

# Impact of a Personalized Text Messaging ART Adherence Tool for Nonurban Substance Users with HIV

Karen Ingersoll, Rebecca Dillingham, George Reynolds, Jason Freeman, Avi Hosseinbor, Jennifer Hetteema, and Mark Conaway

kareningersoll@virginia.edu



School of Medicine

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**Purpose:** Our aim was to develop and test the impact and feasibility of a personalized, bidirectional text messaging tool for poorly adherent non-urban substance users with HIV.

**Rationale:** ART adherence is lower among nonurban patients who are disproportionately poor, isolated, stigmatized, and lack transportation. Additional challenges to consistent adherence include active substance use and mental disorders. Familiar technology like text messaging could query adherence, substance use, and mood and intervene “just in time” with personalized and tailored (but automated) messages.

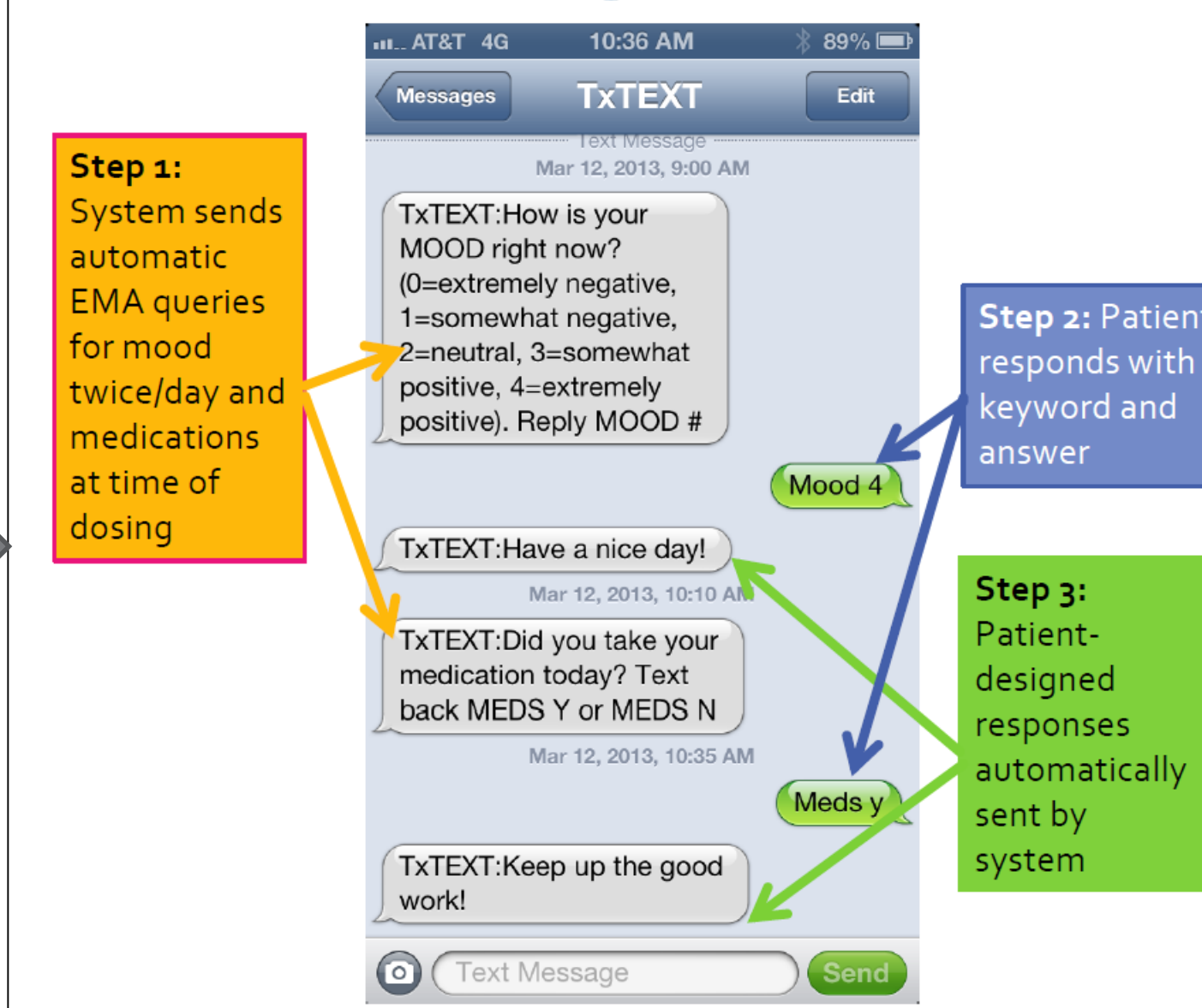
**Intervention:** Treatment Extension by Text (TxText) sent daily ART medication, mood, and substance use queries. Personalized responses were delivered automatically for replies indicating situations of taking medication, not taking medication, avoiding drinking and drug use, engaging in drinking and drug use, positive mood, and negative mood. Participants created a variety of affirming and encouraging messages tailored to each contingency. Some examples of the personalized messages designed by participants were: *Keep your head up, God loves you, Don't forget your grandchildren, Great job!, You need to clear it up, Stay smiling, Be more responsible, Keep up the good work, and Yay!*

