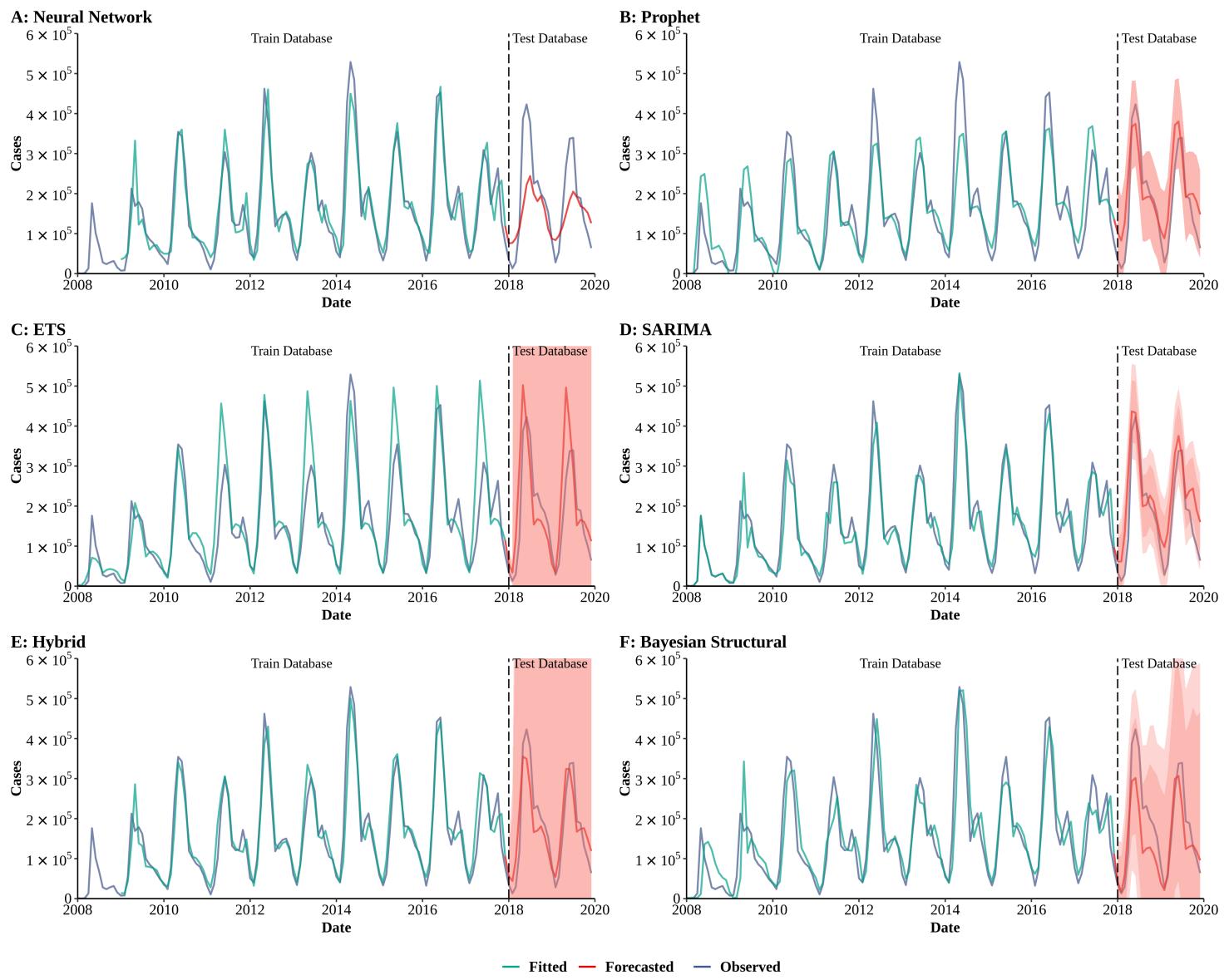


Supplementary Appendix 1:

Temporal trends and shifts of 24 notifiable infectious diseases in China before and after the COVID-19 epidemic



G : RMSE of Models

Method	Train	Test	All
Neural Network	42053.53	89656.49	53930.14
Prophet	55051.71	64877.15	56807.42
ETS	65089.89	83073.19	68416.16
SARIMA	39119.27	66383.62	44830.00
Hybrid*	36939.57	52331.97	40179.21
Bayesian Structural	55741.00	69492.32	58258.73

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	24.94	45.08	28.60
Prophet	37.51	43.26	38.47
ETS	28.97	40.57	30.90
SARIMA	19.86	42.93	23.70
Hybrid*	18.64	35.81	21.76
Bayesian Structural	34.94	36.02	35.12

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.49	2.74	0.66
Prophet	0.65	1.09	0.84
ETS	0.67	0.79	0.65
SARIMA	0.49	0.97	0.57
Hybrid*	0.41	0.92	0.51
Bayesian Structural	0.68	1.13	0.80

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

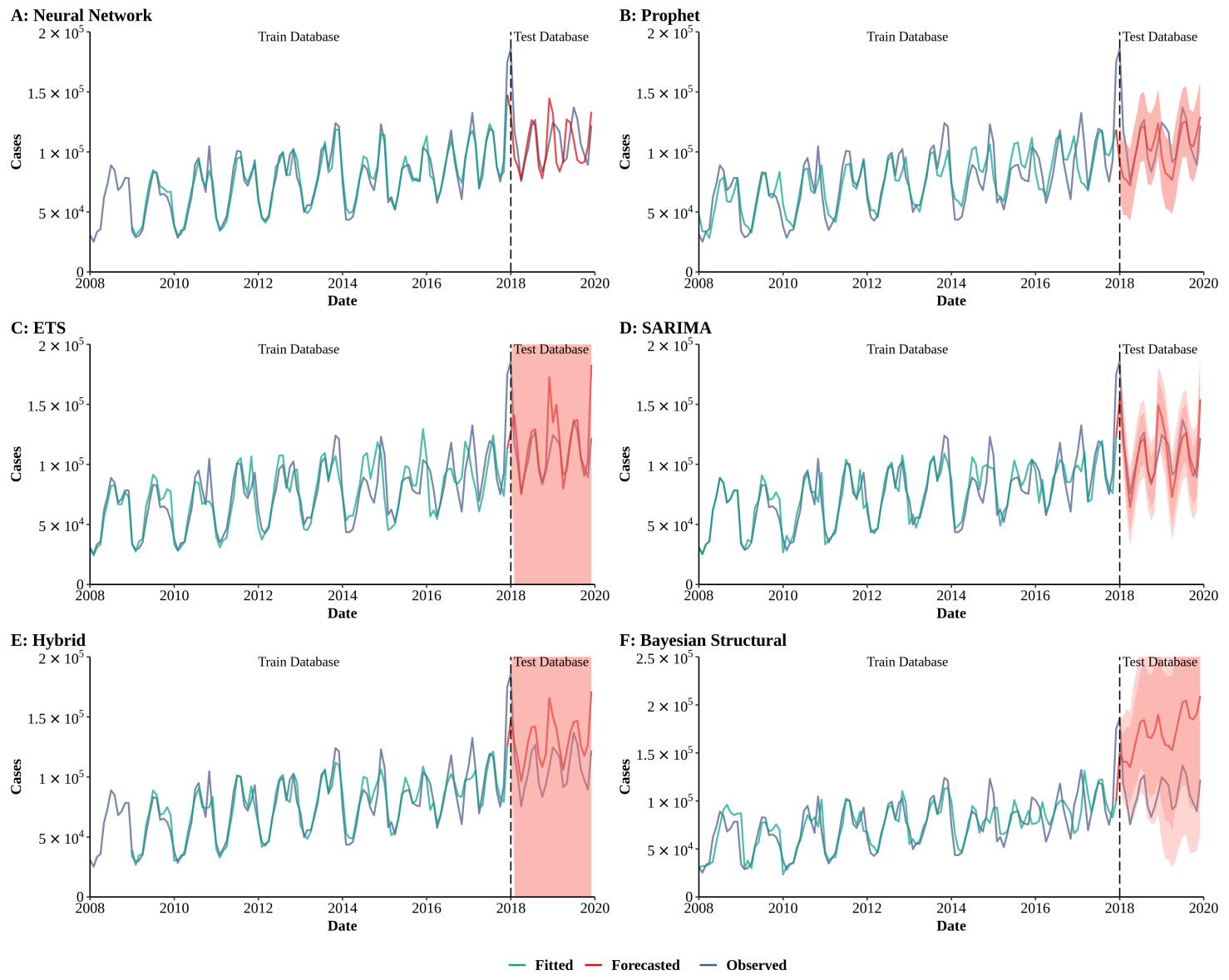
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.87	0.72	0.79
Prophet	0.78	0.79	0.77
ETS	0.75	0.66	0.74
SARIMA	0.89	0.84	0.86
Hybrid*	0.90	0.84	0.88
Bayesian Structural	0.77	0.79	0.76

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 1. Training and comparing variant time series models for hand, foot, and mouth disease (HFMD).

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	6878.69	21108.09	10941.79
Prophet	15061.20	26531.66	17502.99
ETS	14893.12	23846.02	16721.53
SARIMA	12208.94	14963.83	12709.62
Hybrid*	10438.18	26264.10	14648.01
Bayesian Structural	16864.37	67118.38	31429.58

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	6.71	14.15	8.07
Prophet	15.13	16.02	15.28
ETS	13.51	11.11	13.11
SARIMA	10.65	9.44	10.45
Hybrid*	9.39	19.58	11.25
Bayesian Structural	15.04	46.05	20.21

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.38	0.91	0.51
Prophet	0.76	1.56	1.05
ETS	0.72	0.57	0.73
SARIMA	0.59	0.52	0.57
Hybrid*	0.49	1.46	0.77
Bayesian Structural	0.78	6.17	1.67

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

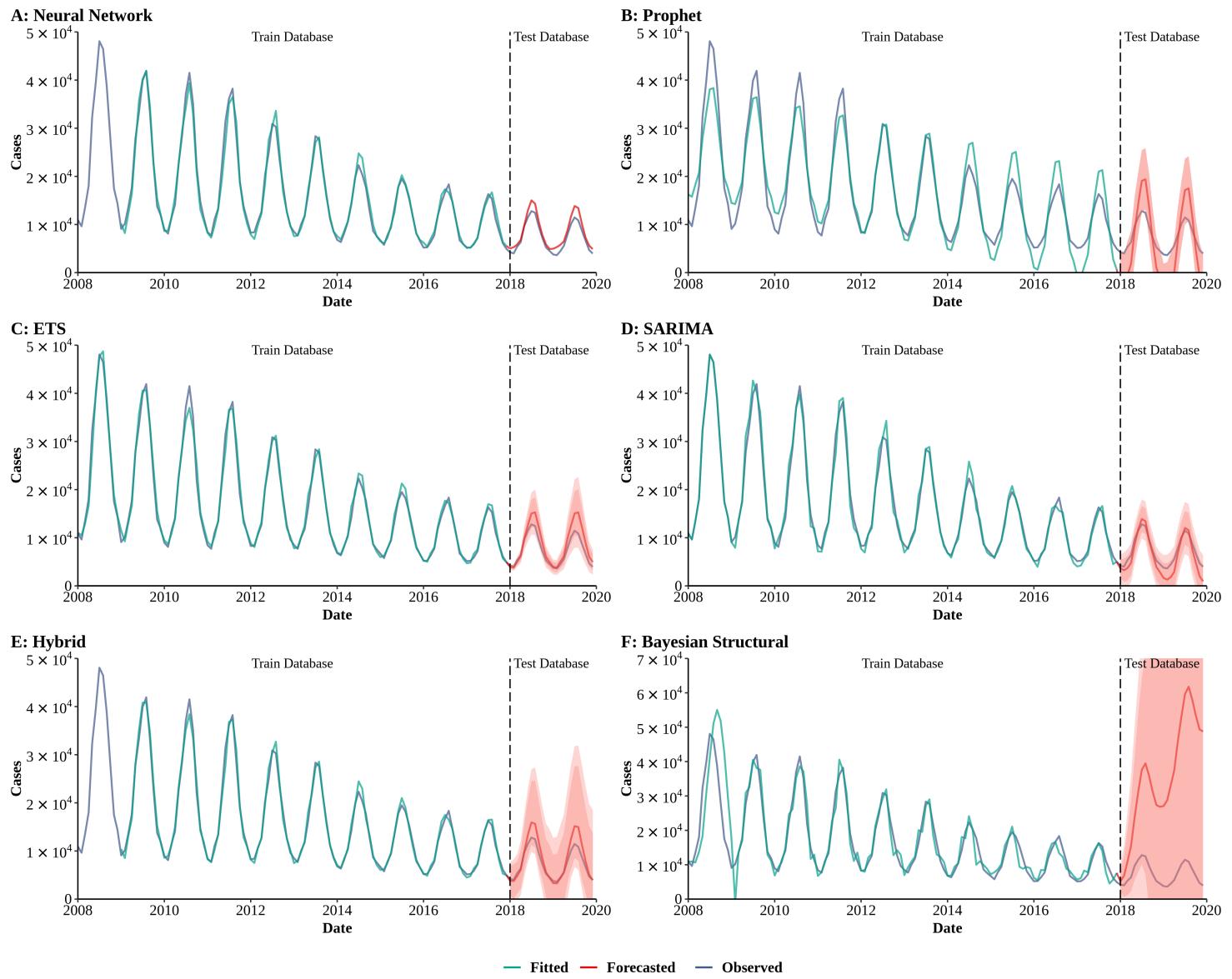
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.93	0.28	0.85
Prophet	0.67	0.05	0.63
ETS	0.69	0.35	0.70
SARIMA	0.78	0.64	0.80
Hybrid*	0.84	0.46	0.78
Bayesian Structural	0.59	0.03	0.51

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 2. Training and comparing variant time series models for infectious diarrhea.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	1263.87	1314.14	1273.16
Prophet	3405.83	5430.37	3818.54
ETS	1233.00	1916.84	1370.87
SARIMA	1348.29	1603.30	1394.03
Hybrid*	1069.45	1800.21	1234.91
Bayesian Structural	4869.63	31686.99	13678.65

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.92	15.53	7.67
Prophet	25.48	108.03	39.24
ETS	5.33	15.90	7.09
SARIMA	6.67	33.90	11.21
Hybrid*	5.13	13.04	6.57
Bayesian Structural	17.69	121.62	35.02

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.24	0.69	0.28
Prophet	0.68	1.26	0.79
ETS	0.22	0.74	0.27
SARIMA	0.22	0.69	0.27
Hybrid*	0.21	0.61	0.26
Bayesian Structural	0.71	6.79	1.61

