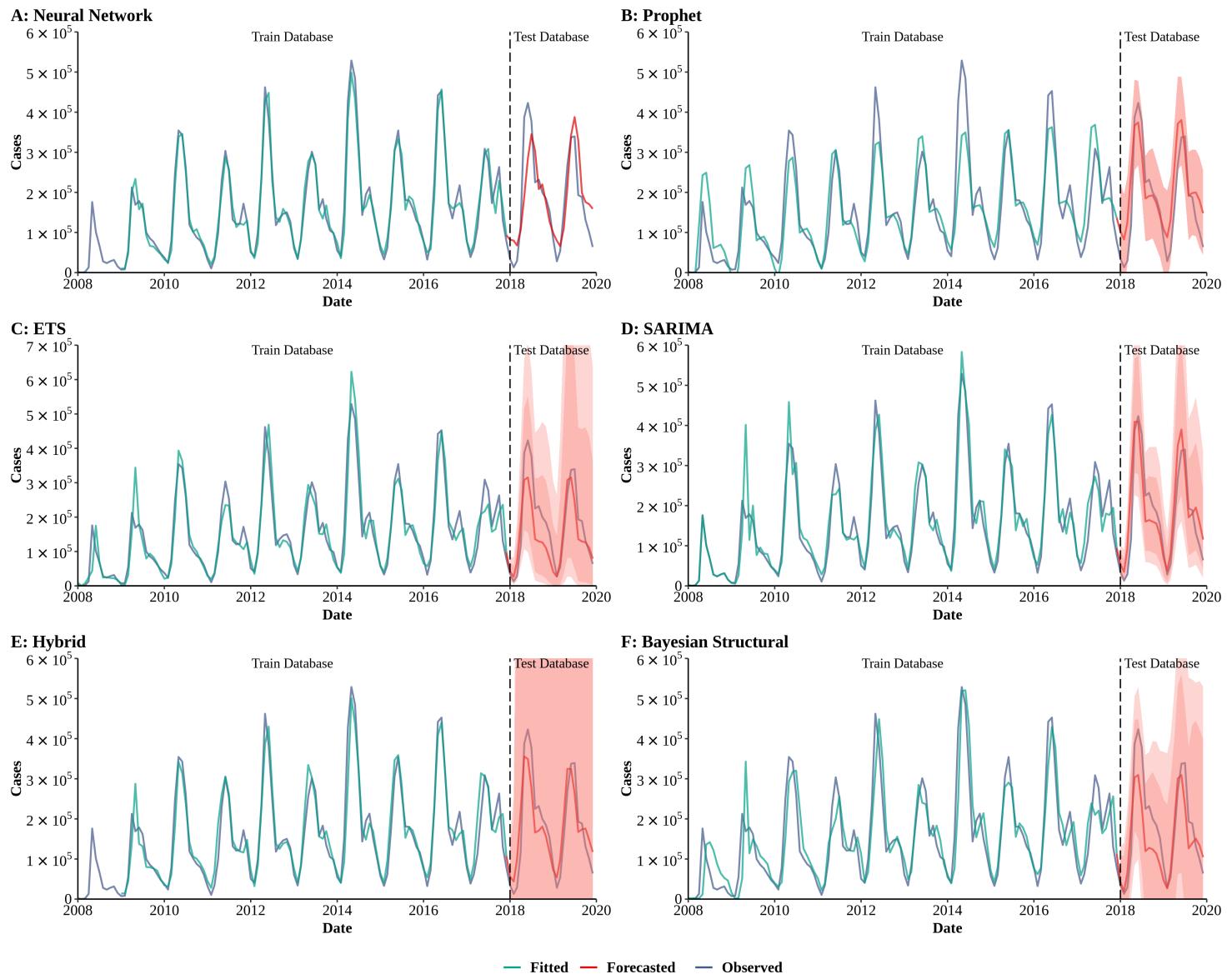


Supplementary Appendix 1:

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	23166.29	70971.65	36809.15
Prophet	55051.71	64877.15	56807.42
ETS	40789.02	63654.84	45406.79
SARIMA	41585.50	53910.64	43880.76
Hybrid*	36961.10	52387.08	40208.46
Bayesian Structural	55741.00	67751.16	57915.91

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	13.13	38.83	17.80
Prophet	37.51	43.26	38.47
ETS	22.63	35.12	24.71
SARIMA	18.83	33.32	21.24
Hybrid*	18.72	35.79	21.82
Bayesian Structural	34.94	36.58	35.21

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.29	1.07	0.42
Prophet	0.65	1.09	0.84
ETS	0.47	1.07	0.56
SARIMA	0.44	0.71	0.49
Hybrid*	0.41	0.92	0.51
Bayesian Structural	0.68	1.12	0.80

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

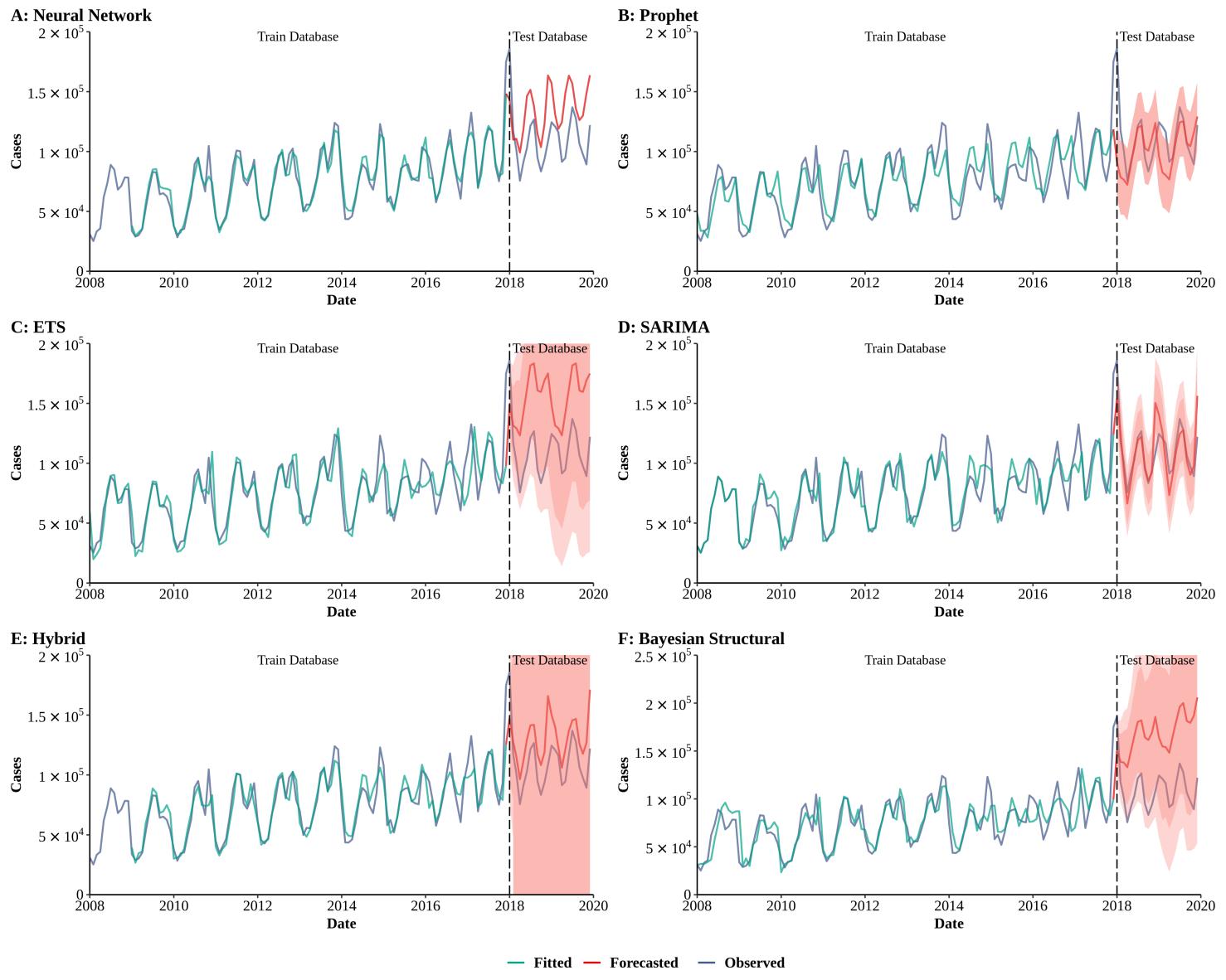
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.96	0.66	0.90
Prophet	0.78	0.79	0.77
ETS	0.88	0.81	0.86
SARIMA	0.88	0.81	0.87
Hybrid*	0.90	0.84	0.88
Bayesian Structural	0.77	0.78	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	6985.44	32542.36	15246.99
Prophet	15061.20	26531.66	17502.99
ETS	14680.65	52087.52	25135.36
SARIMA	12083.49	15076.35	12631.64
Hybrid*	10438.18	26264.10	14648.01
Bayesian Structural	16864.37	63556.50	30170.25

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	6.55	23.09	9.56
Prophet	15.13	16.02	15.28
ETS	13.26	36.59	17.15
SARIMA	10.37	9.05	10.15
Hybrid*	9.39	19.58	11.25
Bayesian Structural	15.04	44.11	19.89

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.39	1.76	0.69
Prophet	0.76	1.56	1.05
ETS	0.66	4.02	1.17
SARIMA	0.59	0.50	0.56
Hybrid*	0.49	1.46	0.77
Bayesian Structural	0.78	5.66	1.62

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

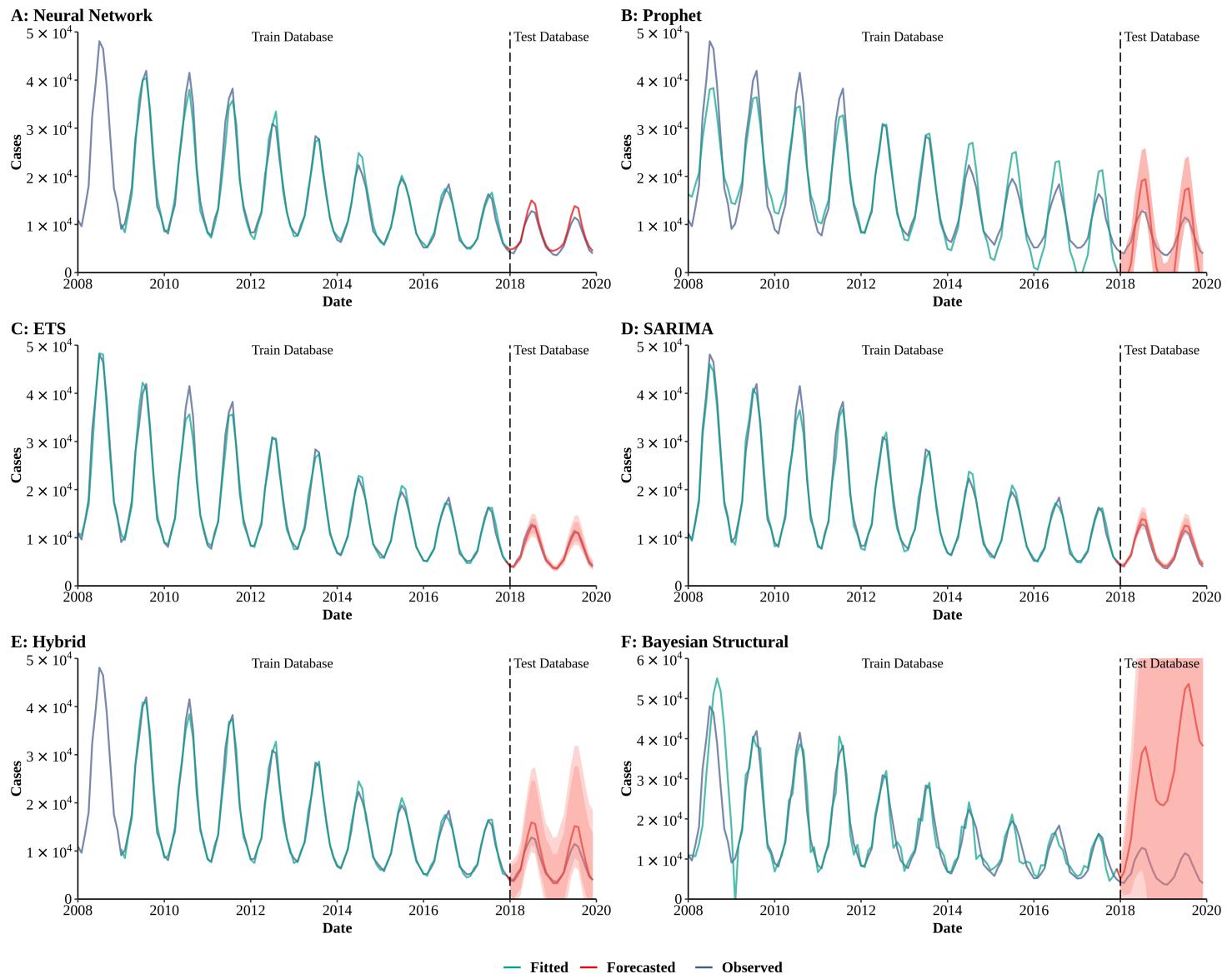
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.93	0.21	0.79
Prophet	0.67	0.05	0.63
ETS	0.69	0.06	0.61
SARIMA	0.79	0.63	0.81
Hybrid*	0.84	0.46	0.78
Bayesian Structural	0.59	0.05	0.52

*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	1341.81	1165.43	1311.50
Prophet	3405.83	5430.37	3818.54
ETS	1253.26	425.26	1157.16
SARIMA	1202.91	776.69	1142.96
Hybrid*	1069.45	1800.21	1234.91
Bayesian Structural	4869.63	26569.85	11722.65

