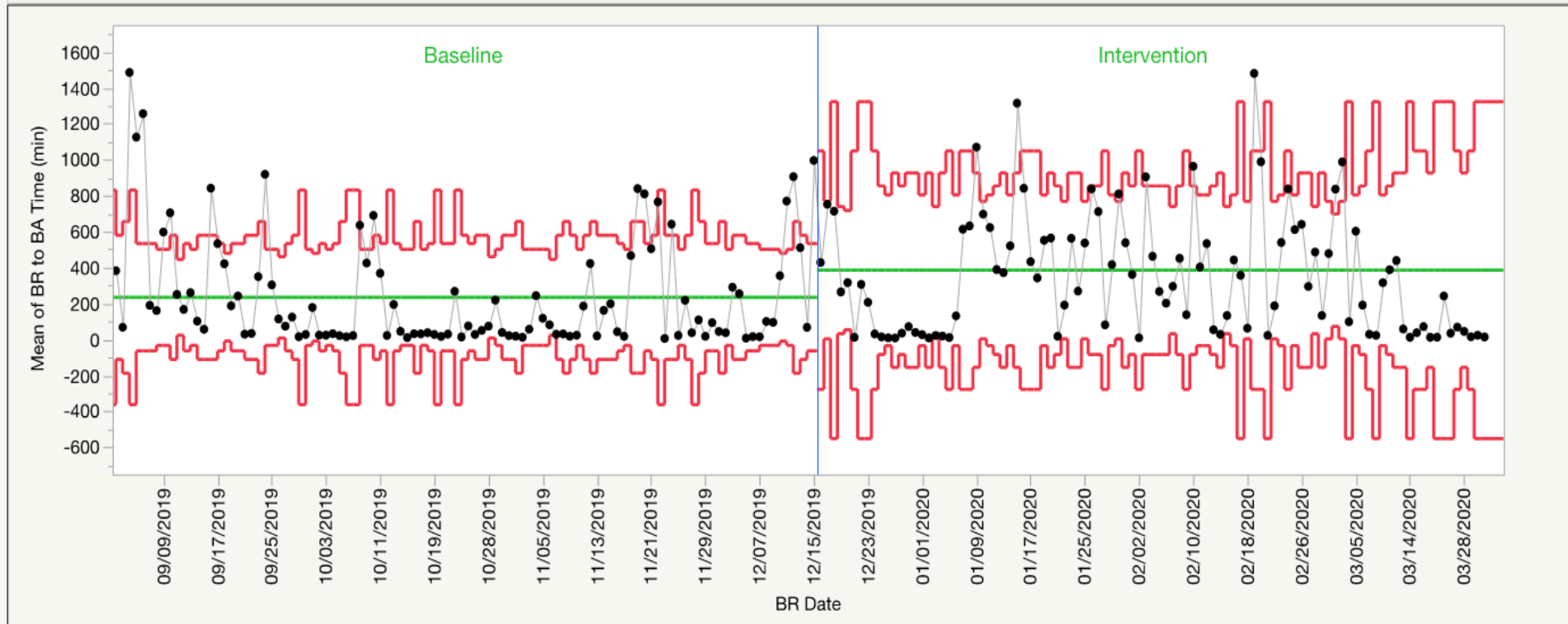
Note: The sigma was calculated using the range.

Phase Limits

Phase	LCL	Avg	UCL
Baseline	.	235	.
Intervention	.	386	.

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Team E – Box-and-Whisker Plot
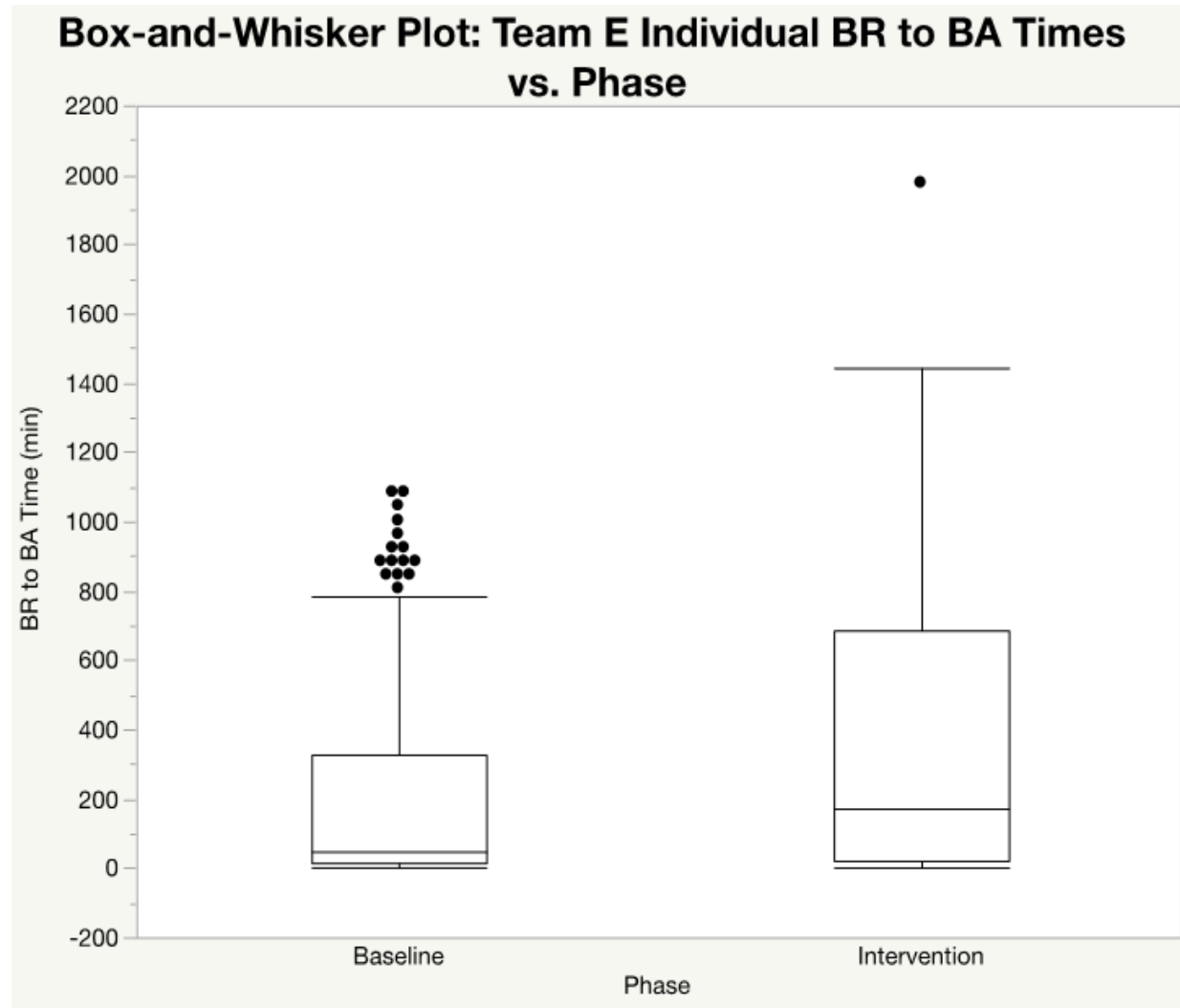
Team E – SPC Chart