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

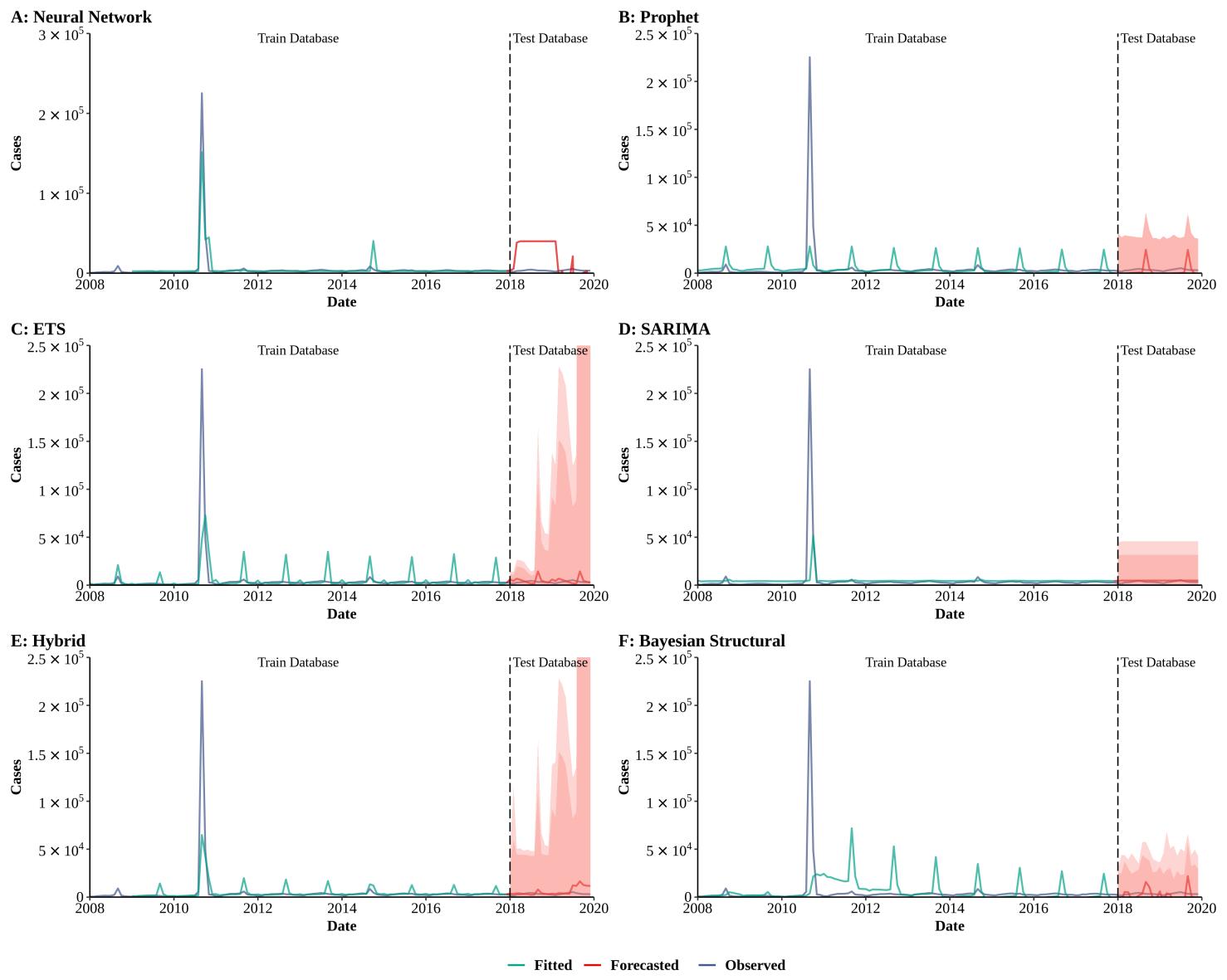
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.98	0.97	0.98
Prophet	0.89	0.97	0.87
ETS	0.99	0.95	0.98
SARIMA	0.99	0.98	0.99
Hybrid*	0.99	0.98	0.98
Bayesian Structural	0.81	0.21	0.22

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 3. Training and comparing variant time series models for dysentery.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	8963.30	42988.97	20043.52
Prophet	19467.68	6921.68	17994.74
ETS	18016.84	3894.02	16523.70
SARIMA	20219.43	1675.45	18470.40
Hybrid*	15873.10	4815.96	14503.87
Bayesian Structural	23260.47	7065.66	21428.84

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	36.37	153.94	57.75
Prophet	84.57	170.09	98.83
ETS	47.96	60.36	50.03
SARIMA	64.62	39.15	60.38
Hybrid*	32.21	52.89	35.97
Bayesian Structural	109.19	138.78	114.12

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.61	1.29	1.03
Prophet	1.22	1.09	1.21
ETS	1.05	0.91	0.79
SARIMA	4.11	94.77	4.42
Hybrid*	0.66	2.13	1.08
Bayesian Structural	1.80	0.81	1.38

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

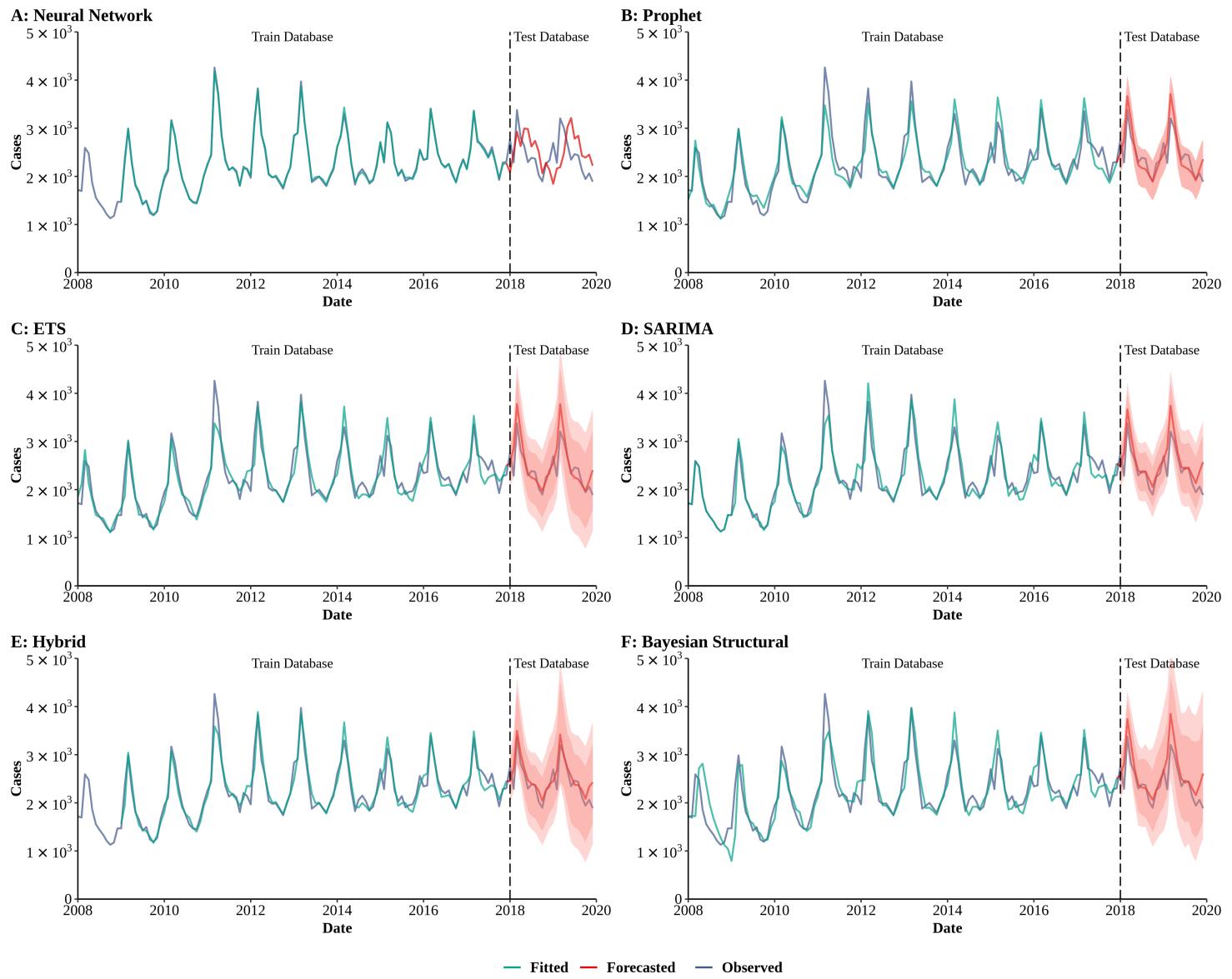
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.88	0.04	0.32
Prophet	0.11	0.01	0.10
ETS	0.24	0.08	0.24
SARIMA	0.04	0.07	0.04
Hybrid*	0.69	0.05	0.64
Bayesian Structural	0.00	0.00	0.00

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 4. Training and comparing variant time series models for acute hemorrhagic conjunctivitis (AHC).

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	33.56	482.70	208.05
Prophet	220.32	258.24	227.08
ETS	222.03	278.77	232.45
SARIMA	223.08	284.61	234.46
Hybrid*	166.39	222.37	177.89
Bayesian Structural	307.54	317.07	309.15

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	1.15	16.62	3.96
Prophet	7.32	8.02	7.44
ETS	7.08	7.83	7.21
SARIMA	6.22	8.47	6.60
Hybrid*	5.12	7.20	5.49
Bayesian Structural	9.98	9.12	9.83

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.08	1.61	0.30
Prophet	0.51	0.67	0.58
ETS	0.49	0.66	0.56
SARIMA	0.47	0.74	0.51
Hybrid*	0.35	0.72	0.44
Bayesian Structural	0.66	0.80	0.72

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

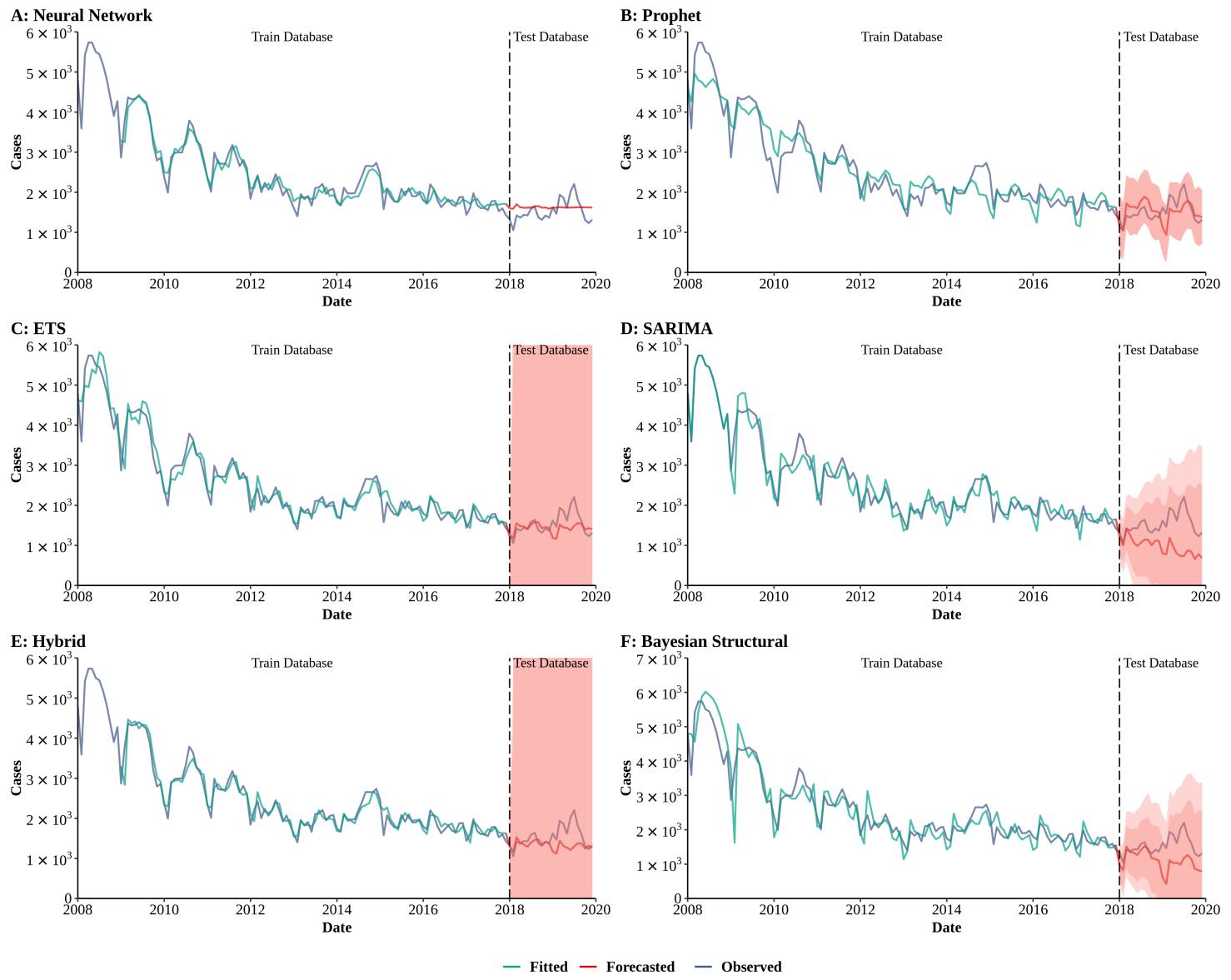
J : R-squared of Models

Method	Train	Test	All
Neural Network	1.00	0.03	0.86
Prophet	0.86	0.75	0.84
ETS	0.86	0.74	0.84
SARIMA	0.87	0.74	0.85
Hybrid*	0.92	0.76	0.90
Bayesian Structural	0.76	0.73	0.75

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 5. Training and comparing variant time series models for hepatitis E.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	184.59	280.50	205.39
Prophet	357.76	287.44	347.03
ETS	260.91	277.10	263.67
SARIMA	271.67	666.19	368.07
Hybrid*	187.26	344.95	224.33
Bayesian Structural	407.92	559.82	436.92

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	6.60	15.16	8.16
Prophet	10.63	15.67	11.47
ETS	7.02	13.18	8.05
SARIMA	7.94	44.11	13.97
Hybrid*	5.78	15.84	7.61
Bayesian Structural	11.08	35.18	15.09

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.97	14.07	1.28
Prophet	1.01	1.52	1.46
ETS	0.71	2.22	0.97
SARIMA	0.59	3.89	0.85
Hybrid*	0.57	2.39	0.88
Bayesian Structural	1.06	2.54	0.98