**Sample:** Participants were recruited from 2 clinics serving mostly nonurban patients. They were adults prescribed ART who reported substance use in the last 30 days and <95% adherence in the past 14 days. Mean age was 42.4 (SD=10) with mean reading at the 10<sup>th</sup> grade level. There were significant substance use and mental disorders in the sample, with alcohol, cocaine, and marijuana the most commonly abused drugs.

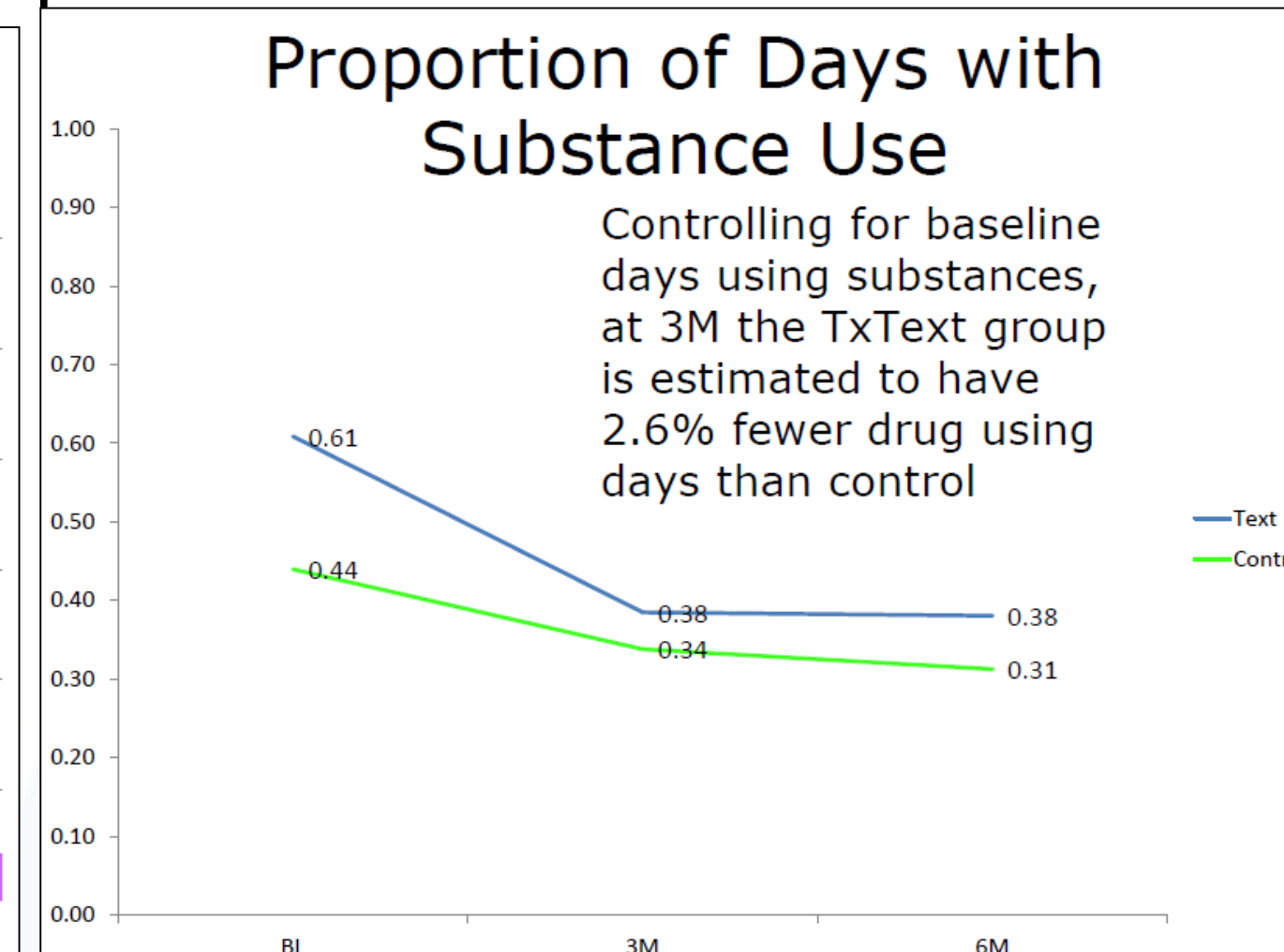
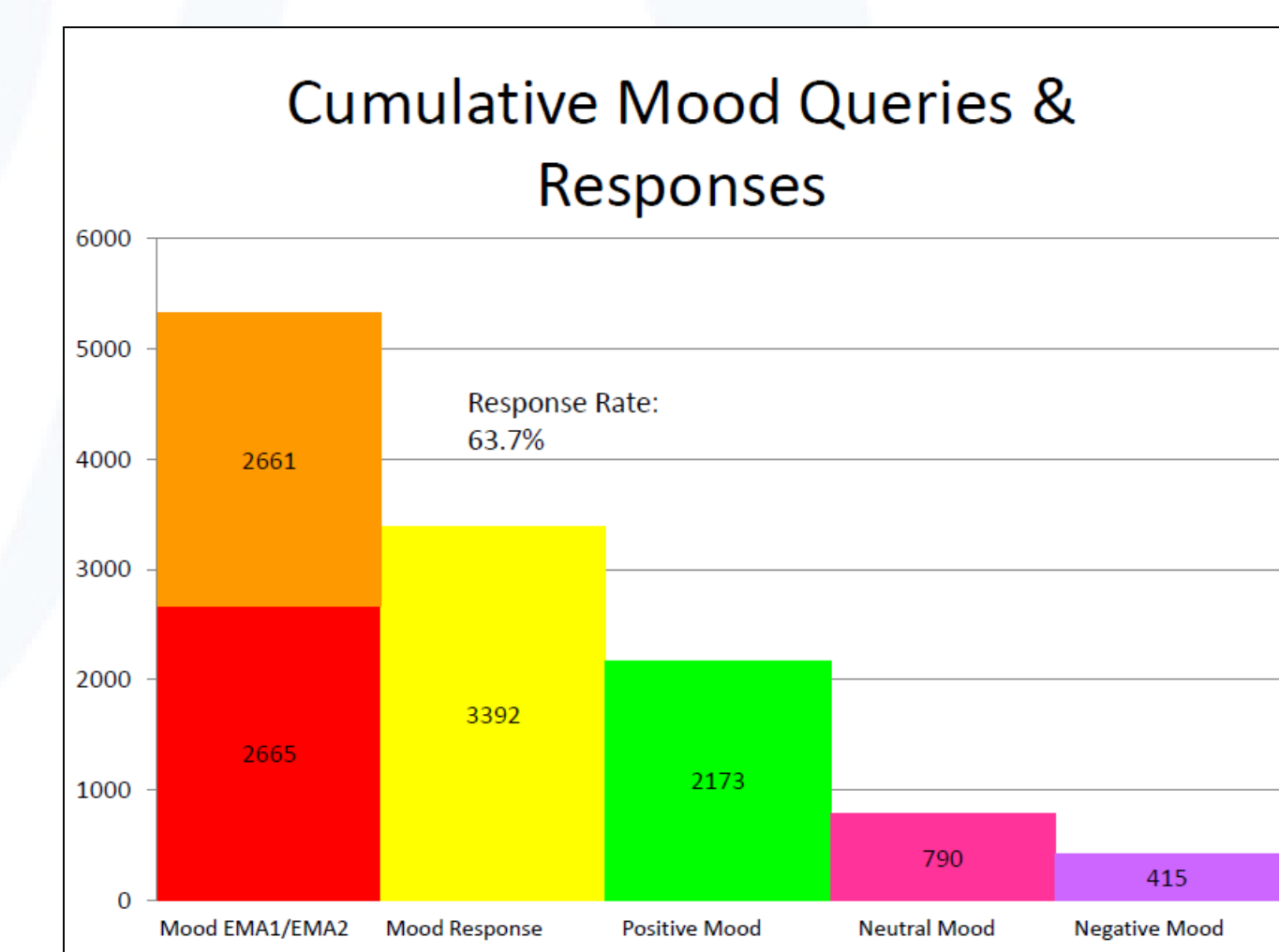
