

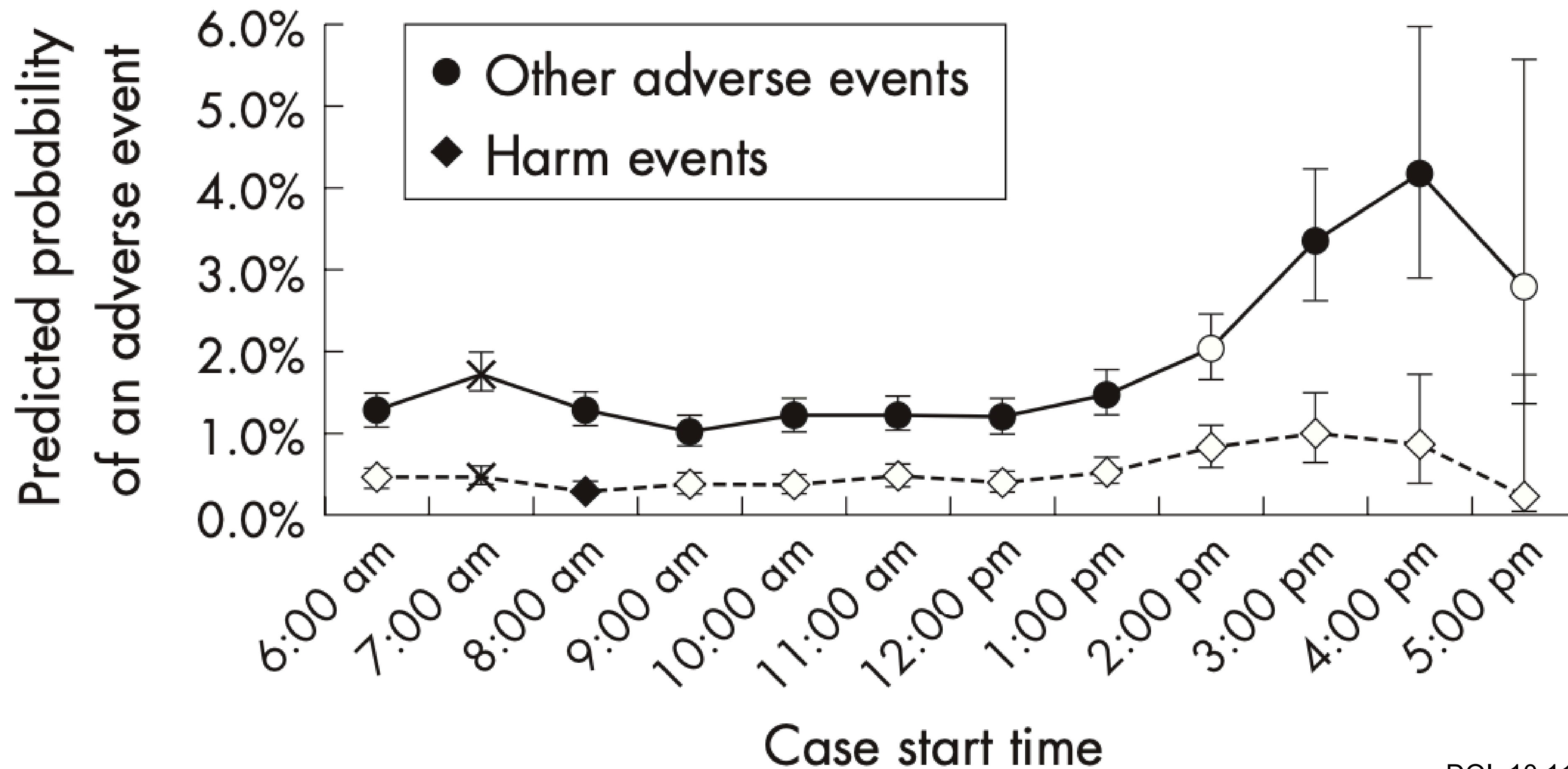
Diurnal Variation in Anesthetic Care

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Anesthetic Adverse Events

Duke 2000-2004



Late Operating Room Start Times Impact Mortality and Cost for Nonemergent Cardiac Surgery

Kenan W. Yount, MD, MBA,* Christine L. Lau, MD, MBA, Leora T. Yarboro, MD, Royi K. Chanta, MD, Irving L. Kron, MD, John A. Kern, MD, and Gorav Ailawadi, MD

Does the time of day in orthopedic trauma surgery affect mortality and complication rates?

Sascha Halvachiza
Valentin Neuhaus

Time of Day Is Associated With Postoperative Morbidity *An Analysis of the National Surgical Quality Improvement Program Data*

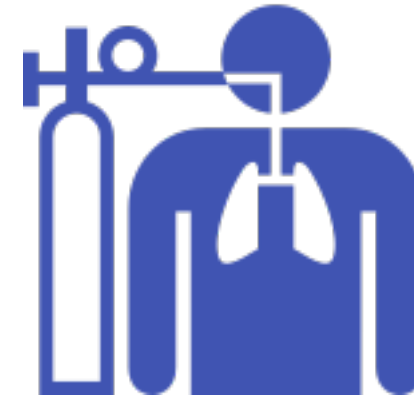
Rachel R. Kelz, MD, MSCE,*† Kathryn M. Freeman, BA,† Patrick W. Hosokawa, MS,‡
David A. Asch, MD, MBA,§¶ Francis R. Spitz, MD,*† Miriam Moskowitz, RN, MSN,*
William G. Henderson, MPH, PhD,|| Marc E. Mitchell, MD,**
and Kamal M. F. Itani, MD, FACS††

- Perioperative outcomes vary across the day
- Many potential causes
- One *might* be anesthetic care

Does anesthetic care vary
across the OR Day?