SPC XBar Chart: Team E Daily Average BR to BA Times (min)
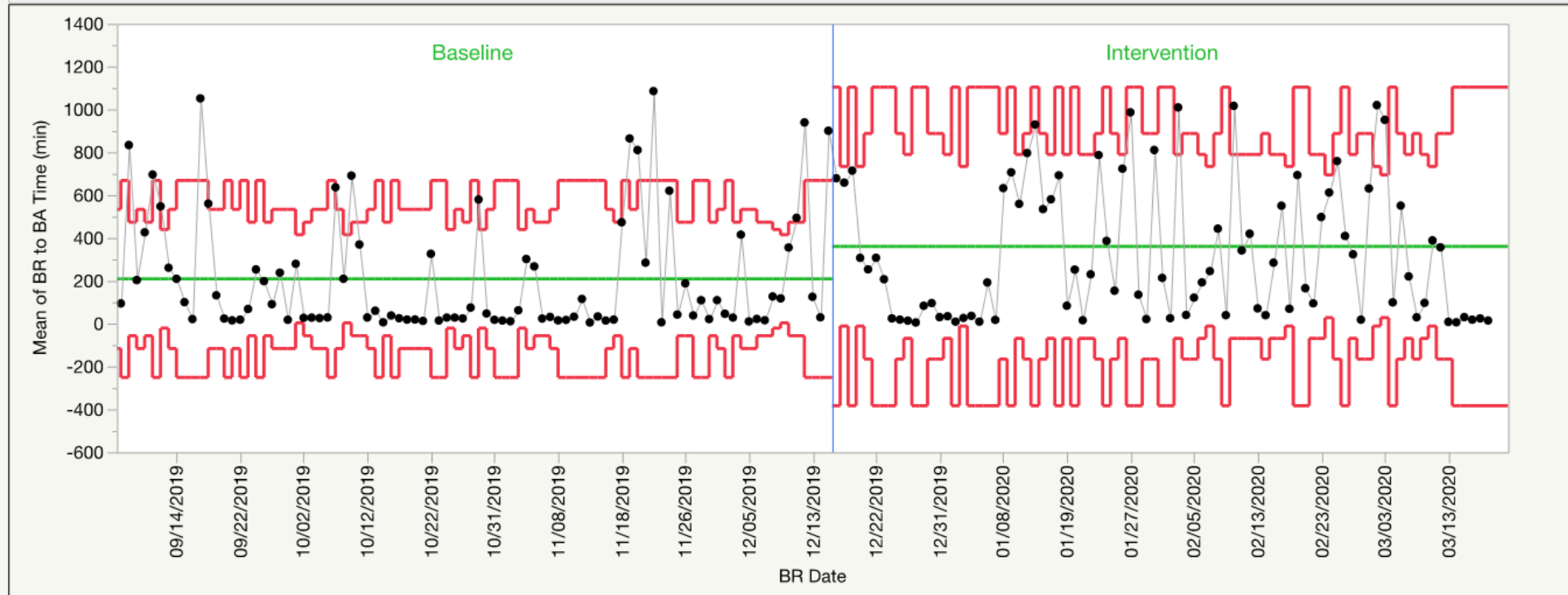
Note: The sigma was calculated using the range.

Phase Limits

Phase	LCL	Avg	UCL
Baseline	.	208	.
Intervention	.	360	.

