

# REDUCING HOSPITAL READMISSION RATES BY IMPLEMENTING AN INPATIENT TOBACCO DEPENDENCE TREATMENT SERVICE

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## BACKGROUND

In the United States, the Joint Commission (JC) recommends that **all** current smokers receive tobacco cessation services as an inpatient and be followed up within one month after hospital discharge.

Few hospitals implement JC standards due to extra costs, the voluntary nature of the standards, and the lack of evidence demonstrating financial benefits to the hospital and insurers.

The Medical University of South Carolina (MUSC) recently implemented an inpatient tobacco dependence treatment service (TDTS) which provides a bedside consult with patients and phone follow-up using interactive voice recognition (IVR) technology after discharge consistent with JC standards. A previous study (Nahhas GJ, et al, NTR, 2016), found that those exposed to the TDTS had 2-fold higher quit rate 1-month after discharge compared to those not exposed to the program.

## OBJECTIVES

This study tests two hypotheses:

**H1:** Unplanned hospital readmission rates will be higher among current cigarette smokers compared to former and never smokers.

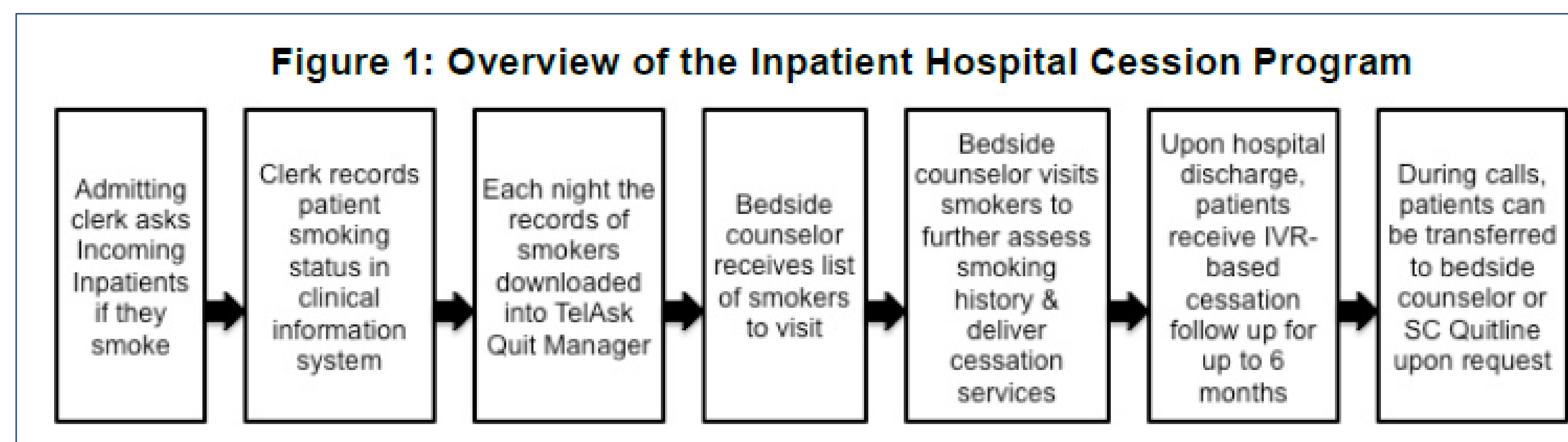
**H2:** Among current smokers, hospital readmission rates will be lower among those *exposed* to the TDTS compared to those *not exposed* to the TDTS.

## STUDY POPULATION

- The study population included 17,080 acute care patients admitted and discharged from the MUSC hospital between November 1, 2014 and June 31, 2015.
- Table 1 provides a description of the characteristics of the overall study population, and for current, former and never smokers.
- There were some notable differences in the characteristics of current, former and never smokers. Former smokers were significantly older and had higher Charlson Comorbidity Index scores compared to current and never smokers.
- Current smokers had longer hospitalizations and were more likely to be uninsured compared to former and never smokers.