ASPIRE Measures

Pulmonary



Blood Pressure



Pain Management



Neuromuscular
Monitoring



Postoperative
Nausea and
Vomiting



Temperature





Design



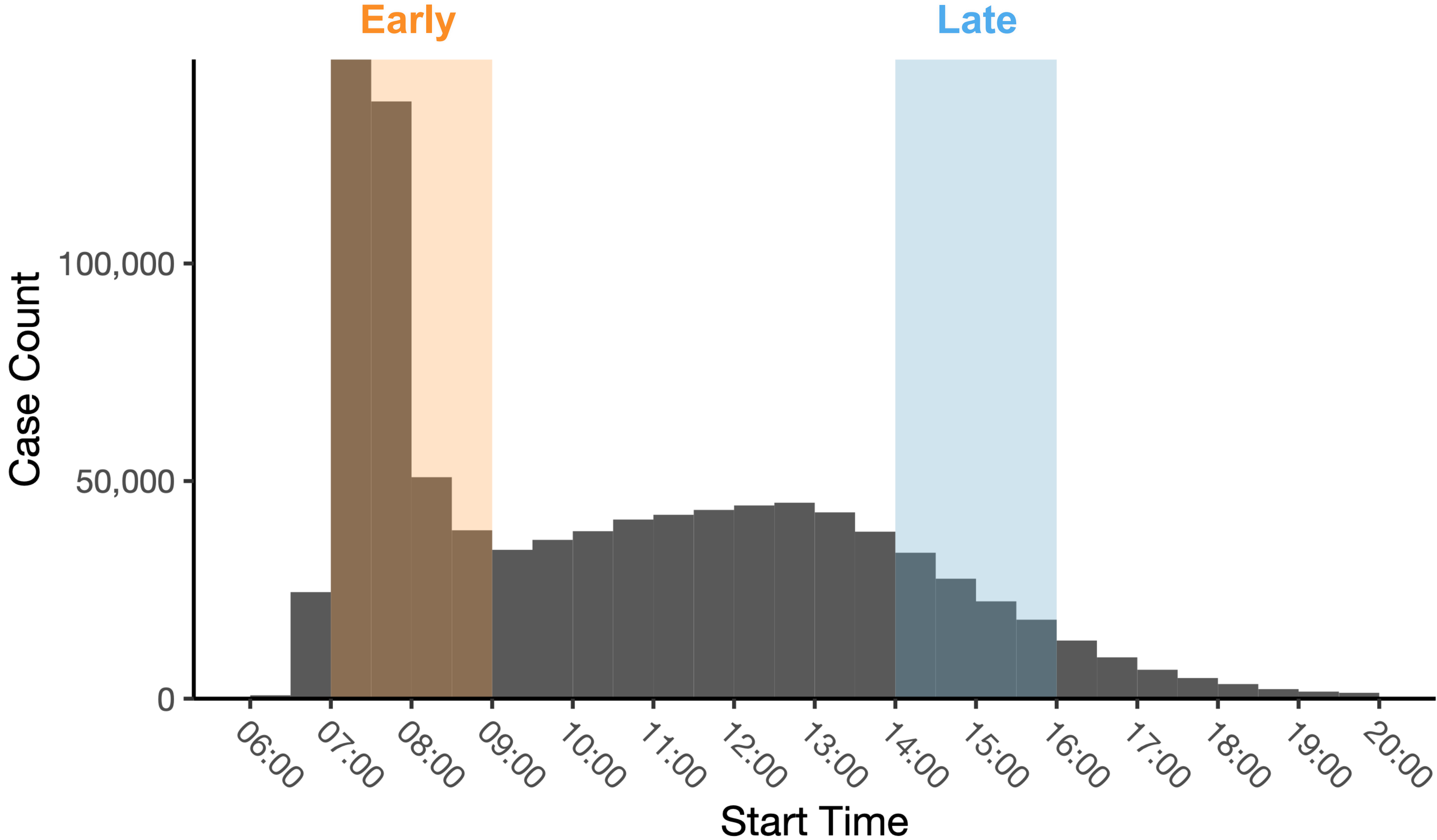
Inclusion Criteria

- Adult patients (≥ 18 years-old) in 2022 Standardized Data File
- January 1, 2016 – December 31, 2021

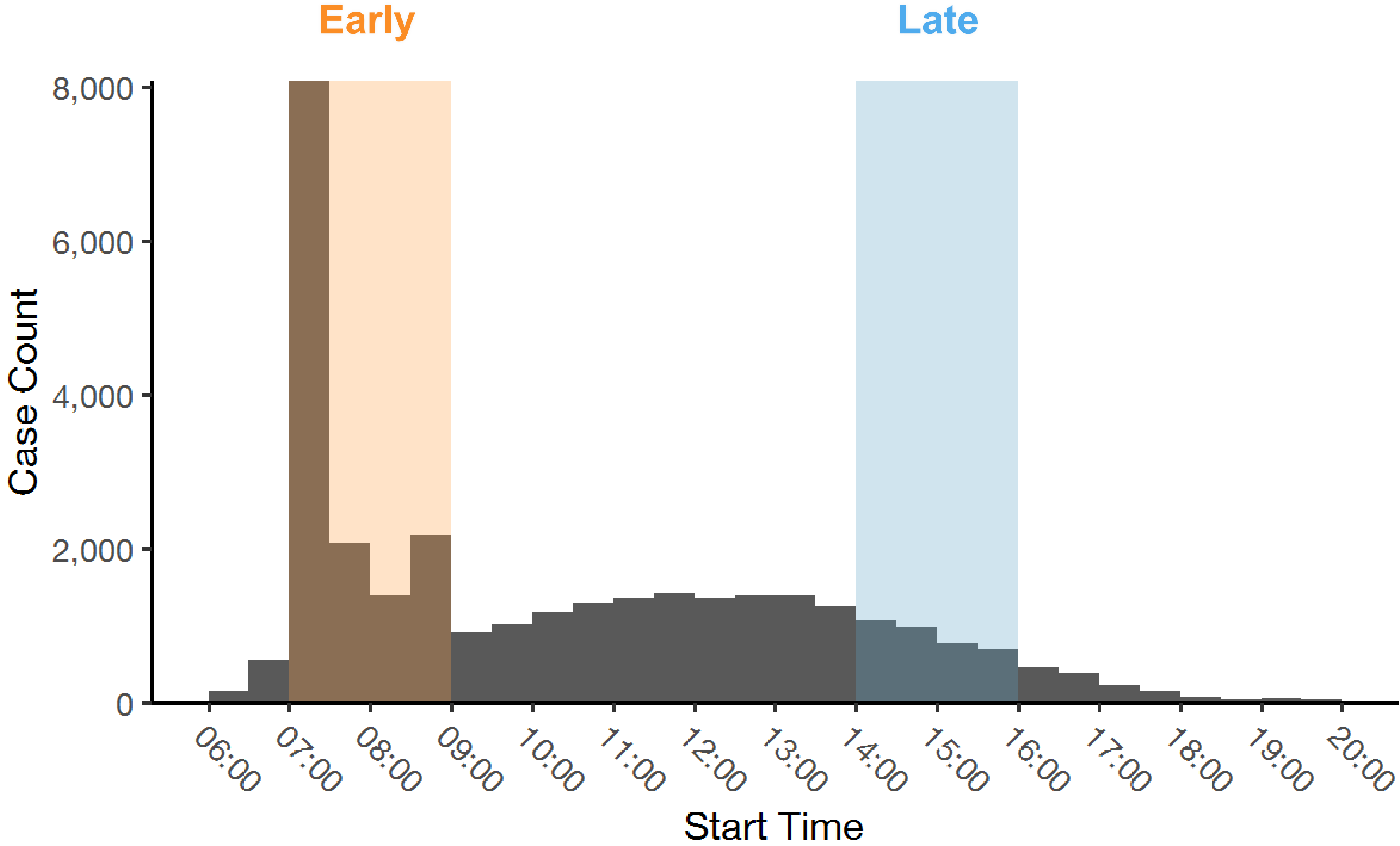
Exclusion Criteria

- Cardiac, obstetric and non-operative procedures
- ASA 5, 6, or E classes
- BMI < 15 | BMI > 60
- Weight < 30 kg | Weight >200 kg
- Fails inclusion/exclusion criteria ≥ 1 considered ASPIRE measure
 - Inclusions include GETA, NMB, predicted surgical duration > 1 hr, predicted ventilation > 45 minutes, extubation in OR, patients not taken to ICU

