

Supplementary materials

Table S1. ARDL Model Coefficients for Predicting Dengue Onset

Predictor	Estimate	Std. Error	t Value	p Value	Significance
Intercept	-38.48169	36.91063	-1.043	0.2982	
Lag 4 Onset	0.78552	0.03785	20.753	< 0.0001	***
Lag 5 Temperature	2.20021	1.03258	2.131	0.0341	*
Lag 8 Humidity	-0.21996	0.19690	-1.117	0.2650	
Lag 2 Rainfall	0.02130	0.01810	1.177	0.2404	
Intercept	-38.48169	36.91063	-1.043	0.2982	

Significant codes: 0 ‘***’, 0.001 ‘**’, 0.01 ‘*’ 0.05 ‘.’

Table S2. Durbin-Watson Test Results

Statistic	Value
Durbin-Watson (DW)	1.1877
p-value	0.0000000000172

Table S3. SVM Model Parameters and Summary

Parameter	Value
SVM type	Eps-regression
SVM Kernel	Radial
Cost	1
Gamma	1
Epsilon	0.1
Number of support vector	225

Table S4. Comparison of Actual, ARDL Forecasted, and Hybrid Forecasted Values (ARDL-SVM) for 2024

Forecast Period (2024)	Actual	ARDL forecasted	Hybrid forecasted (ARDL-SVM)
Week 1	30	216	75
Week 2	17	329	50
Week 3	34	512	60
Week 4	43	846	59
Week 5	48	1443	67
Week 6	49	2365	45

Week 7	30	3982	44
Week 8	26	6726	47
Week 9	32	11364	42
Week 10	27	19158	59
Week 11	25	32349	39
Week 12	13	54632	40

Table S5. Metrics for ARDL and Hybrid (ARDL-SVM) Forecasted Values

Accuracy Metrics	ARDL forecasted	Hybrid forecasted (ARDL-SVM)
MSE	382609078	588
RMSE	19560	24

Table S6. Importance Weights of Intervention Variables Based on Random Forest Results

Variable	Importance Weight
SRT	0.242
PTP	0.356
LC	0.252
ULV	0.149

Table S7. Multiple R-squared Value Comparison Between Original Model and Sensitivity Analysis Model

Model	Multiple R-squared Value
Original Model	0.6741
Sensitivity Analysis Model	0.6754