Team F – Box-and-Whisker Plot
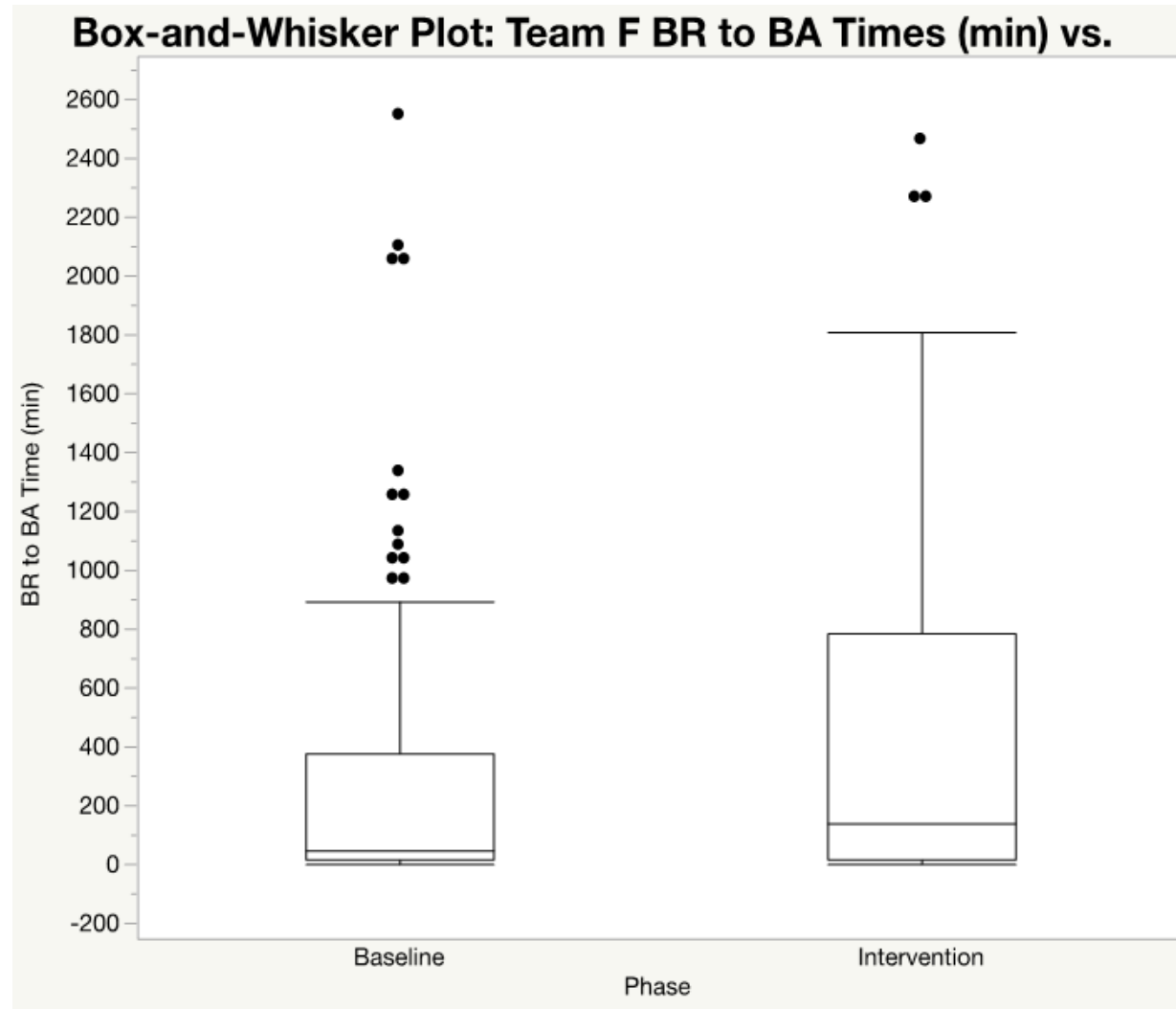
Team F – SPC Chart

SPC XBar Chart: Team F Daily Averge BR to BA Time (min)
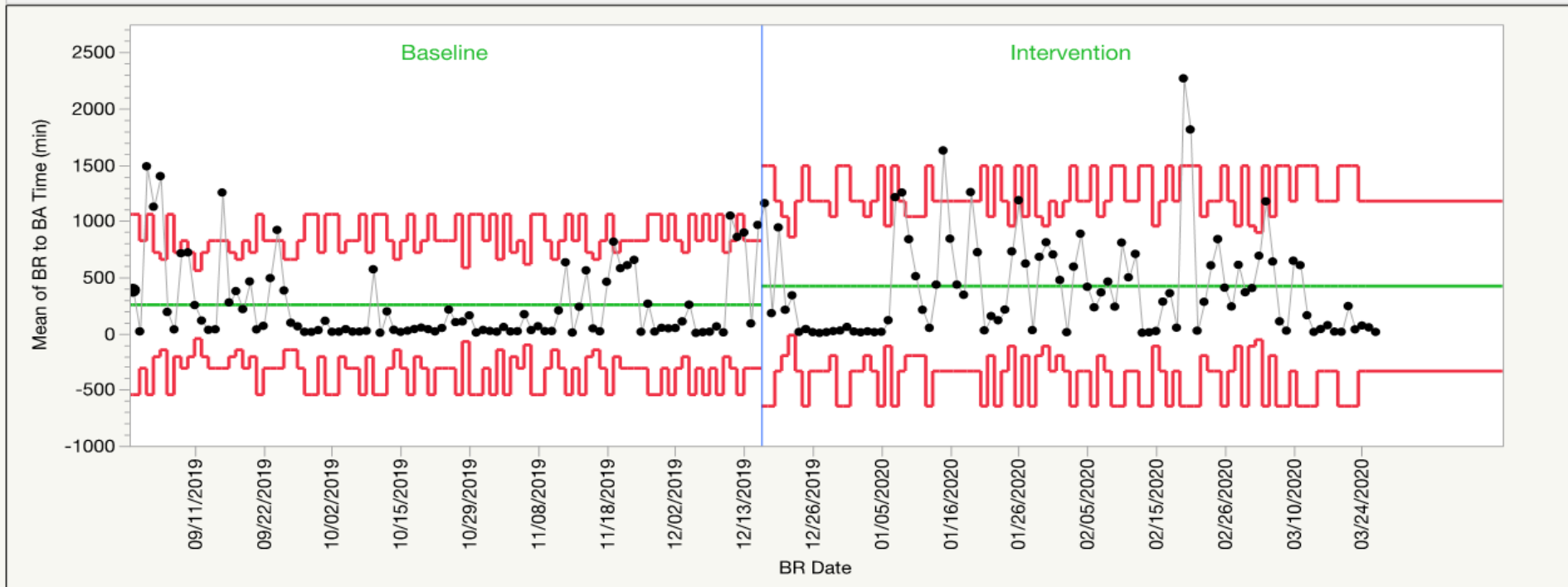
Phase Limits

Phase	LCL	Avg	UCL
Baseline	.	255	.
Intervention	.	419	.