Exposure: Anesthesia Start Time



Exposure: Anesthesia Start Time



Outcome: Measure Adherence Rates

BP-02	Avoided monitoring gaps
BP-03	Avoided MAP < 65 mmHg
NMB-02	Reversed neuromuscular blockade
PAIN-02	Used non-opioid analgesics
PONV-05	Used graded PONV prophylaxis
PUL-03	Used appropriate PEEP
TEMP-02	Monitored core temperature

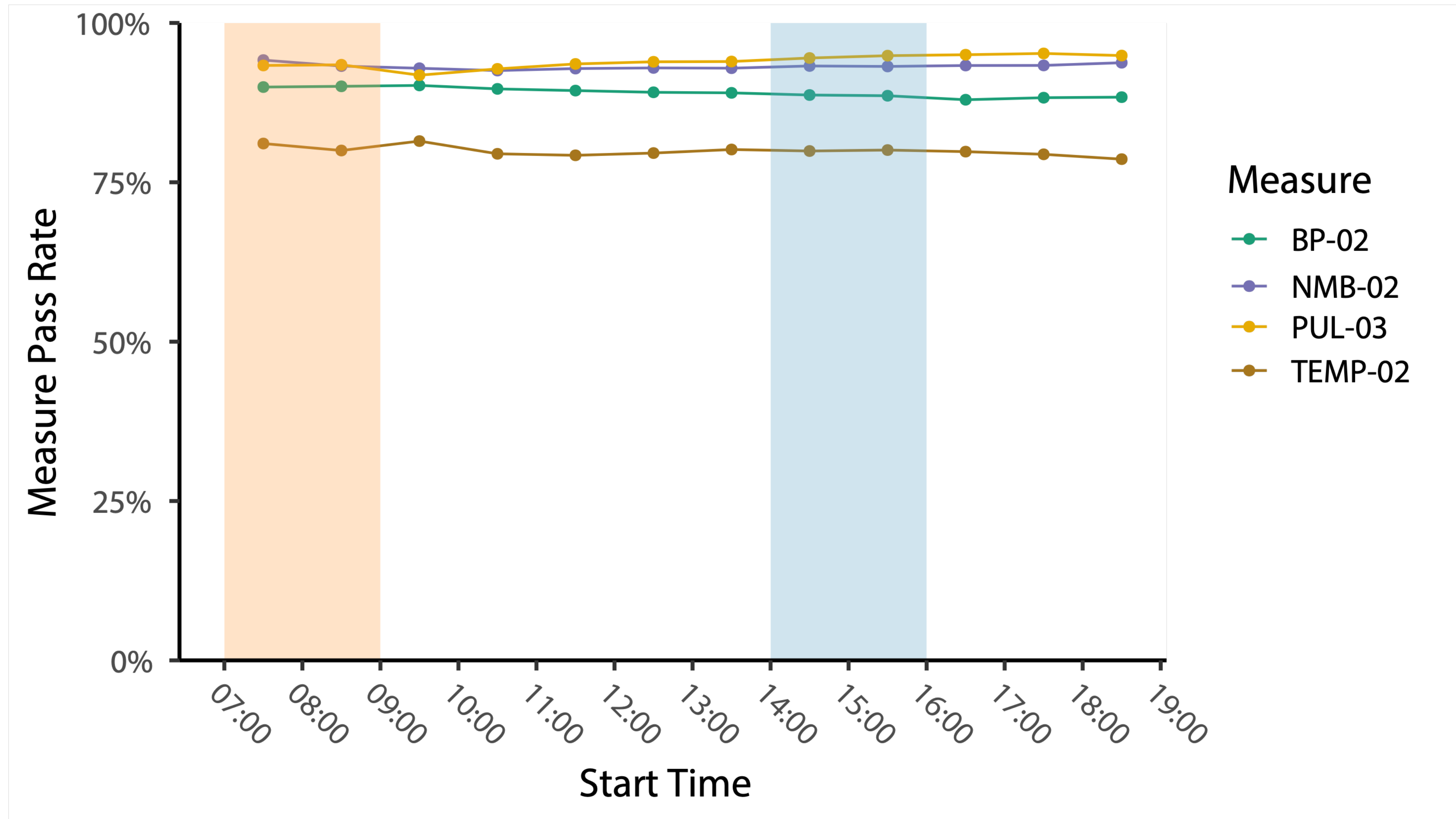


Results



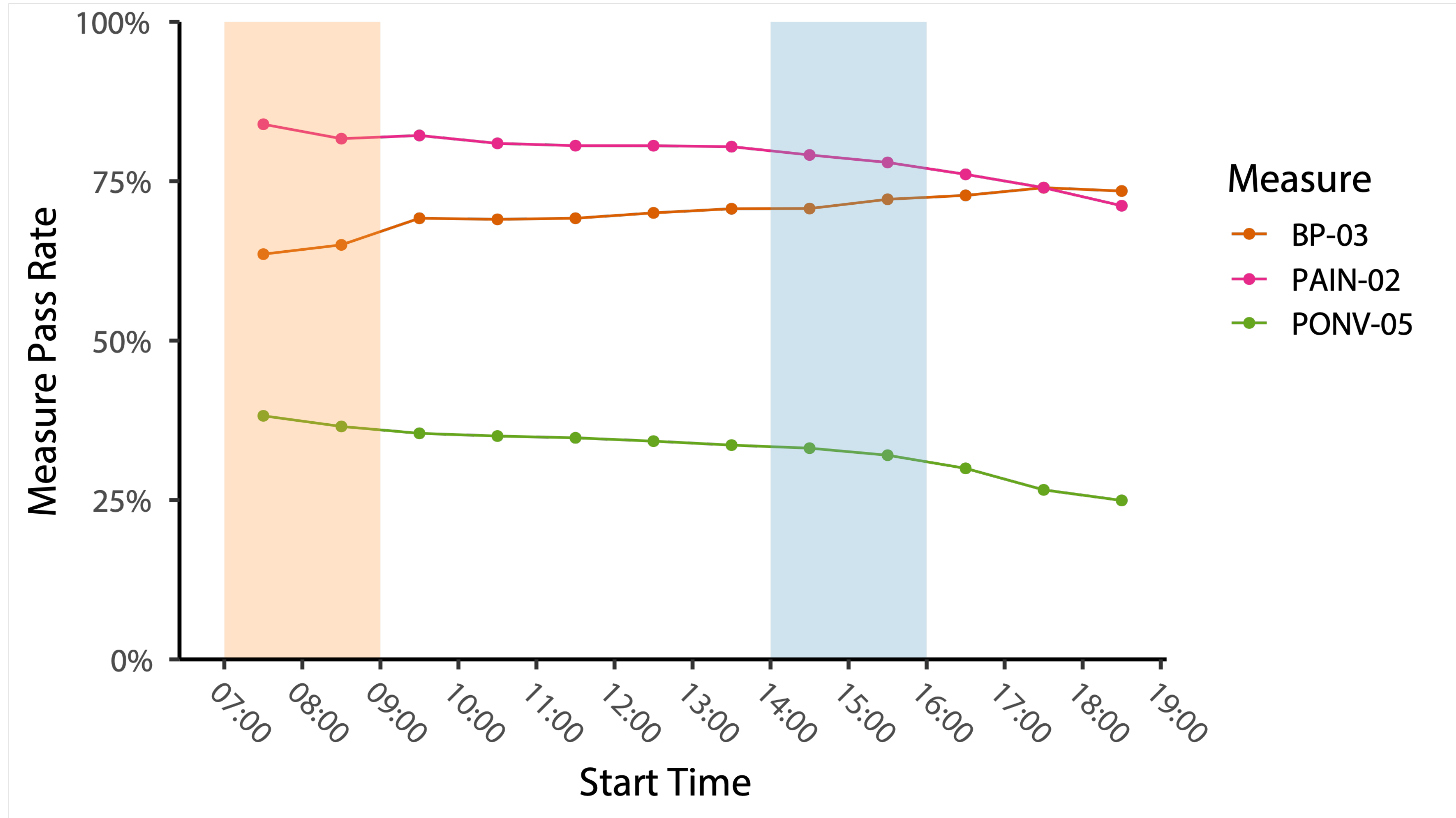
UNADJUSTED

Quality Measure Pass Rate Across the Day



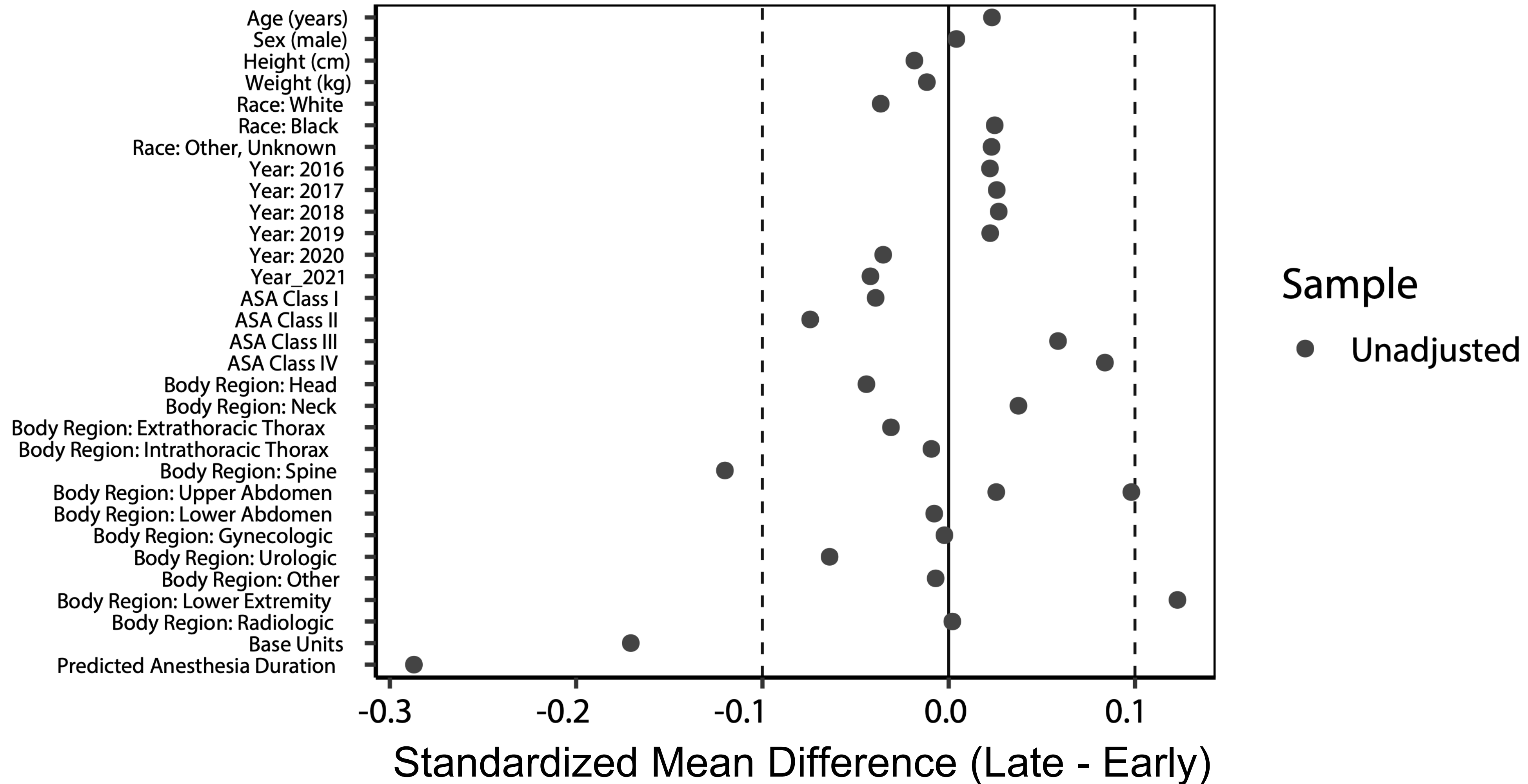
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Quality Measure Pass Rate Across the Day



