## Supplemental Materials

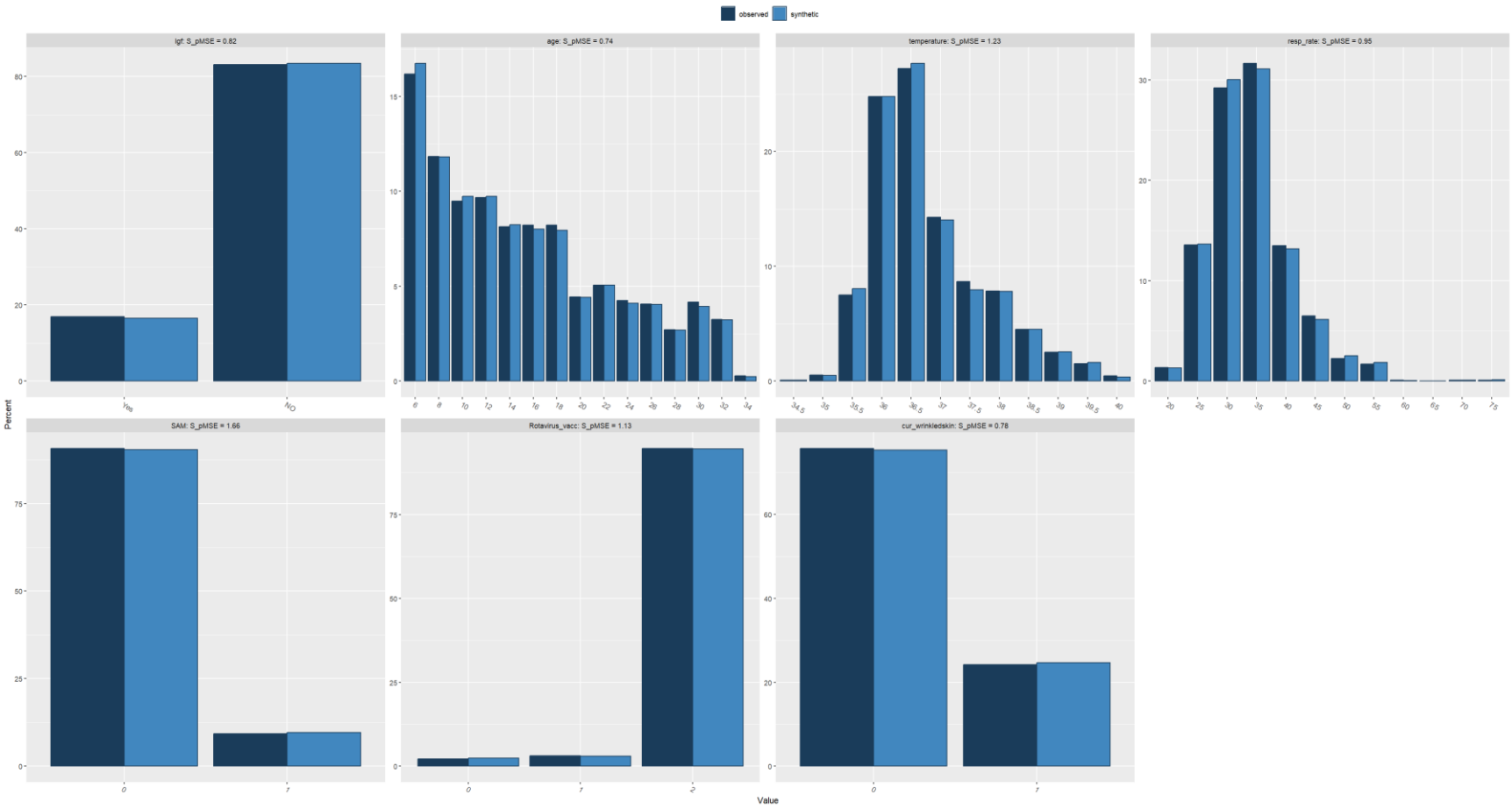