## TOBACCO DEPENDENCE TREATMENT SERVICE

Figure 1 provides a brief overview of the TDTS at MUSC.



- All current smokers admitted to MUSC during the study period were eligible to receive a bedside consult from a trained tobacco treatment specialist and receive automated IVR follow-up calls at 3, 14 and 30 days after discharge to assess smoking status and offer referrals to tobacco treatment service if desired.
- However, not all identified smokers received the service.
- Reasons for not receiving the service included being discharged before the bedside consult was provided and failure to answer any of the 18 IVR follow-up calls made with 30 days after discharge from the hospital.
- Exposure to the TDTS was defined as follows: of the 3,158 current smokers in the study, 1,663 (53%) received either a bedside consult (n=885) and/or phone follow-up (778) (exposed) while 1,495 (47%) did not (unexposed).

## APPROACH

The study utilized in-place data capture mechanisms to link patient data across 3 data sets: 1) the MUSC electronic health records (EHR) database; 2) the MUSC-TDTS database, and 3) the South Carolina Inpatient Hospitalization Dataset (i.e., state billing claims data). Initial linkage between the MUSC EHR and TDTS databases was done to identify MUSC inpatients eligible for the study, and this merged database was sent to the South Carolina Revenue and Fiscal Affairs Office (SC-RFAO) to obtain data on subsequent hospital readmissions that occurred in the state.

Secondary data analyses were carried out to compare unplanned readmissions at 30, 90 and 180 days post-discharge from MUSC among current, former and never smokers. In addition, among current smokers we compared hospital readmissions between those exposed to the TDTS and those not exposed to the service. Unplanned readmissions were defined as any procedure that was defined by the Centers for Medicare and Medicaid Services as being "Definitely Planned" and/or coded as an elective admission.

## RESULTS

Table 1: Characteristics of the Study Population

	Total	Smoking Status			p-value
		Smokers	Former	Never	
<b>N**</b>	17,080	3,158 (18.5%)	5,187 (30.4%)	8,735 (51.1%)	
<b>Age</b>	52.2 (18.8)	48.6 (15.5)	59.4 (17.1)	49.3 (19.6)	<0.0001
<b>Length of Stay</b>	5.5 (7.5)	6.2 (9.2)	5.7 (7.1)	5.1 (7.1)	<0.0001
<b>Charlson Index</b>	1.3 (2.0)	1.2 (2.0)	1.7 (2.3)	1.1 (1.9)	<0.0001
<b>Race</b>					<0.0001
White	10142 (59.4%)	1898 (60.1%)	3546 (68.4%)	4698 (53.8%)	
Black	6034 (35.3%)	1168 (37.0%)	1467 (28.3%)	3399 (38.9%)	
Hispanic	394 (2.3%)	41 (1.3%)	54 (1.0%)	299 (3.4%)	
Other	510 (3.0%)	51 (1.6%)	120 (2.3%)	339 (3.9%)	
<b>Gender</b>					<0.0001
Female	9780 (57.3%)	1398 (44.3%)	2434 (46.9%)	5948 (68.1%)	
Male	7300 (42.7%)	1760 (55.7%)	2753 (53.1%)	2787 (31.9%)	
<b>Insurance</b>					<0.0001
Uninsured	1821 (10.7%)	809 (25.6%)	370 (7.1%)	642 (7.4%)	
Medicare	6935 (40.6%)	911 (28.9%)	2853 (55.0%)	3171 (36.3%)	
Medicaid	2743 (16.1%)	610 (19.3%)	600 (11.6%)	1533 (17.6%)	
Private	5048 (29.6%)	742 (23.5%)	1229 (23.7%)	3077 (35.2%)	
Other	533 (3.1%)	86 (2.7%)	135 (2.6%)	312 (3.6%)	