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

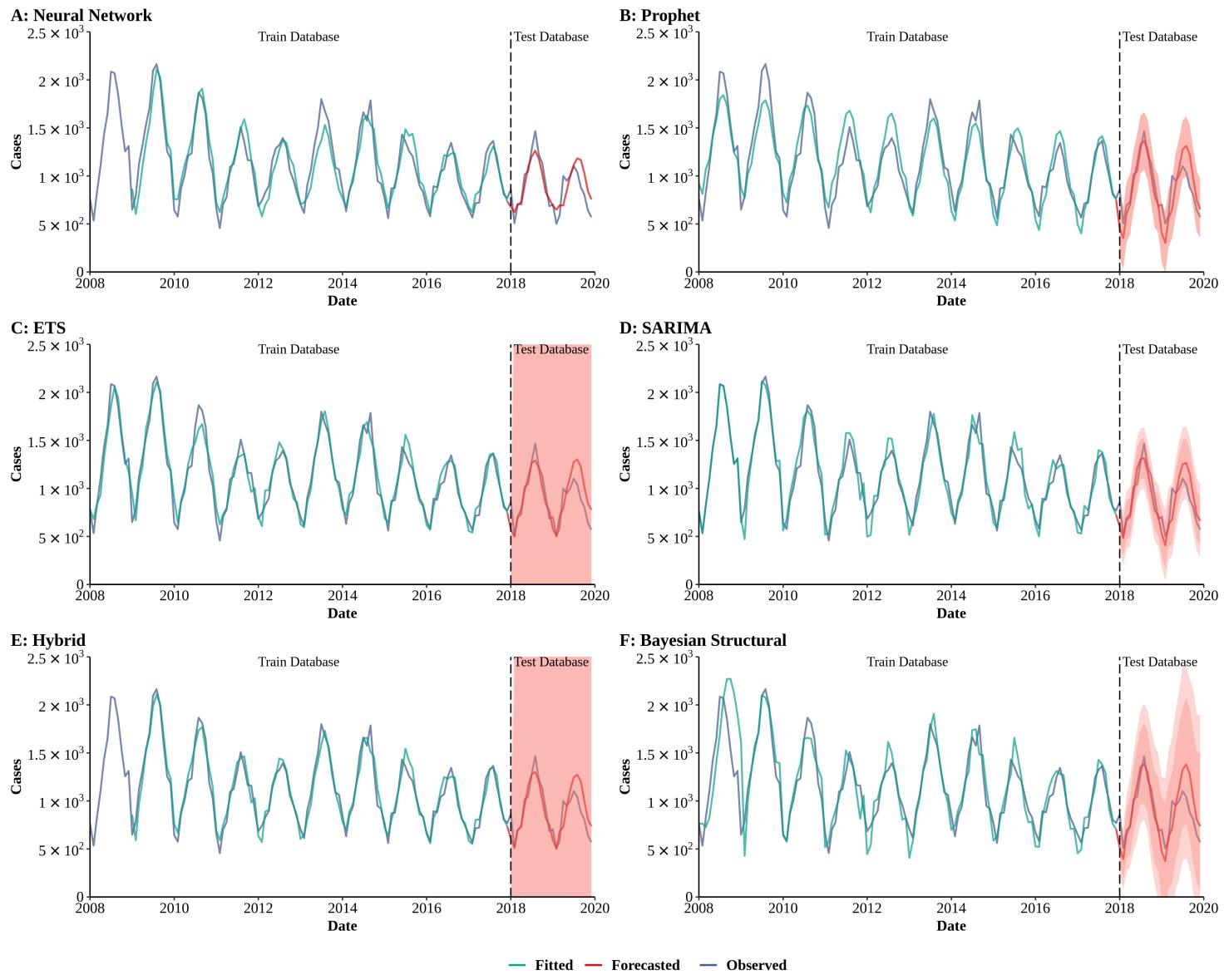
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.94	0.02	0.93
Prophet	0.89	0.14	0.89
ETS	0.94	0.09	0.94
SARIMA	0.94	0.05	0.91
Hybrid*	0.94	0.00	0.92
Bayesian Structural	0.88	0.02	0.88

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 6. Training and comparing variant time series models for hepatitis A.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	132.63	144.47	134.86
Prophet	157.00	180.26	161.11
ETS	103.40	156.15	113.90
SARIMA	108.73	145.15	115.60
Hybrid*	93.86	146.31	105.36
Bayesian Structural	205.97	181.17	202.05

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	10.32	13.93	10.97
Prophet	12.04	18.89	13.18
ETS	7.60	13.92	8.65
SARIMA	8.22	13.74	9.14
Hybrid*	7.23	12.80	8.24
Bayesian Structural	12.66	17.40	13.45

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.69	1.19	0.75
Prophet	0.70	0.85	0.77
ETS	0.43	0.95	0.54
SARIMA	0.41	0.82	0.46
Hybrid*	0.43	0.88	0.51
Bayesian Structural	0.73	0.88	0.70

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

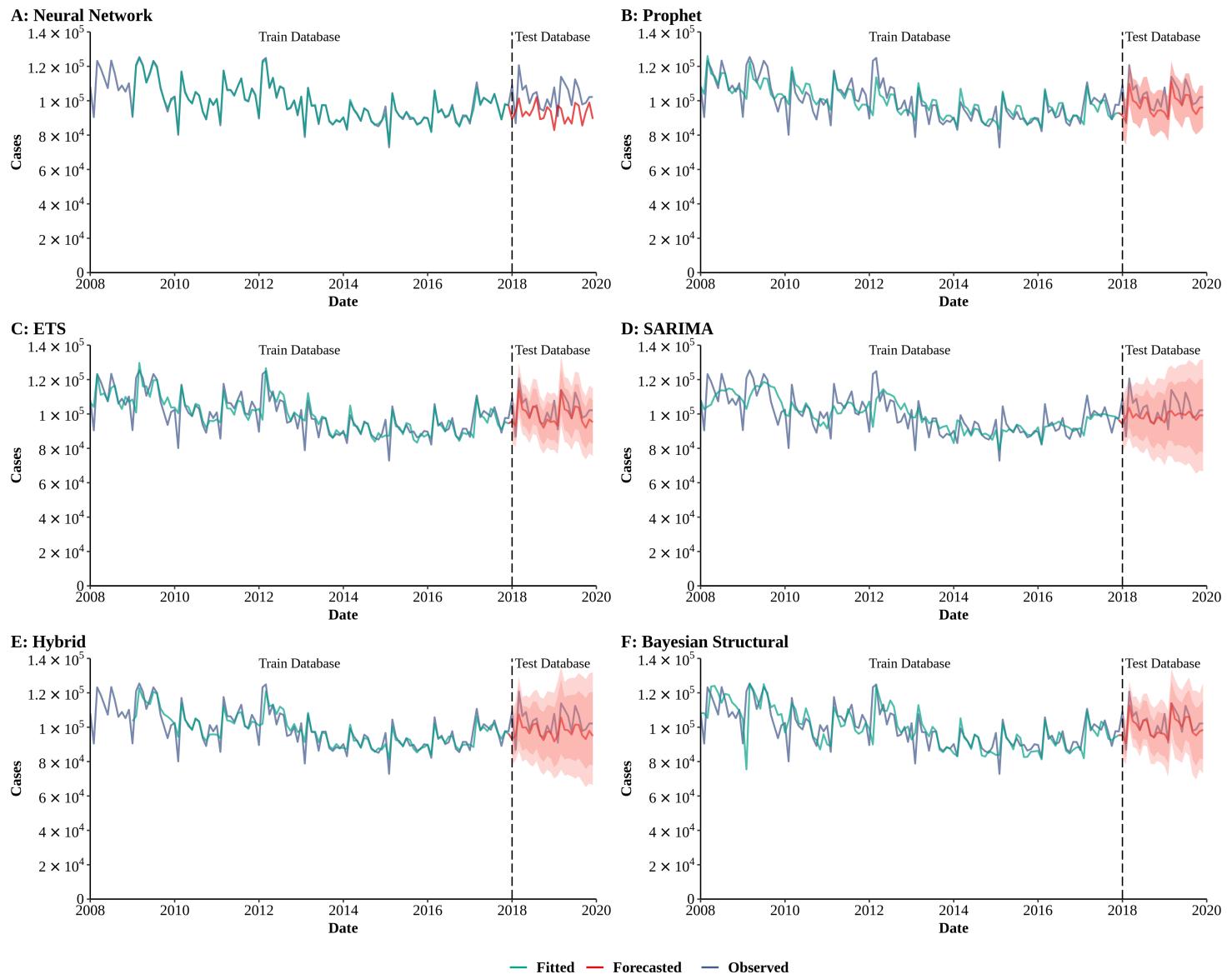
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.87	0.67	0.86
Prophet	0.84	0.71	0.82
ETS	0.93	0.67	0.91
SARIMA	0.93	0.73	0.91
Hybrid*	0.93	0.70	0.91
Bayesian Structural	0.78	0.69	0.78

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 7. Training and comparing variant time series models for enteric fever.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	939.88	13011.63	5612.94
Prophet	6373.59	7132.88	6506.30
ETS	6162.82	5694.30	6087.24
SARIMA	8022.36	8368.94	8081.15
Hybrid*	4820.37	7811.50	5486.87
Bayesian Structural	8376.61	5082.33	7923.26

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	0.61	11.40	2.57
Prophet	4.51	5.59	4.69
ETS	4.12	4.36	4.16
SARIMA	5.77	6.51	5.89
Hybrid*	3.23	6.23	3.77
Bayesian Structural	5.41	3.52	5.10

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.08	1.70	0.34
Prophet	0.54	1.06	0.87
ETS	0.49	0.77	0.73
SARIMA	1.80	2.63	1.91
Hybrid*	0.40	1.50	0.81
Bayesian Structural	0.65	0.70	0.83

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

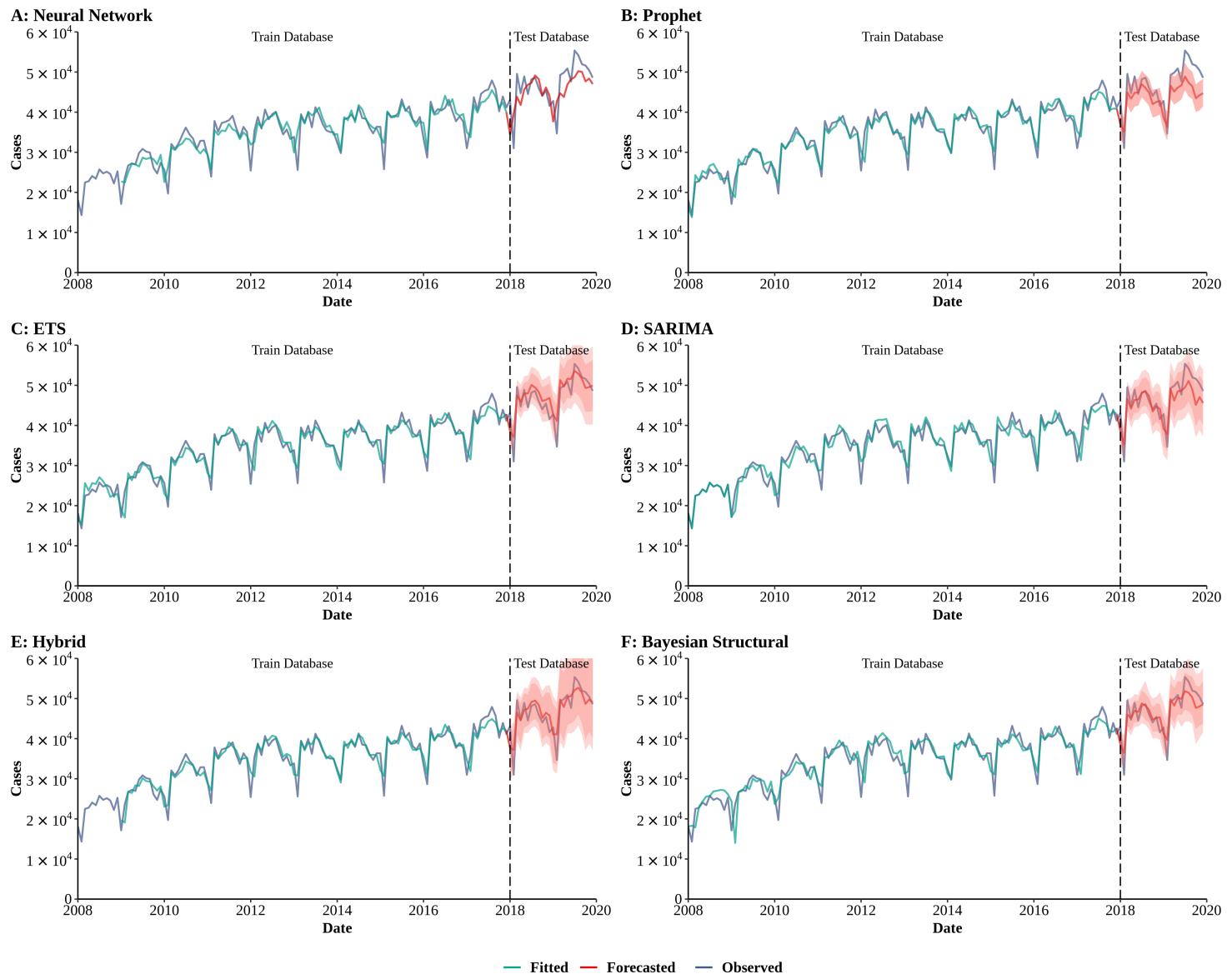
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.99	0.05	0.75
Prophet	0.67	0.67	0.64
ETS	0.70	0.68	0.68
SARIMA	0.49	0.13	0.45
Hybrid*	0.80	0.45	0.73
Bayesian Structural	0.54	0.70	0.54

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 8. Training and comparing variant time series models for hepatitis B.

