PREDICTING NO SHOWS IN FAMILY MEDICINE[1]

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PRESENTATION OVERVIEW

- Project Goal
- Explanation of Data Set and Impact of No Show Rate
- Visit Specific No Show Predictors
  - Return Visits
  - Hospital Discharge Visits
- Which Patients Aren't Showing Up?
- Proposed Interventions to achieve goal
- Conclusion and Summary

PROJECT GOAL IS TO REDUCE NO SHOW RATE AT AU FAMILY MEDICINE CLINIC

Current No Show Rate: 16.5%

Goal No Show Rate: 12%

No Show Rate (y-axis)

16.50%

No Show Excess

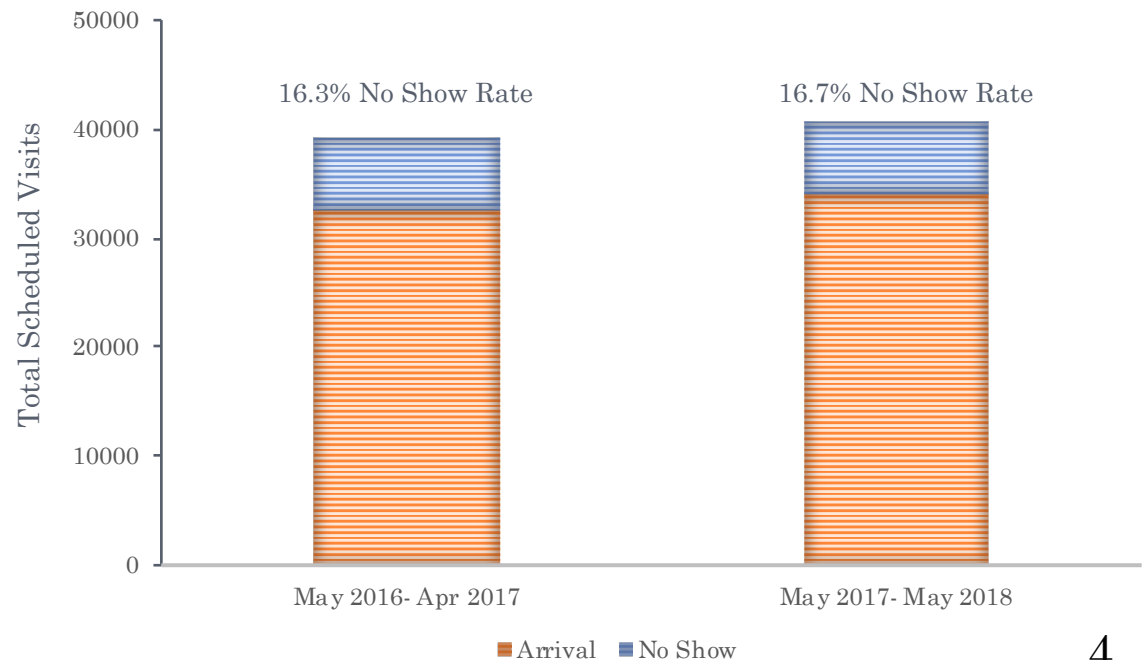12%

No Show Rate   Goal Rate

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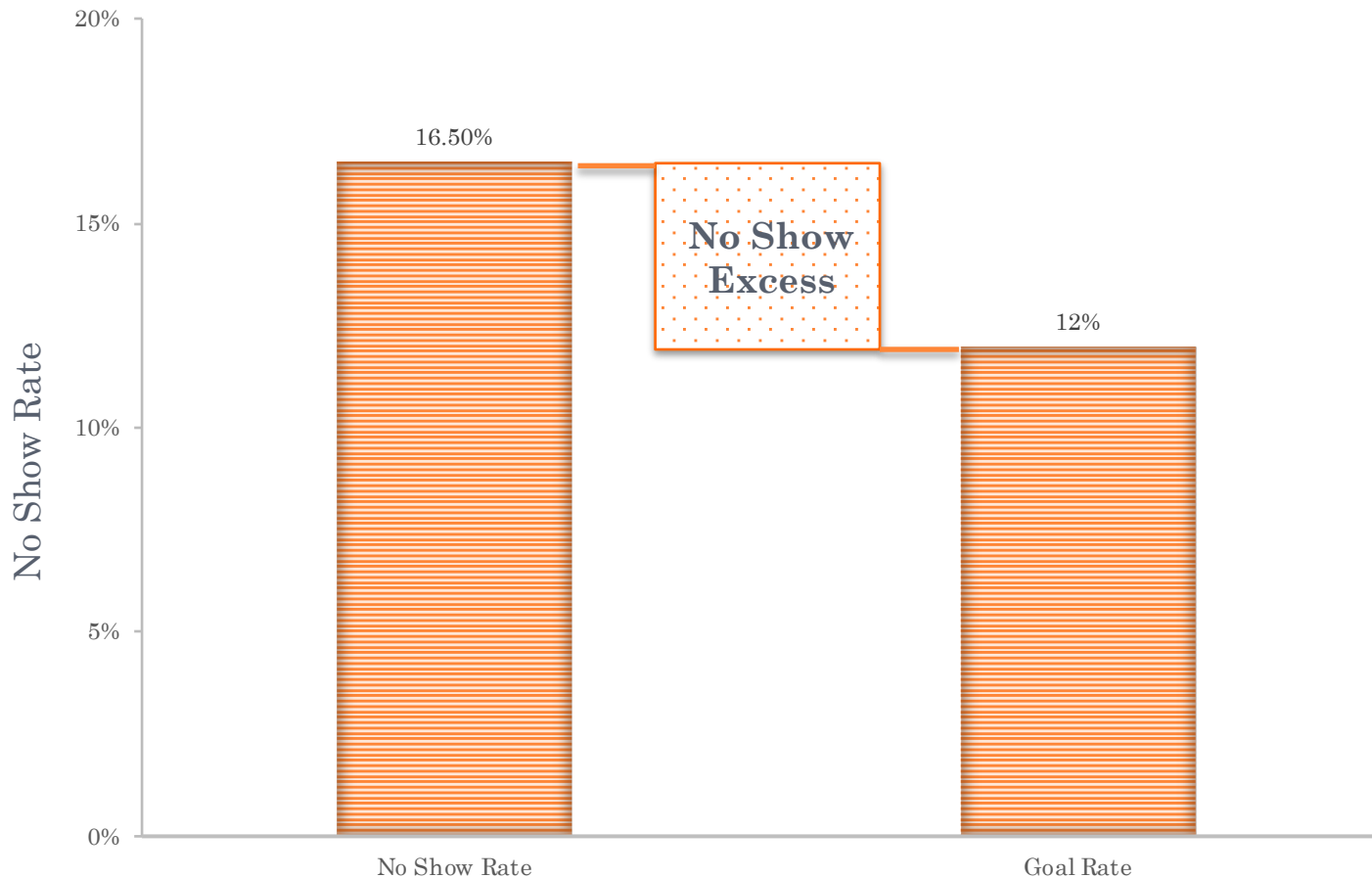
WORKING DATA SET INCLUDES 79,000 PATIENT ENCOUNTERS OVER TWO YEARS

○ What's Included in the Data?
- *Past No Show Rate*
- Age
- Appointment day
- Insurance type
- Provider type
- Race
- Sex
- Visit type
- Zip code

AU FAMILY MEDICINE CLINIC NO SHOW RATE

16.3% No Show Rate   16.7% No Show Rate

Total Scheduled Visits

50000
40000
30000
20000
10000
0

May 2016- Apr 2017   May 2017- May 2018

■ Arrival ■ No Show

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# HEALTHCARE IMPACT OF NO SHOWS IS POOR OUTCOMES AND MORE ED VISITS

Patient No Shows Negatively Impact Health

- Patients who No Show are at risk of:[1,2]
  - Poorly controlled disease states, especially in diabetes and high blood pressure
  - Not being up to date on preventative services and vaccines
  - Higher quantity of visits to the emergency department and inpatient admissions to the hospital
- Clinic suffers from patient No Shows[3]
  - Lack of continuity of care and disrupted flow
  - Empty slots take up appointment time that could have been used to see another patient

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FINANCIAL IMPACT OF CURRENT NO SHOW RATE VS. GOAL RATE IS ~$670,000 FOR 2017*