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.97	12.07	7.08
Prophet	25.48	108.03	39.24
ETS	4.50	4.48	4.50
SARIMA	4.92	8.70	5.55
Hybrid*	5.13	13.04	6.57
Bayesian Structural	17.69	116.35	34.14

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.26	0.55	0.29
Prophet	0.68	1.26	0.79
ETS	0.20	0.25	0.21
SARIMA	0.22	0.43	0.23
Hybrid*	0.21	0.61	0.26
Bayesian Structural	0.71	5.88	1.45

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

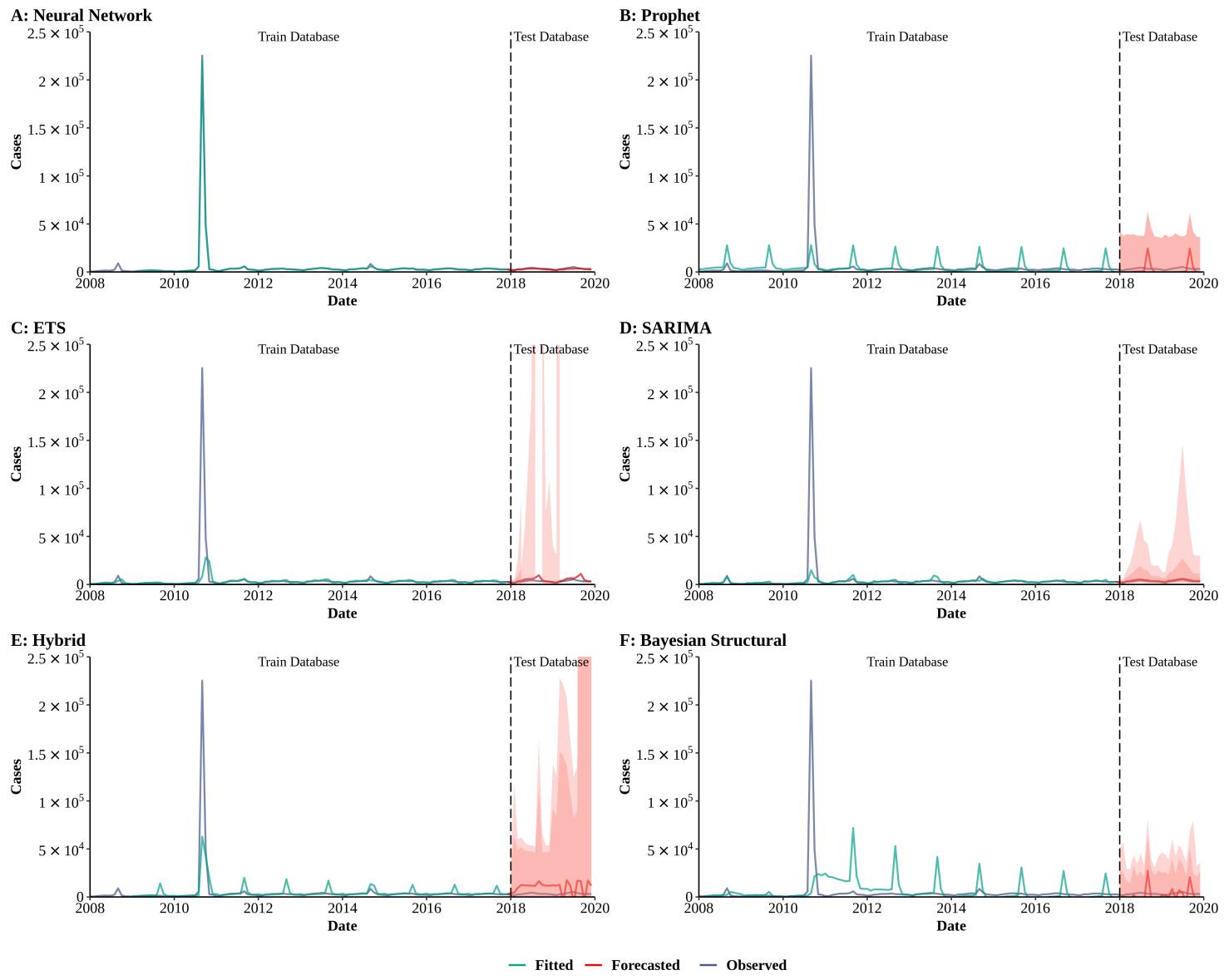
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.98	0.98	0.98
Prophet	0.89	0.97	0.87
ETS	0.99	0.98	0.99
SARIMA	0.99	0.99	0.99
Hybrid*	0.99	0.98	0.98
Bayesian Structural	0.81	0.33	0.32

*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	543.35	681.98	571.27
Prophet	19467.68	6921.68	17994.74
ETS	20016.56	2443.01	18299.74
SARIMA	19596.49	750.79	17891.69
Hybrid*	16068.29	9575.93	15096.98
Bayesian Structural	23260.47	7834.35	21473.34

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	2.31	16.00	4.82
Prophet	84.57	170.09	98.83
ETS	22.76	30.15	23.99
SARIMA	20.55	18.79	20.26
Hybrid*	31.21	124.49	48.17
Bayesian Structural	109.19	148.07	115.67

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.03	2.01	0.05
Prophet	1.22	1.09	1.21
ETS	0.63	1.08	2.22
SARIMA	2.39	1.38	2.31
Hybrid*	0.66	1.34	1.10
Bayesian Structural	1.80	0.70	1.34

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

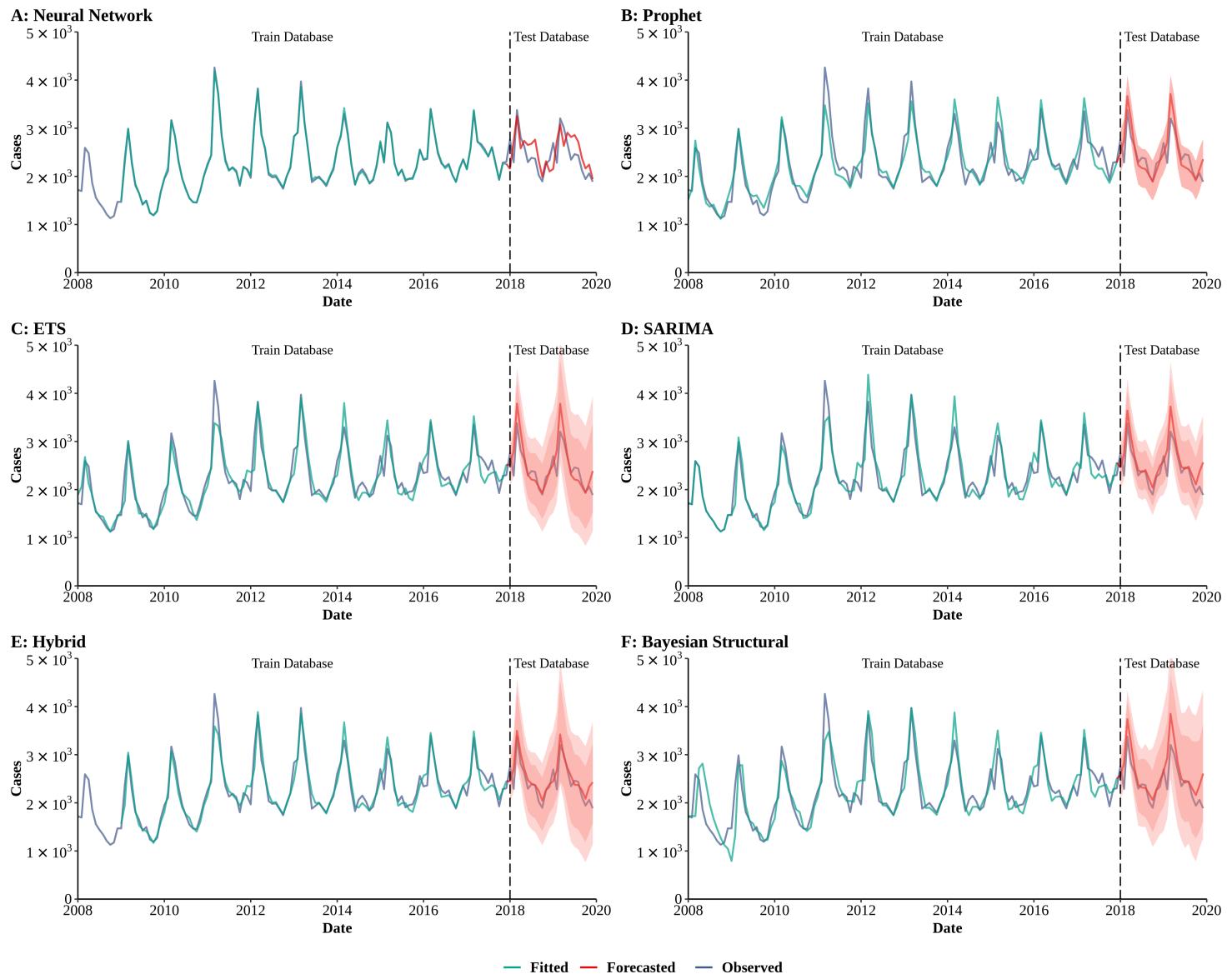
J : R-squared of Models

Method	Train	Test	All
Neural Network	1.00	0.69	1.00
Prophet	0.11	0.01	0.10
ETS	0.09	0.43	0.08
SARIMA	0.37	0.91	0.34
Hybrid*	0.67	0.00	0.52
Bayesian Structural	0.00	0.02	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	30.96	322.84	140.48
Prophet	220.32	258.24	227.08
ETS	222.31	277.30	232.38
SARIMA	230.76	273.79	238.47
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	0.98	11.47	2.89
Prophet	7.32	8.02	7.44
ETS	6.96	7.95	7.13
SARIMA	6.43	8.26	6.73
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	0.07	1.03	0.22
Prophet	0.51	0.67	0.58
ETS	0.48	0.65	0.55
SARIMA	0.47	0.71	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

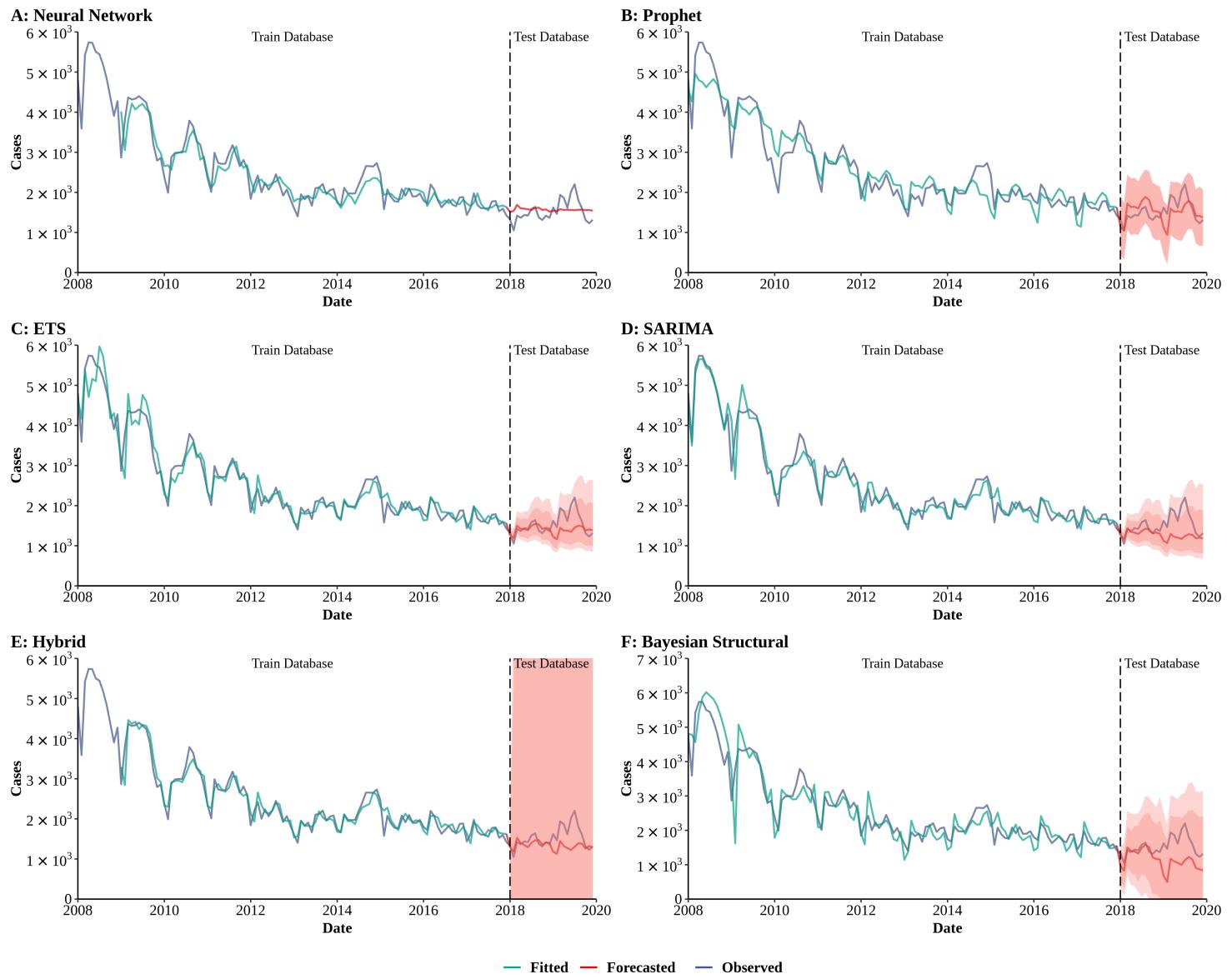
J : R-squared of Models

Method	Train	Test	All
Neural Network	1.00	0.42	0.93
Prophet	0.86	0.75	0.84
ETS	0.86	0.75	0.84
SARIMA	0.86	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	263.66	270.96	265.00
Prophet	357.76	287.44	347.03
ETS	264.30	292.03	269.12
SARIMA	252.13	388.66	279.56
Hybrid*	188.44	339.85	223.72
Bayesian Structural	407.92	537.14	432.15

