Supplementary Equation 1:

$$\log(cough\ episodes/hour) = b_j + \beta_0 + \beta_1 sine\left(\frac{2\pi t}{24}\right) + \beta_2 cosine\left(\frac{2\pi t}{24}\right) + \beta_3 treatment\ day + \varepsilon_{ij}$$

In the equation above, j represents the participant, i represents the day of the recording, and t is the hour of the day.

Supplementary Table 1: Recordings in All Enrolled Participants and in Study Group

	All Enrolled	Study Group
Number of participants evaluated	97	66
Total recordings	1642	1122
Recordings excluded from analysis (%)	685 (42%)	452 (40%)
… recording malfunction	45	36
… recordings with high background noise	485	308
… MP3 to WAV conversion error	18	14
… recordings not checked by nurse	58	38
… recordings started after 24 hours	16	10
… recordings shorter than 1 hour	63	46
Participants with adequate recordings	94	64
Recordings contributing to analysis	957 (936 total days)	670 (661 total days)
Hours contributing to analysis	17,412	12,108

From the 97 enrolled participants in the parent study, there were 3 participants who did not have a single adequate recording during the study period due to high background noise. The 3 excluded comprised of 2 participants (recordings=4) who were drug-susceptible HIV-negative and 1 participant (recordings=4) who was TB-culture negative. Therefore, the number of participants with adequate recordings in all enrolled participants was 97% (94/97), and for the HIV-negative with culture-confirmed drug-susceptible pulmonary TB study group was also 97% (64/66).

Supplementary Table 2: Cough, Culture, and Smear in Participants with Matched Samples in Study Group

| Day of Treatment	Pre-tx	3	7	14	21	30	60
Number of participants evaluated	26	57	52	49	32	30	23
Participants with "no cough" (%)	12%	40%	37%	49%	66%	57%	65%
Participants with culture-positive samples (%)	96%	86%	7.7%	53%	47%	43%	0.0%
Participants with culture-negative samples (%)	0.0%	3.5%	9.6%	37%	28%	50%	96%
Participants with indeterminate culture samples (%)	3.9%	11%	83%	10%	25%	6.7%	4.4%
Participants with smear negative samples (%)	27%	23%	37%	47%	56%	60%	87%
Participants with smear paucibacillary samples (%)	7.7%	7.0%	5.8%	12%	9.4%	10%	4.4%
Participants with smear + samples (%)	31%	21%	21%	25%	22%	20%	8.7%
Participants with smear ++ samples (%)	3.9%	23%	23%	12%	13%	10%	0.0%
Participants with smear +++ samples (%)	31%	26%	13%	4.0%	0.0%	0.0%	0.0%
Median cough frequency in participants	2.3	0.83	0.66	0.43	0.088	0.24	0.18
Median cough frequency in culture-positive participants	2.4	1.0	0.67	0.96	0.53	0.47	-*
Cough >0.7 in culture-positive participants (%)	92%	63%	65%	65%	53%	62%	-*
Median TTP in participants	6.0	10	11	11	12	14	-*
Median TTP in participants with "no cough"	5.5	9.5	12	13	14	17	-*
Median TTP in participants with cough >0.7	6.0	10	11	10	11	12	-*
Median log$_{10}$CFU in participants	4.1	3.5	3.3	3.3	3.2	2.9	-*
Median log$_{10}$CFU in participants with "no cough"	4.2	3.6	3.2	3.0	2.9	2.4	-*
Median log$_{10}$CFU in participants with cough >0.7	4.1	3.5	3.3	3.5	3.4	3.2	-*

Only participants with both cough and sputum data on a given day were included. "No cough" was defined as ≤0.7 cough events per hour. Cough frequency is based on cough episodes per hour. Estimated-CFU counts over time, based on our equation log$_{10}$CFU = 5.1 − (0.16×TTP), so only included positive cultures. No culture positive samples were found at day 60. -* represents no observations. All values rounded to two significant figures.