Includes clinic and inpatient revenue

YEARLY FINANCIAL IMPACT OF HIGH NO SHOW RATE

Legend: ■ Total Revenue Now   ■ Total Revenue at Goal No Show Rate
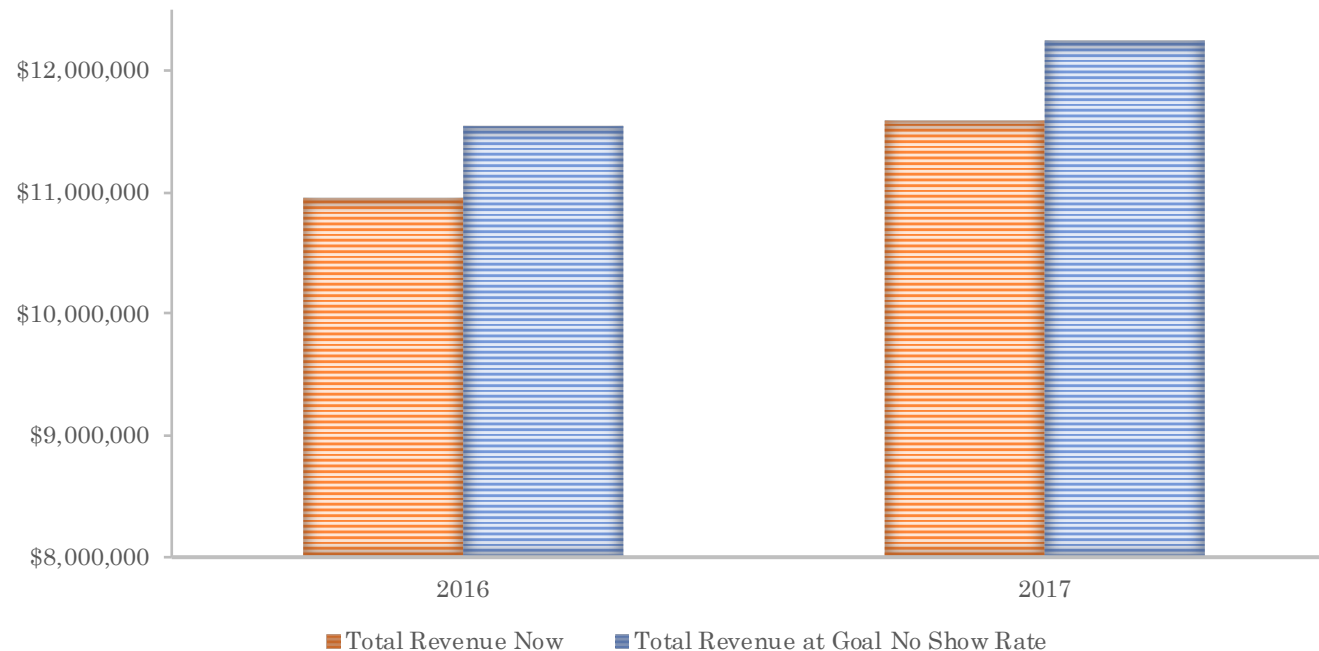
*Revenue data assumes $80 professional services revenue and $118 facility revenue for every family medicine visit. Then, from historical data, it is assumed that 3% of every patient that comes to clinic will be admitted to the hospital during the year and that every inpatient visit generates $5,444 of additional revenue.

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ALL VISIT TYPES ARE ABOVE GOAL RATE EXCEPT FOR SAME DAY VISITS

Focus first on return visits due to large volume and maximum benefit of reducing no show rate