Geolocalization SPC Charts

Teams E & F – Number of Floors
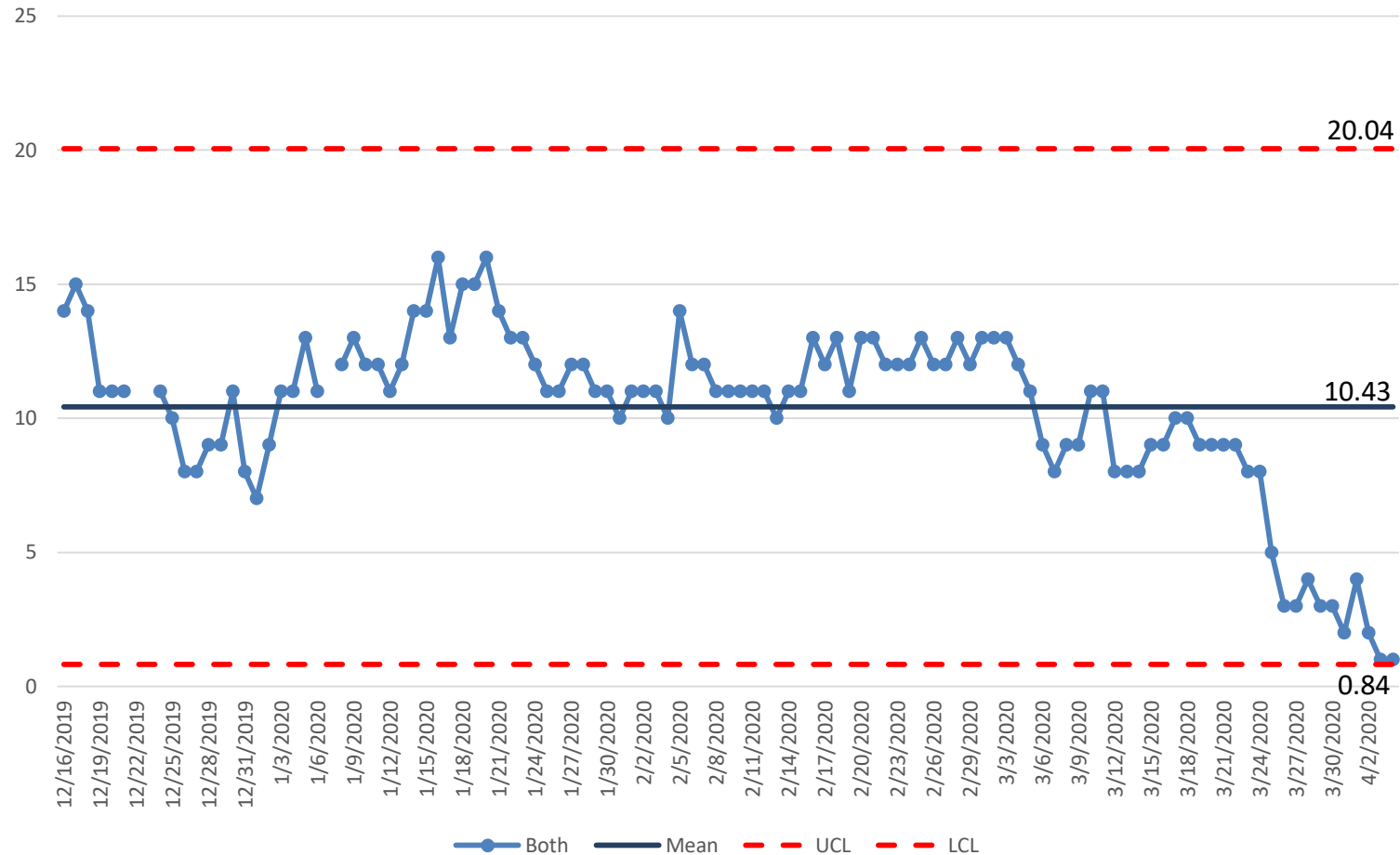
Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.