Supplementary Table 3: Correlation Between Short Recordings and 24-Hour Recordings in Study Group

| Time Interval | Observation | Discovery Set (n = 178) | | Validation Set (n = 89) | |
		Window	Spearman's ρ (se)	Spearman's ρ (se)	ICC
2 hours	Best	2 p.m. – 4 p.m.	0.79 (0.05)	0.73 (0.07)	0.60
2 hours	Worst	11 p.m. - 1 a.m.	0.44 (0.07)	0.35 (0.10)	0.14
4 hours	Best	2 p.m. - 6 p.m.	0.86 (0.04)	0.86 (0.06)	0.67
4 hours	Afternoon	12 p.m. - 4 p.m.	0.84 (0.04)	0.85 (0.06)	0.75
4 hours	Morning	9 a.m. - 1 p.m.	0.77 (0.05)	0.83 (0.06)	0.66
4 hours	Worst	10 p.m. - 2 a.m.	0.54 (0.06)	0.41 (0.10)	0.27
8 hours	Best	12 p.m. - 8 p.m.	0.92 (0.03)	0.93 (0.04)	0.84
8 hours	Working*	9 a.m. - 5 p.m.	0.89 (0.04)	0.91 (0.04)	0.84
8 hours	Worst	10 p.m. - 6 a.m.	0.76 (0.05)	0.67 (0.08)	0.79
12 hours	Best	11 a.m. - 11 p.m.	0.95 (0.02)	0.93 (0.04)	0.90
12 hours	Worst	6 p.m. - 6 a.m.	0.88 (0.04)	0.83 (0.06)	0.86

Correlation (Spearman's rho and standard error) and intra-class correlation coefficient (ICC) between cough as recorded over 2-12 hour windows, versus 24-hour cough. All cough recordings that were complete to within 23.5 hours were included. Working* represents standard working hours (9 a.m. – 5 p.m.).

Supplementary Figure 1: Daytime and Nighttime Cough Frequency in Study Group
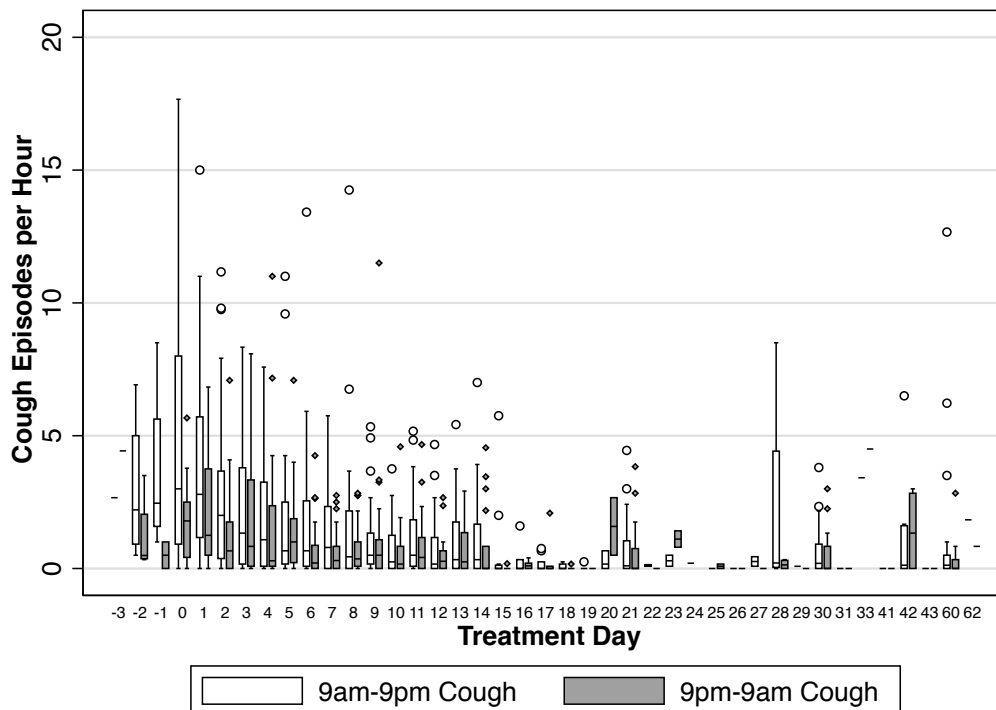
Supplemental Figure 1 shows daytime and nighttime cough frequency based on 12-hour intervals (9 a.m. – 9 p.m. and 9 p.m. – 9 a.m.); from 3 days prior to treatment until treatment day 62 (study period).