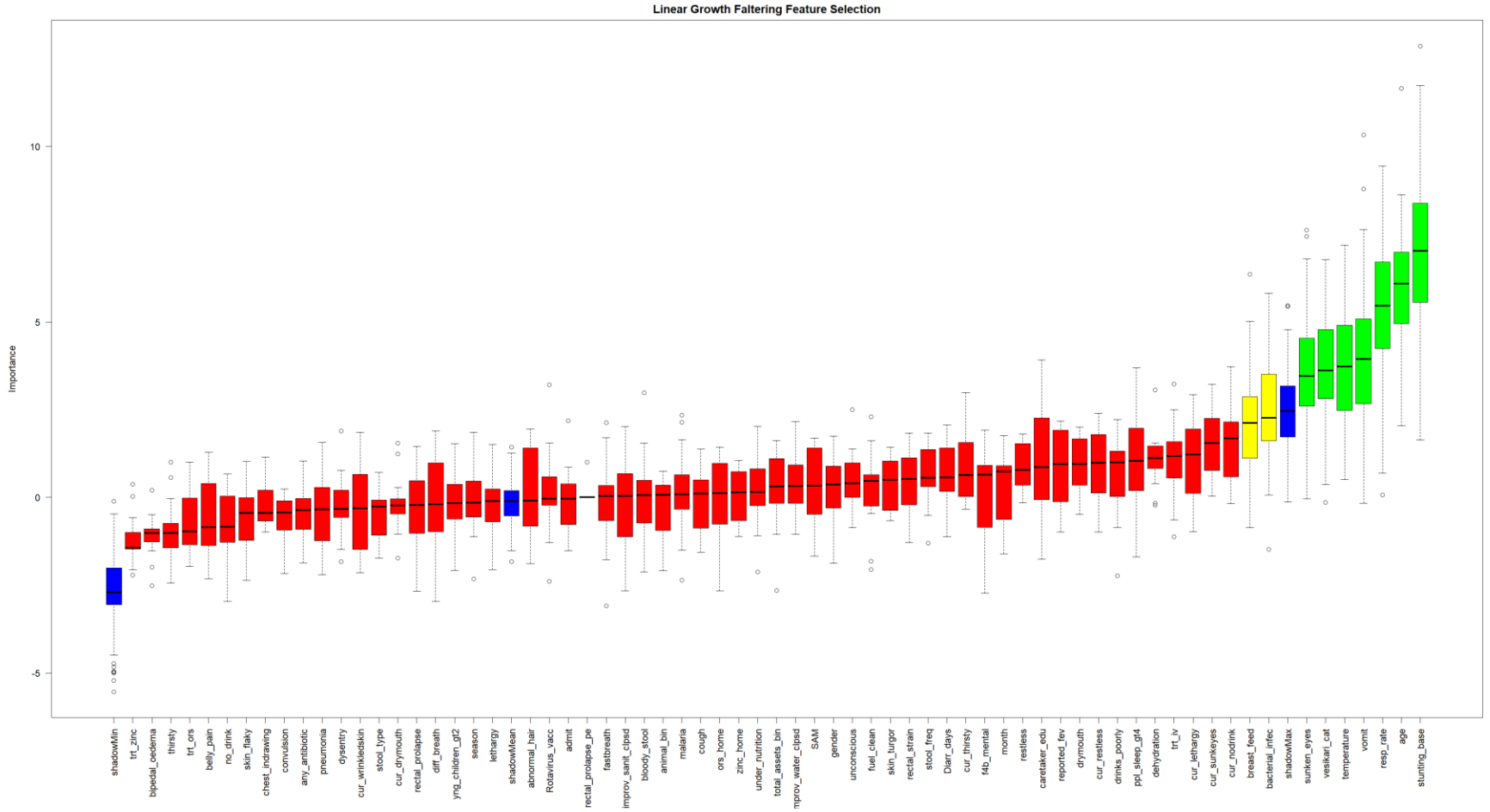