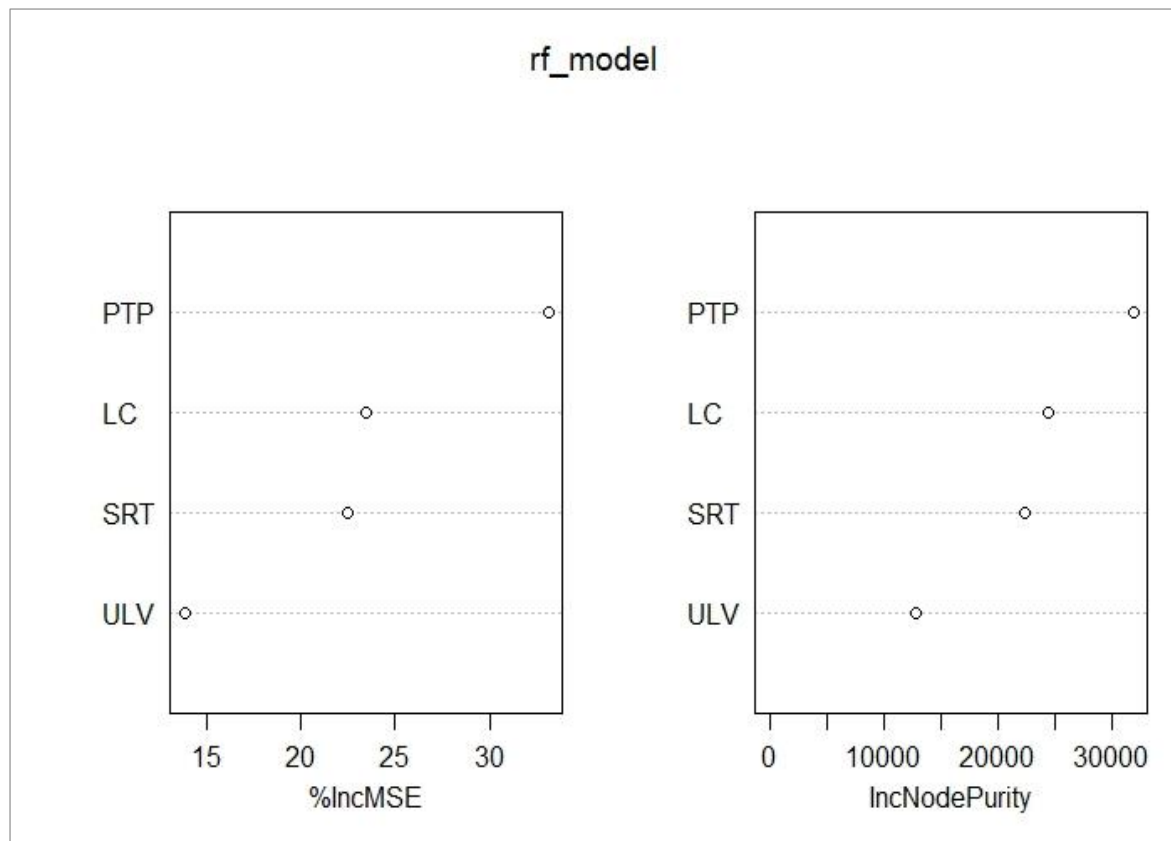


Figure S1. Variable Importance of Intervention Variables (PTP, LC, SRT, ULV) Based on Random Forest Model Using %IncMSE and IncNodePurity Metrics

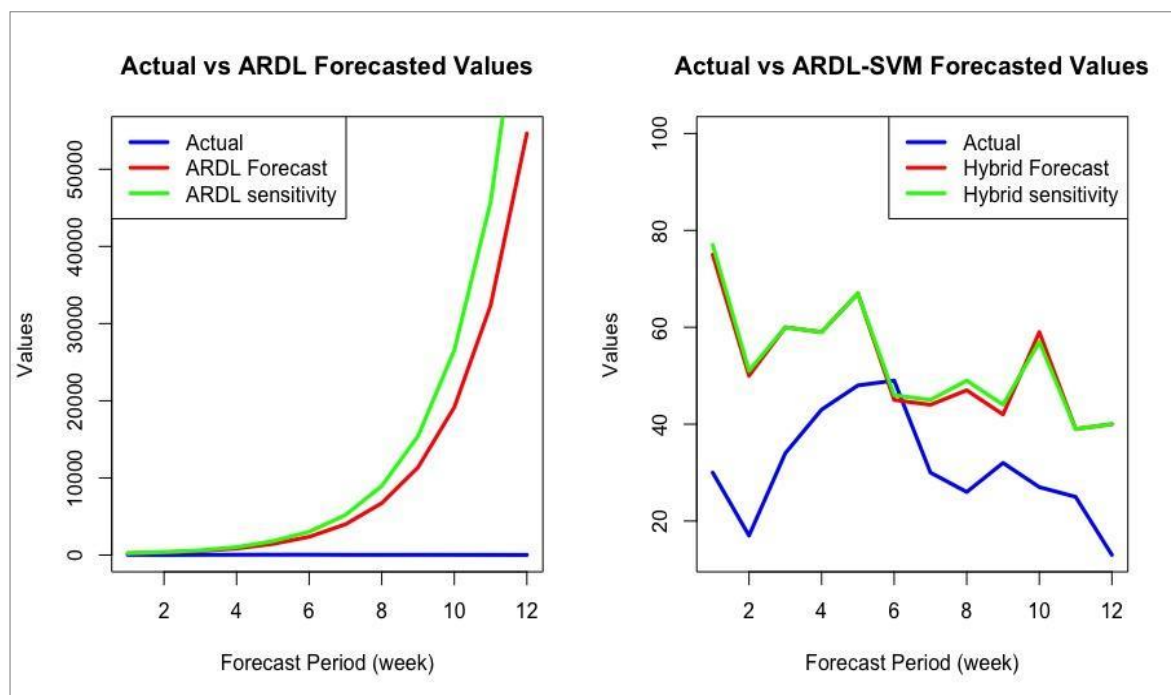


Figure S2. Comparison of Original ARDL and Hybrid Forecasting Performance and Sensitivity Analysis ARDL and Hybrid Forecasting Performance with Actual Dengue Onset