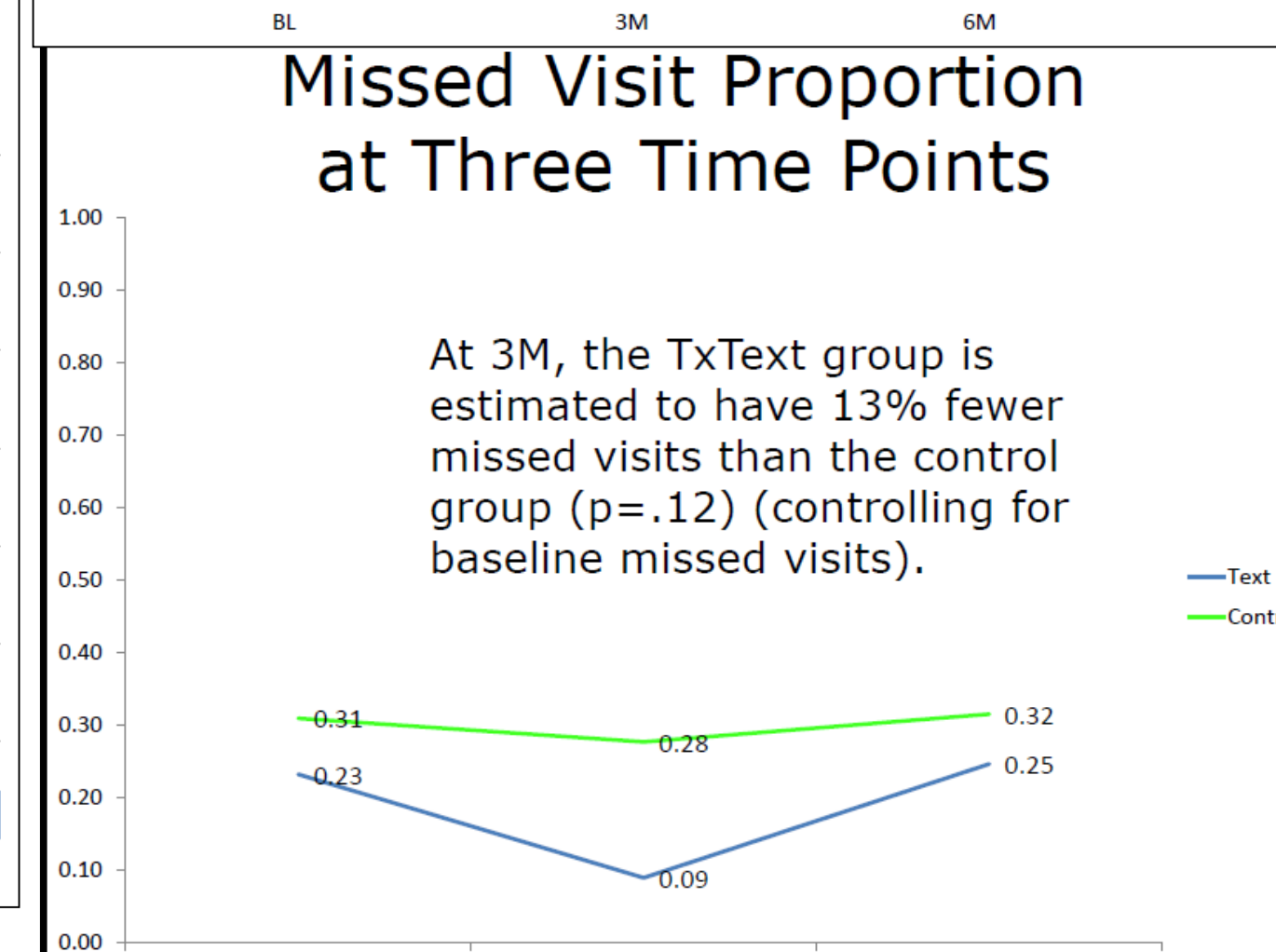
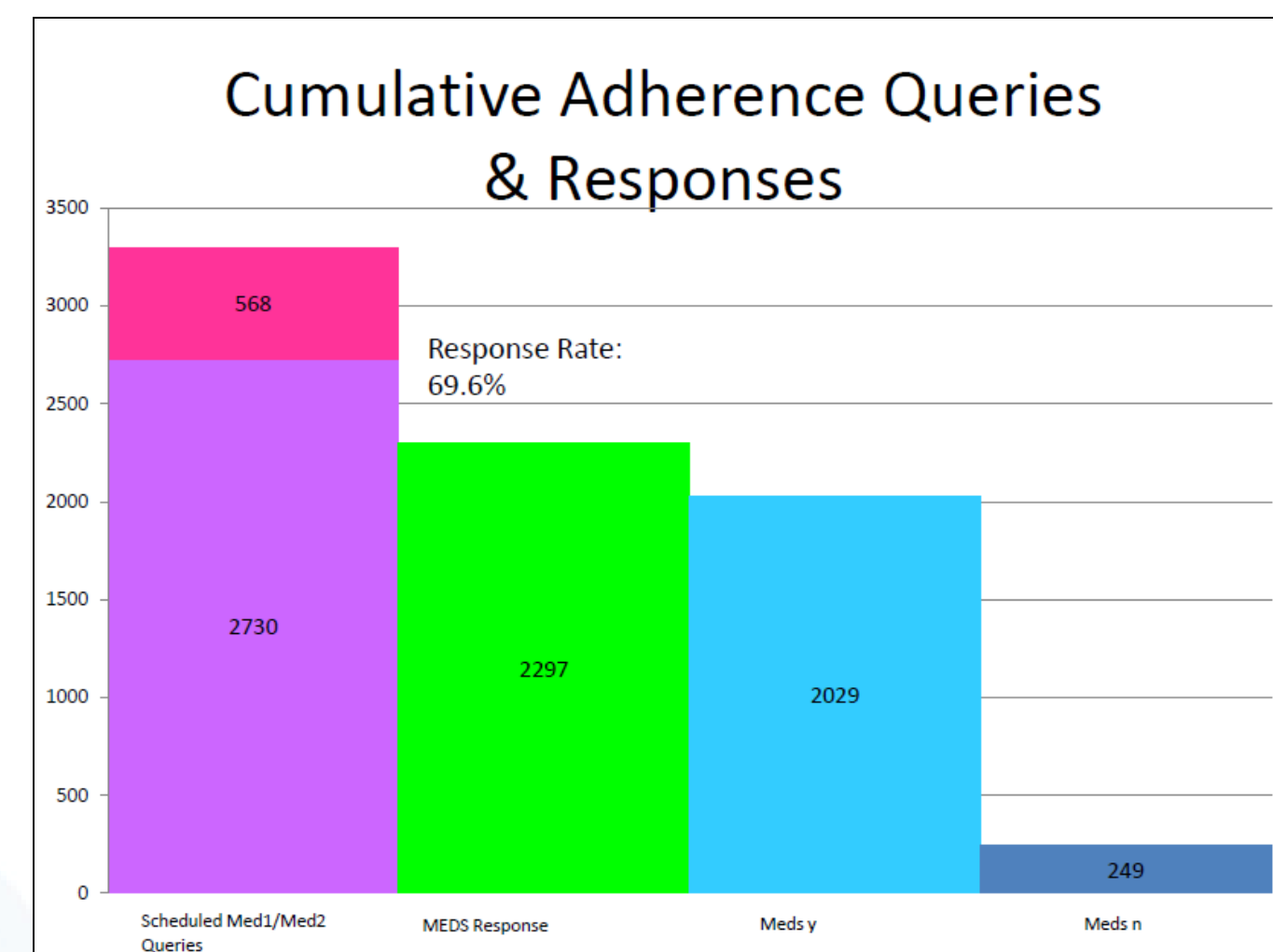
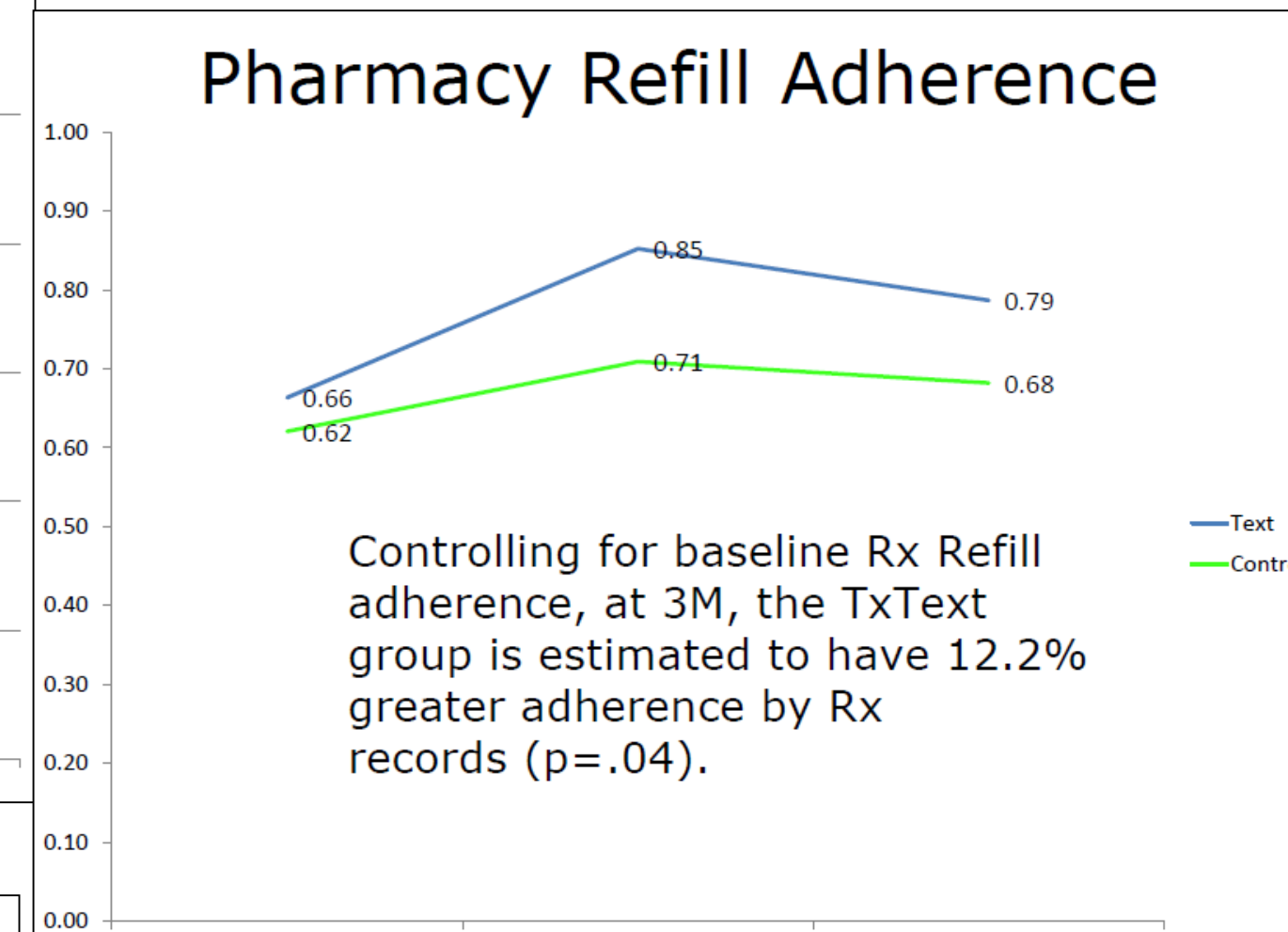
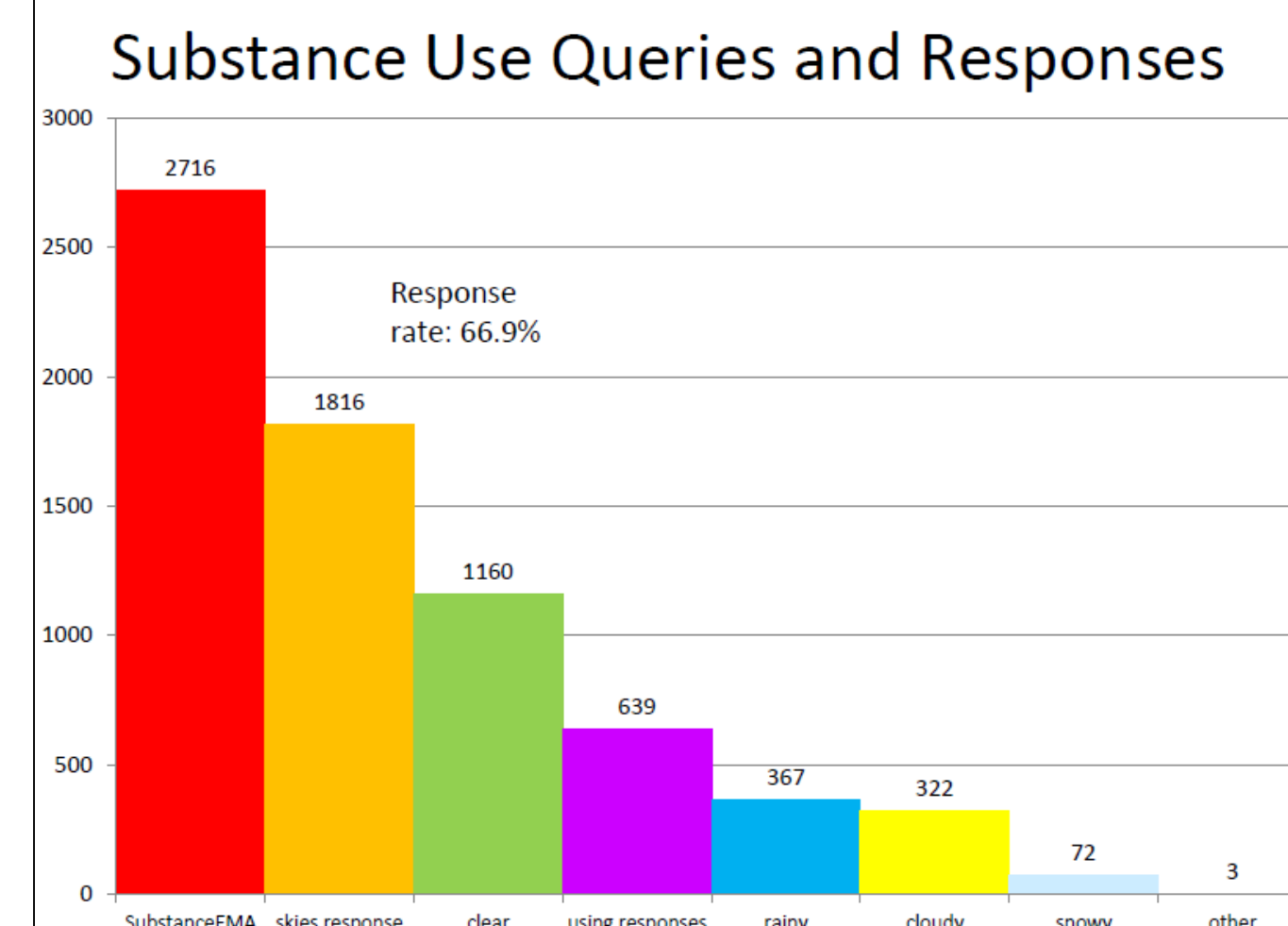
**Methods:** Following baseline assessment, 63 participants were randomized to (TxText, n=33) or treatment as usual (TAU, n=30). TxText participants received a study phone. The intervention was 12 weeks, with 3M and 6M follow-ups. Primary outcomes included pharmacy refill rate, missed visit proportion (MVP), and substance use days on TLFB.