Supplementary Figure 2: Cough Frequency, Time to Positivity and Estimated-CFU by Days of Treatment in Study Group
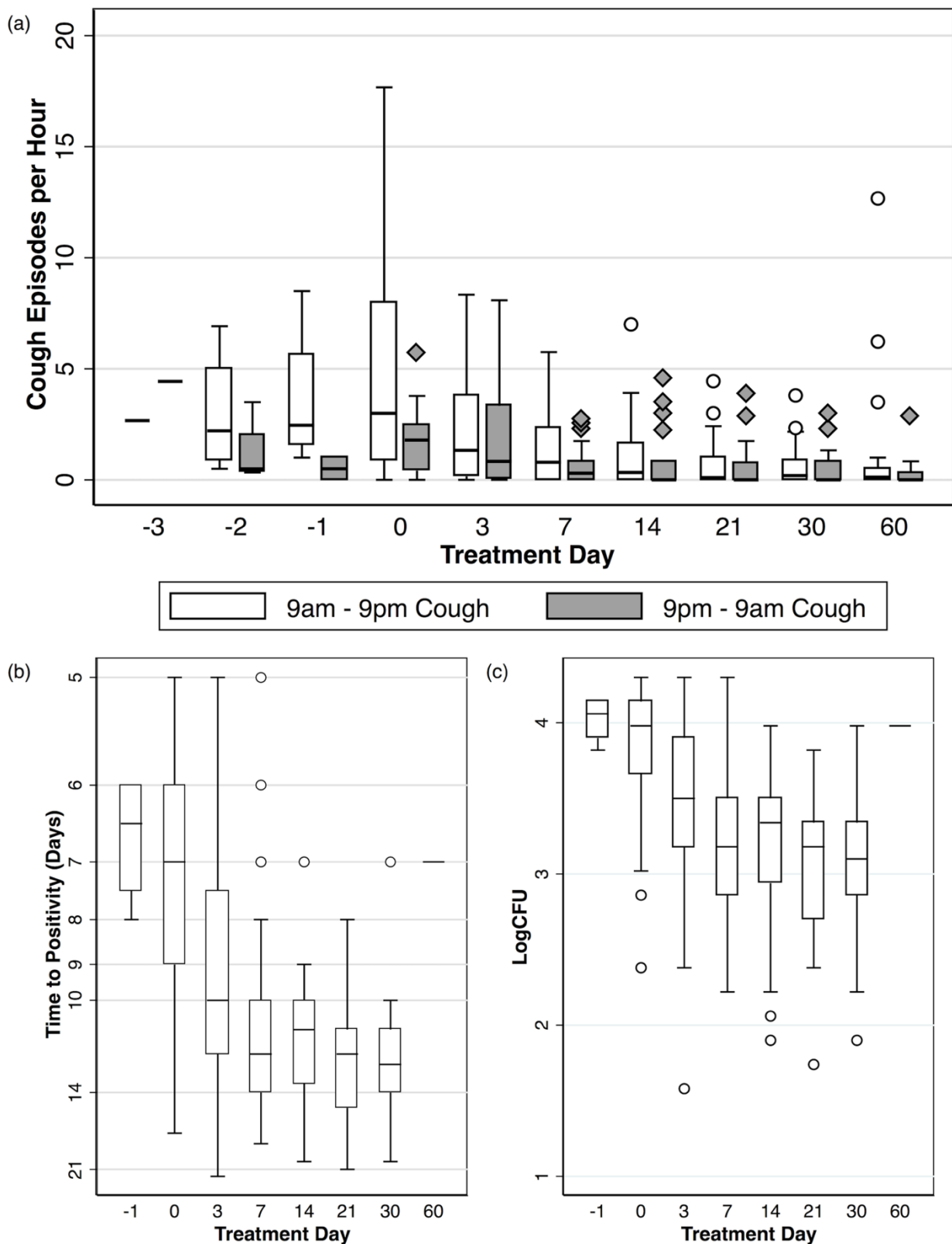

Supplementary Figure 2(a) shows daytime and nighttime cough frequency based on 12-hour intervals (9 a.m. – 9 p.m. and 9 p.m.–9 a.m.); this is only graphed for days on which sputum samples were collected.

Supplementary Figure 2(b) shows changes in time to positivity (TTP) at these same time points: the actual days to positivity are presented in an inverse scale (1/TTP). This represents longer time to positivity as treatment continues.

Supplementary Figure 2(c) shows estimated-CFU counts over time, based on our equation $\log_{10}CFU = 5.1 - (0.16 \times TTP)$, so only included positive cultures.