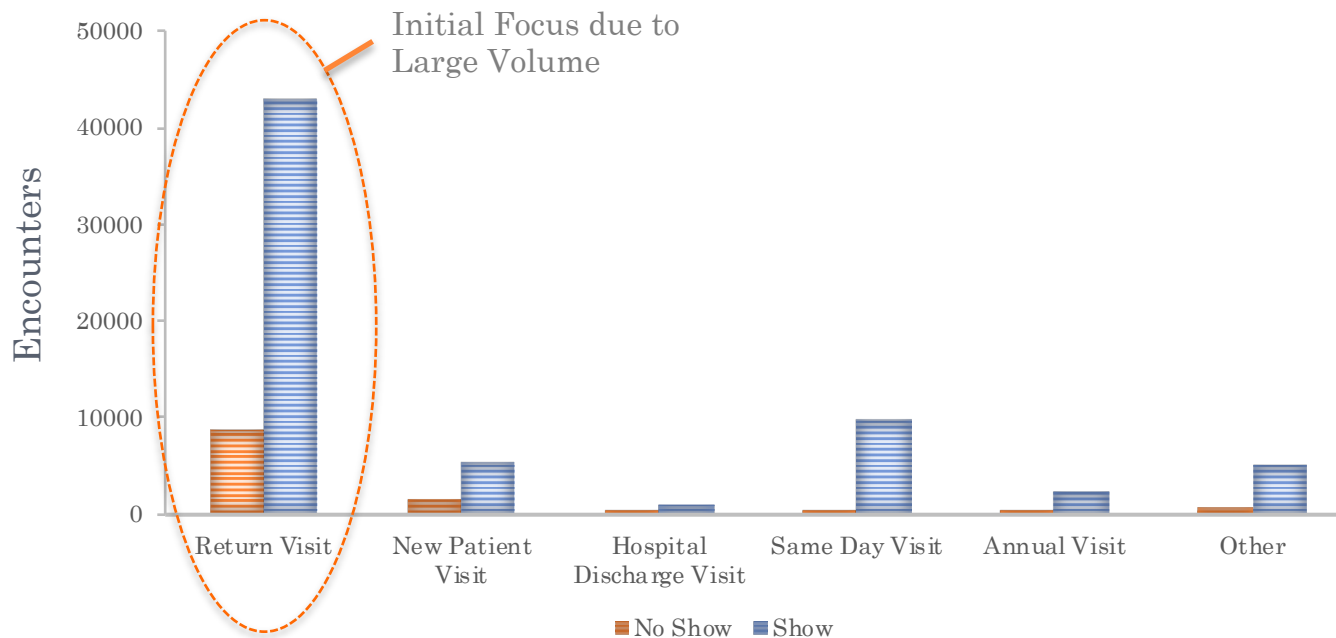**NO SHOW RATE BY VISIT TYPE WITH VOLUMES ABOVE BAR**
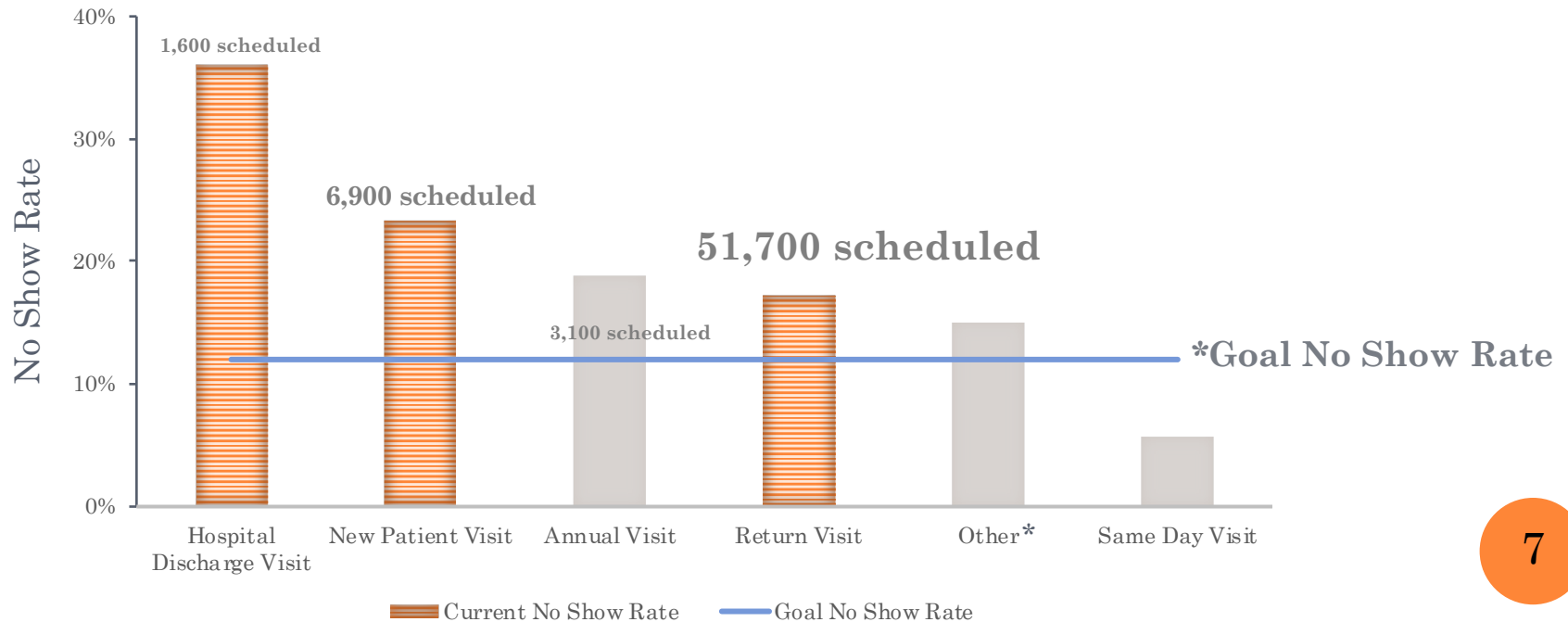
*Other includes Lab Visit, Procedures, Consults, and similar type visits