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	8.39	14.44	9.49
Prophet	10.63	15.67	11.47
ETS	6.94	13.47	8.03
SARIMA	6.80	18.57	8.76
Hybrid*	5.85	15.56	7.61
Bayesian Structural	11.08	32.39	14.63

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

I : MASE of Models

Method	Train	Test	All
Neural Network	1.29	8.52	1.56
Prophet	1.01	1.52	1.46
ETS	0.71	2.72	0.86
SARIMA	0.73	3.81	0.91
Hybrid*	0.57	2.40	0.88
Bayesian Structural	1.06	2.51	0.97

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

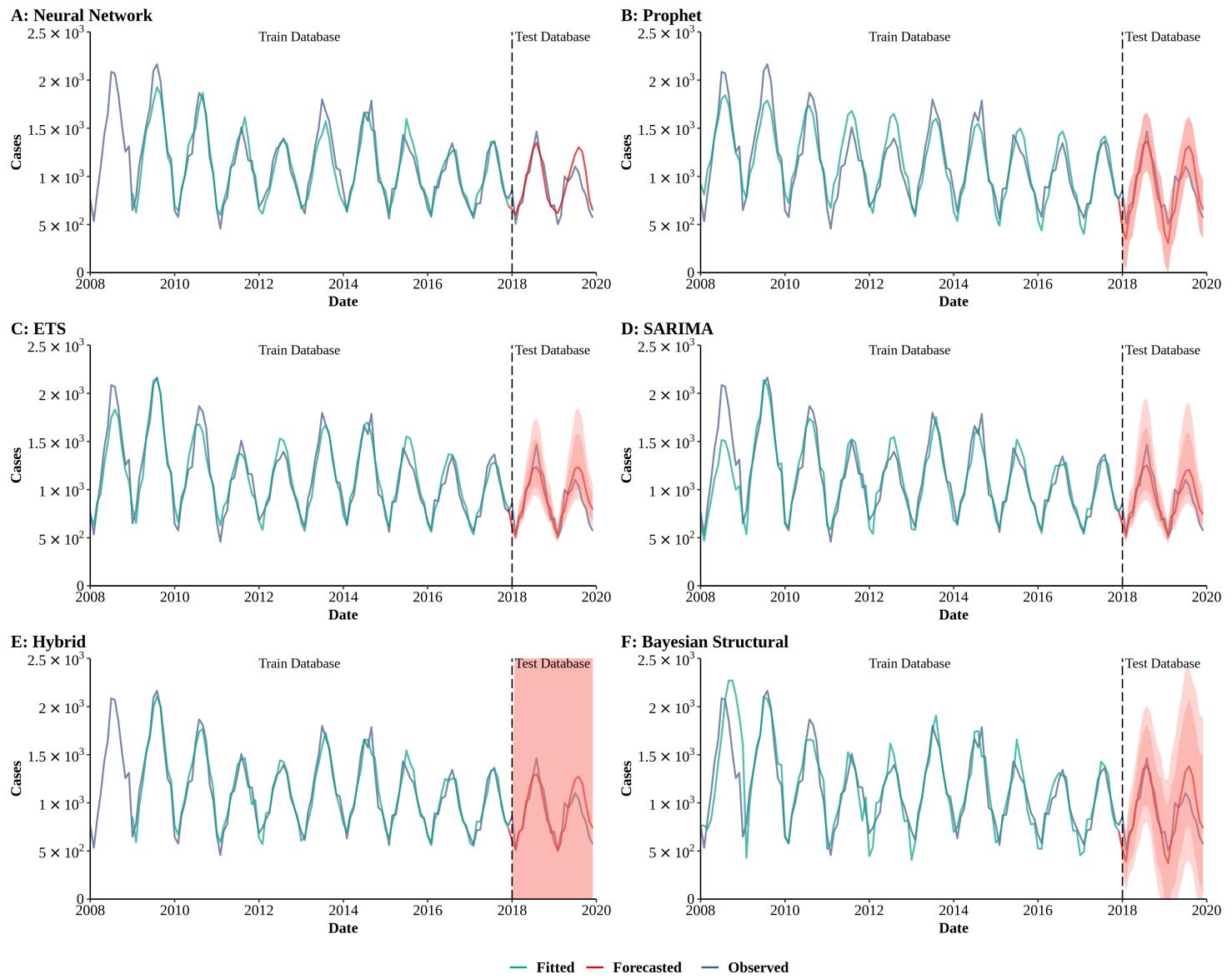
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.87	0.00	0.87
Prophet	0.89	0.14	0.89
ETS	0.94	0.06	0.94
SARIMA	0.94	0.00	0.94
Hybrid*	0.93	0.00	0.92
Bayesian Structural	0.88	0.01	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	118.60	142.54	123.30
Prophet	157.00	180.26	161.11
ETS	114.48	146.08	120.33
SARIMA	148.40	131.32	145.69
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	8.51	12.76	9.28
Prophet	12.04	18.89	13.18
ETS	8.20	13.64	9.11
SARIMA	9.43	12.75	9.98
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	0.57	0.89	0.62
Prophet	0.70	0.85	0.77
ETS	0.48	1.04	0.59
SARIMA	0.61	0.96	0.65
Hybrid*	0.43	0.88	0.51
Bayesian Structural	0.73	0.88	0.70

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

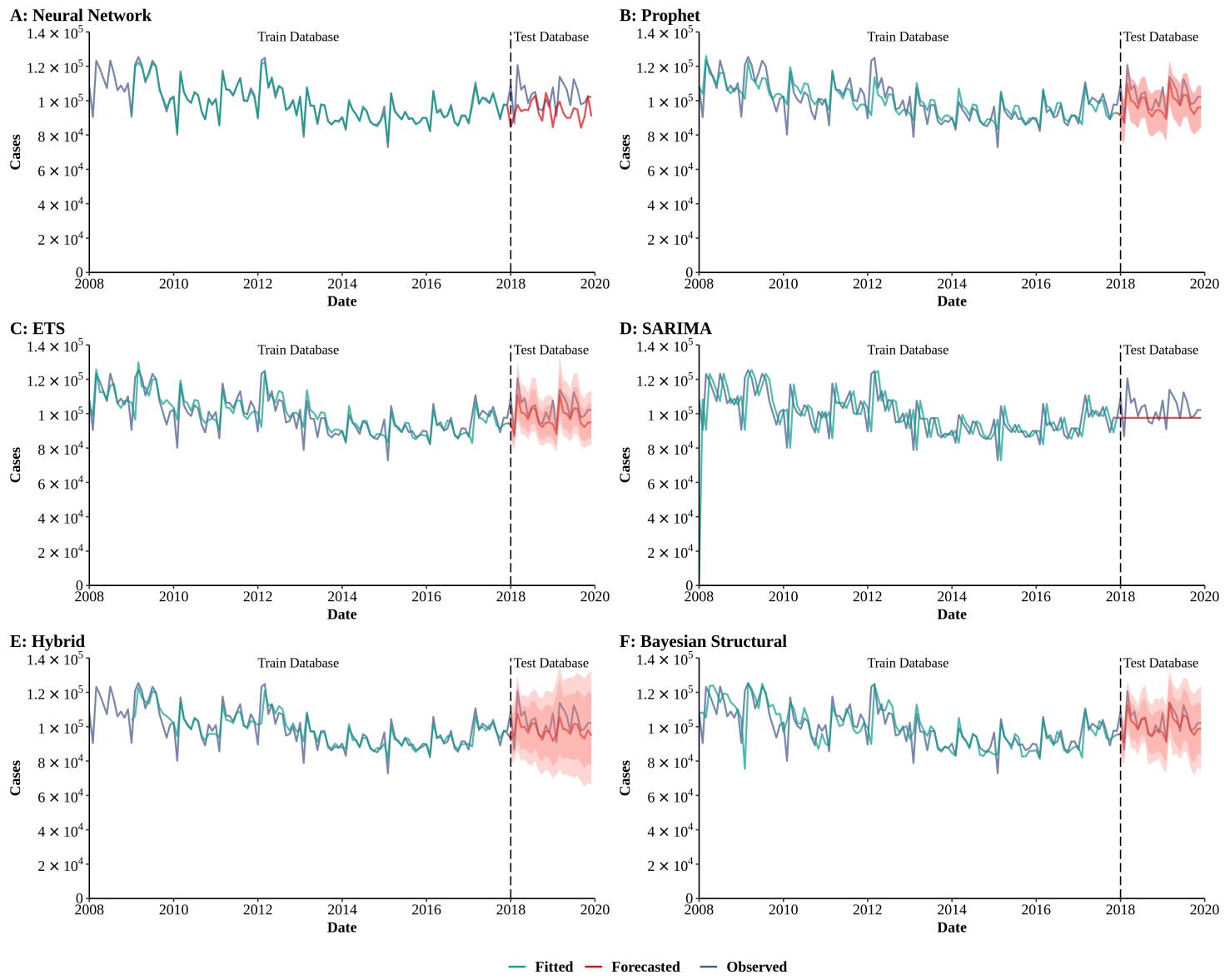
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.90	0.72	0.88
Prophet	0.84	0.71	0.82
ETS	0.91	0.67	0.90
SARIMA	0.86	0.73	0.86
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	1042.85	12621.77	5463.98
Prophet	6373.59	7132.88	6506.30
ETS	6186.51	6740.76	6282.28
SARIMA	15019.02	9396.49	14236.98
Hybrid*	4820.37	7811.5	5486.87
Bayesian Structural	8376.61	4952.78	7909.57

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

H : SMAPE of Models			
Method	Train	Test	All
Neural Network	0.71	10.55	2.50
Prophet	4.51	5.59	4.69
ETS	4.23	5.29	4.41
SARIMA	9.86	7.33	9.44
Hybrid*	3.23	6.23	3.77
Bayesian Structural	5.41	3.43	5.08

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

I : MASE of Models			
Method	Train	Test	All
Neural Network	0.10	1.61	0.35
Prophet	0.54	1.06	0.87
ETS	0.51	0.98	0.78
SARIMA	0.99	Inf	1.16
Hybrid*	0.40	1.5	0.81
Bayesian Structural	0.65	0.64	0.82

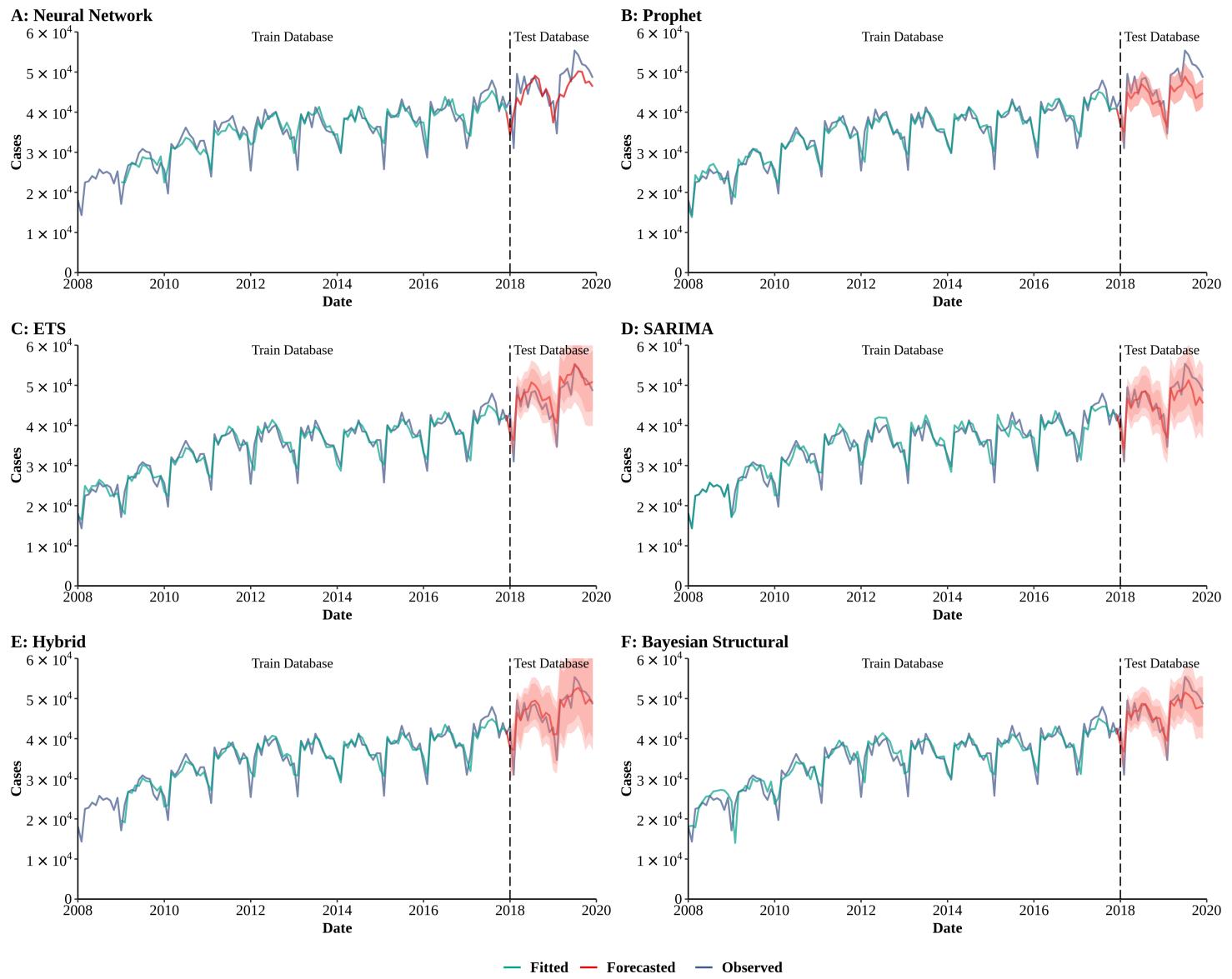
*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