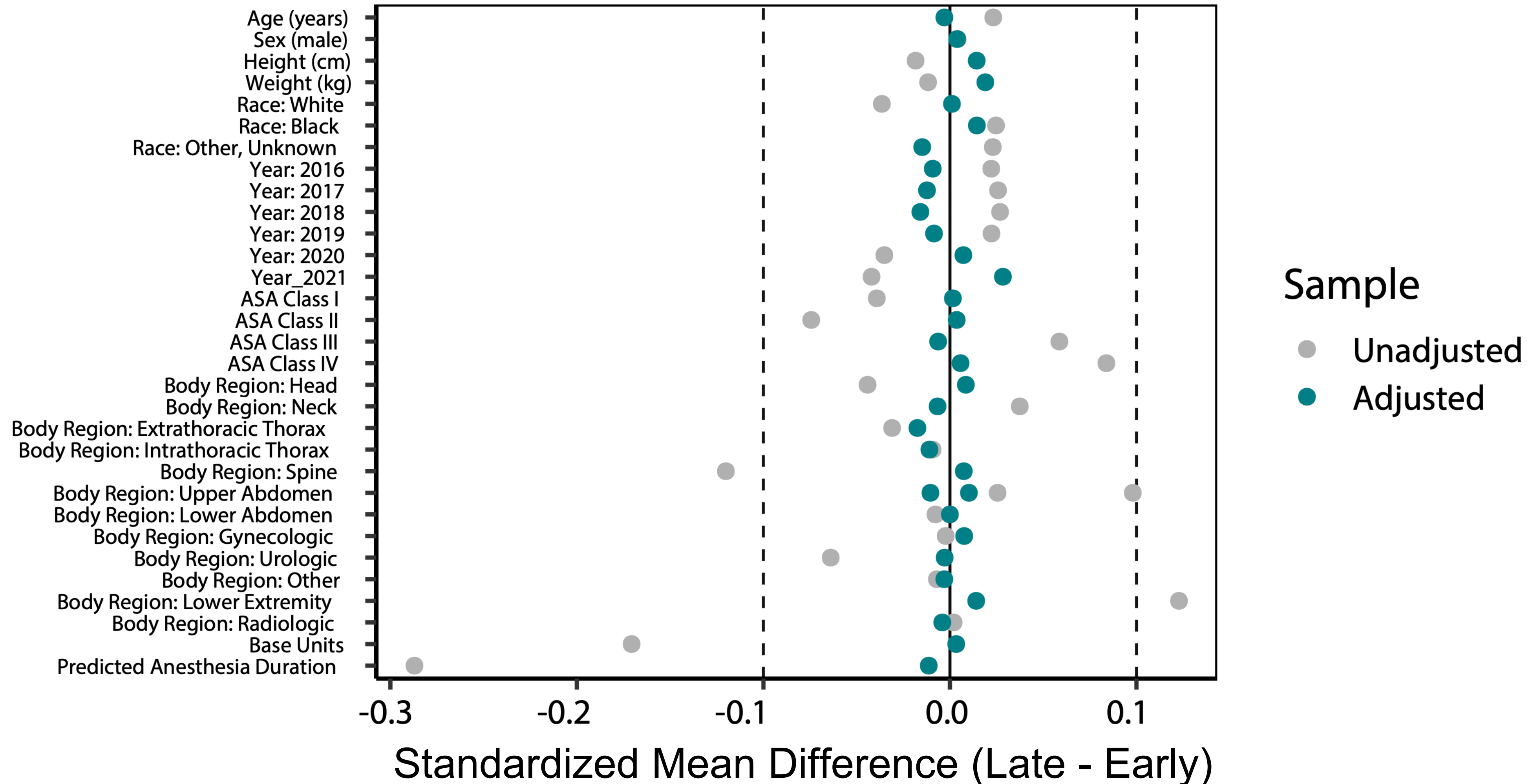
Patients and Cases Vary Over the Day

Covariate Balance

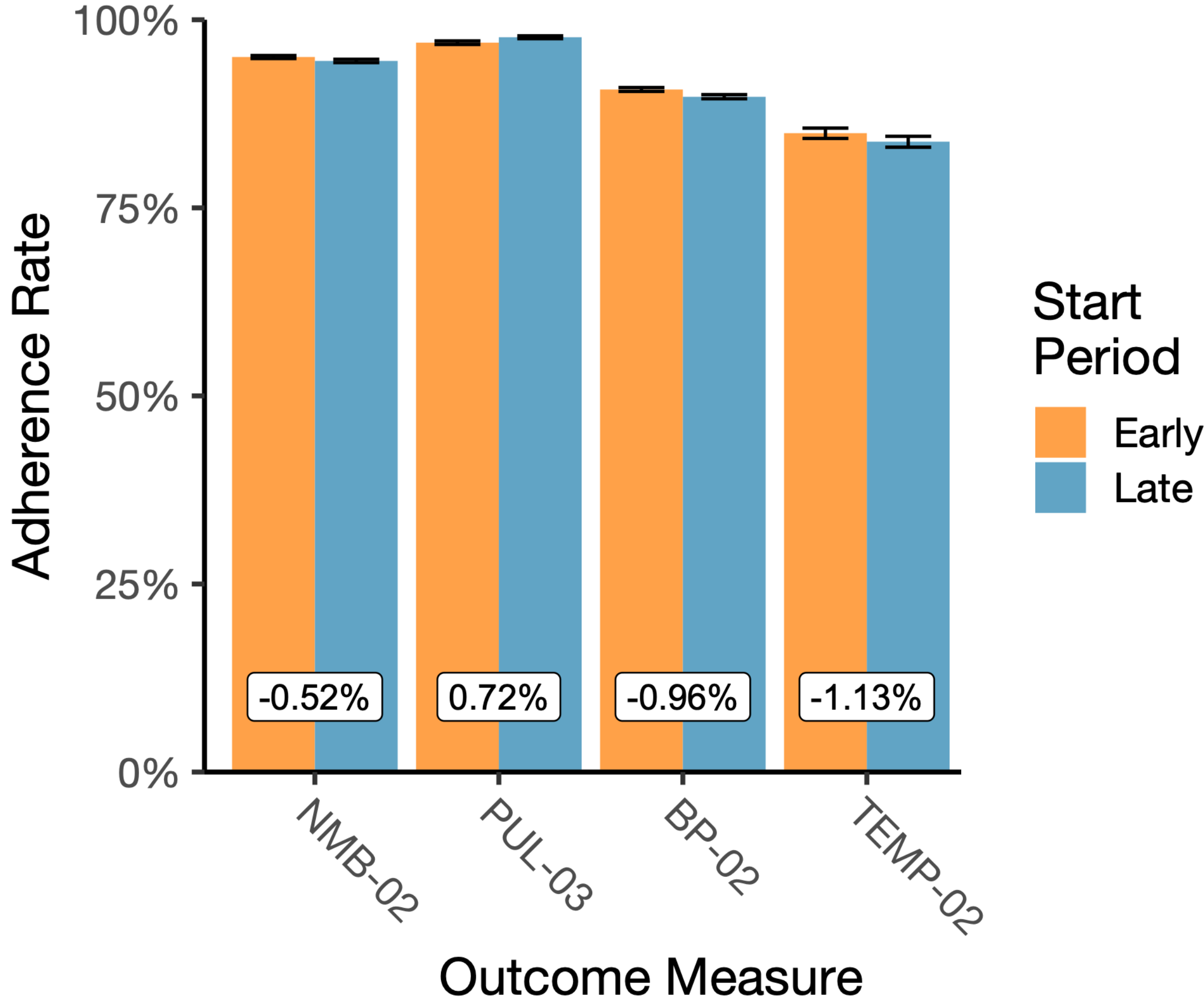


Propensity Score Matching Achieves Balance