APPROACH: PREDICT NO SHOWS BY SEGMENTING ENCOUNTERS BY VISIT TYPE
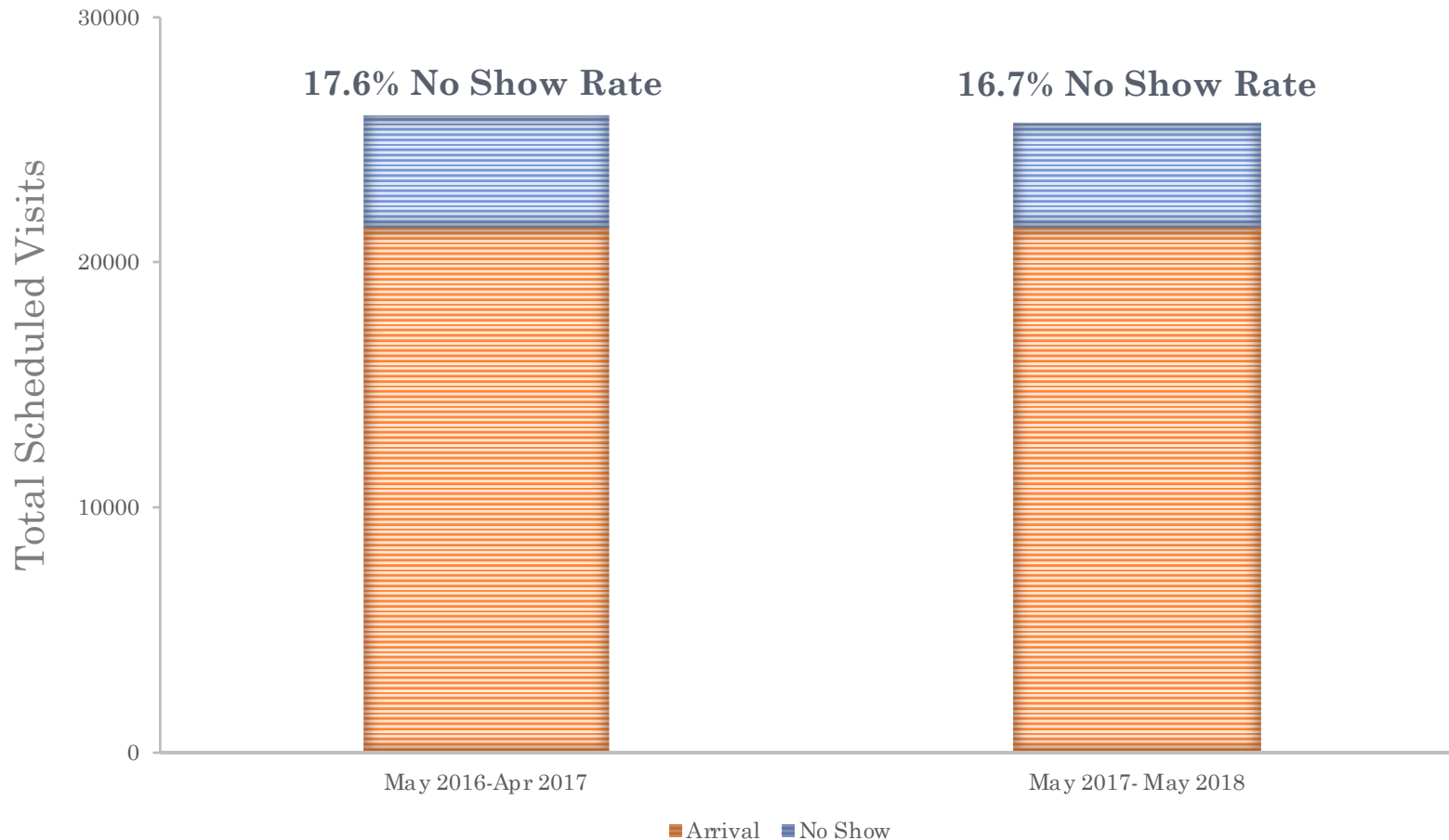
Focus on Three Visit Types

1) Return Visits 2) New Patient Visits 3) Hospital Discharge Visits

SHOW AND NO SHOW TOTALS BY VISIT TYPE

RETURN VISIT NO SHOW RATE HAS BEEN ~17% FOR THE LAST TWO YEARS

RETURN VISIT NO SHOW RATES AND VOLUMES BY YEAR

17.6% No Show Rate (May 2016-Apr 2017)
16.7% No Show Rate (May 2017- May 2018)

Y-axis: Total Scheduled Visits (0, 10000, 20000, 30000)