J : R-squared of Models			
Method	Train	Test	All
Neural Network	0.99	0.02	0.75
Prophet	0.67	0.67	0.64
ETS	0.70	0.71	0.67
SARIMA	0.10		0.09
Hybrid*	0.80	0.45	0.73
Bayesian Structural	0.54	0.7	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	2281.29	4500.74	2817.99
Prophet	1745.29	4232.62	2350.36
ETS	1865.64	2945.75	2084.88
SARIMA	1943.45	2973.30	2149.63
Hybrid*	1842.27	2852.31	2063.03
Bayesian Structural	2461.40	2653.99	2494.53

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.13	8.43	5.73
Prophet	4.04	8.04	4.71
ETS	4.45	5.24	4.58
SARIMA	4.30	5.40	4.48
Hybrid*	4.21	5.11	4.37
Bayesian Structural	5.84	4.77	5.66

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.79	1.63	0.94
Prophet	0.41	1.65	0.74
ETS	0.45	0.97	0.70
SARIMA	0.57	0.84	0.62
Hybrid*	0.44	1.05	0.71
Bayesian Structural	0.57	1.02	0.87

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

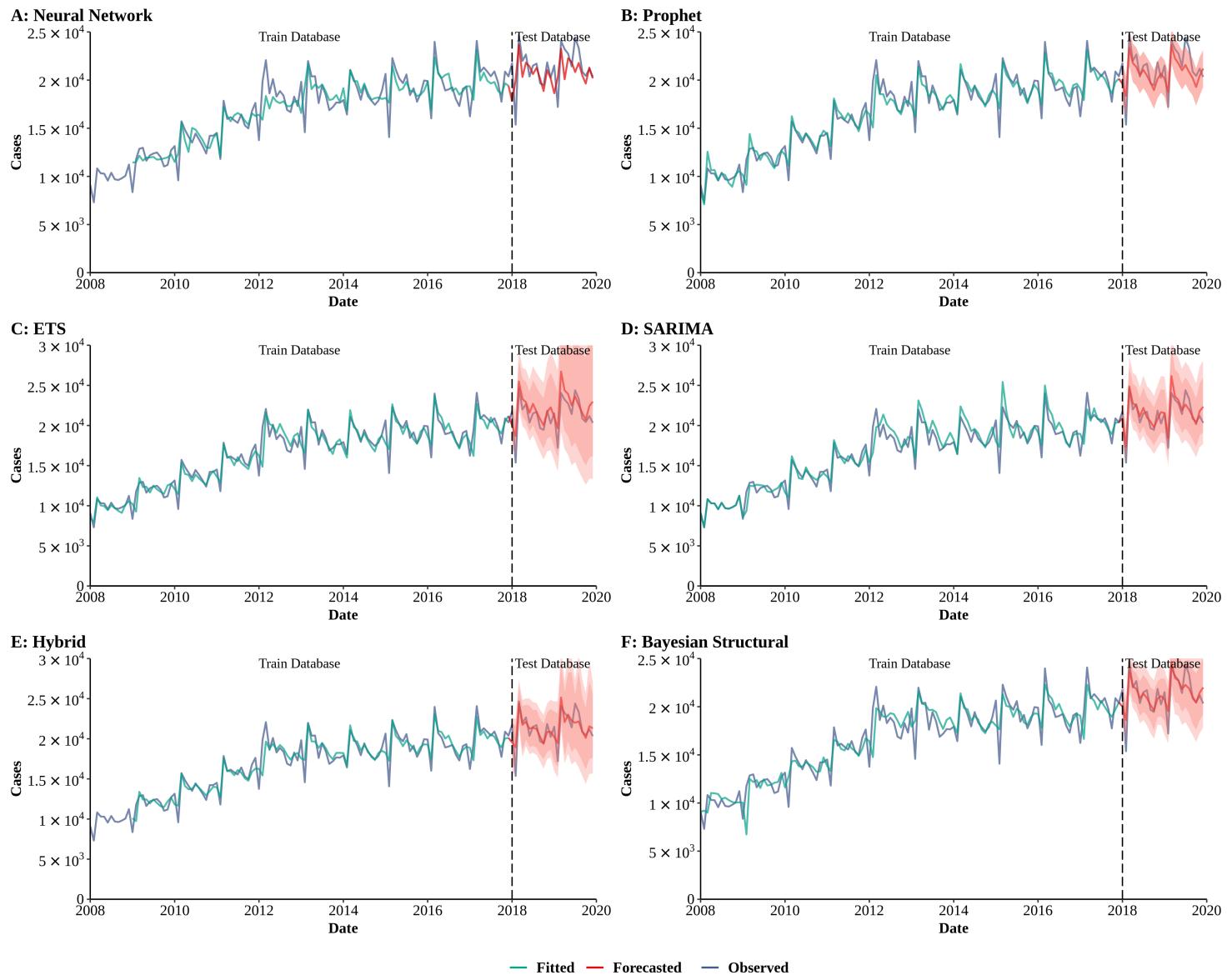
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.84	0.42	0.85
Prophet	0.93	0.76	0.93
ETS	0.93	0.78	0.94
SARIMA	0.92	0.78	0.93
Hybrid*	0.90	0.74	0.92
Bayesian Structural	0.87	0.81	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	1312.88	1933.97	1445.79
Prophet	1007.63	1379.99	1078.66
ETS	1062.58	1478.36	1142.43
SARIMA	1076.37	1059.44	1073.56
Hybrid*	1058.35	1274.67	1100.84
Bayesian Structural	1329.26	1191.46	1307.31

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	5.75	6.89	5.96
Prophet	4.50	5.41	4.65
ETS	4.85	5.74	5.00
SARIMA	4.61	4.11	4.53
Hybrid*	4.56	4.61	4.57
Bayesian Structural	6.28	4.25	5.94

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.99	0.88	0.96
Prophet	0.44	0.93	0.66
ETS	0.48	0.73	0.65
SARIMA	0.61	0.49	0.59
Hybrid*	0.45	0.74	0.75
Bayesian Structural	0.60	0.76	1.01

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

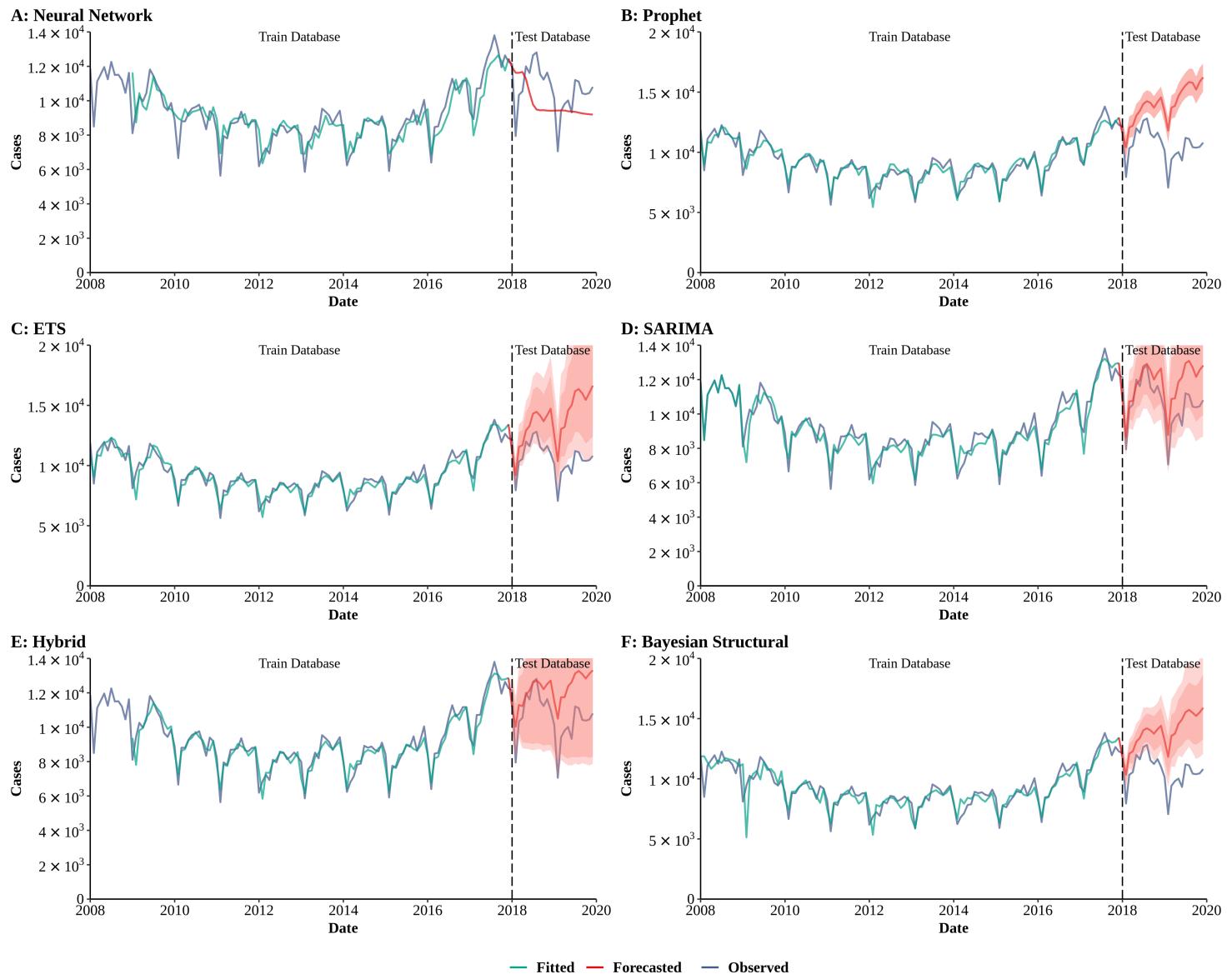
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.83	0.24	0.82
Prophet	0.93	0.69	0.93
ETS	0.92	0.68	0.92
SARIMA	0.93	0.77	0.94
Hybrid*	0.89	0.63	0.90
Bayesian Structural	0.88	0.71	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	768.48	1740.44	1016.83
Prophet	471.53	3697.52	1569.68
ETS	528.79	3631.33	1559.10
SARIMA	531.86	1435.89	761.16
Hybrid*	456.14	1903.21	910.39
Bayesian Structural	804.54	3582.51	1636.60

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	6.21	14.24	7.67
Prophet	4.05	27.30	7.93
ETS	4.51	26.01	8.10
SARIMA	4.50	11.09	5.60
Hybrid*	3.93	14.80	5.91
Bayesian Structural	5.80	26.65	9.27

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.92	11.56	1.39
Prophet	0.47	5.18	1.38
ETS	0.52	3.45	1.26
SARIMA	0.58	1.58	0.76
Hybrid*	0.48	3.43	1.01
Bayesian Structural	0.67	5.30	1.44