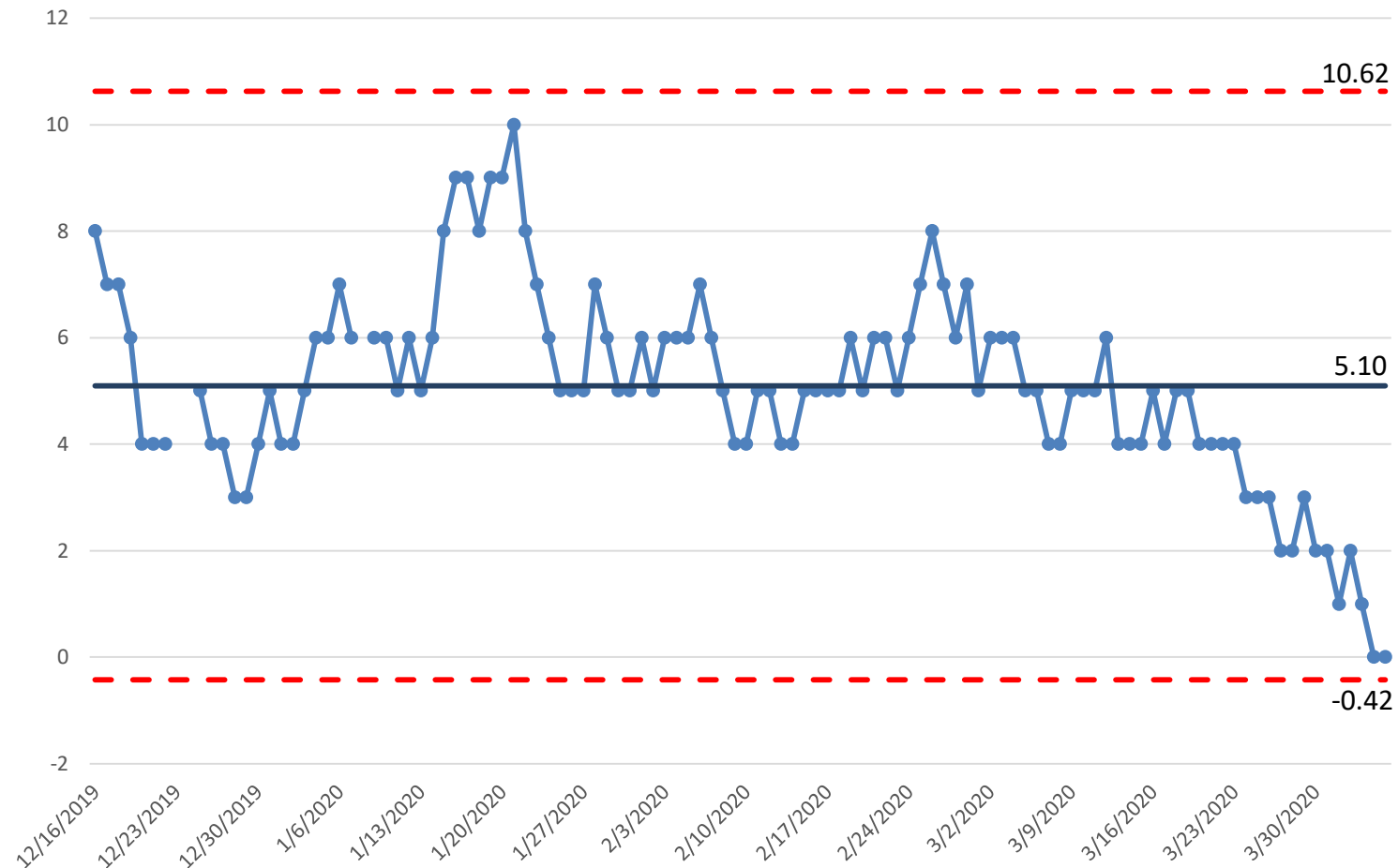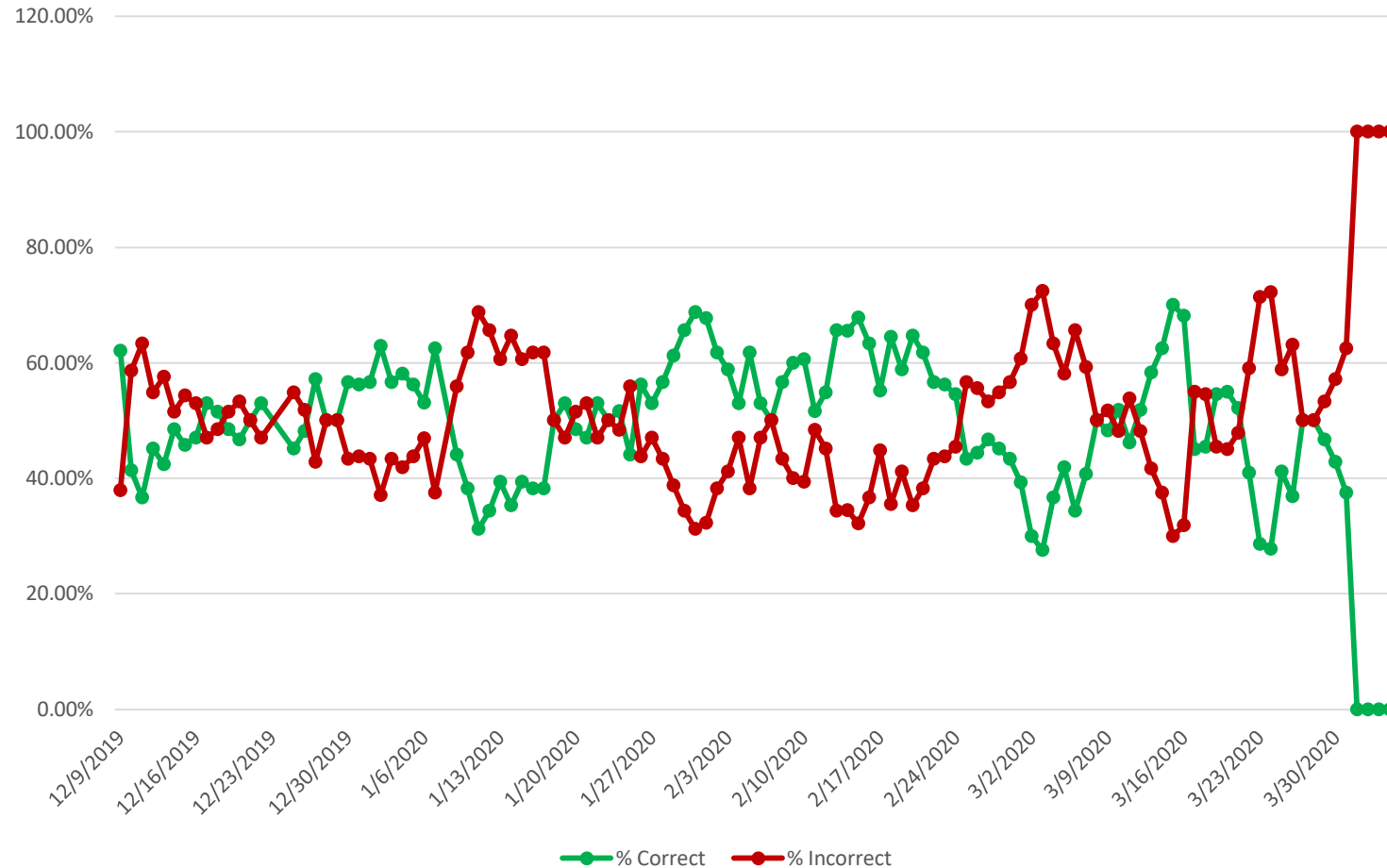
Geolocalization SPC Charts
Teams E – Number of Floors

Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.
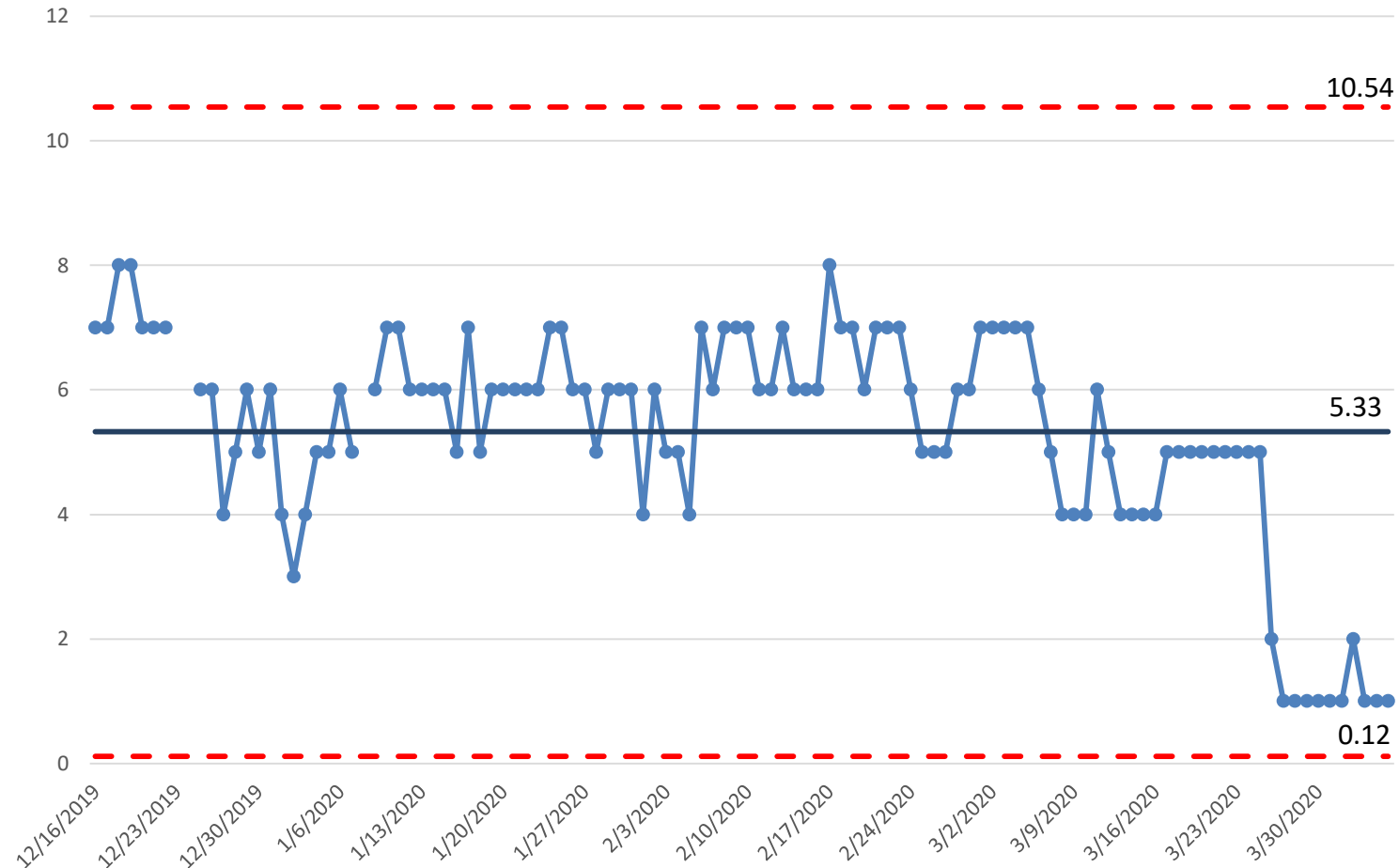
Geolocalization SPC Charts