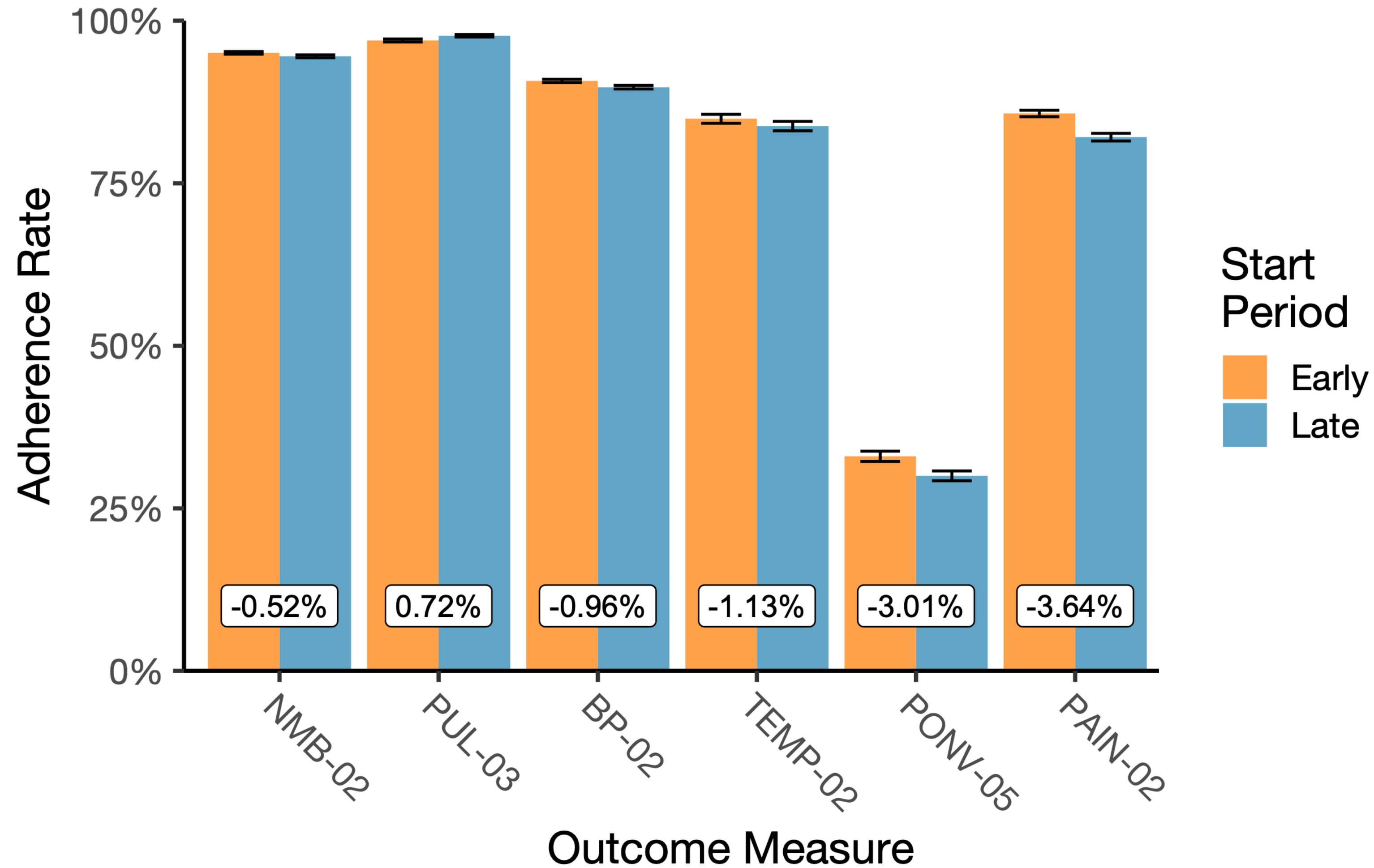
Covariate Balance



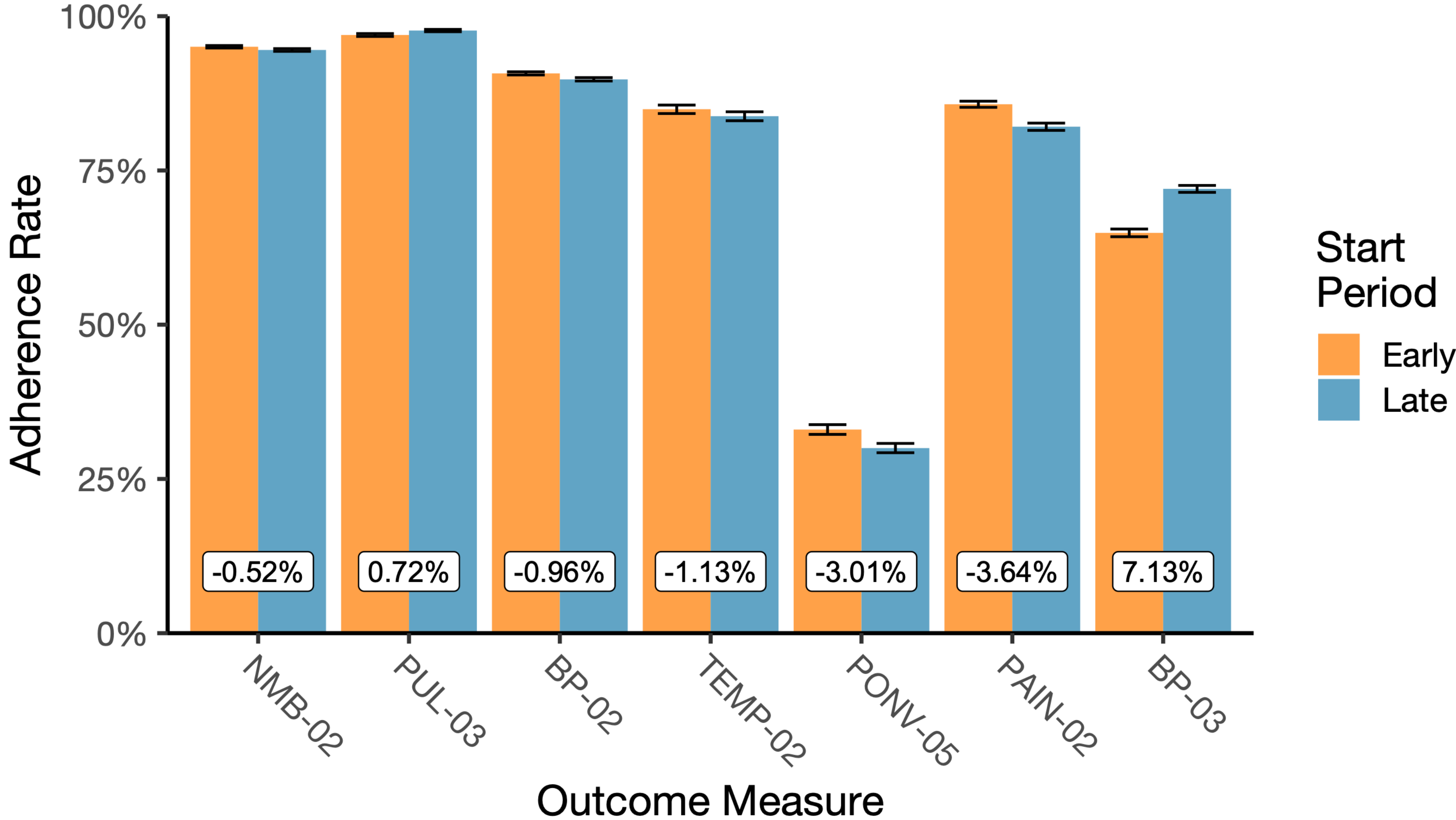
Effect of Late Start on Quality Measures