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

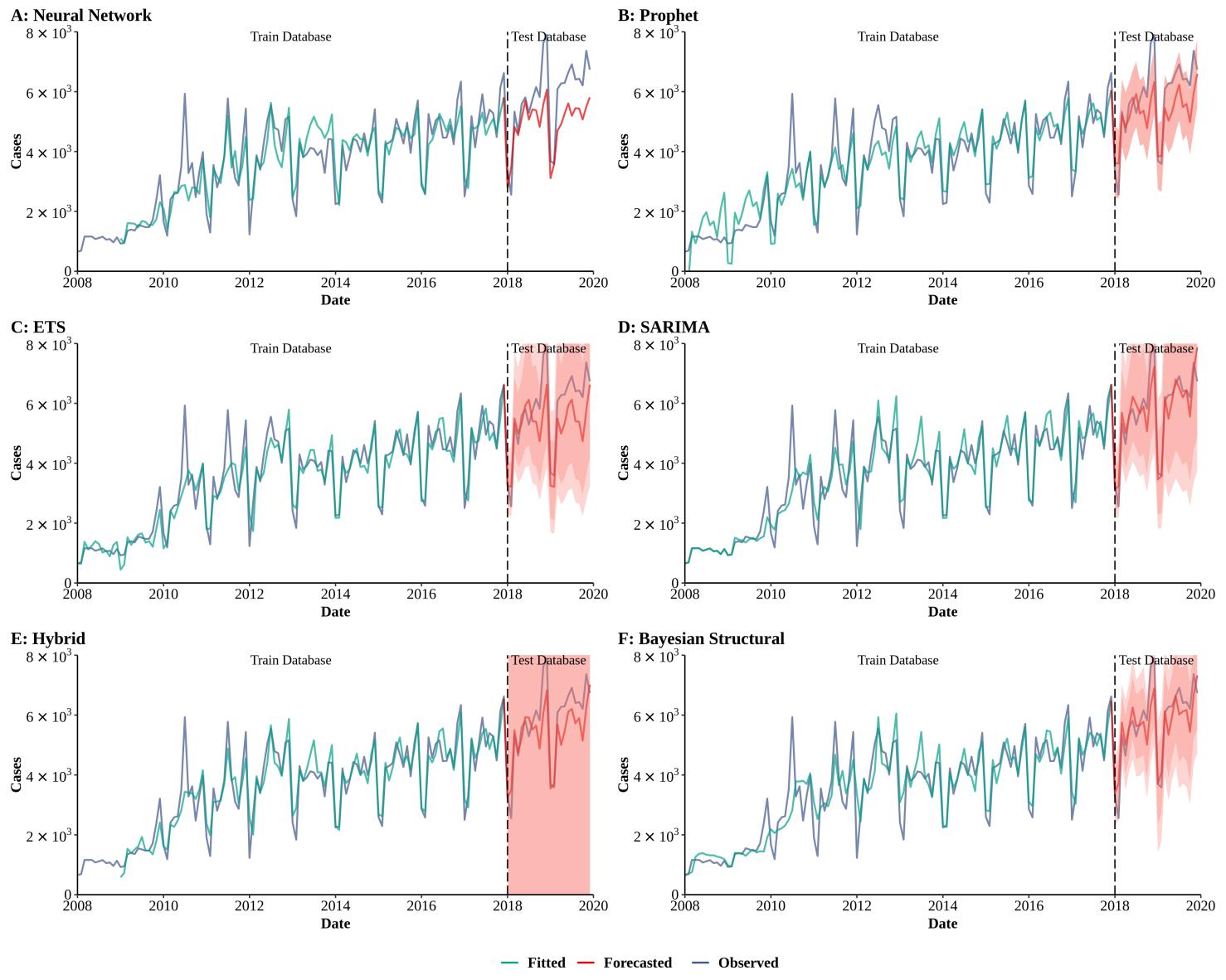
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.76	0.00	0.63
Prophet	0.92	0.08	0.60
ETS	0.90	0.17	0.63
SARIMA	0.91	0.52	0.83
Hybrid*	0.92	0.28	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	596.07	1073.56	707.28
Prophet	574.77	891.28	638.51
ETS	495.51	902.15	583.31
SARIMA	551.30	518.54	545.98
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	12.69	16.54	13.39
Prophet	19.42	13.50	18.43
ETS	11.50	13.56	11.84
SARIMA	10.56	7.26	10.01
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	0.69	1.55	0.81
Prophet	0.54	1.16	0.70
ETS	0.42	0.97	0.60
SARIMA	0.54	0.45	0.51
Hybrid*	0.39	0.76	0.53
Bayesian Structural	0.51	0.60	0.65

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

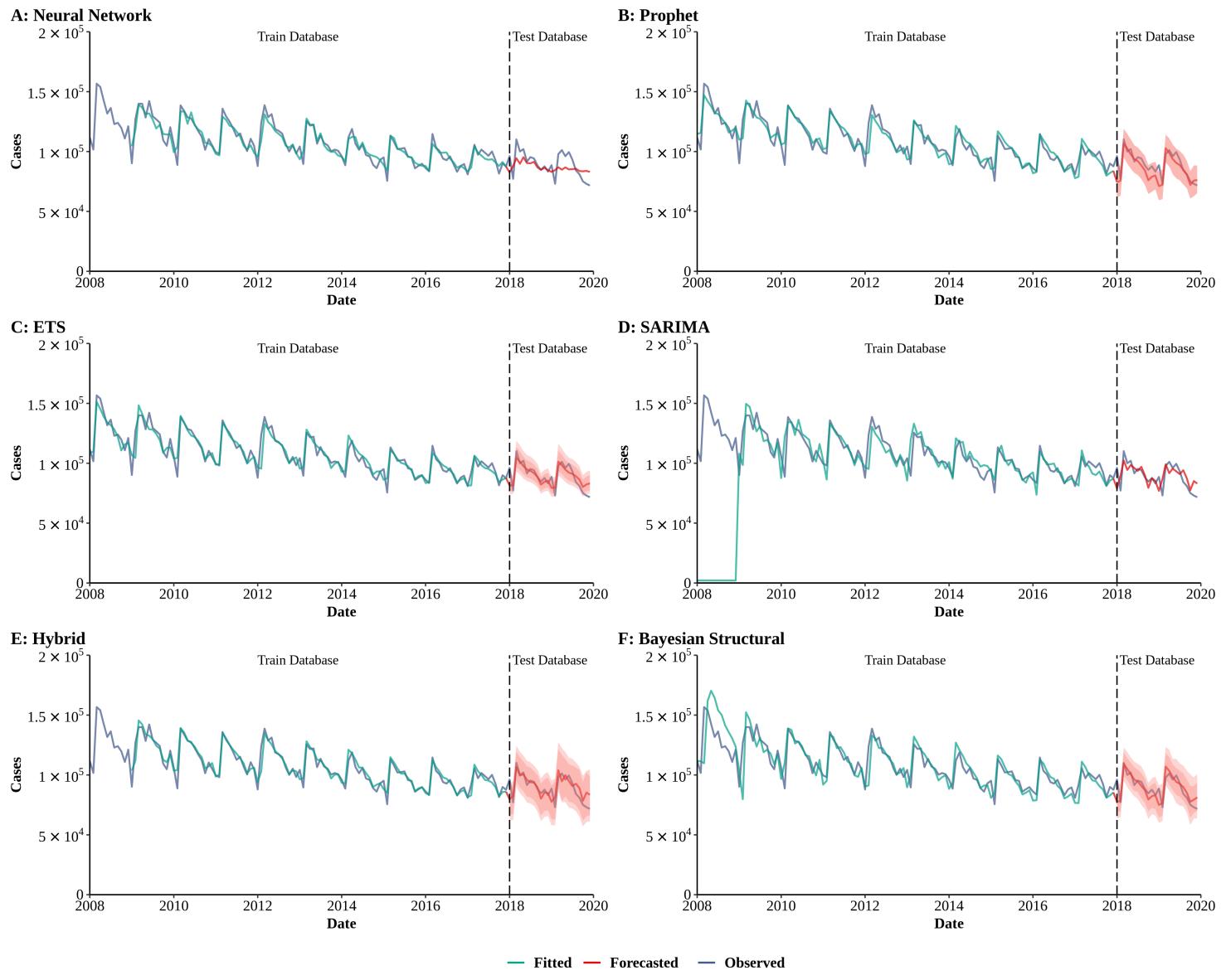
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.81	0.81	0.82
Prophet	0.86	0.80	0.87
ETS	0.90	0.74	0.90
SARIMA	0.87	0.85	0.90
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	5030.28	9071.85	5972.13
Prophet	6212.04	7120.76	6372.49
ETS	5942.67	5897.21	5935.12
SARIMA	40903.90	7918.45	37479.66
Hybrid*	4755.05	6802.06	5187.66
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	3.60	8.56	4.50
Prophet	4.20	5.89	4.48
ETS	3.73	5.55	4.03
SARIMA	24.50	7.31	21.64
Hybrid*	3.12	6.28	3.69
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	0.65	3.27	0.87
Prophet	0.48	0.82	0.72
ETS	0.43	1.10	0.67
SARIMA	2.03	0.99	1.90
Hybrid*	0.37	0.87	0.57
Bayesian Structural	0.76	0.78	0.79

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

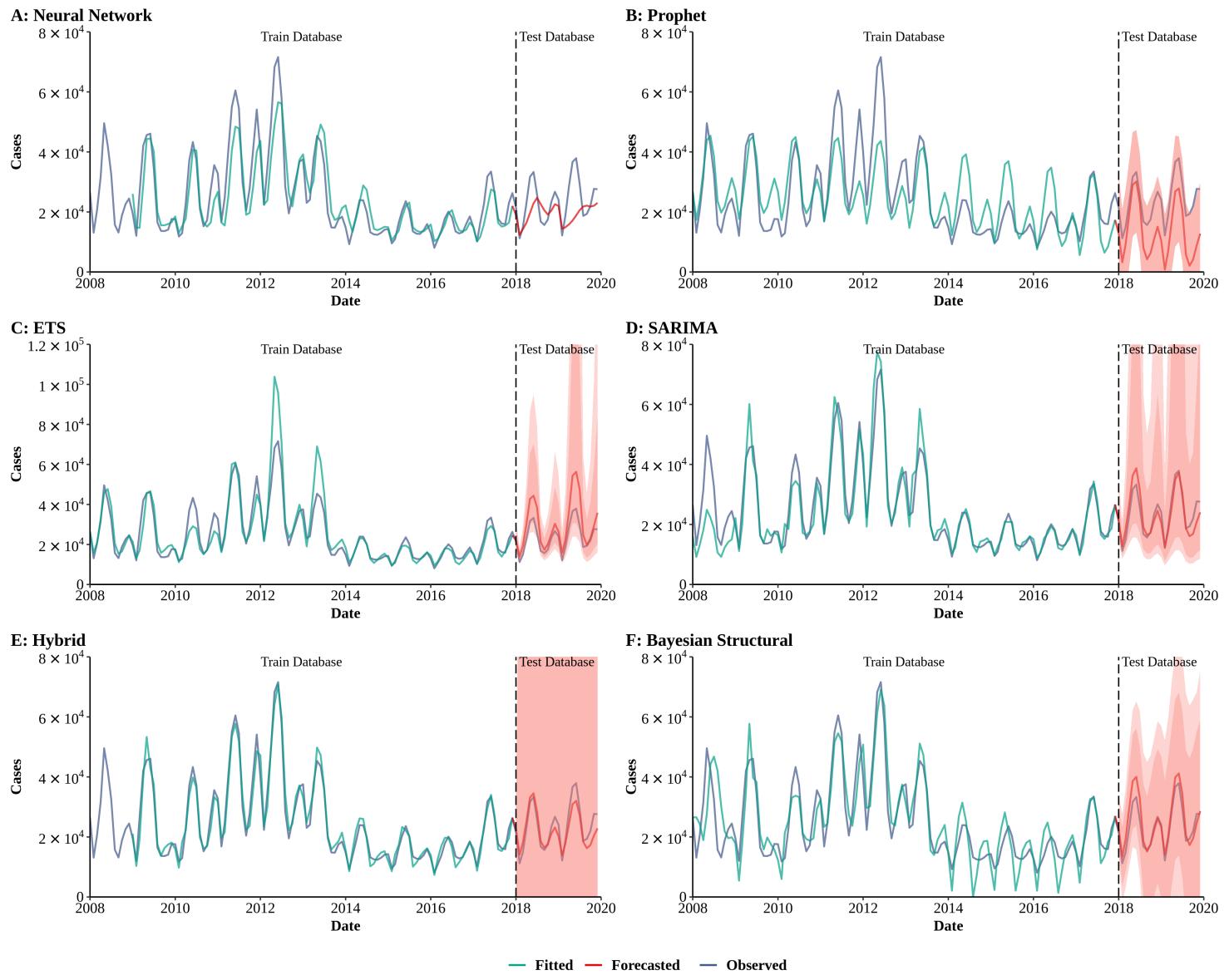
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.90	0.37	0.87
Prophet	0.86	0.69	0.87
ETS	0.88	0.68	0.89
SARIMA	0.00	0.41	0.00
Hybrid*	0.91	0.57	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	6262.62	7847.20	6579.18
Prophet	8694.83	11301.79	9180.87
ETS	6438.00	8451.67	6815.05
SARIMA	5460.20	3226.85	5155.60
Hybrid*	2705.90	3379.12	2840.20
Bayesian Structural	6676.57	3516.83	6261.67

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	17.24	24.85	18.63
Prophet	27.51	72.56	35.01
ETS	12.86	21.30	14.27
SARIMA	14.06	11.14	13.58
Hybrid*	9.79	12.56	10.29
Bayesian Structural	28.18	11.13	25.34

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.85	2.93	1.01
Prophet	1.01	1.58	1.12
ETS	0.56	0.79	0.59
SARIMA	0.51	0.46	0.50
Hybrid*	0.34	0.63	0.37
Bayesian Structural	0.78	0.44	0.65