(A) Neural Network model; (B) Prophet model; (C) Exponential smoothing (ETS) model; (D) Seasonal autoregressive integrated moving average (SARIMA) model; (E) Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; (F) Bayesian structural model; (G) Root mean square error (RMSE) of variant models; (H) Symmetric mean absolute percentage error of variant models; (I) Mean absolute scaled error (MASE) of variant models; (J) R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	2283.06	4428.11	2798.17
Prophet	1745.29	4232.62	2350.36
ETS	1901.95	2834.65	2086.56
SARIMA	1950.18	3064.16	2175.82
Hybrid*	1842.27	2852.31	2063.03
Bayesian Structural	2461.40	2640.21	2492.09

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.11	8.26	5.68
Prophet	4.04	8.04	4.71
ETS	4.53	5.03	4.62
SARIMA	4.31	5.62	4.53
Hybrid*	4.21	5.11	4.37
Bayesian Structural	5.84	4.79	5.66

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.79	1.57	0.93
Prophet	0.41	1.65	0.74
ETS	0.46	1.05	0.70
SARIMA	0.59	0.93	0.65
Hybrid*	0.44	1.05	0.71
Bayesian Structural	0.57	1.01	0.87

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

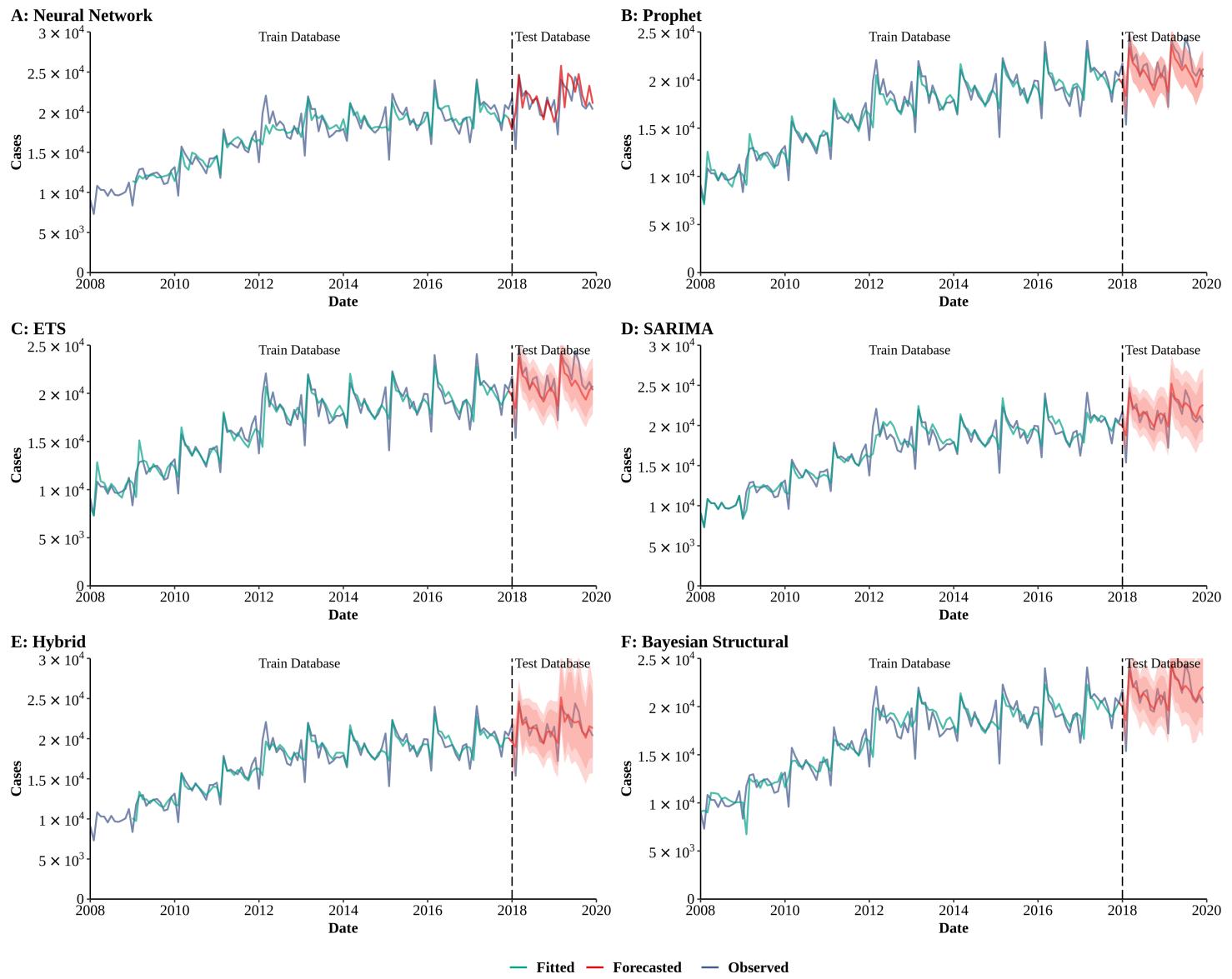
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.84	0.42	0.85
Prophet	0.93	0.76	0.93
ETS	0.92	0.78	0.93
SARIMA	0.92	0.77	0.93
Hybrid*	0.90	0.74	0.92
Bayesian Structural	0.87	0.80	0.91

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 9. Training and comparing variant time series models for syphilis.

(A) Neural Network model; (B) Prophet model; (C) Exponential smoothing (ETS) model; (D) Seasonal autoregressive integrated moving average (SARIMA) model; (E) Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; (F) Bayesian structural model; (G) Root mean square error (RMSE) of variant models; (H) Symmetric mean absolute percentage error of variant models; (I) Mean absolute scaled error (MASE) of variant models; (J) R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	1315.07	2000.42	1463.75
Prophet	1007.63	1379.99	1078.66
ETS	1095.27	1395.98	1150.86
SARIMA	1045.40	1268.70	1085.81
Hybrid*	1058.35	1274.67	1100.84
Bayesian Structural	1329.26	1221.64	1311.94

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.81	7.45	6.11
Prophet	4.50	5.41	4.65
ETS	4.80	5.31	4.88
SARIMA	4.36	4.81	4.43
Hybrid*	4.56	4.61	4.57
Bayesian Structural	6.28	4.45	5.97

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.98	0.68	0.88
Prophet	0.44	0.93	0.66
ETS	0.47	0.89	0.68
SARIMA	0.72	0.81	0.74
Hybrid*	0.45	0.74	0.75
Bayesian Structural	0.60	0.82	1.02

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

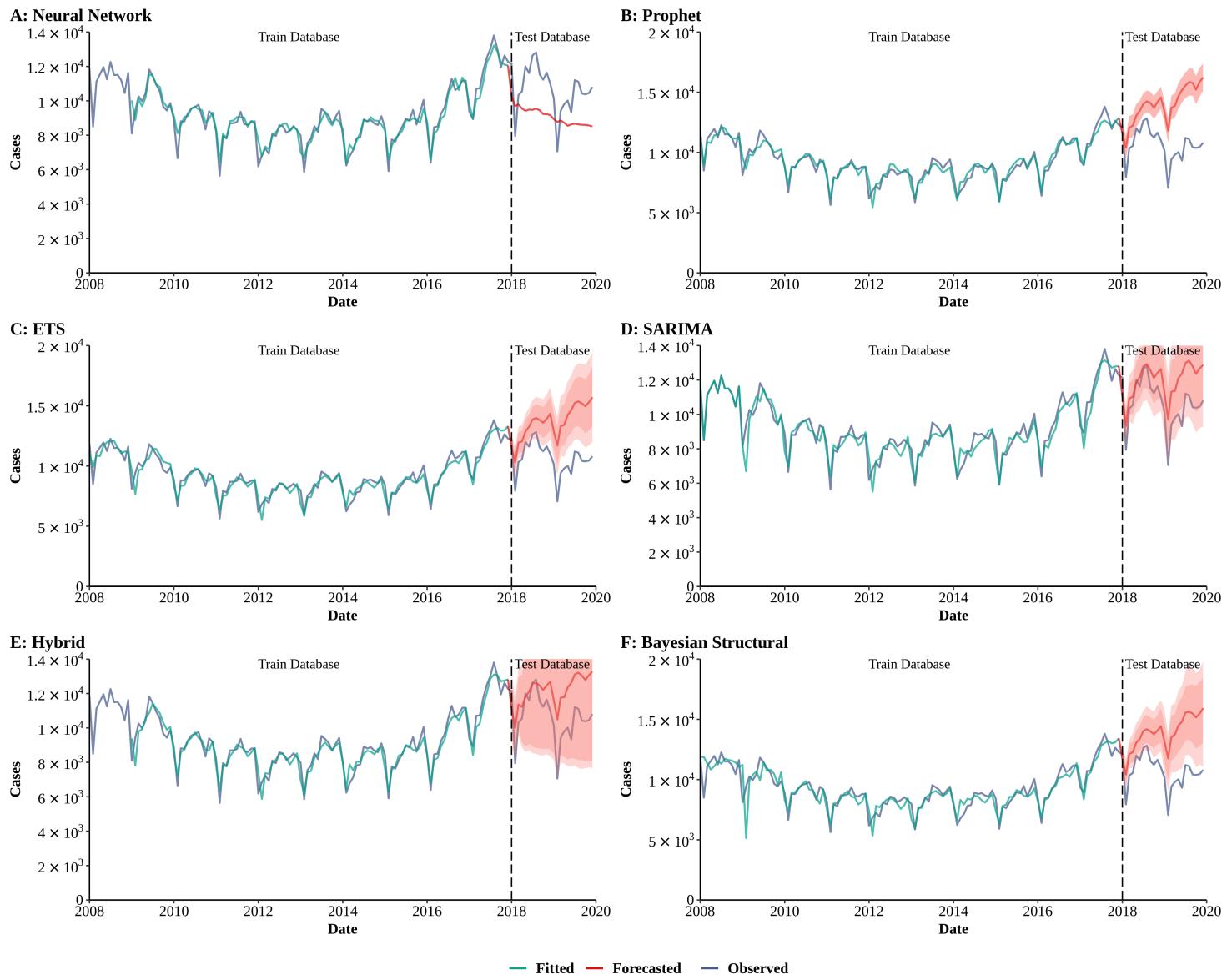
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.83	0.29	0.82
Prophet	0.93	0.69	0.93
ETS	0.92	0.67	0.92
SARIMA	0.93	0.68	0.93
Hybrid*	0.89	0.63	0.90
Bayesian Structural	0.88	0.69	0.89

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 10. Training and comparing variant time series models for hepatitis C.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	435.60	1974.72	929.65
Prophet	471.53	3697.52	1569.68
ETS	542.29	3374.10	1463.73
SARIMA	537.46	1620.16	823.53
Hybrid*	452.42	1890.45	904.02
Bayesian Structural	804.54	3554.50	1626.39

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	3.60	18.43	6.30
Prophet	4.05	27.30	7.93
ETS	4.66	25.29	8.10
SARIMA	4.33	12.80	5.74
Hybrid*	3.93	14.80	5.91
Bayesian Structural	5.80	26.53	9.25

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.58	15.97	1.25
Prophet	0.47	5.18	1.38
ETS	0.54	5.21	1.42
SARIMA	0.51	2.26	0.76
Hybrid*	0.48	3.50	1.01
Bayesian Structural	0.67	5.32	1.43

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

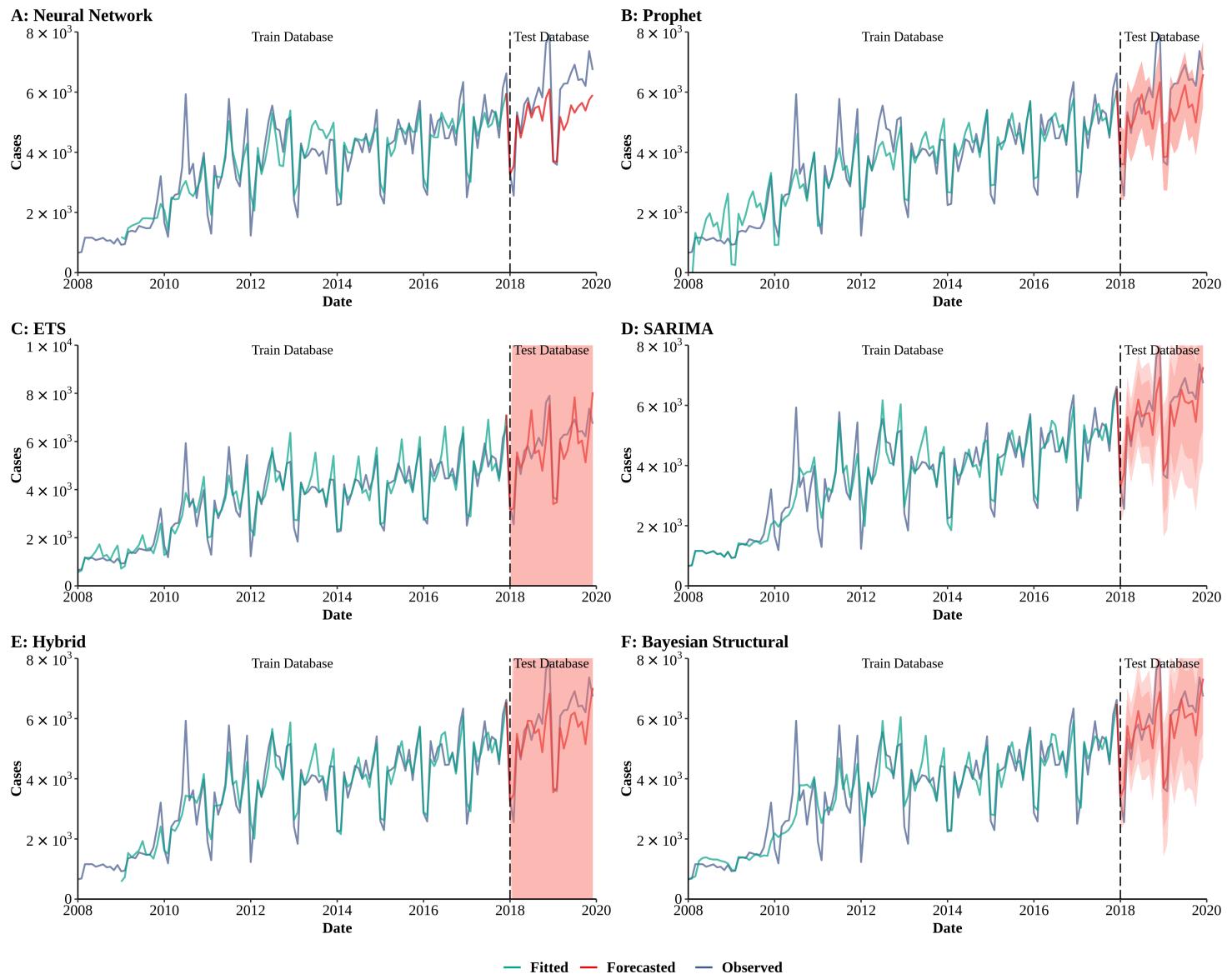
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.93	0.13	0.72
Prophet	0.92	0.08	0.60
ETS	0.90	0.11	0.63
SARIMA	0.90	0.46	0.81
Hybrid*	0.92	0.26	0.78
Bayesian Structural	0.78	0.11	0.57

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 11. Training and comparing variant time series models for gonorrhea.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	569.38	980.63	663.39
Prophet	574.77	891.28	638.51
ETS	548.11	801.15	597.77
SARIMA	565.96	596.71	571.20
Hybrid*	487.79	728.33	539.56
Bayesian Structural	610.87	614.95	611.56

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	12.73	13.89	12.94
Prophet	19.42	13.50	18.43
ETS	11.74	10.89	11.60
SARIMA	11.33	8.77	10.91
Hybrid*	10.65	10.58	10.64
Bayesian Structural	13.48	8.89	12.71

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.74	1.43	0.84
Prophet	0.54	1.16	0.70
ETS	0.46	0.54	0.45
SARIMA	0.60	0.61	0.59
Hybrid*	0.39	0.76	0.53
Bayesian Structural	0.51	0.60	0.65