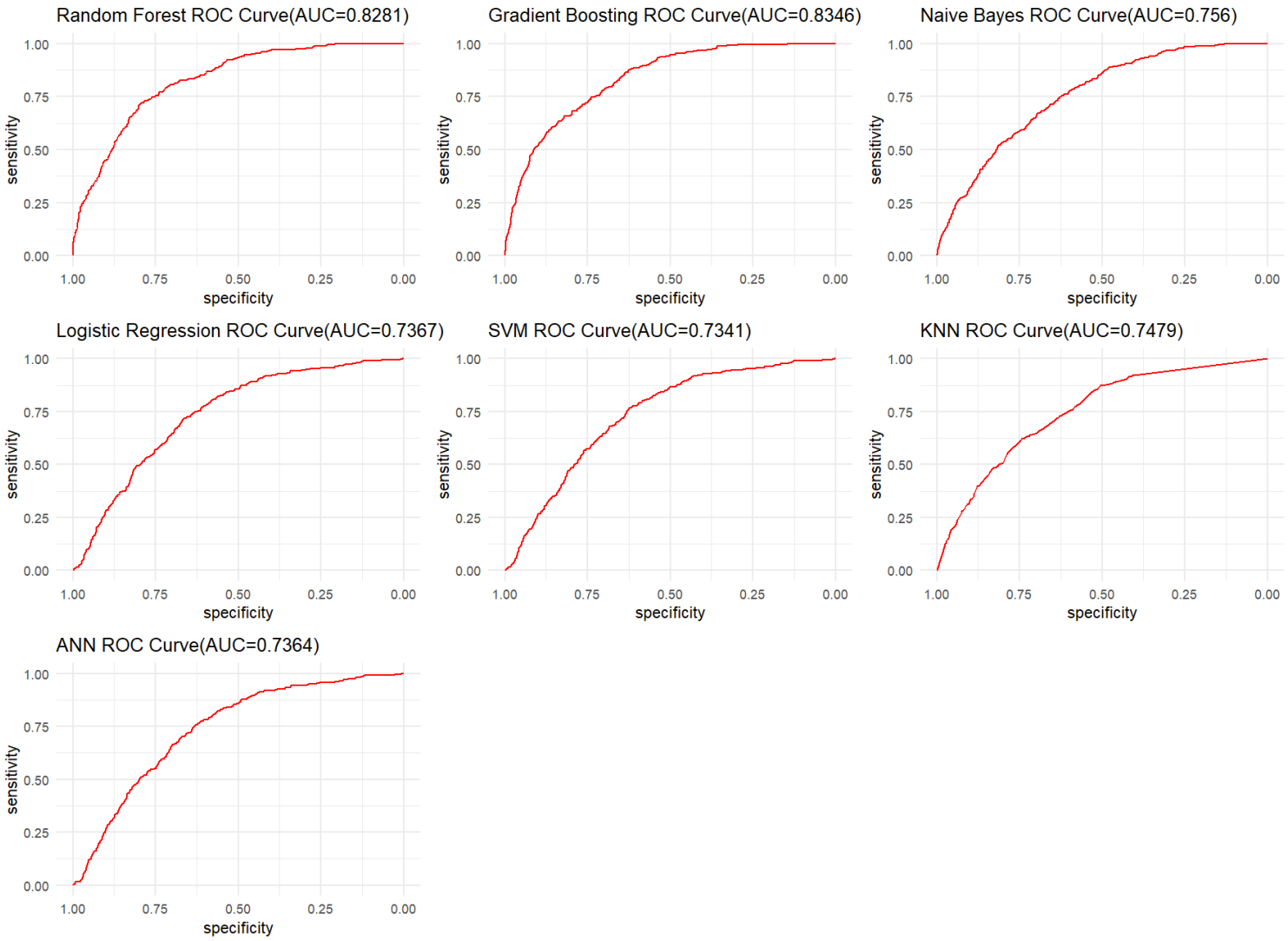