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

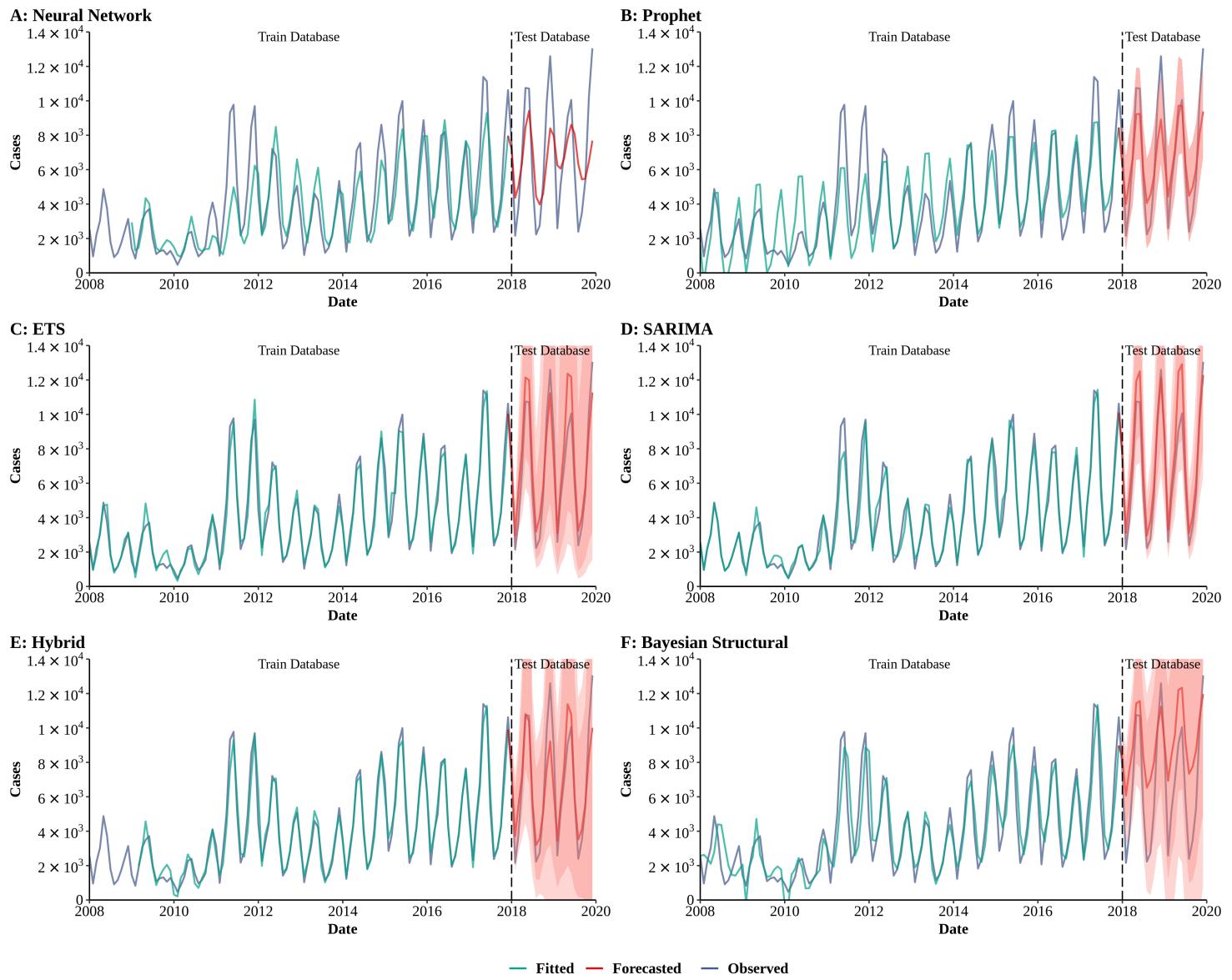
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.80	0.12	0.75
Prophet	0.58	0.76	0.51
ETS	0.86	0.90	0.84
SARIMA	0.86	0.82	0.86
Hybrid*	0.96	0.81	0.95
Bayesian Structural	0.77	0.89	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	1558.42	2408.54	1744.09
Prophet	1374.66	1735.82	1441.15
ETS	510.89	1332.81	716.64
SARIMA	572.96	1233.43	726.03
Hybrid*	509.08	1479.54	784.50
Bayesian Structural	1181.05	2937.21	1612.53

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	29.92	32.53	30.40
Prophet	37.43	25.25	35.40
ETS	11.00	18.69	12.28
SARIMA	10.42	16.31	11.40
Hybrid*	12.95	18.58	13.99
Bayesian Structural	29.16	41.57	31.23

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.84	1.61	0.97
Prophet	0.63	0.89	0.69
ETS	0.21	0.42	0.27
SARIMA	0.24	0.32	0.26
Hybrid*	0.22	0.49	0.29
Bayesian Structural	0.52	1.58	0.81

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

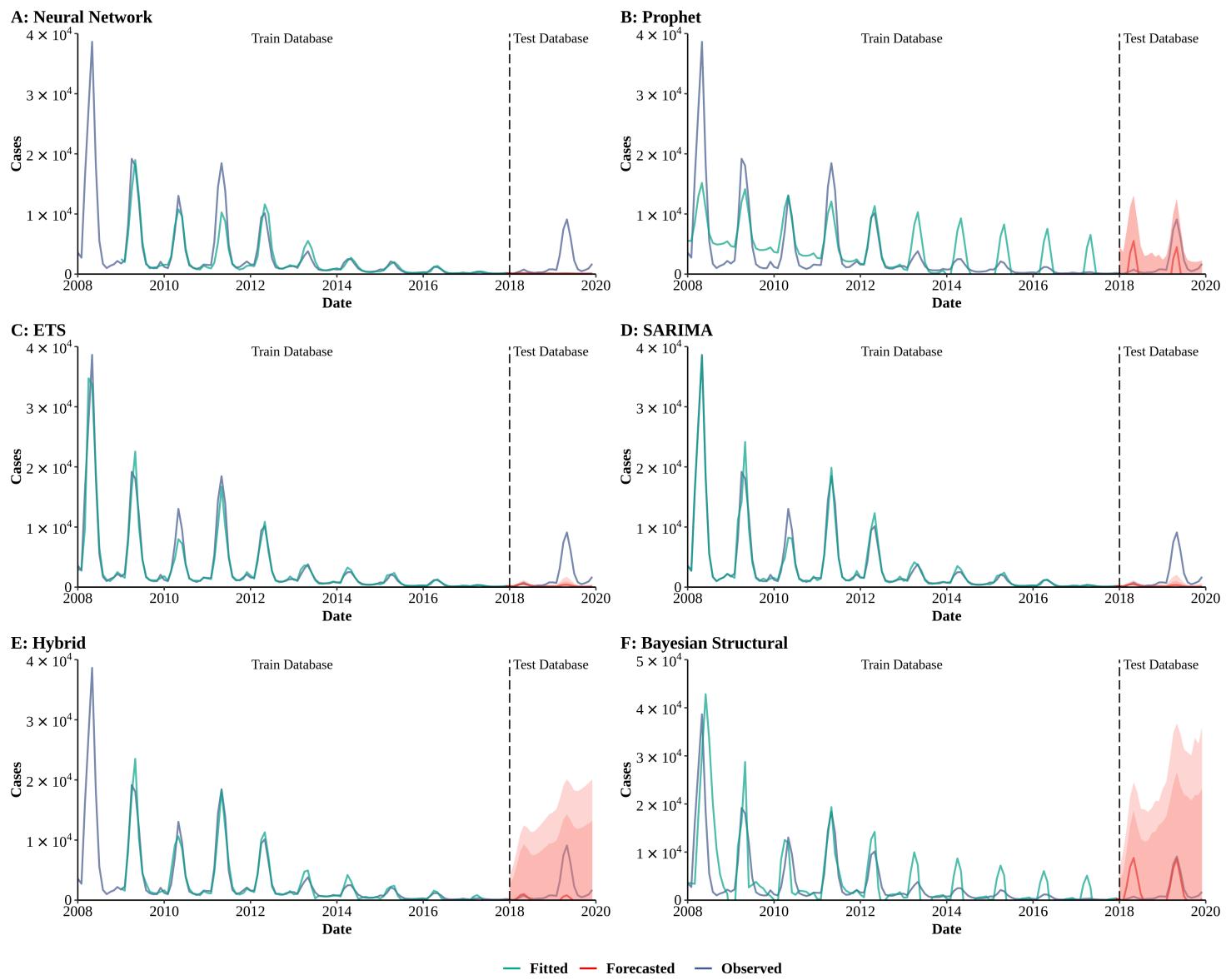
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.67	0.61	0.67
Prophet	0.73	0.88	0.77
ETS	0.96	0.87	0.94
SARIMA	0.95	0.92	0.94
Hybrid*	0.97	0.83	0.93
Bayesian Structural	0.80	0.86	0.74

*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	1573.72	2812.30	1861.26
Prophet	3846.09	4937.86	4048.55
ETS	1391.54	2718.32	1686.77
SARIMA	1058.91	2734.35	1476.66
Hybrid*	901.09	2727.67	1420.25
Bayesian Structural	5191.85	2524.56	4850.26

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	22.14	128.75	41.52
Prophet	100.31	181.14	113.78
ETS	15.10	110.44	30.99
SARIMA	14.79	113.77	31.29
Hybrid*	45.17	163.72	66.72
Bayesian Structural	98.49	148.92	106.89

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.59	104.62	0.89
Prophet	1.45	2.67	1.66
ETS	0.33	21.71	0.51
SARIMA	0.23	24.49	0.38
Hybrid*	0.40	6.90	0.59
Bayesian Structural	1.68	0.99	0.93

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

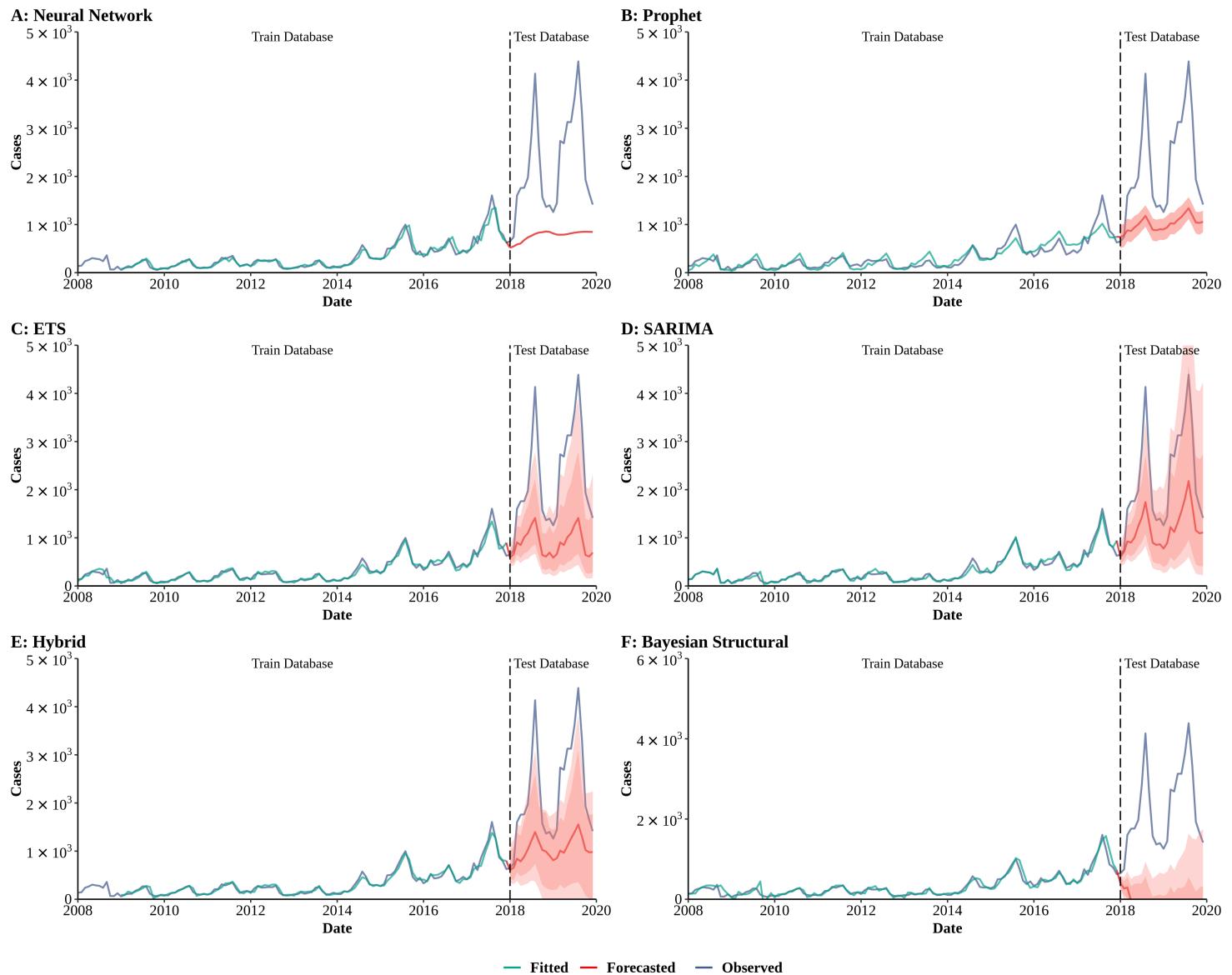
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.86	0.00	0.77
Prophet	0.56	0.29	0.49
ETS	0.94	0.16	0.91
SARIMA	0.97	0.14	0.93
Hybrid*	0.95	0.22	0.87
Bayesian Structural	0.53	0.37	0.53

*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	70.71	1737.35	743.56
Prophet	118.82	1490.06	617.91
ETS	61.36	1534.59	628.99
SARIMA	59.63	1221.93	501.81
Hybrid*	56.17	1425.04	609.76
Bayesian Structural	90.87	3914.19	1600.11

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	12.81	85.94	26.11
Prophet	29.51	65.75	35.55
ETS	14.45	77.64	24.98
SARIMA	13.86	54.60	20.65
Hybrid*	15.00	64.13	23.94
Bayesian Structural	23.35	186.56	50.55

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.68	70.50	5.22
Prophet	1.14	17.73	4.23
ETS	0.54	8.12	3.10
SARIMA	0.54	4.87	2.14
Hybrid*	0.52	9.35	3.29
Bayesian Structural	0.78	19.69	6.32