Legend: Arrival, No Show

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PAST PERFORMANCE IS MOST PREDICTIVE OF NO SHOW

REALTIVE IMPORTANCE OF DIFFERENT PREDICTORS
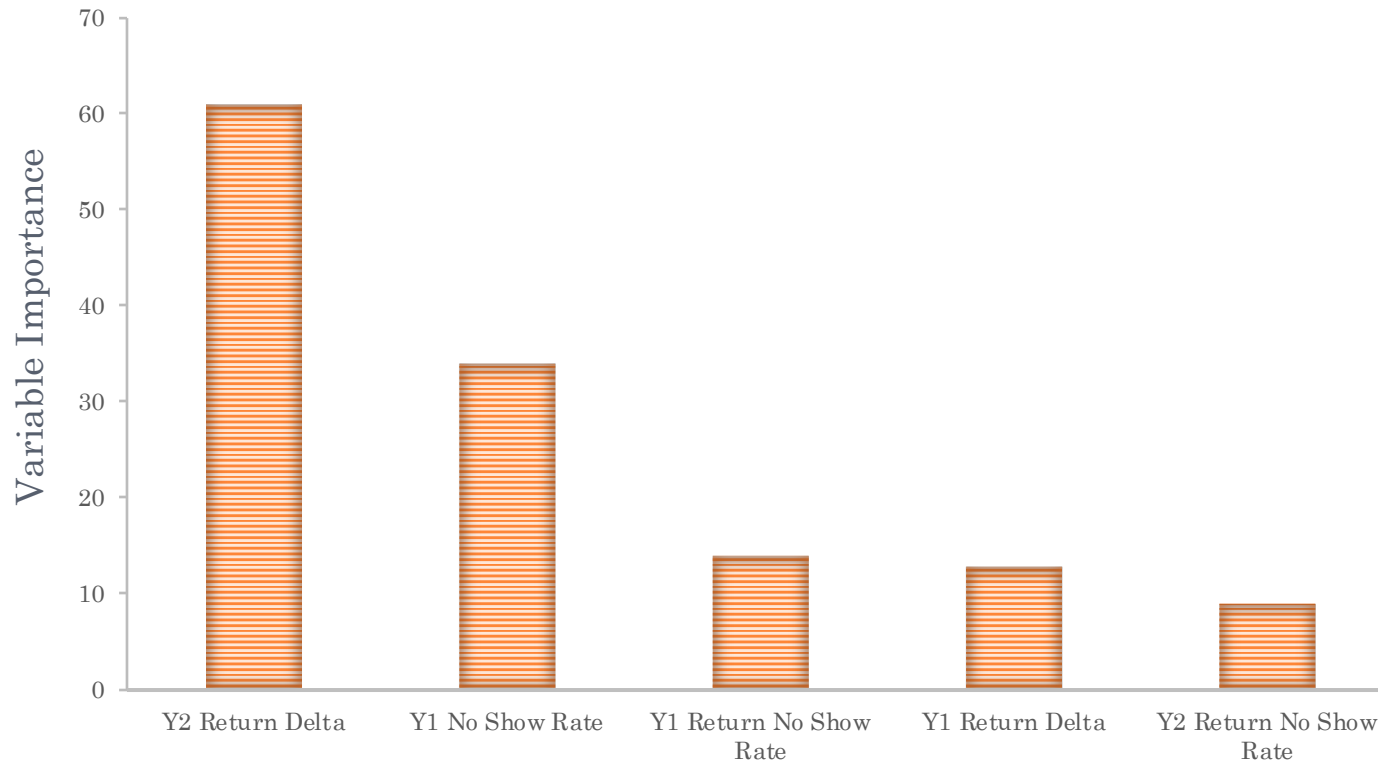
*No Show Rate: Percentage of visits patient didn't show up to appt.
*No Show Delta: Value of missed appts. in relation to made appts.