Supplementary Figure 3: Box Plot of Time to Positivity and Estimated-CFU by Smear Results in Pre-Treatment Samples from Study Group
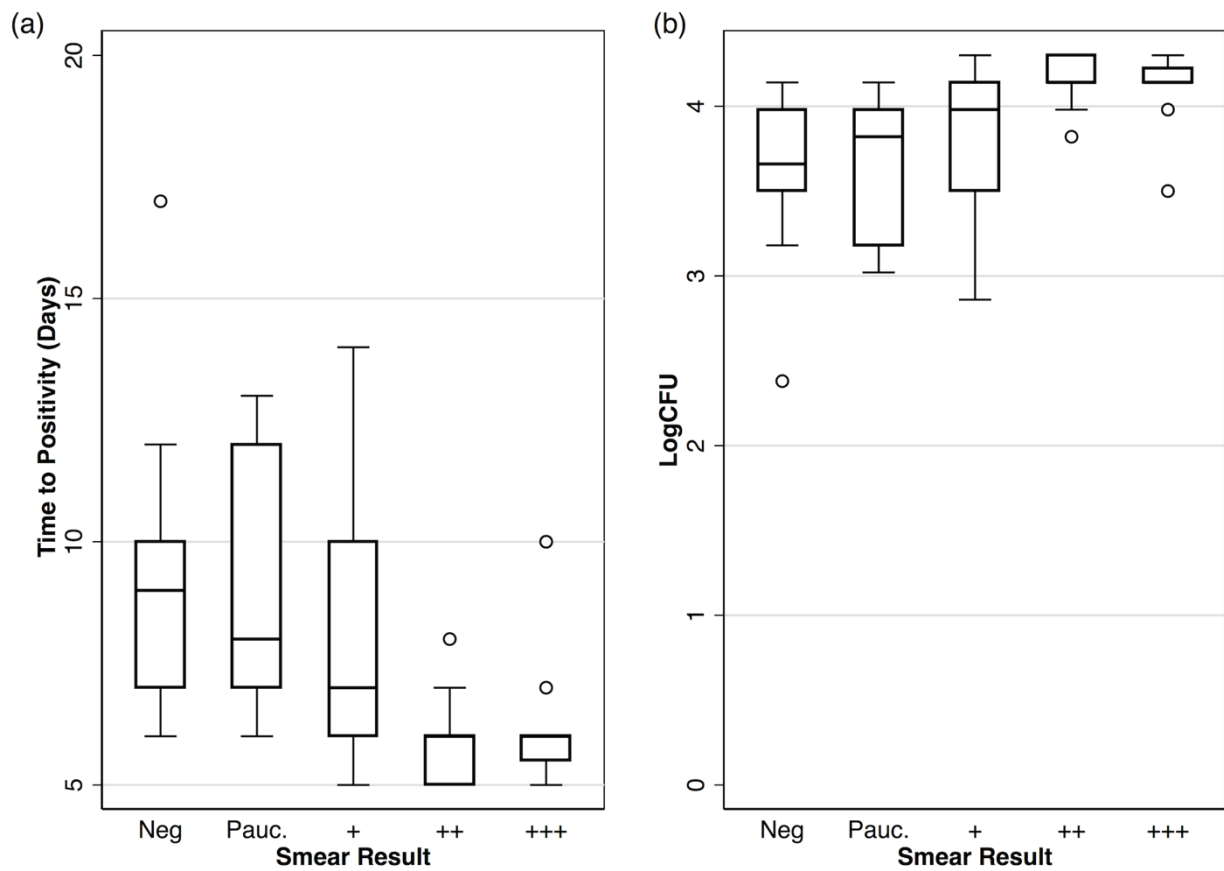
Supplementary Figure 3(a) shows a boxplot between time to positivity (TTP) by smear results in all culture-positive pre-treatment sputum samples. The correlation between TTP and smear had a Spearman rho of -0.53, and a p<0.001. **Supplementary Figure 3(b)** shows a boxplot between estimated-CFU counts by smear results in all culture-positive pre-treatment sputum samples. Estimated-CFU counts were obtained by the equation $\log_{10}CFU = 5.1 - (0.16 \times TTP)$. The correlation between estimated-CFU and smear had a Spearman rho of 0.53, and p<0.001.