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

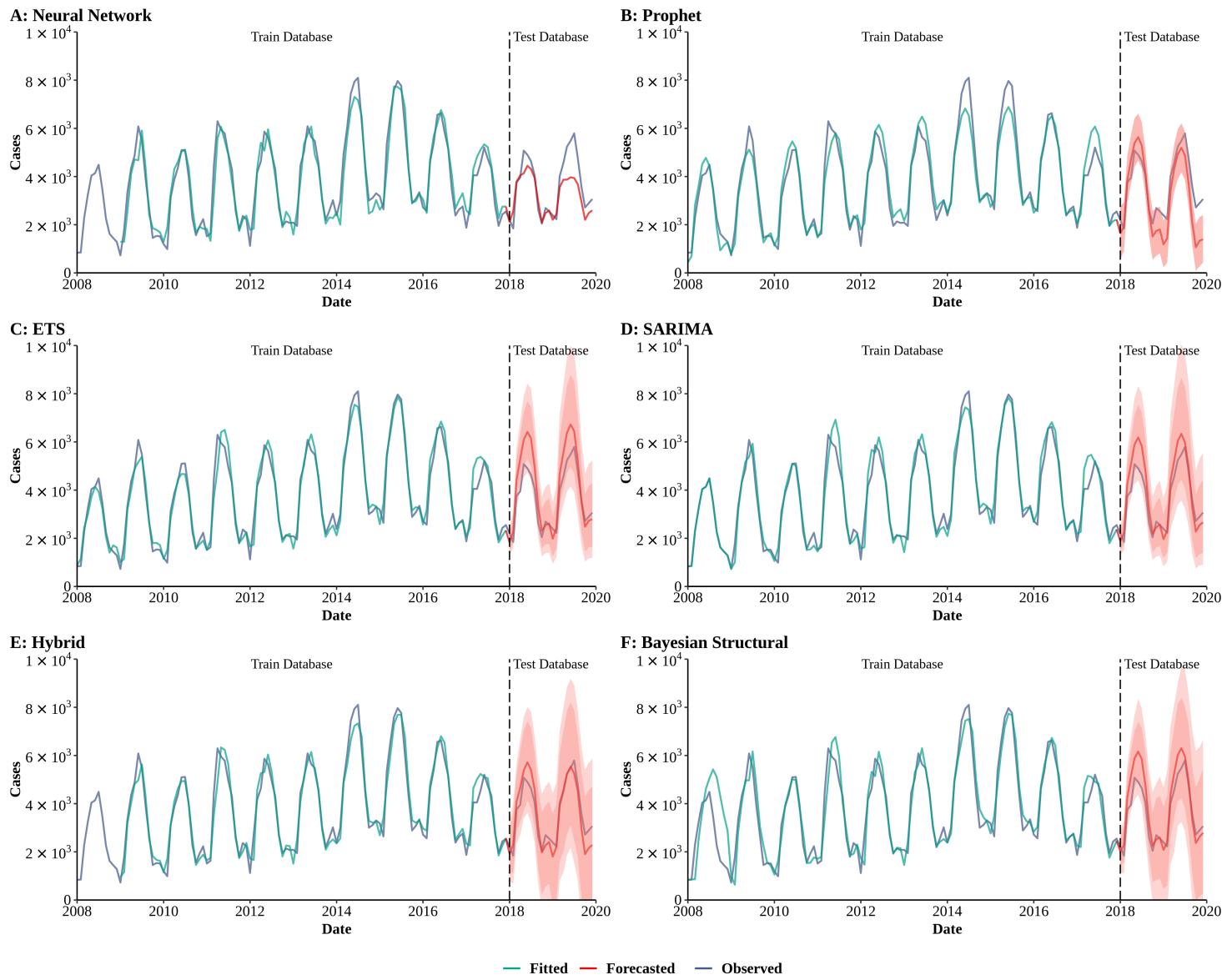
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.94	0.21	0.53
Prophet	0.81	0.84	0.75
ETS	0.95	0.77	0.76
SARIMA	0.95	0.91	0.89
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	476.56	721.00	529.46
Prophet	508.54	878.22	586.56
ETS	402.23	784.80	487.32
SARIMA	427.34	619.29	464.87
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	12.14	14.47	12.56
Prophet	11.14	28.12	13.97
ETS	9.61	15.33	10.57
SARIMA	9.00	13.31	9.72
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	0.47	1.29	0.56
Prophet	0.46	0.95	0.58
ETS	0.37	0.78	0.46
SARIMA	0.37	0.66	0.42
Hybrid*	0.39	0.57	0.45
Bayesian Structural	0.58	0.66	0.61

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

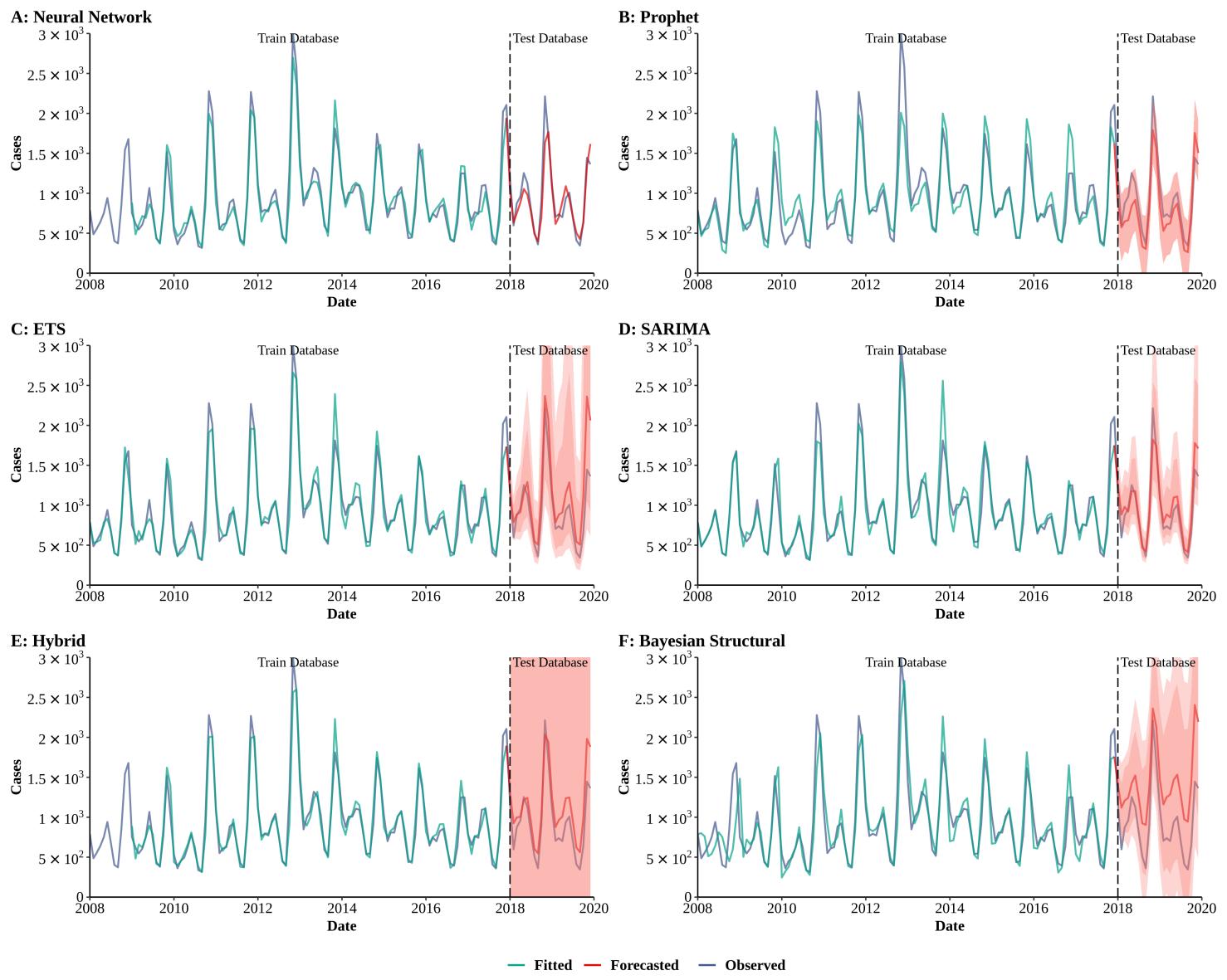
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.93	0.81	0.91
Prophet	0.92	0.82	0.89
ETS	0.95	0.94	0.93
SARIMA	0.95	0.93	0.94
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	129.41	164.96	136.56
Prophet	207.66	207.95	207.71
ETS	140.57	300.89	177.64
SARIMA	151.85	162.02	153.59
Hybrid*	121.62	249.60	153.06
Bayesian Structural	236.21	520.65	302.78

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	9.78	12.05	10.19
Prophet	14.26	21.87	15.53
ETS	9.00	20.91	10.99
SARIMA	8.90	12.89	9.57
Hybrid*	8.28	23.35	11.02
Bayesian Structural	16.84	46.29	21.75

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.32	0.42	0.33
Prophet	0.45	0.62	0.48
ETS	0.29	0.58	0.34
SARIMA	0.29	0.44	0.31
Hybrid*	0.26	0.75	0.34
Bayesian Structural	0.50	1.69	0.65

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

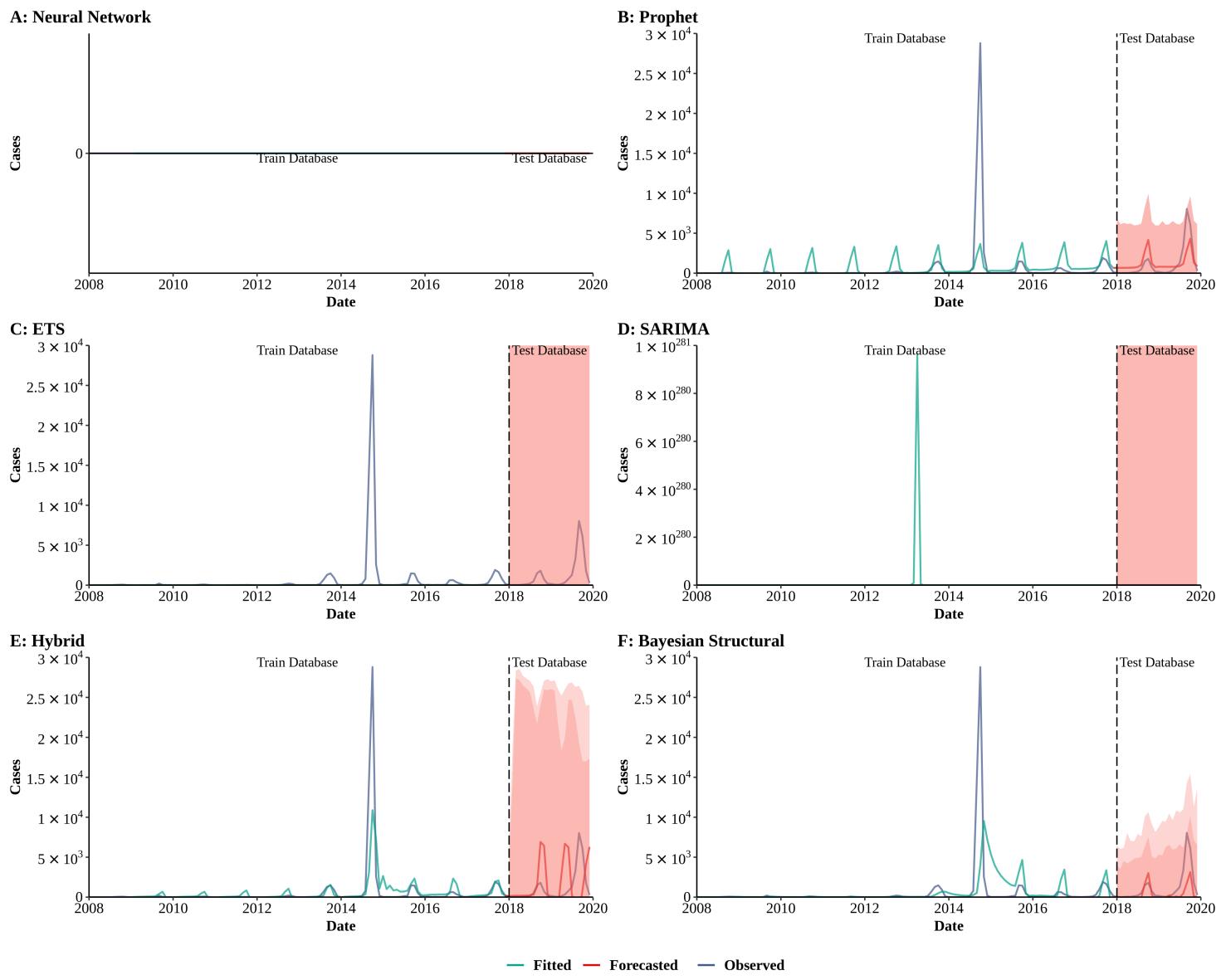
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.94	0.87	0.93
Prophet	0.82	0.87	0.82
ETS	0.92	0.84	0.87
SARIMA	0.91	0.88	0.90
Hybrid*	0.94	0.88	0.91
Bayesian Structural	0.78	0.81	0.68

*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.