PAST PERFORMANCE IS MOST PREDICTIVE OF NO SHOW

Day of the week also played a role in prediction

VARIABLE IMPORTANCE IN PREDICTION

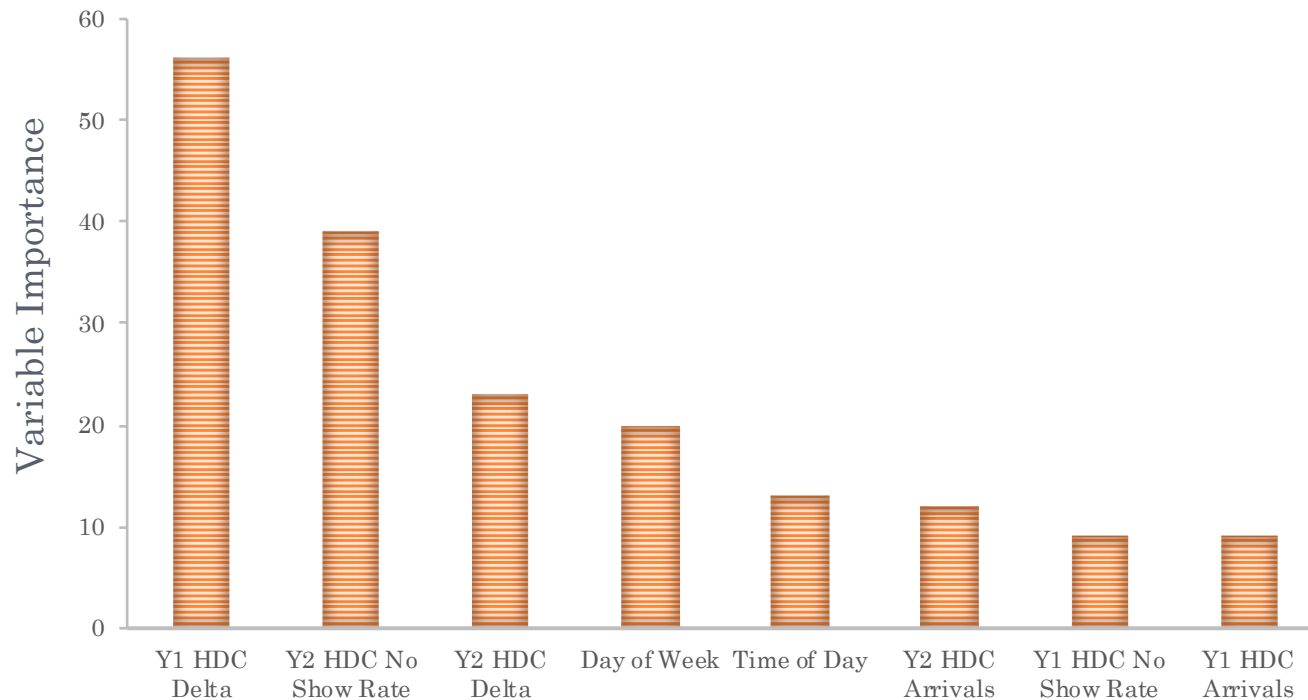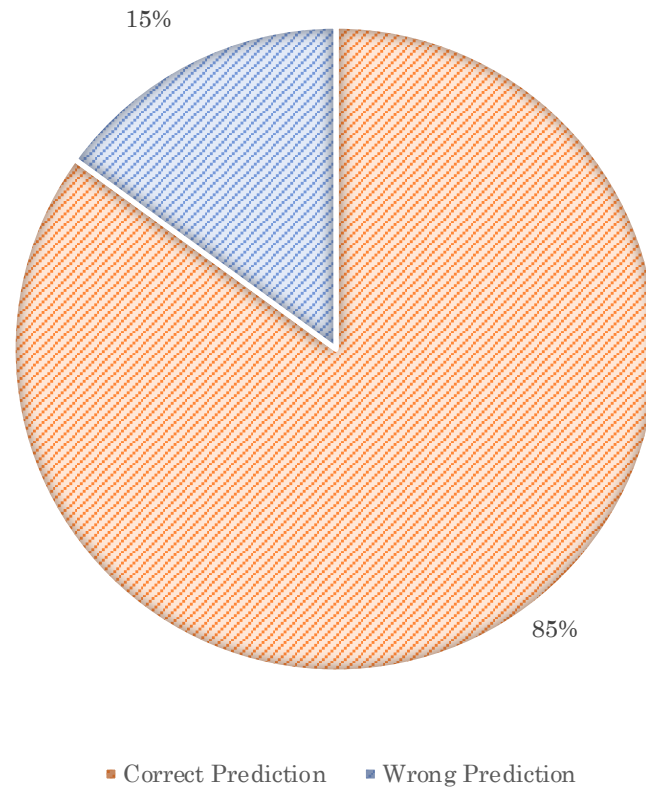
*No Show Rate: Percentage of visits patient didn't show up to appt.
*No Show Delta: Value of missed appts. in relation to made appts.
*Arrivals: How many total appts. a patient showed up for

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PREDICTION MODEL IS ACCURATE 85% OF THE TIME WITH CURRENT DATA

PREDICTIVE ACCURACY OF THE MODEL

15%

85%

■ Correct Prediction   ■ Wrong Prediction

21

THREE TIERED DATA BASED INTERVENTION AIMED AT REDUCING NO SHOW RATE TO 12%

Four Cohorts each randomly split into control and intervention groups

- Cohort 1: n= 2,819 (25% of patients), NSR= 28%
  - Patients with 1 No Show in current year
- Cohort 2: n= 843 (7.5% of patients), NSR= 37%
  - Patients with 2 No Shows in current year
- Cohort 3: n= 527 (5% of patients), NSR= 47%
  - Patients with 3 or more No Shows in current year
- Foundations of Interventions:
  - Nudge Theory [4, 5]
  - Practical Staff Reminder Systems [6, 7, 8]
  - Patient Education [9]

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EXPLANATION OF INTERVENTIONS

Control group – No intervention is employed for these patients, they receive the same reminder letters and reminder messages that every patient receives