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

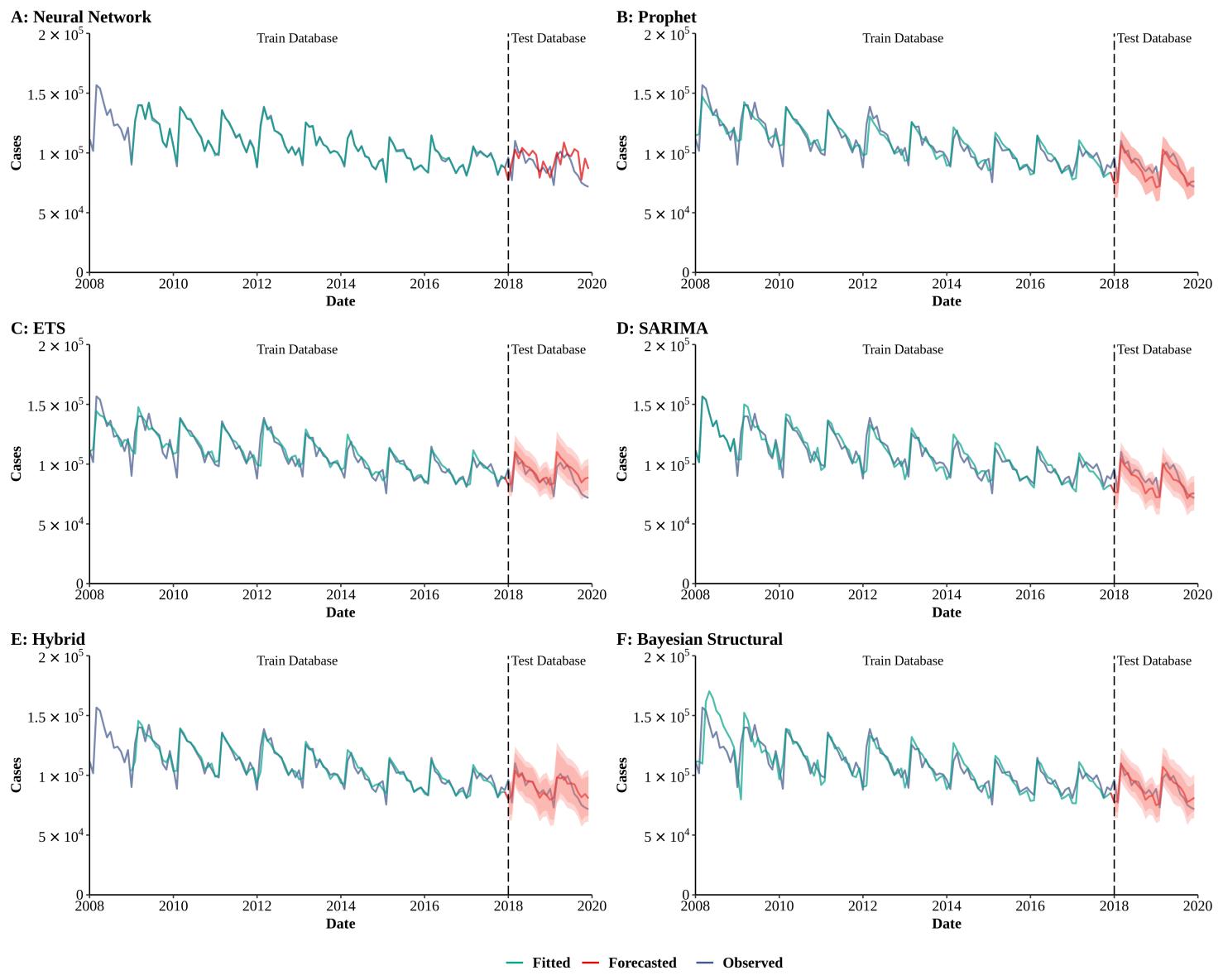
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.83	0.85	0.84
Prophet	0.86	0.80	0.87
ETS	0.88	0.68	0.88
SARIMA	0.87	0.85	0.89
Hybrid*	0.87	0.82	0.89
Bayesian Structural	0.84	0.82	0.88

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 12. Training and comparing variant time series models for acquired immunodeficiency syndrome (AIDS).

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	926.09	11418.63	4940.46
Prophet	6212.04	7120.76	6372.49
ETS	6394.79	8013.86	6691.89
SARIMA	6746.33	7346.78	6850.06
Hybrid*	4732.52	6267.17	5046.38
Bayesian Structural	10801.55	6343.39	10194.82

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	0.63	10.58	2.44
Prophet	4.20	5.89	4.48
ETS	4.06	7.17	4.58
SARIMA	4.55	6.35	4.85
Hybrid*	3.09	5.53	3.54
Bayesian Structural	6.30	5.39	6.15

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.08	0.99	0.27
Prophet	0.48	0.82	0.72
ETS	0.47	1.20	0.77
SARIMA	0.58	0.97	0.63
Hybrid*	0.37	1.01	0.57
Bayesian Structural	0.76	0.78	0.79

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

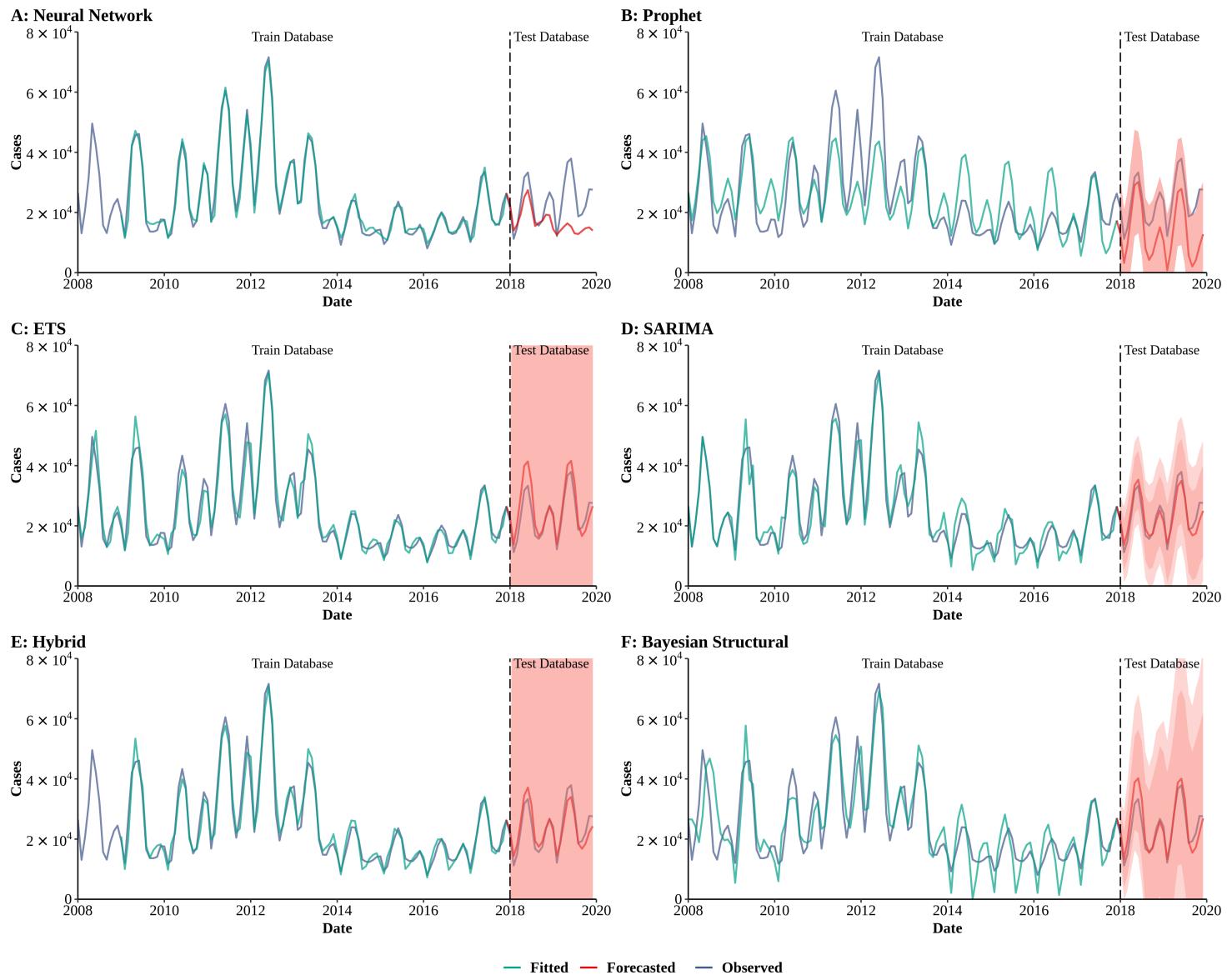
J : R-squared of Models

Method	Train	Test	All
Neural Network	1.00	0.17	0.91
Prophet	0.86	0.69	0.87
ETS	0.86	0.59	0.87
SARIMA	0.86	0.71	0.87
Hybrid*	0.91	0.64	0.90
Bayesian Structural	0.71	0.66	0.74

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 13. Training and comparing variant time series models for tuberculosis.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	1888.51	9439.91	4372.66
Prophet	8694.83	11301.79	9180.87
ETS	3190.13	4130.14	3365.08
SARIMA	3817.26	2604.14	3643.23
Hybrid*	2735.76	2940.75	2774.16
Bayesian Structural	6676.57	3692.63	6278.51

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	7.03	33.05	11.76
Prophet	27.51	72.56	35.01
ETS	10.05	13.24	10.58
SARIMA	13.78	9.85	13.12
Hybrid*	10.01	11.10	10.21
Bayesian Structural	28.18	11.67	25.42

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.23	2.98	0.44
Prophet	1.01	1.58	1.12
ETS	0.36	0.51	0.39
SARIMA	0.39	0.44	0.39
Hybrid*	0.34	0.50	0.36
Bayesian Structural	0.78	0.44	0.65

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

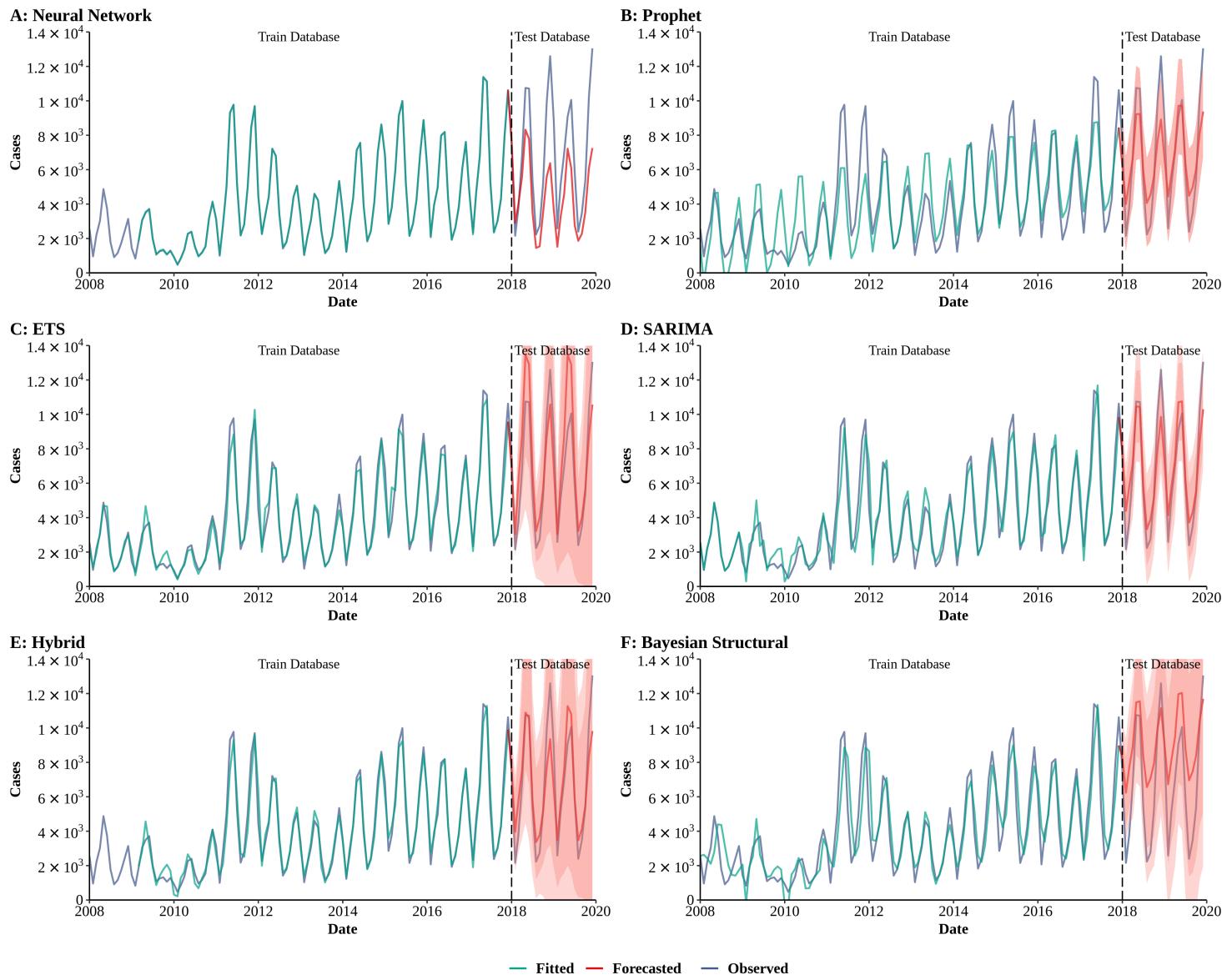
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.98	0.14	0.89
Prophet	0.58	0.76	0.51
ETS	0.94	0.84	0.93
SARIMA	0.92	0.87	0.92
Hybrid*	0.96	0.83	0.95
Bayesian Structural	0.77	0.84	0.78

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 14. Training and comparing variant time series models for mumps.