Effect of Late Start on Quality Measures



Effect of Late Start on Quality Measures



Interim Conclusions

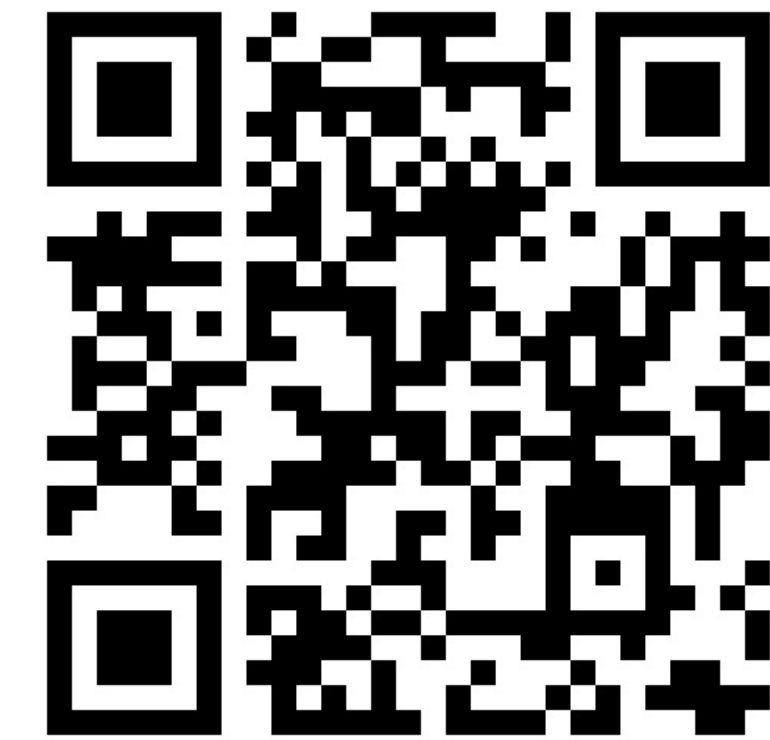
- **Shared trend of case start times**
- **Biggest case difference across day: case complexity and duration**
- **Many quality metrics remain constant across the day, however:**
 - **Marginal decrease in use of non-opioid analgesics and PONV prophylaxis as day progresses**
 - **Improvement in hypotension avoidance as day progresses (NNT = 15)**