Teams F – Number of Floors

Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.
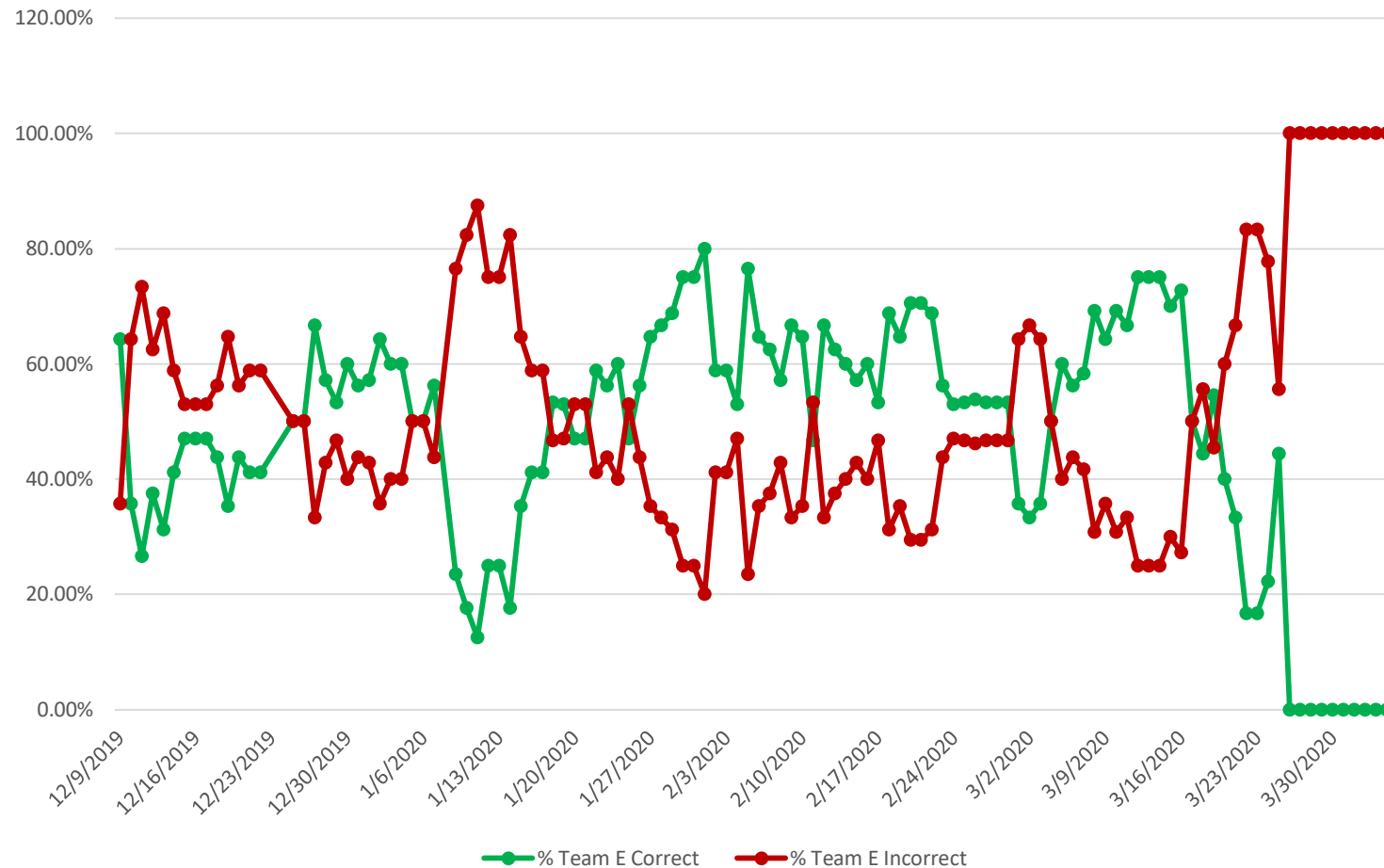
Geolocalization Charts
Teams E & F – Patient Assignment to Floors Med7 & Med9

Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.
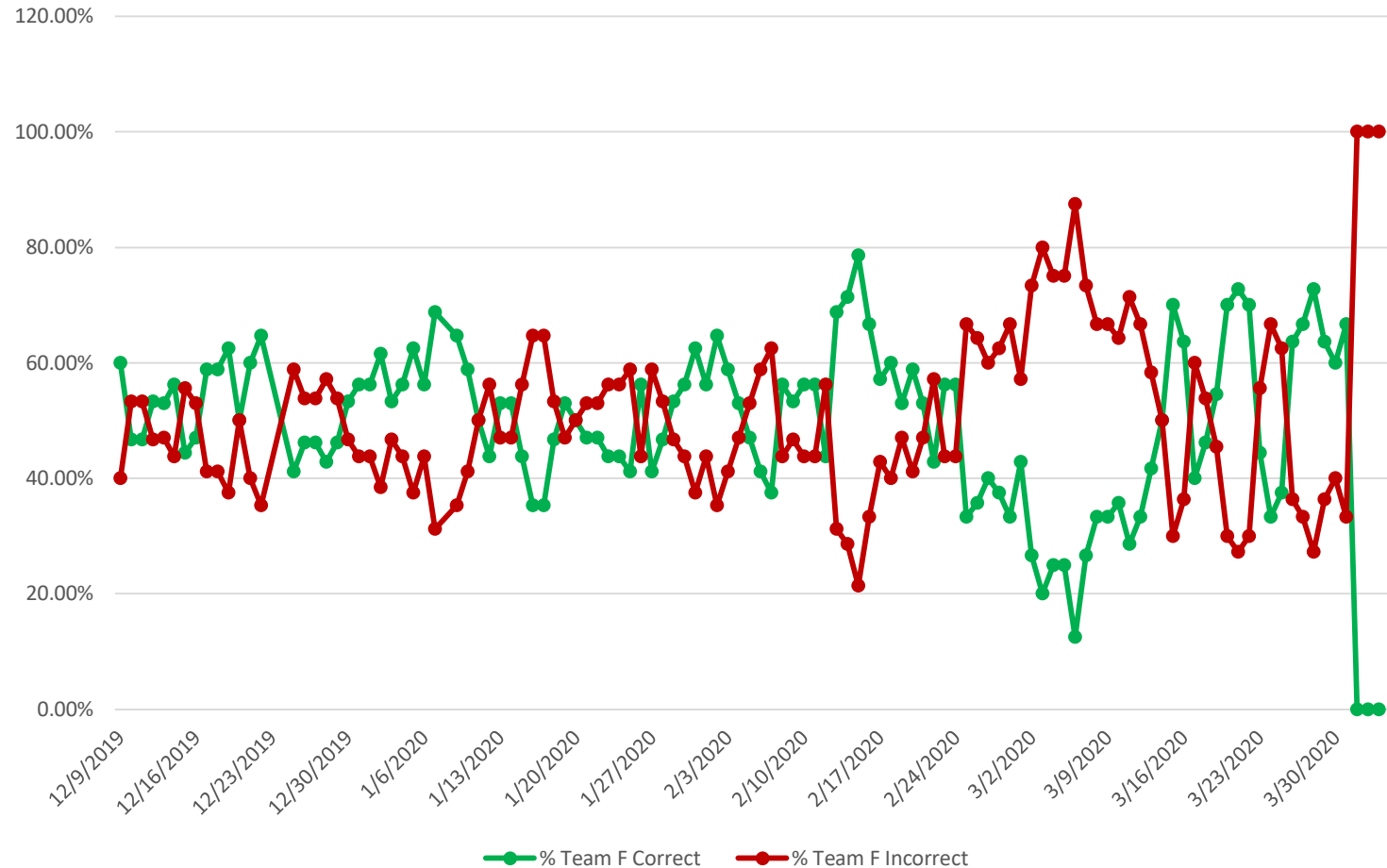
Geolocalization Charts