(A) Neural Network model; (B) Prophet model; (C) Exponential smoothing (ETS) model; (D) Seasonal autoregressive integrated moving average (SARIMA) model; (E) Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; (F) Bayesian structural model; (G) Root mean square error (RMSE) of variant models; (H) Symmetric mean absolute percentage error of variant models; (I) Mean absolute scaled error (MASE) of variant models; (J) R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	29.04	2915.36	1252.92
Prophet	1374.66	1735.82	1441.15
ETS	552.93	1810.59	895.07
SARIMA	828.28	1383.70	943.83
Hybrid*	508.99	1502.46	792.46
Bayesian Structural	1181.05	2847.68	1585.54

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	0.93	41.46	8.41
Prophet	37.43	25.25	35.40
ETS	10.99	22.29	12.87
SARIMA	19.34	19.98	19.45
Hybrid*	12.93	19.23	14.09
Bayesian Structural	29.16	40.76	31.09

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.01	1.26	0.25
Prophet	0.63	0.89	0.69
ETS	0.23	0.52	0.32
SARIMA	0.37	0.52	0.40
Hybrid*	0.22	0.50	0.29
Bayesian Structural	0.52	1.55	0.80

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

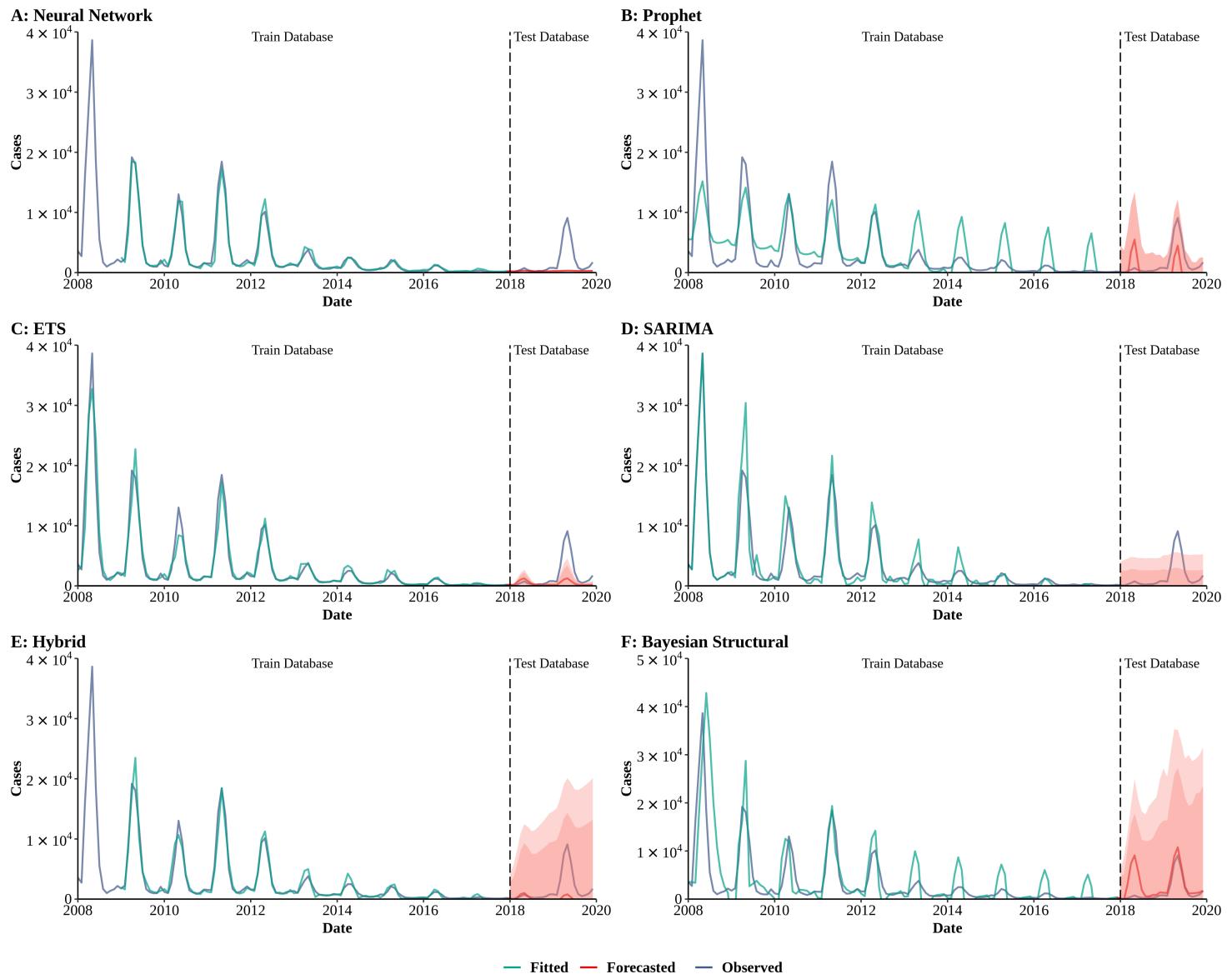
J : R-squared of Models

Method	Train	Test	All
Neural Network	1.00	0.76	0.85
Prophet	0.73	0.88	0.77
ETS	0.96	0.77	0.91
SARIMA	0.90	0.88	0.90
Hybrid*	0.97	0.82	0.93
Bayesian Structural	0.80	0.88	0.75

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 15. Training and comparing variant time series models for scarlet fever.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	643.06	2716.01	1295.98
Prophet	3846.09	4937.86	4048.55
ETS	1446.68	2466.42	1660.71
SARIMA	1993.53	4134.74	2482.16
Hybrid*	901.63	2737.13	1423.83
Bayesian Structural	5191.85	2616.69	4858.39

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	23.92	88.97	35.75
Prophet	100.31	181.14	113.78
ETS	18.09	103.34	32.30
SARIMA	78.76	200.00	98.96
Hybrid*	47.16	164.45	68.49
Bayesian Structural	98.49	79.47	95.32

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.29	74.50	0.53
Prophet	1.45	2.67	1.66
ETS	0.37	6.72	0.54
SARIMA	0.43	22.43	0.68
Hybrid*	0.40	6.93	0.59
Bayesian Structural	1.68	0.89	0.92

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

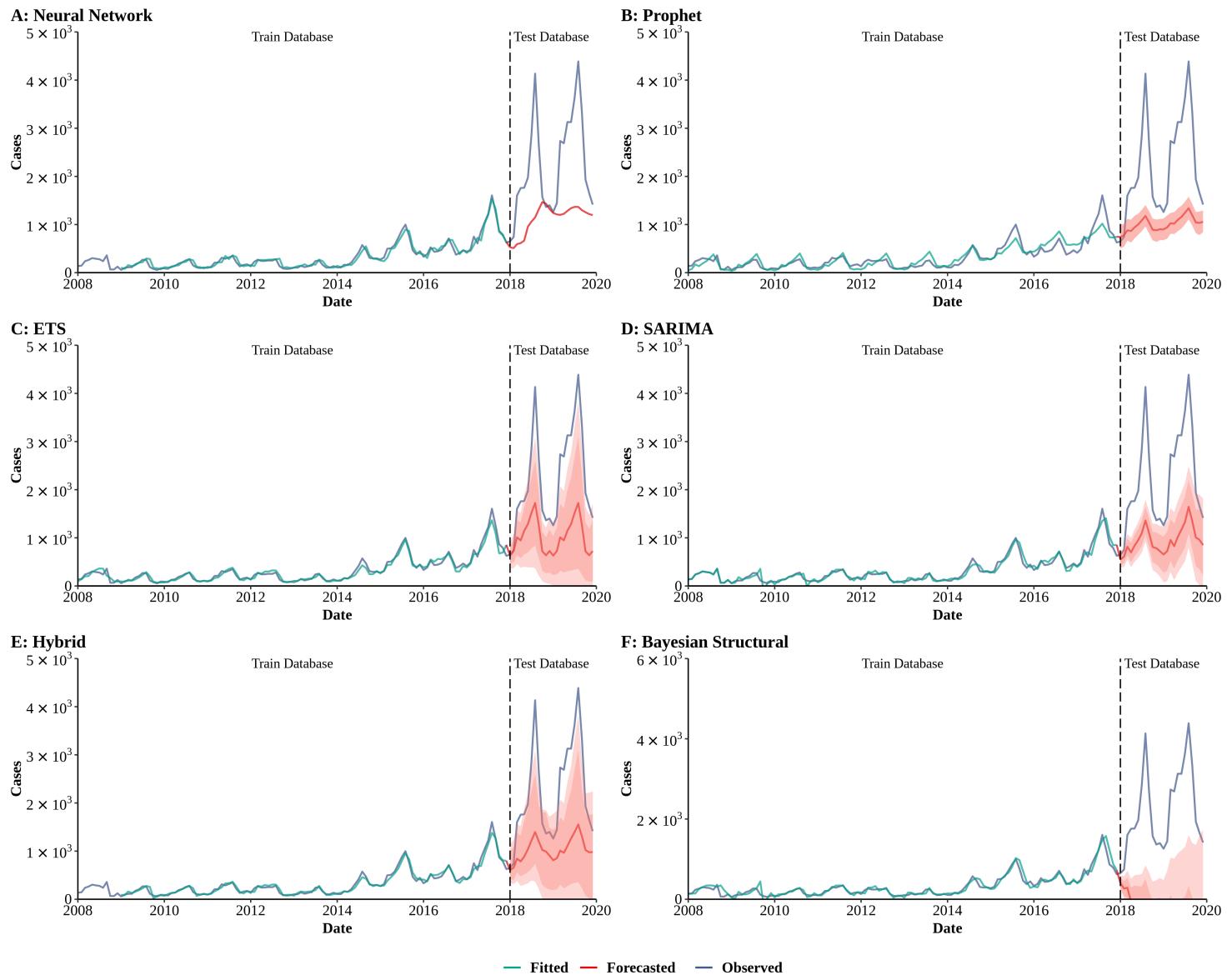
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.97	0.39	0.89
Prophet	0.56	0.29	0.49
ETS	0.94	0.38	0.91
SARIMA	0.91	0.13	0.85
Hybrid*	0.95	0.21	0.87
Bayesian Structural	0.53	0.53	0.52

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 16. Training and comparing variant time series models for rubella.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	64.43	1426.06	610.86
Prophet	118.82	1490.06	617.91
ETS	63.48	1386.27	568.90
SARIMA	72.94	1478.97	607.45
Hybrid*	56.17	1425.04	609.76
Bayesian Structural	90.87	3891.60	1590.90

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	18.00	58.52	25.37
Prophet	29.51	65.75	35.55
ETS	15.71	67.51	24.34
SARIMA	19.31	72.68	28.21
Hybrid*	15.00	64.13	23.94
Bayesian Structural	23.35	186.65	50.56

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.68	16.15	3.42
Prophet	1.14	17.73	4.23
ETS	0.60	5.59	2.64
SARIMA	0.63	7.66	2.71
Hybrid*	0.52	9.35	3.29
Bayesian Structural	0.78	19.86	6.32

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

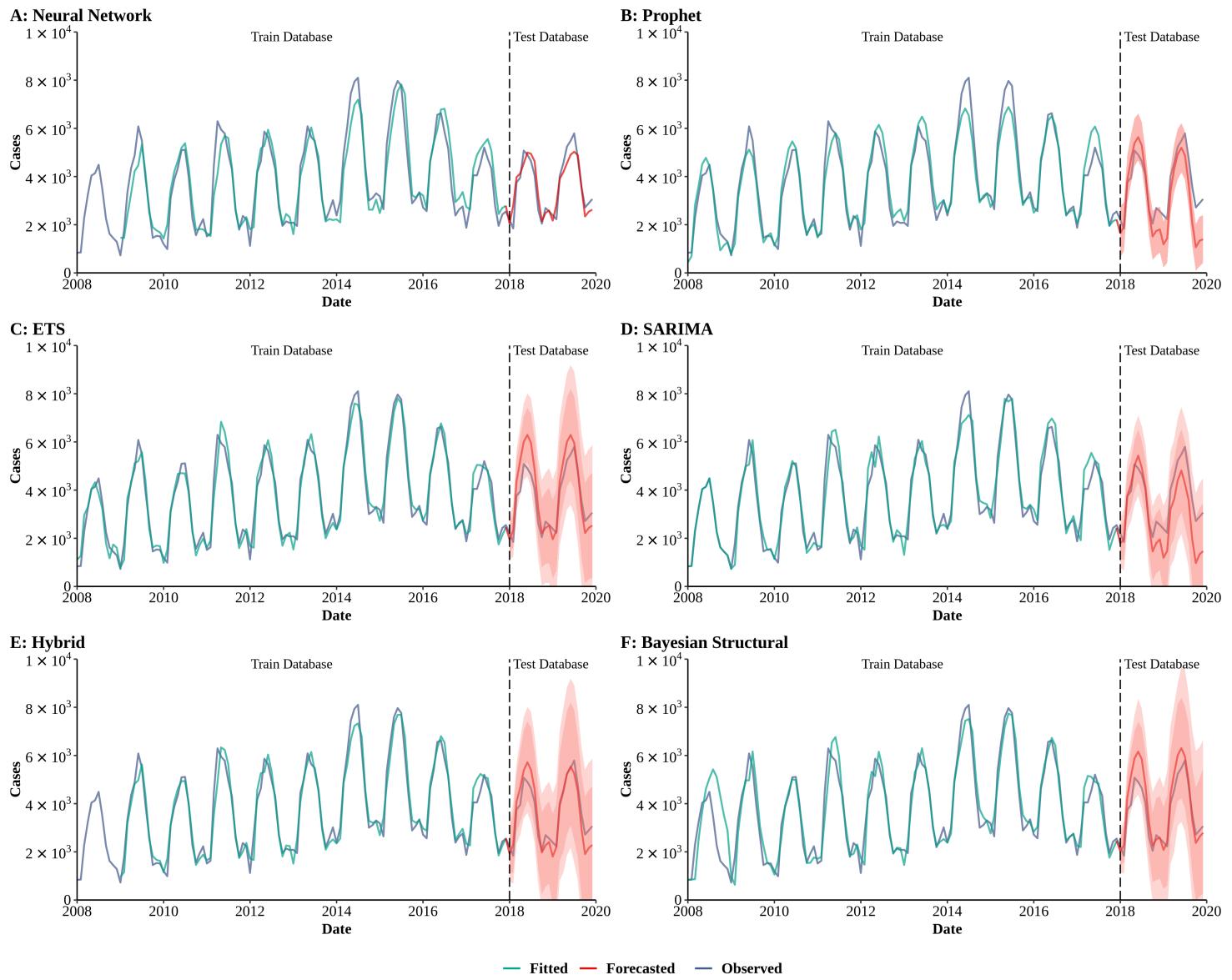
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.95	0.21	0.72
Prophet	0.81	0.84	0.75
ETS	0.95	0.79	0.84
SARIMA	0.93	0.87	0.76
Hybrid*	0.96	0.86	0.80
Bayesian Structural	0.90	0.08	0.38

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 17. Training and comparing variant time series models for pertussis.