Figure 1: Readmission Rates by Smoking Status

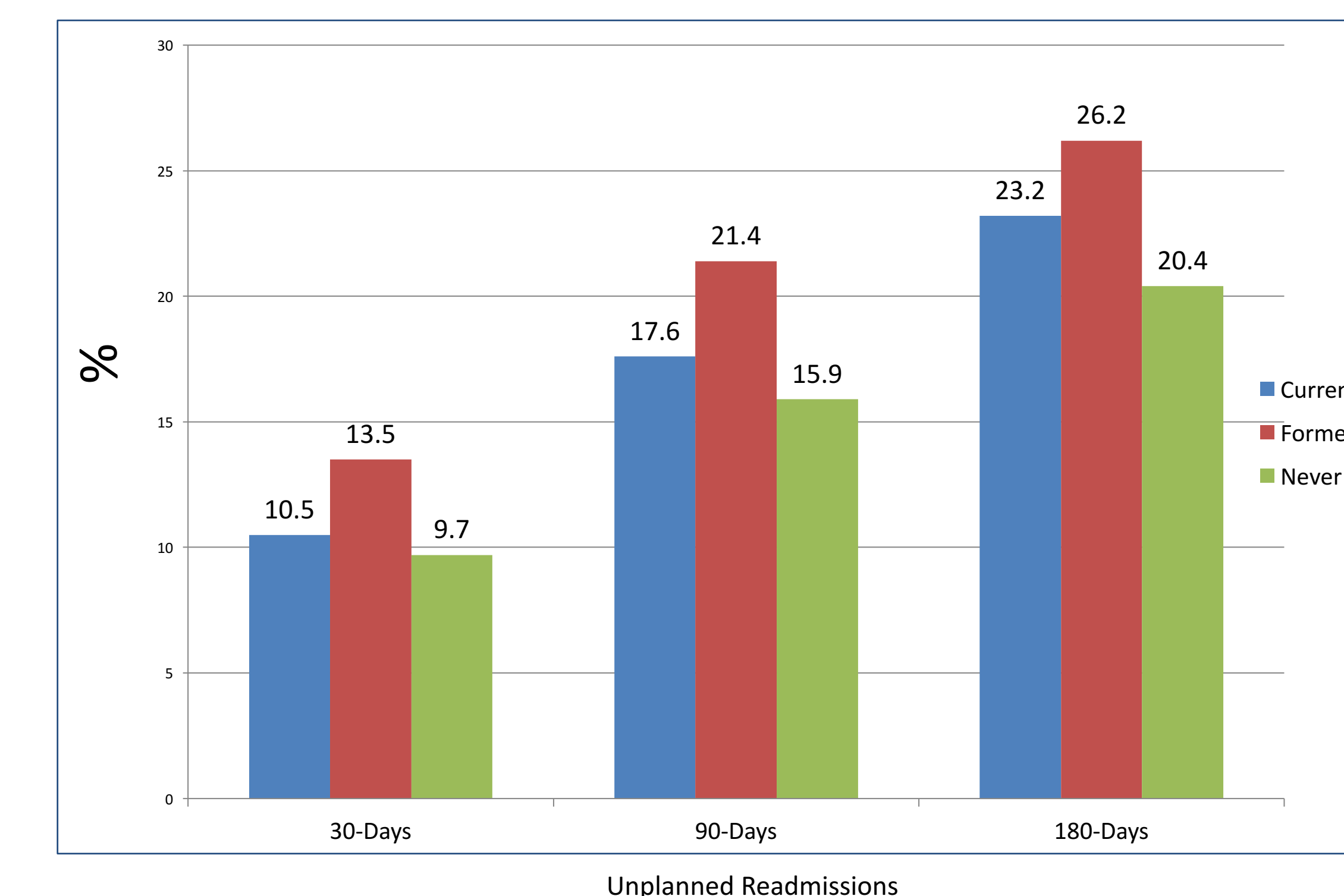


Figure 2: Readmission Rates by Exposure Status to TDTS

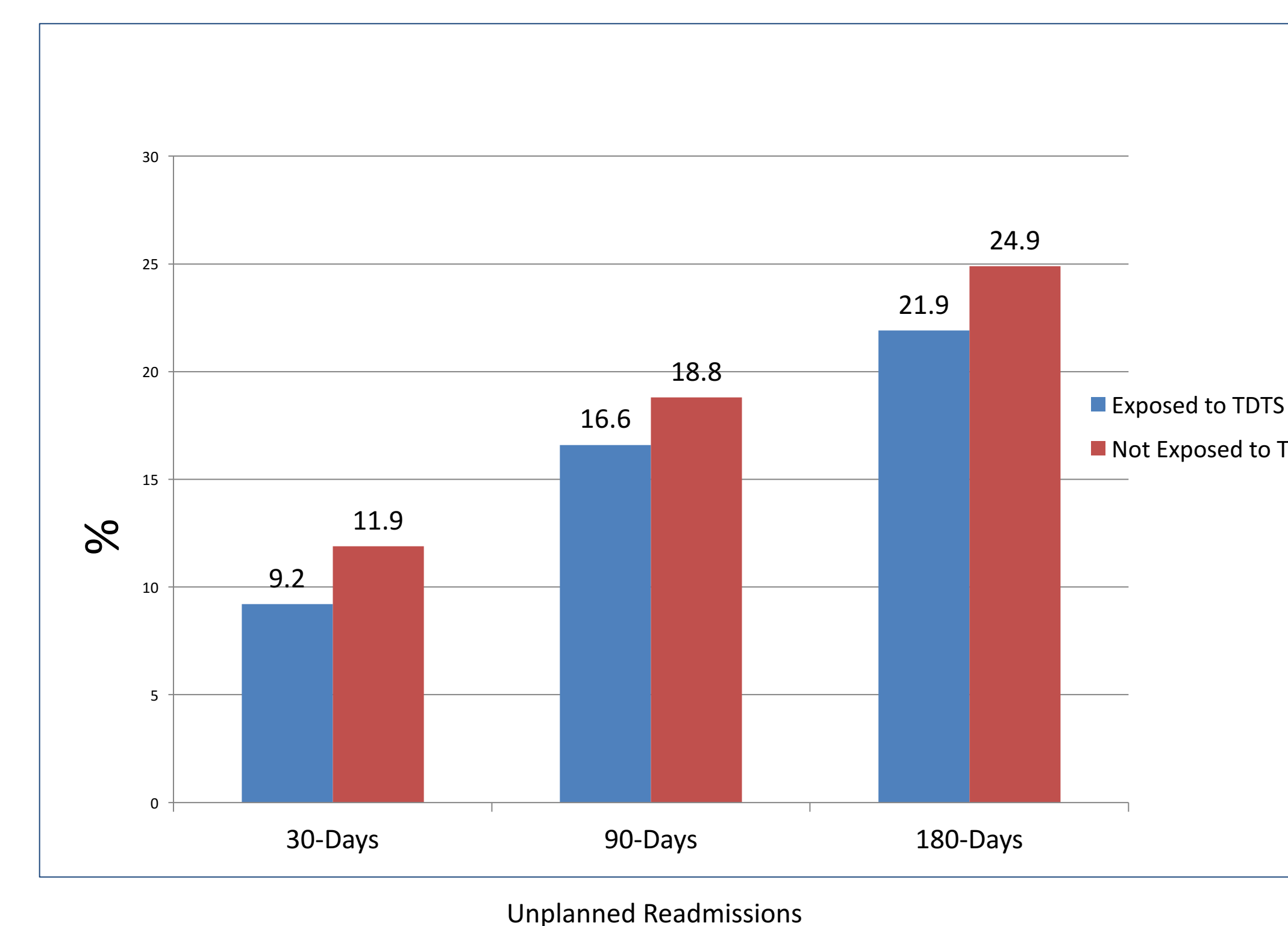
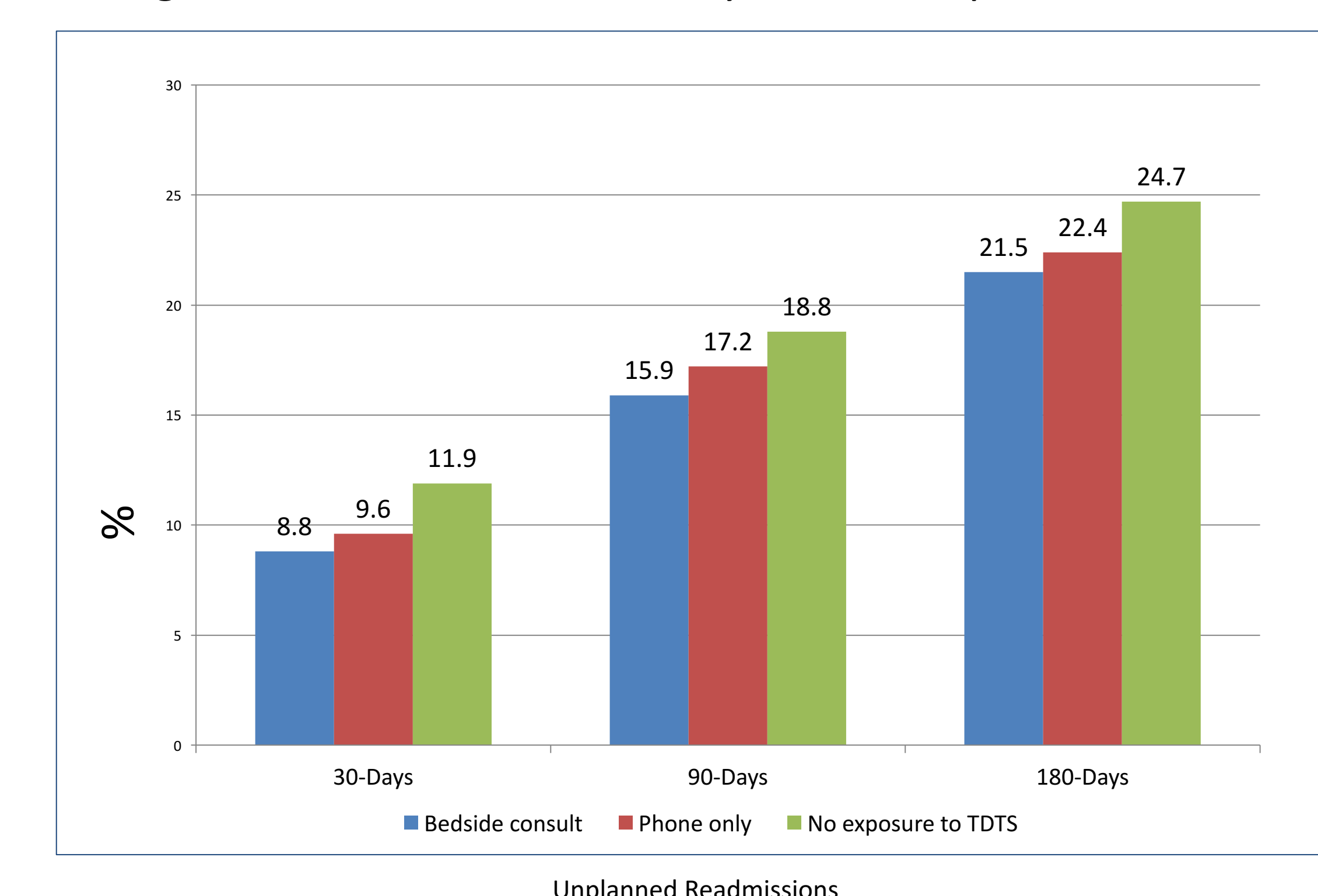


Figure 3: Readmission Rates by Level of Exposure to TDTS



## CONCLUSIONS

- In unadjusted analyses, current smokers had higher rates of unplanned readmissions compared to never smokers, but lower rates compared to former smokers at 30, 90 and 180 days.
- Exposure to the TDTS was associated with a clinically important reductions in unplanned hospital readmissions at 30, 90, and 180 days.
- Next Steps:** Future analyses will seek to confirm these results controlling for potential confounders and compare readmission rates in smokers *before* (2012-2013) and *after* (2014-2015) the TDTS was implemented.