Crafted Letter – This letter has 'social norm' theory language geared at 'nudging' patients towards arriving at appointments and was sent at the *beginning of the study*
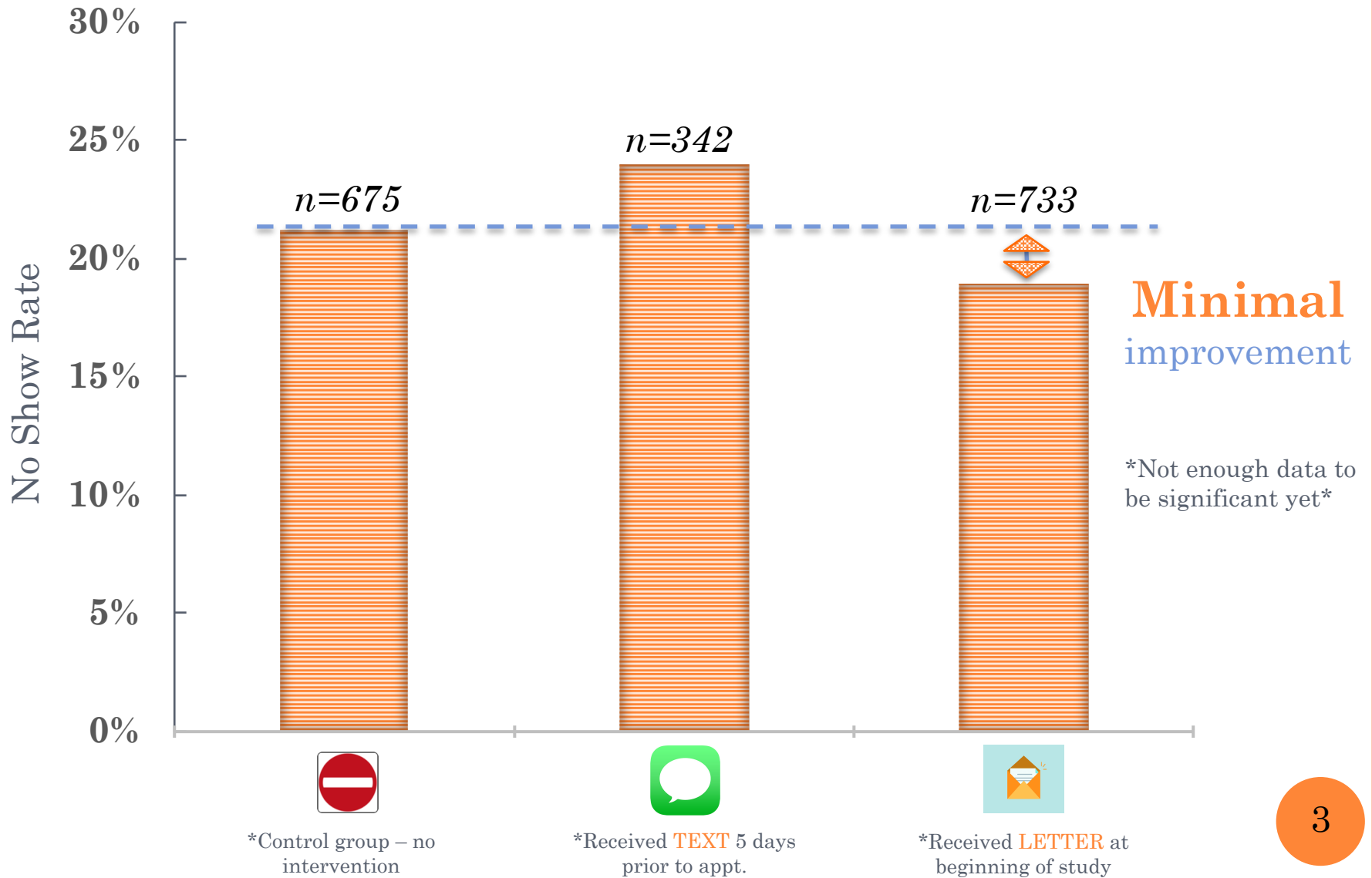
Crafted Text Message – This text message has abbreviated 'social norm' theory language and is sent either *5 days prior* or *1 day prior* to an appointment depending on group

Scripted Staff Phone Call – This phone call is performed by the AU staff and is a personal scripted reminder *5 days prior* to an appointment

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PATIENTS WITH 2 NO-SHOWS

No Show Rate

- 30%
- 25%
- 20%
- 15%
- 10%
- 5%
- 0%

n=302

n=118

n=147

9.8% improvement

Not enough data to be significant yet

*Control group – no intervention

*Received LETTER at beginning of study and CALL 5 days prior to appt.

*Received LETTER at beginning of study and TEXT 5 days prior to appt.

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PATIENTS WITH 3 OR MORE NO-SHOWS

*Significant results achieved with a **p-value of < .01** and **Power of .84***

19% improvement

n=310   n=88   n=93   n=87

No Show Rate

*Control group – no intervention

*Received LETTER at beginning of study and TEXT 1 day prior to appt.

*Received LETTER at beginning of study and CALL 5 days prior to appt.

*Received LETTER at beginning of study and CALL 5 days prior and TEXT 1 day prior to appt.

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SUMMARY OF INTERVENTION SUCCESS

Intervention	Patient Group	Patient #	No-Show Rate
Control Group	1 No-Show	675	*21.2%*
Text Only (5 days)	1 No-Show	342	*24.0%*
Letter Only	1 No-Show	733	*18.9%*
Control Group	2 No-Shows	302	*26.8%*
Letter & Call (5 days)	2 No-Shows	118	*17.8%*
Letter & Text (5 days)	2 No-Shows	147	*17.0%*
Control Group	3 or more No-Shows	310	*39.7%*
Letter & Text (1 day)	3 or more No-Shows	88	*37.6%*
Letter & Call (5 days)	3 or more No-Shows	93	*32.9%*
Letter & Call (5 days) & Text (1 day)	3 or more No-Shows	87	*20.7%*

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