(A) Neural Network model; (B) Prophet model; (C) Exponential smoothing (ETS) model; (D) Seasonal autoregressive integrated moving average (SARIMA) model; (E) Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; (F) Bayesian structural model; (G) Root mean square error (RMSE) of variant models; (H) Symmetric mean absolute percentage error of variant models; (I) Mean absolute scaled error (MASE) of variant models; (J) R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	622.78	432.35	592.73
Prophet	508.54	878.22	586.56
ETS	406.95	671.52	461.69
SARIMA	480.66	939.83	582.87
Hybrid*	427.35	489.75	439.36
Bayesian Structural	682.57	611.43	671.24

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	14.24	10.58	13.58
Prophet	11.14	28.12	13.97
ETS	10.78	14.47	11.39
SARIMA	10.70	29.08	13.77
Hybrid*	9.94	12.91	10.48
Bayesian Structural	15.14	12.61	14.72

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.65	0.65	0.65
Prophet	0.46	0.95	0.58
ETS	0.40	0.71	0.47
SARIMA	0.44	1.05	0.53
Hybrid*	0.39	0.57	0.45
Bayesian Structural	0.58	0.66	0.61

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

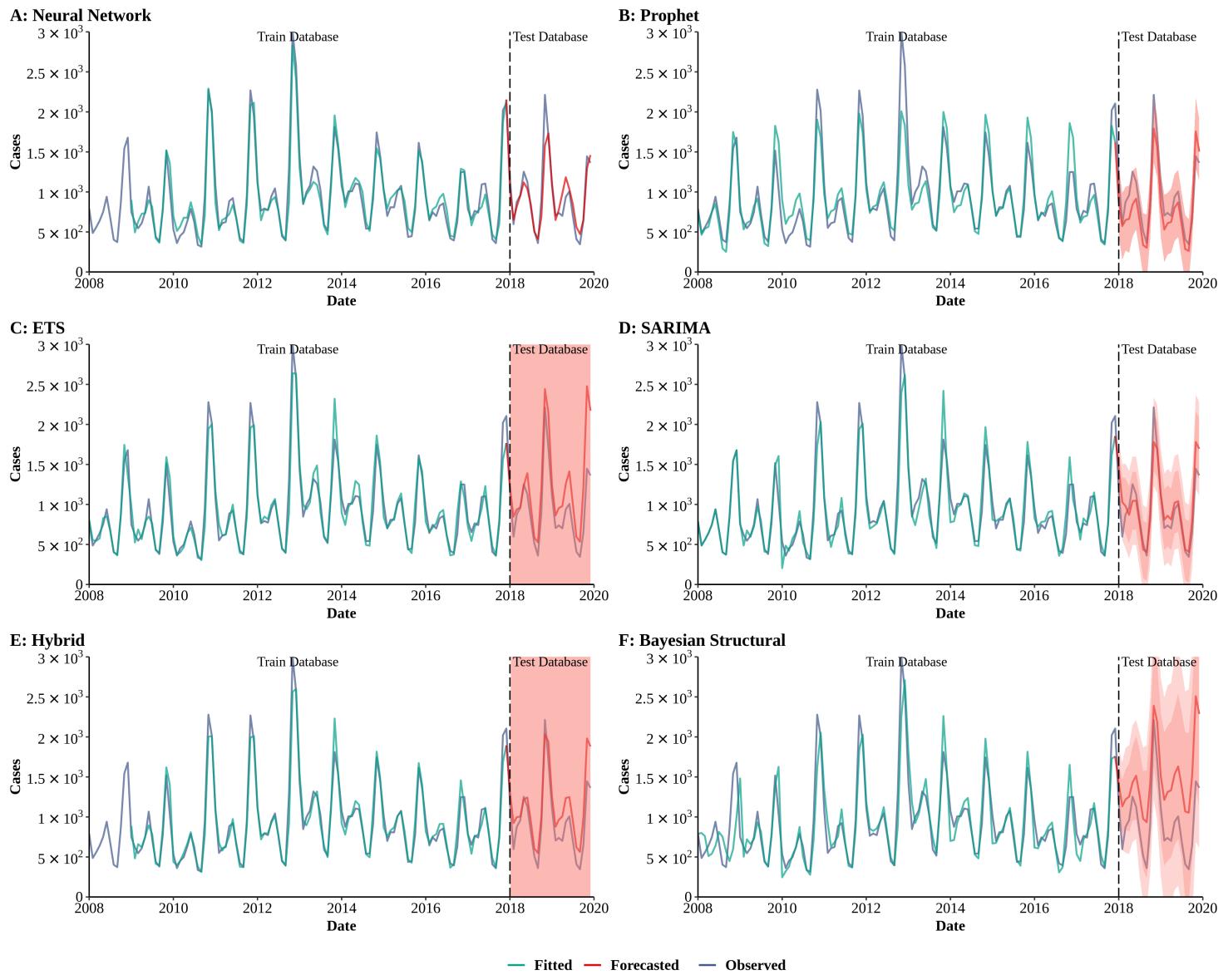
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.88	0.87	0.88
Prophet	0.92	0.82	0.89
ETS	0.95	0.91	0.93
SARIMA	0.93	0.78	0.89
Hybrid*	0.94	0.89	0.93
Bayesian Structural	0.86	0.93	0.86

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 18. Training and comparing variant time series models for brucellosis.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	115.43	175.55	128.47
Prophet	207.66	207.95	207.71
ETS	138.51	363.29	194.90
SARIMA	160.21	187.83	165.13
Hybrid*	121.62	249.60	153.06
Bayesian Structural	236.21	579.47	320.09

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	10.45	12.64	10.85
Prophet	14.26	21.87	15.53
ETS	9.22	26.08	12.03
SARIMA	10.50	14.22	11.12
Hybrid*	8.28	23.35	11.02
Bayesian Structural	16.84	49.65	22.31

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.30	0.43	0.32
Prophet	0.45	0.62	0.48
ETS	0.30	0.71	0.37
SARIMA	0.29	0.52	0.32
Hybrid*	0.26	0.75	0.34
Bayesian Structural	0.50	1.89	0.68

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

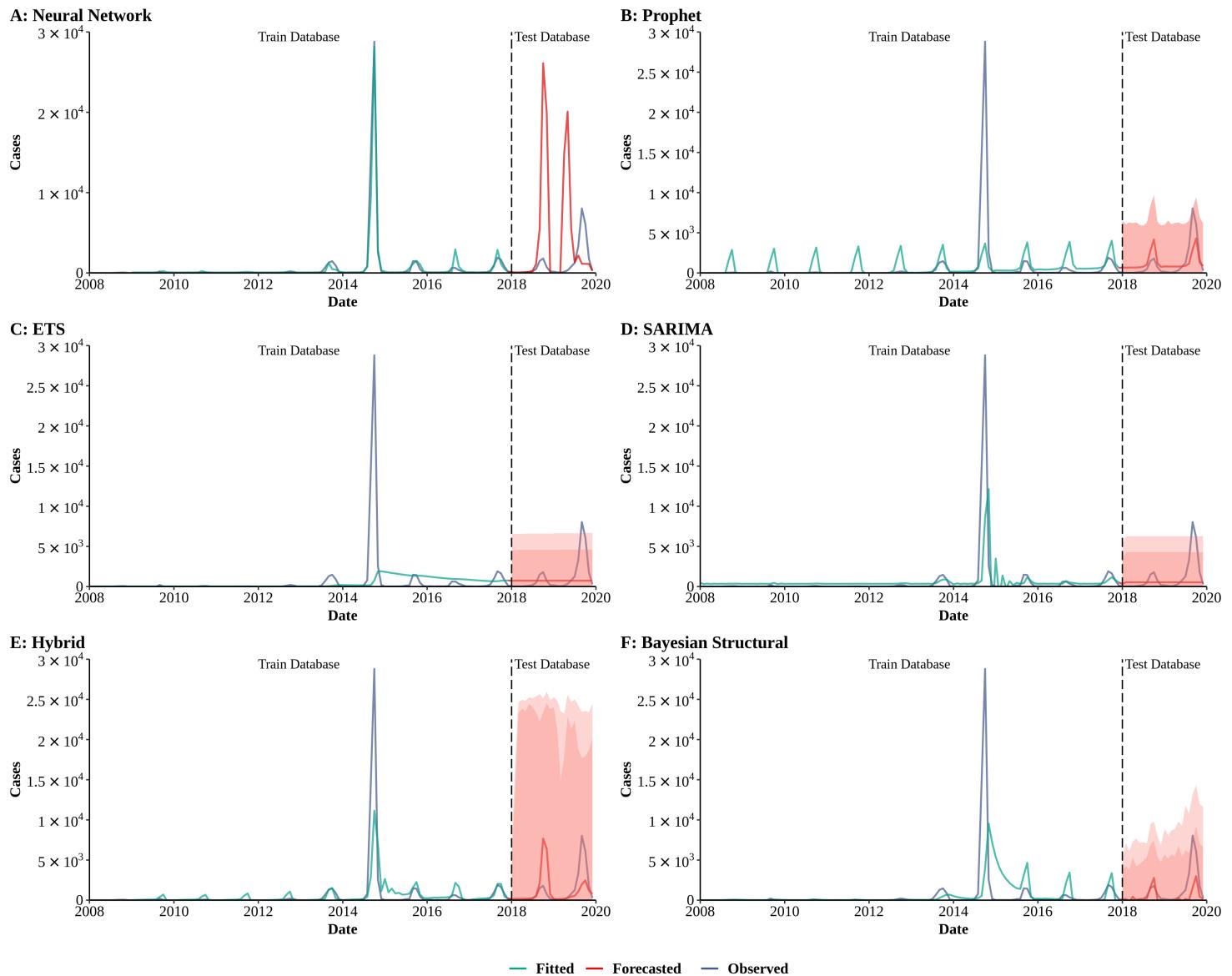
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.95	0.85	0.93
Prophet	0.82	0.87	0.82
ETS	0.92	0.83	0.86
SARIMA	0.90	0.83	0.88
Hybrid*	0.94	0.88	0.91
Bayesian Structural	0.78	0.76	0.65

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 19. Training and comparing variant time series models for hemorrhagic fever with renal syndrome (HFRS).

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	612.61	8689.18	3746.29
Prophet	2733.45	1410.49	2560.86
ETS	2951.77	2016.17	2817.50
SARIMA	2506.27	2061.79	2437.83
Hybrid*	2141.12	2270.48	2165.22
Bayesian Structural	2924.70	1688.46	2757.42

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	112.23	110.67	111.94
Prophet	151.58	110.96	144.81
ETS	118.71	119.28	118.80
SARIMA	153.81	117.69	147.79
Hybrid*	136.11	85.09	126.83
Bayesian Structural	120.88	136.8	123.53

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.29	1.01	0.74
Prophet	1.51	1.61	1.54
ETS	1.22	Inf	32.93
SARIMA	1.67	117.87	2.13
Hybrid*	0.88	1.4	1.32
Bayesian Structural	1.43	1.33	2.09

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

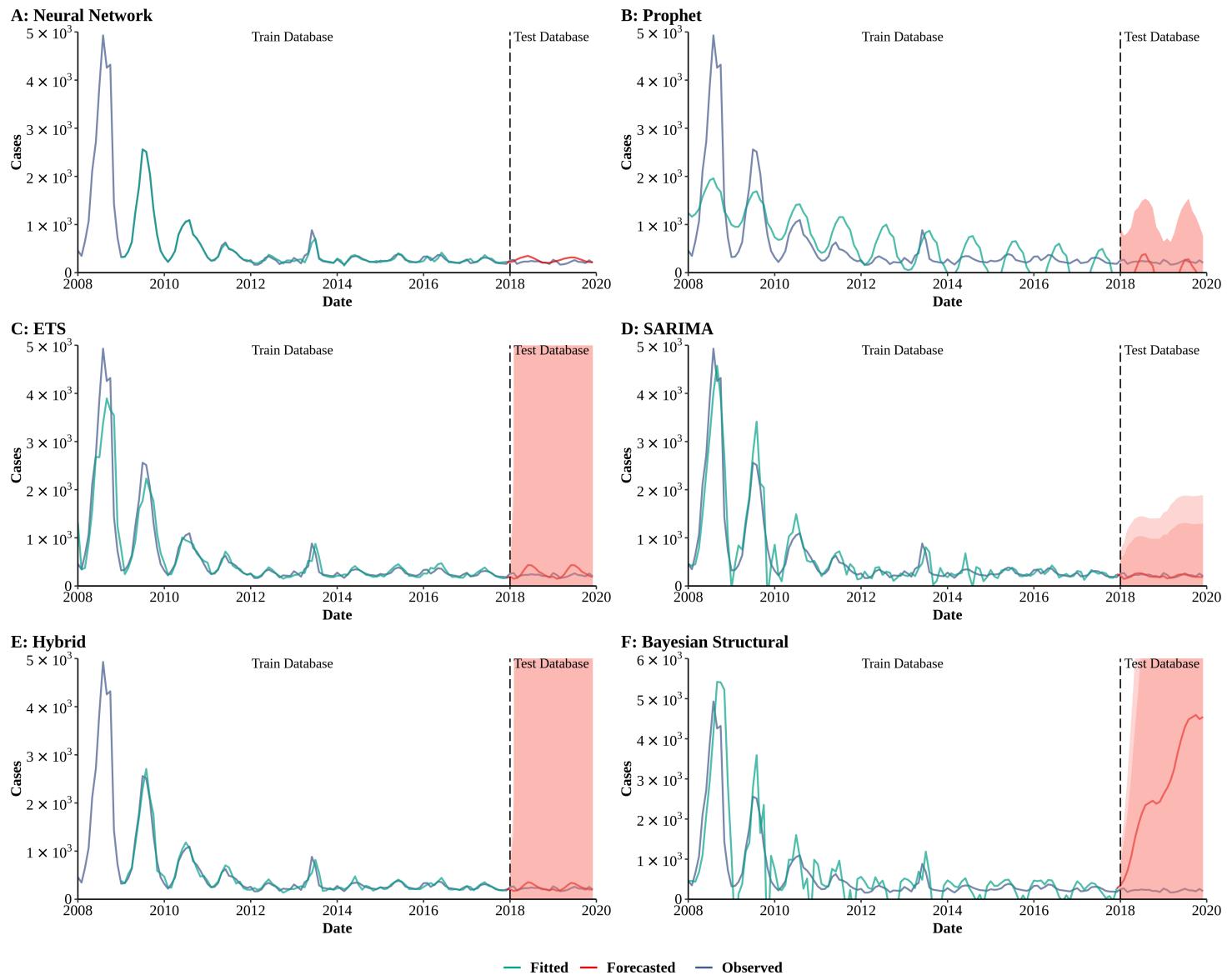
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.96	0	0.32
Prophet	0.14	0.53	0.17
ETS	0.01	0.01	0.01
SARIMA	0.27	0.01	0.25
Hybrid*	0.66	0.1	0.49
Bayesian Structural	0.07	0.46	0.08

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 20. Training and comparing variant time series models for dengue fever.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	41.59	67.78	47.44
Prophet	603.18	438.84	579.04
ETS	320.71	106.25	295.96
SARIMA	268.29	40.38	245.47
Hybrid*	89.14	59.66	84.55
Bayesian Structural	601.14	2868.36	1293.21

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	8.67	22.71	11.23
Prophet	81.31	133.30	89.97
ETS	18.37	31.12	20.50
SARIMA	31.64	13.81	28.67
Hybrid*	14.00	19.51	15.00
Bayesian Structural	68.27	156.94	83.04

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.25	2.68	0.36
Prophet	2.36	2.47	2.70
ETS	0.81	1.67	0.92
SARIMA	0.62	1.39	0.63
Hybrid*	0.56	1.51	0.55
Bayesian Structural	2.03	12.79	1.85