Reflections on the MPOG Standardized Data File

Standardized
Data File

≈ **MPOG Flat File**



<https://mpog.org/sdf/>

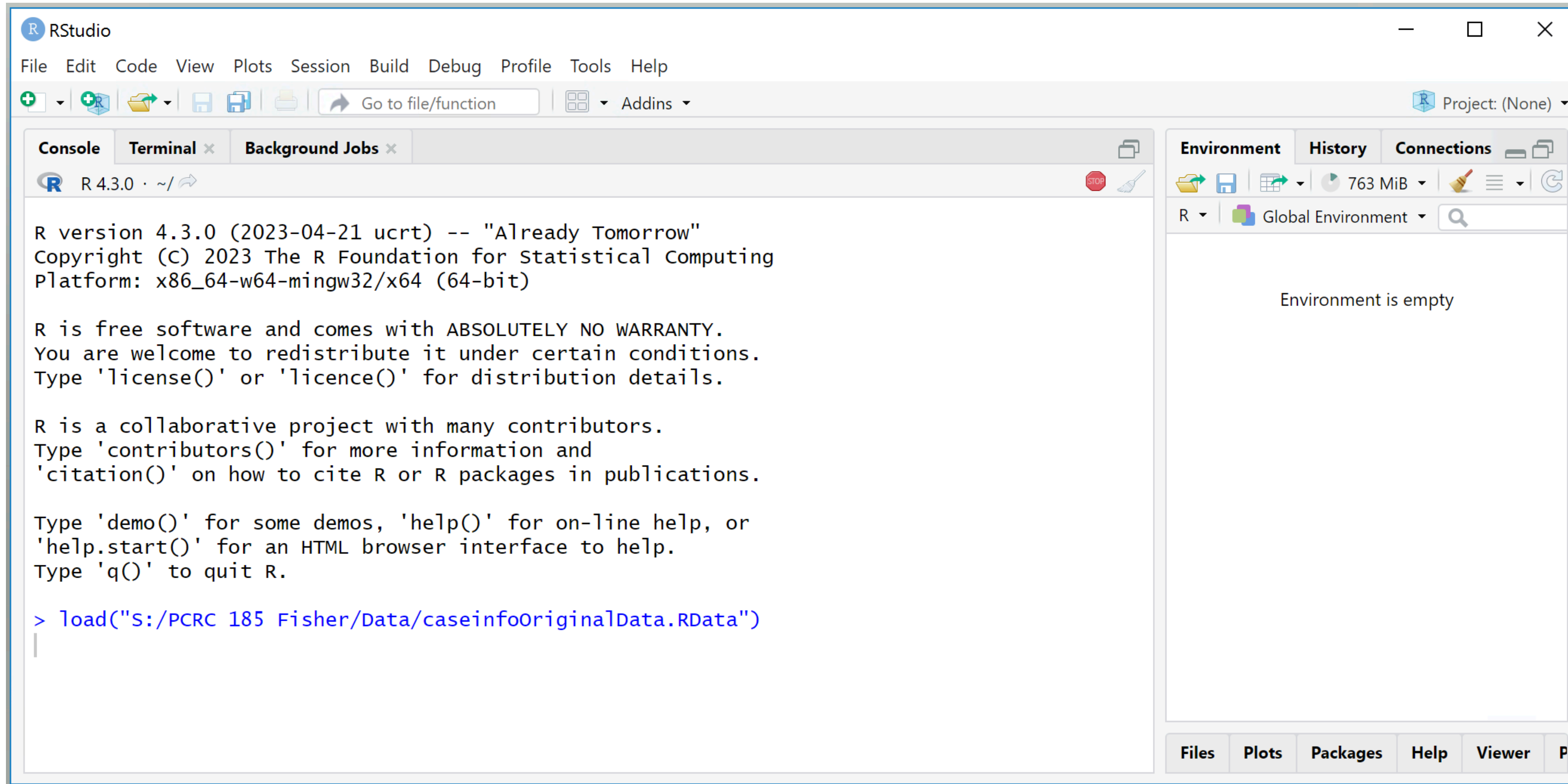
————— **>200 Features** —————→

← **6 Years of Cases** —

Case ID	Date	Institution	...
e671f0fb-60	1/1/2016	1	...
f847f04x-g5	1/1/2016	4	...
f893750w-25	1/1/2016	19	...
...

- Uses robust phenotypes
- Less waiting for data
- No minute-by-minute physiology or medication data

Do you need $>12,000,000$ cases?



The screenshot shows the RStudio interface. The console window displays the R version 4.3.0 (2023-04-21 ucrt) -- "Already Tomorrow" and copyright information. The console also shows the command `> load("S:/PCRC 185 Fisher/Data/caseinfoOriginalData.RData")` entered. The Environment pane on the right shows "Environment is empty".

```
R version 4.3.0 (2023-04-21 ucrt) -- "Already Tomorrow"
Copyright (C) 2023 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

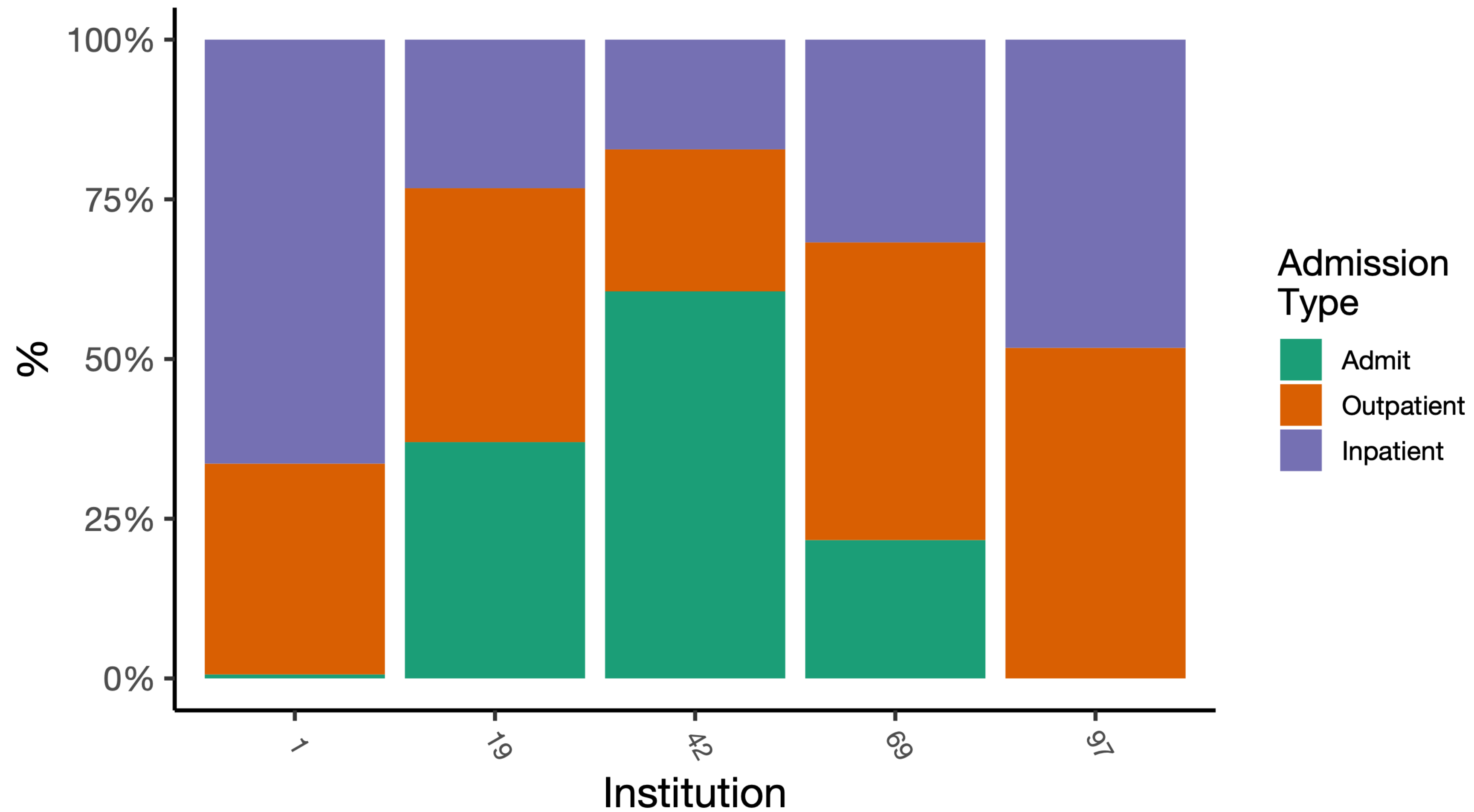
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> load("S:/PCRC 185 Fisher/Data/caseinfoOriginalData.RData")
```

Consider the time involved and account for the opportunity cost.

Do you need to check your data? *YES.*





Thank You

Yale Anesthesiology
Robert B. Schonberger
Hung-Mo Lin

Yale Center for Analytical Science
Julian Zhao
Yanhong Deng

**Multicenter Perioperative
Outcomes Group**
Michael Mathis
MPOG Research Team

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