Team E – Patient Assignment to Floors Med7 and Med9

Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.

Geolocalization Charts
Team F – Patient Assignment to Floors Med7 and Med9

Note: Starting March 11, Teams E & F were designated COVID-19 teams and all new patients were assigned to 5Sky.

Return on Investment

	Total Decrease in Costs
Length of Stay for Teams E & F	
Estimated Decreased Days per Admission	0.03125 days	
Average Cost of Bed (per day)*	$2,604.00	
Number of Admissions (9/1/19-12/15/19)	447	**$36,374.63**

*American Health Association, 2018

If this intervention reduced LOS for 50% of patients, it could reduce costs by $18,187.32.
If it reduced LOS for 75% of patients, it could reduce costs by $27,280.97.

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Intervention Timeline
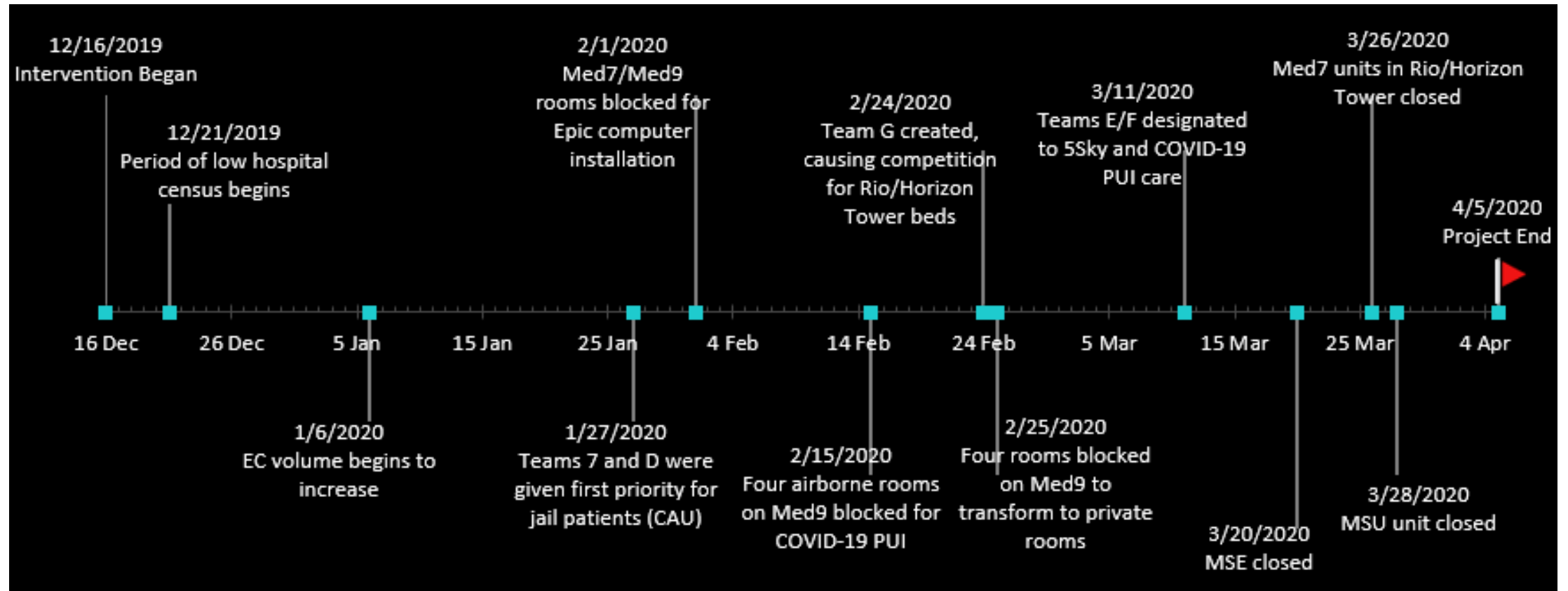
Expansion of Implementation

- Before we expand to other teams and floors, we would like to re-test the intervention to ensure that it is effective

- Next steps will include reevaluating the intervention and identifying an appropriate testing period

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Conclusions & What's Next

- Conclusions
  - Due to circumstances out of our control in the hospital, we cannot say whether the interventions were effective or not

- What's Next
  - Reevaluate and retest proposed interventions
  - Root cause analysis where the boarding time is >235 minutes in the absence of lack of bed availability/high hospital census
  - Further studies on the effects of geolocalization in an unbiased context to provide data on the effects on length of stay, patient's satisfaction, and provider's satisfaction
  - Exploring the possibility of automated and more efficient ways to assign patients to specific teams

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Transition Plan

- DCO Before 10am reboot.
- Power UP reboot in EC.
- Monthly Power Through 1st Tuesday meetings.
- EPIC grand central go live July 11th.
- 5SKY COVID transition plan
- All Medicine teams accepting PUI and all admits receiving mass screening.

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Thank you!