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

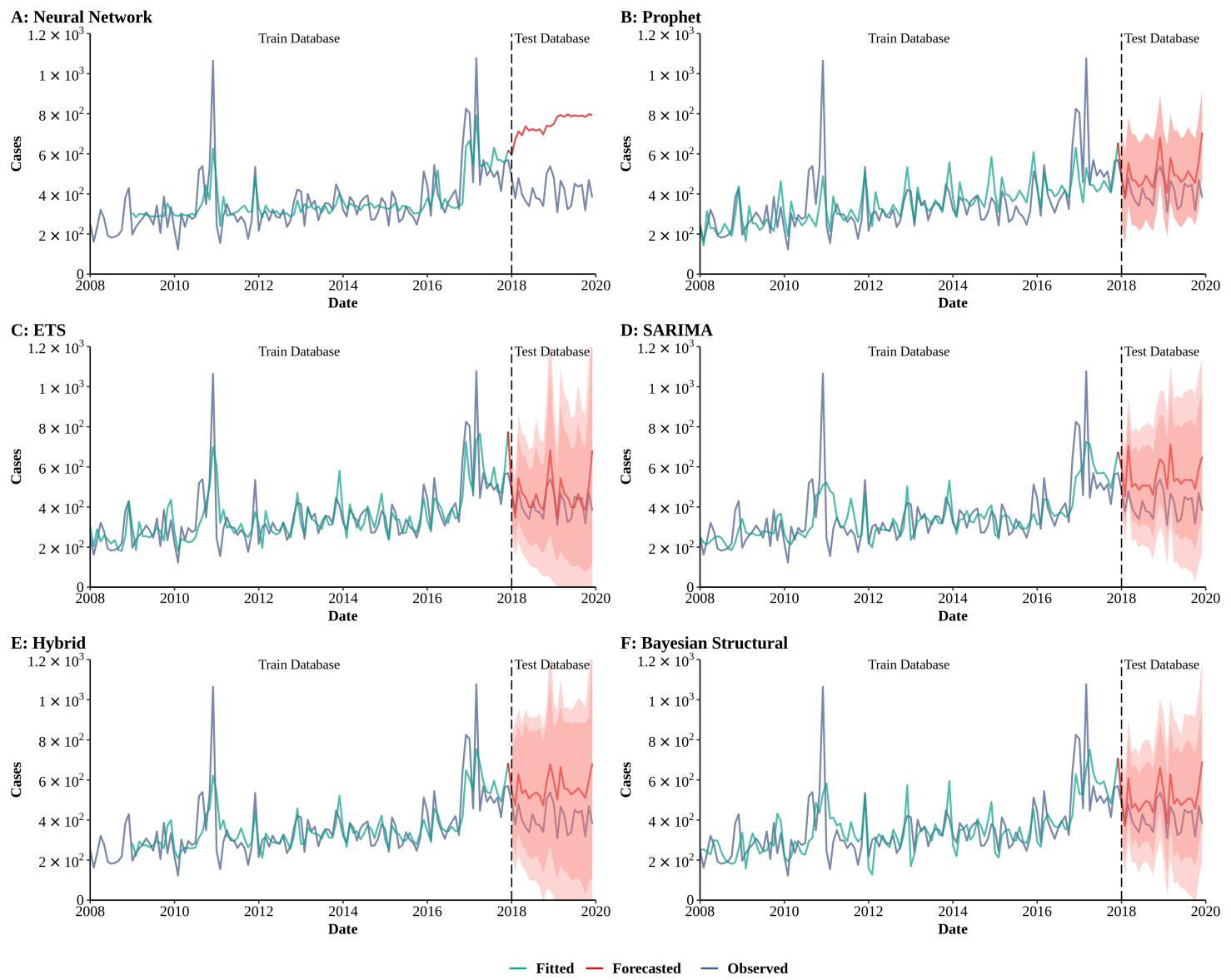
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.99	0.00	0.99
Prophet	0.50	0.05	0.47
ETS	0.86	0.07	0.86
SARIMA	0.90	0.07	0.91
Hybrid*	0.96	0.07	0.96
Bayesian Structural	0.69	0.01	0.23

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 21. Training and comparing variant time series models for malaria.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	95.85	346.43	171.28
Prophet	112.31	110.10	111.95
ETS	97.63	87.40	96.00
SARIMA	112.21	149.24	119.19
Hybrid*	96.17	156.13	109.54
Bayesian Structural	119.07	115.99	118.56

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	18.24	58.49	25.56
Prophet	19.64	19.54	19.62
ETS	17.96	14.36	17.36
SARIMA	19.91	29.31	21.48
Hybrid*	16.85	30.99	19.42
Bayesian Structural	22.52	21.38	22.33

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	1.59	18.52	3.05
Prophet	0.73	1.20	0.99
ETS	0.66	0.72	0.84
SARIMA	1.62	1.87	1.68
Hybrid*	0.63	2.40	1.38
Bayesian Structural	0.82	1.15	1.16

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

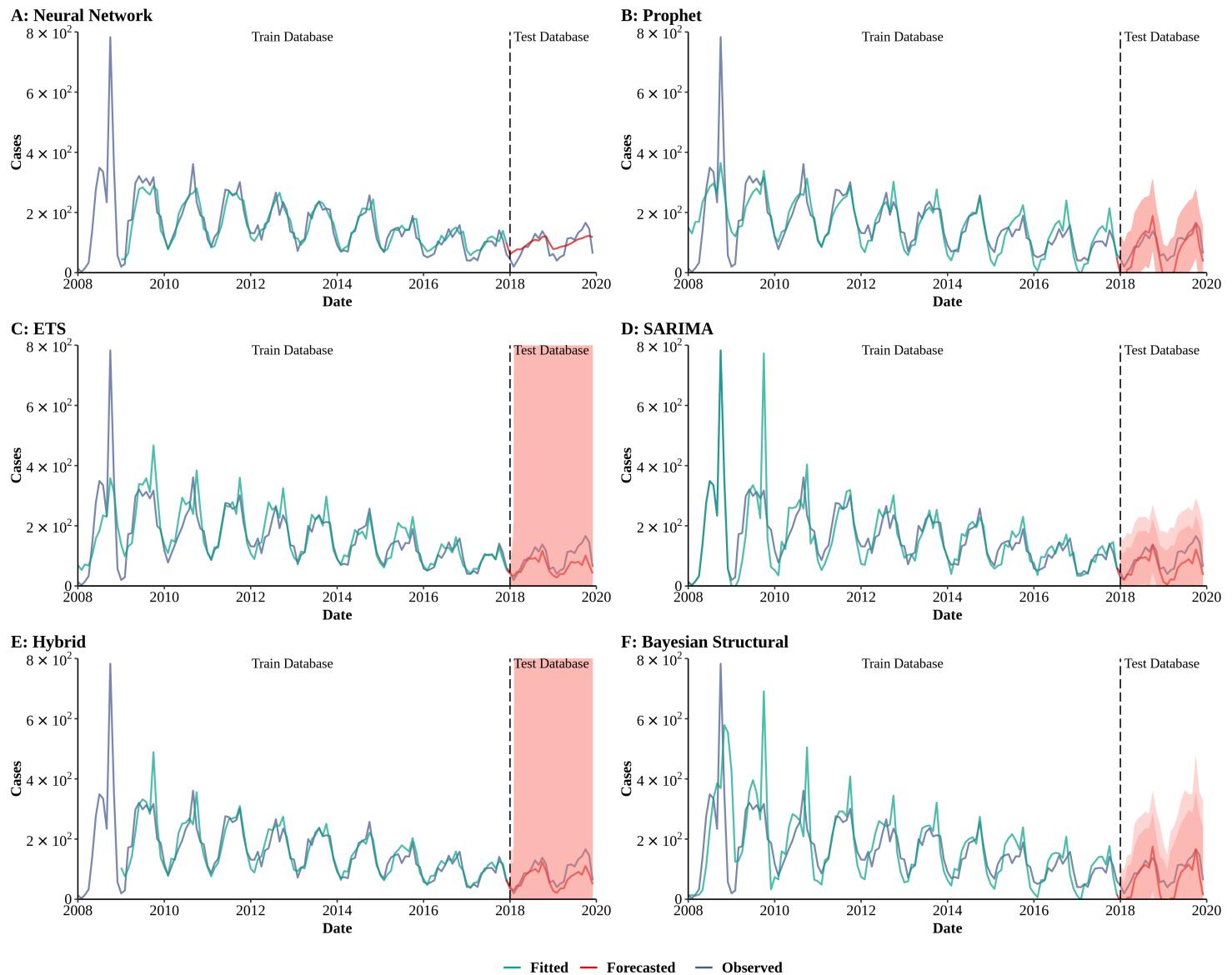
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.62	0.02	0.25
Prophet	0.44	0.30	0.41
ETS	0.58	0.33	0.56
SARIMA	0.45	0.45	0.40
Hybrid*	0.60	0.40	0.48
Bayesian Structural	0.41	0.38	0.40

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 22. Training and comparing variant time series models for echinococcosis.

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	32.08	28.18	31.41
Prophet	61.24	40.07	58.25
ETS	62.77	35.60	59.11
SARIMA	60.04	34.29	56.57
Hybrid*	35.81	30.42	34.89
Bayesian Structural	99.95	43.44	92.95

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	18.23	29.96	20.36
Prophet	32.12	72.98	38.93
ETS	24.59	35.48	26.41
SARIMA	25.86	45.09	29.07
Hybrid*	16.79	32.40	19.63
Bayesian Structural	39.53	83.92	46.93

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.91	3.48	1.04
Prophet	0.82	0.95	0.95
ETS	0.81	1.75	0.91
SARIMA	0.54	1.28	0.59
Hybrid*	0.70	1.45	0.74
Bayesian Structural	1.26	0.98	0.94

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

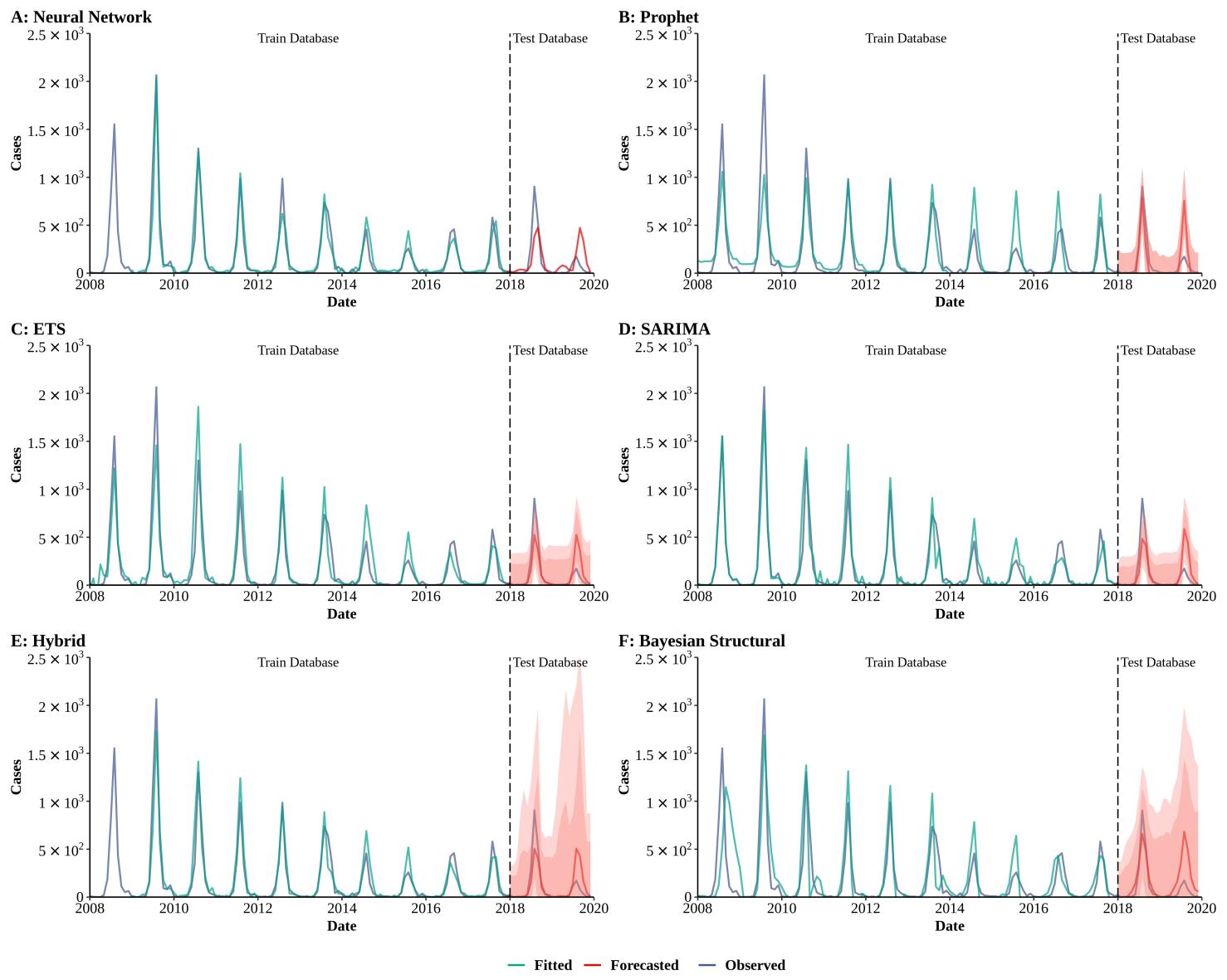
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.82	0.68	0.82
Prophet	0.63	0.80	0.64
ETS	0.62	0.70	0.64
SARIMA	0.75	0.75	0.77
Hybrid*	0.80	0.79	0.82
Bayesian Structural	0.41	0.84	0.46

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 23. Training and comparing variant time series models for typhus.

(A) Neural Network model; (B) Prophet model; (C) Exponential smoothing (ETS) model; (D) Seasonal autoregressive integrated moving average (SARIMA) model; (E) Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; (F) Bayesian structural model; (G) Root mean square error (RMSE) of variant models; (H) Symmetric mean absolute percentage error of variant models; (I) Mean absolute scaled error (MASE) of variant models; (J) R-squared of variant models.



G : RMSE of Models

Method	Train	Test	All
Neural Network	92.50	159.76	107.89
Prophet	173.93	182.40	175.37
ETS	157.73	128.70	153.27
SARIMA	116.70	148.78	122.63
Hybrid*	102.42	136.92	109.50
Bayesian Structural	240.71	161.49	229.41

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

H : SMAPE of Models

Method	Train	Test	All
Neural Network	74.51	116.08	82.06
Prophet	115.31	165.91	123.74
ETS	99.12	57.26	92.14
SARIMA	93.50	82.76	91.71
Hybrid*	82.39	76.13	81.25
Bayesian Structural	122.15	127.88	123.10

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

I : MASE of Models

Method	Train	Test	All
Neural Network	0.33	1.05	0.41
Prophet	0.66	0.95	0.72
ETS	0.54	0.69	0.50
SARIMA	0.32	0.77	0.36
Hybrid*	0.37	0.79	0.40
Bayesian Structural	0.89	0.86	0.75

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

J : R-squared of Models

Method	Train	Test	All
Neural Network	0.91	0.40	0.87
Prophet	0.72	0.63	0.69
ETS	0.79	0.60	0.78
SARIMA	0.88	0.49	0.86
Hybrid*	0.89	0.56	0.86
Bayesian Structural	0.56	0.56	0.56

*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

Supplementary Fig. 24. Training and comparing variant time series models for Japanese encephalitis (JE).

(A) Neural Network model; **(B)** Prophet model; **(C)** Exponential smoothing (ETS) model; **(D)** Seasonal autoregressive integrated moving average (SARIMA) model; **(E)** Hybrid models combining SARIMA, ETS, STL (seasonal and trend decomposition using loess), and neural network model; **(F)** Bayesian structural model; **(G)** Root mean square error (RMSE) of variant models; **(H)** Symmetric mean absolute percentage error of variant models; **(I)** Mean absolute scaled error (MASE) of variant models; **(J)** R-squared of variant models.