Figure S1. Histogram comparison for each predictor variable comparing the aggregate demographic characteristics of the original training dataset (n = 1,473) against synthetic dataset (n = 8,894).




Green, yellow, red and blue boxplots represent the Z scores of confirmed, tentative, rejected and shadow features, respectively.
Confirmed and tentative features: *stunting at baseline;age; respiratory rate; vomit;temperature; vesikari_cat; sunken eyes; bacterial infection; breastfeeding.*

Figure S2. Feature selection for linear growth faltering (delta_haz/month) among children aged < 5 years presenting with moderate to severe diarrhea in rural western Kenya, 2015-2018




*RF-Random Forest; GBM-Gradient Boosting; NB- Naïve Bayes; LR-Logistic Regression; SVM- Support vector machine; KNN-K-nearest neighbors; ANN-Artificial Neural Networks; ROC-Receiver operating characteristic curve; AUC-Area under the curve

Figure S3. Receiver operating characteristic curve for linear growth faltering prediction models

Table S1. Statistical analysis comparing synthetic data tables to the original training dataset (n = 8,894)

| | **Snythetic Data** | |
|---|---|---|
| | **n=8,894** | |
| **Variables** | **pMSE** | **S_pMSE** |
| lgf | 0.0000010 | 0.820503 |
| age | 0.0000030 | 0.743468 |
| temperature | 0.0000050 | 1.228149 |
| resp_rate | 0.0000040 | 0.947305 |
| SAM | 0.0000020 | 1.659631 |
| Rotavirus_vacc | 0.0000020 | 1.131343 |
| cur_wrinkledskin | 0.0000010 | 0.779434 |

pMSE- propensity score mean-squared-error; S_pMSE- standardized ration of propensity score mean-squared error.

Table S2. Model performance of linear growth faltering$^{\beta}$ prediction models using combined data

| Algorithm | Sensitivity % [95% CI] | Specificity % [95% CI] | PPV % [95% CI] | NPV % [95% CI] | F1-Score [95% CI] | AUC % [95% CI] | PRAUC % [95% CI] |
|---|---|---|---|---|---|---|---|
| RF | 73.1 [71.1-75.1] | 76.6 [73.1-79.9] | 90.5 [88.9-91.9] | 48.5 [45.3-51.6] | 80.9 [65.2-97.0] | 82.4 [80.5-84.2] | 62.6 [59.4-65.8] |
| GBM | 71.2 [69.0-73.2] | 72.4 [68.7-75.9] | 88.7 [87.0-90.2] | 45.3 [42.2-48.5] | 80.4 [76.6-96.4] | 78.0 [76.0-80.1] | 53.0 [50.2-55.5] |
| NB | 66.0 [63.9-68.2] | 53.2 [49.2-57.2] | 81.1 [79.0-83.0] | 34.1 [31.1-37.2] | 72.8 [58.3-85.8] | 62.2 [59.7-64.7] | 34.3 [32.8-36.6] |
| LR | 56.9 [54.7-59.2] | 54.0 [50.0-58.0] | 79.0 [76.7-81.1] | 29.3 [26.7-32.0] | 64.9 [50.1-89.9] | 56.9 [54.3-59.5] | 29.0 [26.5-31.9] |
| SVM | 58.5 [56.3-60.8] | 60.0 [56.0-63.9] | 81.6 [79.4-83.6] | 32.3 [29.6-35.1] | 68.2 [62.2-94.3] | 62.9 [60.4-65.4] | 35.6 [32.3-39.0] |
| KNN | 65.0 [62.8-67.1] | 73.7 [70.1-77.1] | 88.2 [86.4-89.9] | 41.0 [38.1-43.9] | 74.8 [59.9-97.0] | 77.3 [75.2-79.4] | 54.0 [51.2-57.3] |
| ANN | 45.8 [43.6-48.1] | 65.8 [61.9-69.5] | 80.2 [77.7-82.6] | 28.6 [26.3-31.0] | 58.3 [43.6-85.4] | 58.0 [55.5-60.6] | 31.0 [29.1-32.8] |

$^{\beta}$- Linear growth faltering defined as negative change in linear growth

*RF-Random Forest; GBM-Gradient Boosting; NB- Naïve Bayes; LR-Logistic Regression; SVM- Support vector machine; KNN-K-nearest neighbors; ANN-Artificial Neural Networks; 95% CI- 95% Confidence Interval; PPV- Positive Predictive Value; NPV- Negative Predictive Value; AUC- Area under the Curve; PRAUC- Precision Recall Area under the Curve