The intervention used queries rather than reminders to elicit active patient responses. Once the patient responded, the tailored personalized message was sent based on whether the response indicated “good” or “bad” recent behavior. This personalized message was conceptualized as the primary intervention.

## Sample Message Flow: Queries



## Results



	Mean	SD	
All participants	42.38	9.96	
Text	42.06	9.08	
Control	42.73	10.99	

	All	Text	Control
Black	41 (65.1%)	23 (69.7%)	18 (60%)
White	18 (28.6%)	9 (27.3%)	9 (30%)
Biracial	3 (4.8%)	1 (3.0%)	2 (6.7%)
Native American	1 (1.6%)	0	1 (3.3%)

	All	Text	Control
Male	38 (60.3%)	19 (57.6%)	19 (63.3%)
Female	23 (36.5%)	13 (39.4%)	10 (33.3%)
Transgender	2 (3.2%)	1 (3.0%)	1 (3.3%)

	All	Text	Control
disabled	27 (42.9%)	17 (51.5%)	10 (33.3%)
unemployed	10 (15.9%)	5 (15.1%)	5 (16.7%)
full time employee	11 (17.5%)	2 (6.1%)	9 (30%)
part time employee	8 (12.7%)	5 (15.1%)	3 (10%)
student	6 (9.5%)	4 (12.1%)	2 (6.7%)
retired	1 (1.6%)	0	1 (3.3%)

	All	Text	Control
less than high school	15 (23.8%)	7 (21.2%)	8 (26.7%)
high school or equivalent	26 (41.3%)	15 (45.5%)	11 (36.7%)
college or more	22 (34.9%)	11 (33.3%)	11 (36.7%)

	All	Text	Control
Major Depression	33 (52.4%)	18 (54.5%)	15 (50%)
Generalized Anxiety Disorder	27 (42.9%)	16 (48.5%)	11 (36.7%)

	All	Text	Control
Alcohol Dependence or Abuse	23 (36.5%)	17 (51.5%)	6 (20%)
Substance Dependence or Abuse	30 (47.6%)	17 (51.5%)	13 (43.3%)

	All	Text	Control
marijuana	17 (56.7%)	12 (70.6%)	5 (38.5%)
cocaine	11 (36.7%)	6 (35.3%)	5 (38.5%)
crystal meth	3 (10%)	1 (5.9%)	2 (15.4%)
heroin	2 (6.7%)	1 (5.9%)	1 (7.7%)
Oxycontin	2 (6.7%)	2 (11.8%)	0

	All	Text	Control
AUDIT Harmful Drinking	31 (49.2%)	20 (60.6%)	11 (36.7%)
AUDIT Likely Alcohol Dependence	17 (27.0%)	14 (42.4%)	3 (10%)
DAST Substance Abuse or Dependence	26 (41.3%)	16 (48.5%)	10 (33.3%)

	All	Text	Control
not applicable (non smoker)	21 (33.3%)	11 (33.3%)	10 (33.3%)
low	12 (19.0%)	5 (15.2%)	7 (23.3%)
medium	15 (23.8%)	8 (24.2%)	7 (23.3%)
high	15 (23.8%)	9 (27.3%)	6 (20%)

**Results:** Sample characteristics are shown above. The sample was nonadherent and using drugs and alcohol frequently. For the full sample at baseline, 6 month pharmacy refill rate was 64%, past 6-months (MVP) was 26.9%, and proportion of 30-day substance use days was 53%.

**Feasibility.** Responses to adherence, substance use and mood queries were high and persisted across the intervention period; rates ranged from 64%-70%.

**Outcomes.** Both groups improved on key outcomes at 3M. MVP data show that the TxText group had 13% fewer missed visits than TAU at 3M, p=.11. Pharmacy refill data show that the TxText group had 12.2% better adherence than TAU at 3M, p=.04. Analyses of substance use days showed a non-significant decrease of 3% of days in the TxText group at 3M compared to TAU. There were no differences between groups at 6M.

**Conclusions:** TxText was feasible and engaging, and participants responded equally frequently to all 3 types of queries. TxText improves adherence, engagement, and substance use post-intervention more than TAU, and these return nearly to baseline levels at 6M, reflecting an intervention effect that fades after it ends. Outcomes indicate a treatment response; TxText merits a fully-powered subsequent trial to confirm results.