MSE of Models			H : SMAPE of Models						I : MASE of Models						J : R-squared of Models		
Method	Train	Test	All	Method	Train	Test	All	Method	Train	Test	All	Method	Train	Test	All		
Network	1.84602724798645e+20	Inf	Inf	Neural Network				Neural Network	0.5			Neural Network	0				
Prophet	2733.45	1410.49	2560.86	Prophet	151.58	110.96	144.81	Prophet	1.51	1.61	1.54	Prophet	0.14	0.53	0.17		
ETS	2990.29	2281.21	2884.24	ETS		200		ETS	0.93	Inf	2.89128965216679e+47	ETS	0		0.01		
SARIMA	Inf	219274805302992	Inf	SARIMA		199.97		SARIMA	0.5	0.98	0.5	SARIMA	0	0.01	0		
Hybrid*	2157.25	3705.31	2510.74	Hybrid*	137.28	136.22	137.09	Hybrid*	0.89	1.41	1.36	Hybrid*	0.65	0.03	0.27		
Bayesian Structural	2924.7	1635.01	2752.80	Bayesian Structural	120.88	150.47	125.81	Bayesian Structural	1.43	1.38	2.11	Bayesian Structural	0.07	0.51	0.09		

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

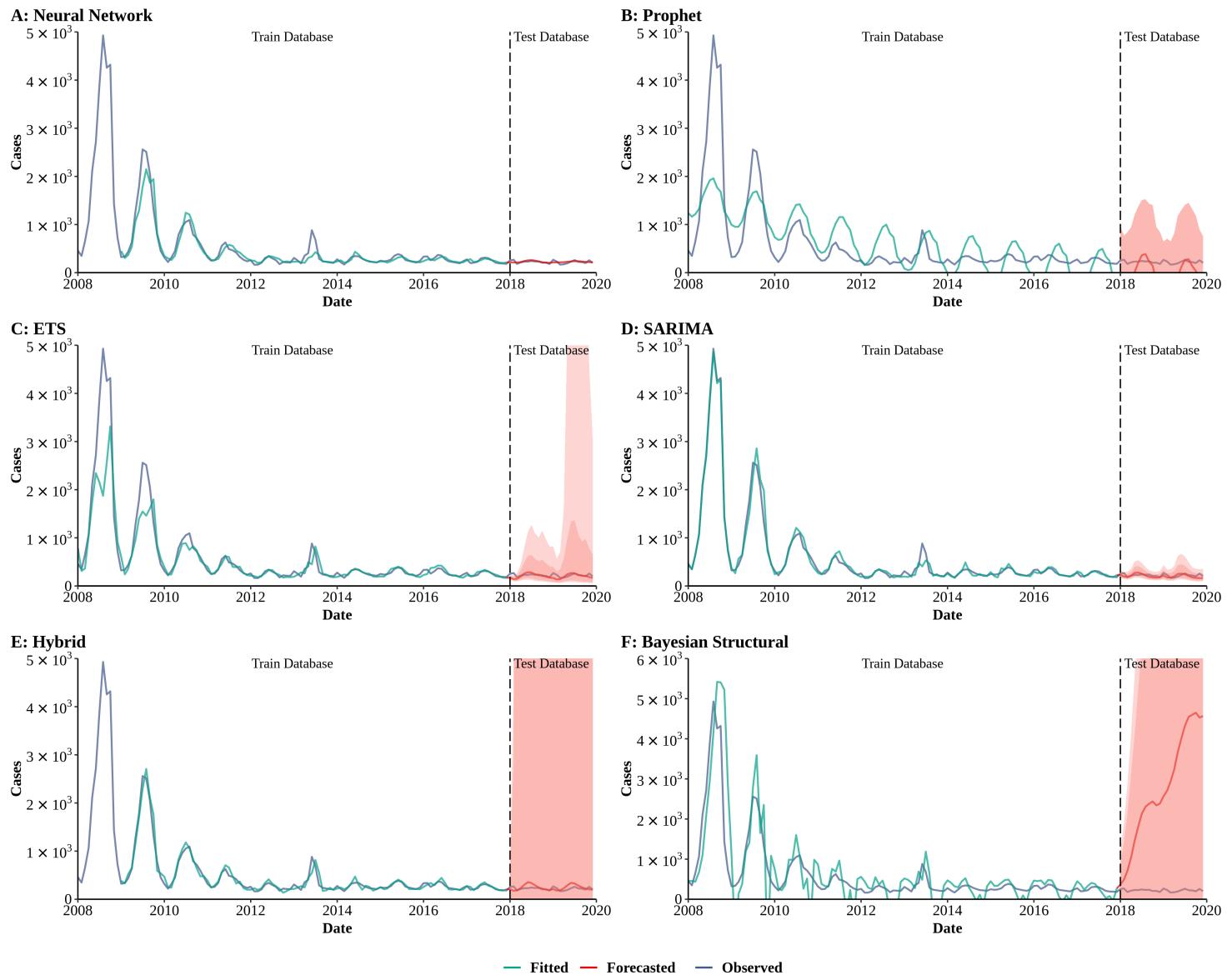
*Hybrid: Combined SARIMA, ETS, STL and Neural Network model

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

*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	143.42	28.46	130.30
Prophet	603.18	438.84	579.04
ETS	414.04	50.21	378.52
SARIMA	108.42	39.92	100.31
Hybrid*	88.96	59.95	84.43
Bayesian Structural	601.14	2873.50	1295.11

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	15.18	10.58	14.34
Prophet	81.31	133.30	89.97
ETS	18.02	17.73	17.98
SARIMA	12.43	15.32	12.91
Hybrid*	14.03	19.68	15.06
Bayesian Structural	68.27	157.04	83.06

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

I : MASE of Models

Method	Train	Test	All
Neural Network	0.91	3.20	0.96
Prophet	2.36	2.47	2.70
ETS	0.92	1.52	1.15
SARIMA	0.33	1.53	0.36
Hybrid*	0.56	1.53	0.56
Bayesian Structural	2.03	12.58	1.85

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

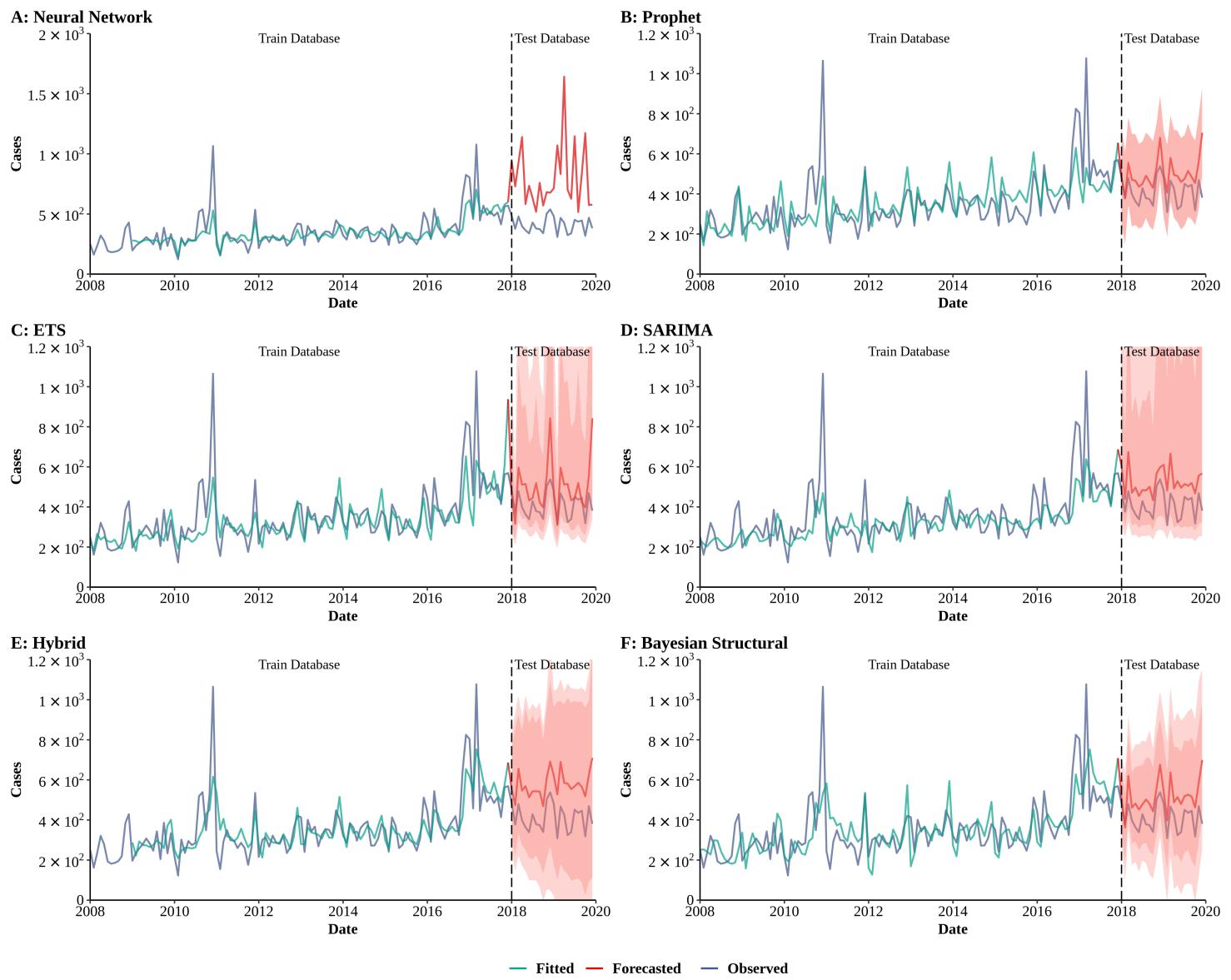
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.89	0.09	0.90
Prophet	0.50	0.05	0.47
ETS	0.85	0.04	0.86
SARIMA	0.98	0.11	0.98
Hybrid*	0.96	0.06	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	95.45	478.23	221.44
Prophet	112.31	110.10	111.95
ETS	109.05	142.56	115.31
SARIMA	110.36	125.16	112.96
Hybrid*	95.87	175.19	114.45
Bayesian Structural	119.07	123.53	119.83

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

H : SMAPE of Models

Method	Train	Test	All
Neural Network	14.42	60.22	22.75
Prophet	19.64	19.54	19.62
ETS	18.07	20.92	18.54
SARIMA	19.26	25.01	20.22
Hybrid*	16.81	34.16	19.96
Bayesian Structural	22.52	23.12	22.62

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

I : MASE of Models

Method	Train	Test	All
Neural Network	1.29	1.30	1.29
Prophet	0.73	1.20	0.99
ETS	0.68	0.81	0.93
SARIMA	1.51	1.54	1.52
Hybrid*	0.62	2.50	1.42
Bayesian Structural	0.82	1.21	1.17

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

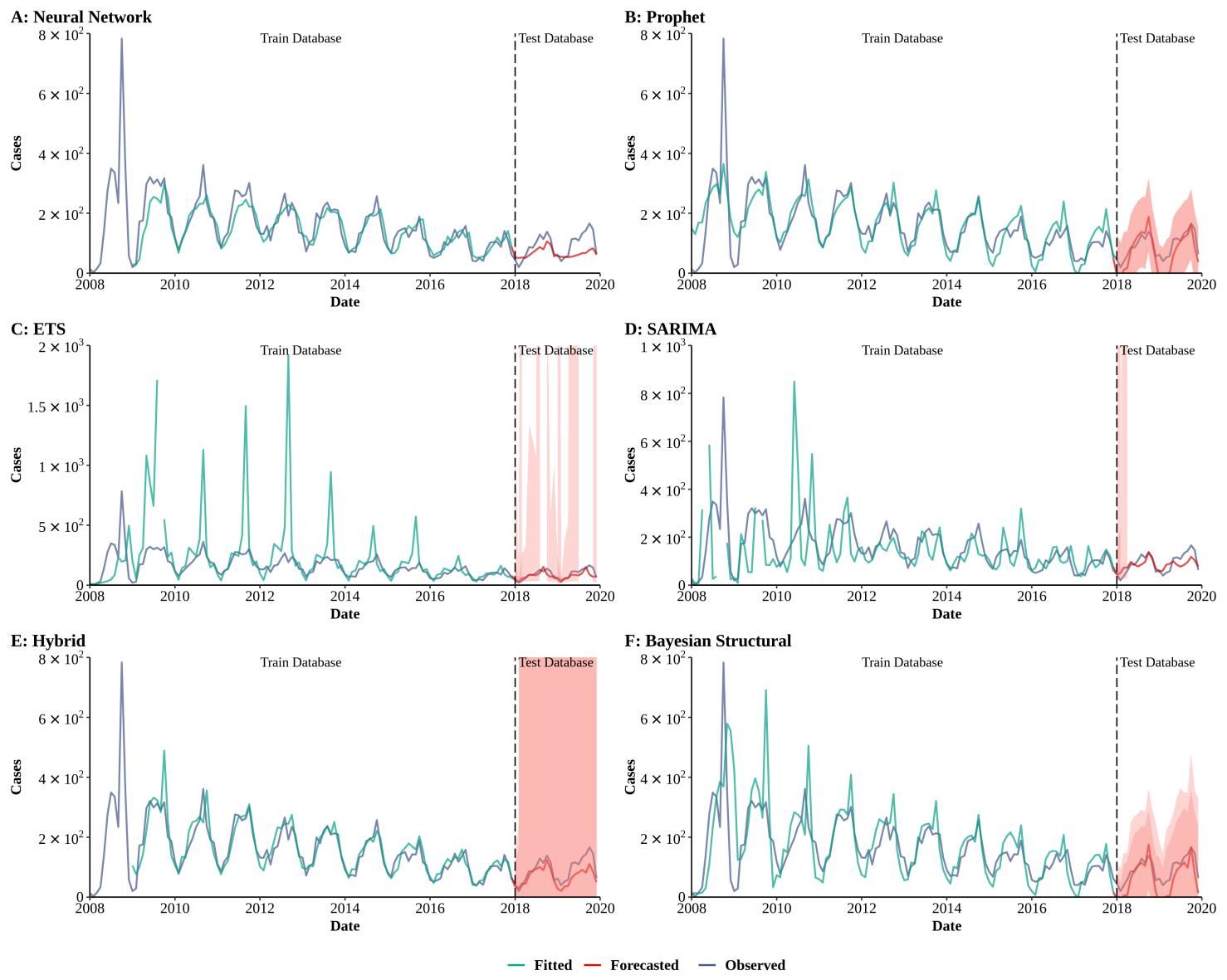
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.66	0.00	0.16
Prophet	0.44	0.30	0.41
ETS	0.50	0.24	0.41
SARIMA	0.52	0.51	0.40
Hybrid*	0.61	0.38	0.45
Bayesian Structural	0.41	0.39	0.39

*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	38.34	39.99	38.64
Prophet	61.24	40.07	58.25
ETS		31.64	
SARIMA		28.12	
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	19.05	36.51	22.23
Prophet	32.12	72.98	38.93
ETS		26.32	
SARIMA		28.67	
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	1.08	4.04	1.26
Prophet	0.82	0.95	0.95
ETS		1.04	
SARIMA		1.50	
Hybrid*	0.7	1.45	0.74
Bayesian Structural	1.26	0.98	0.94

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

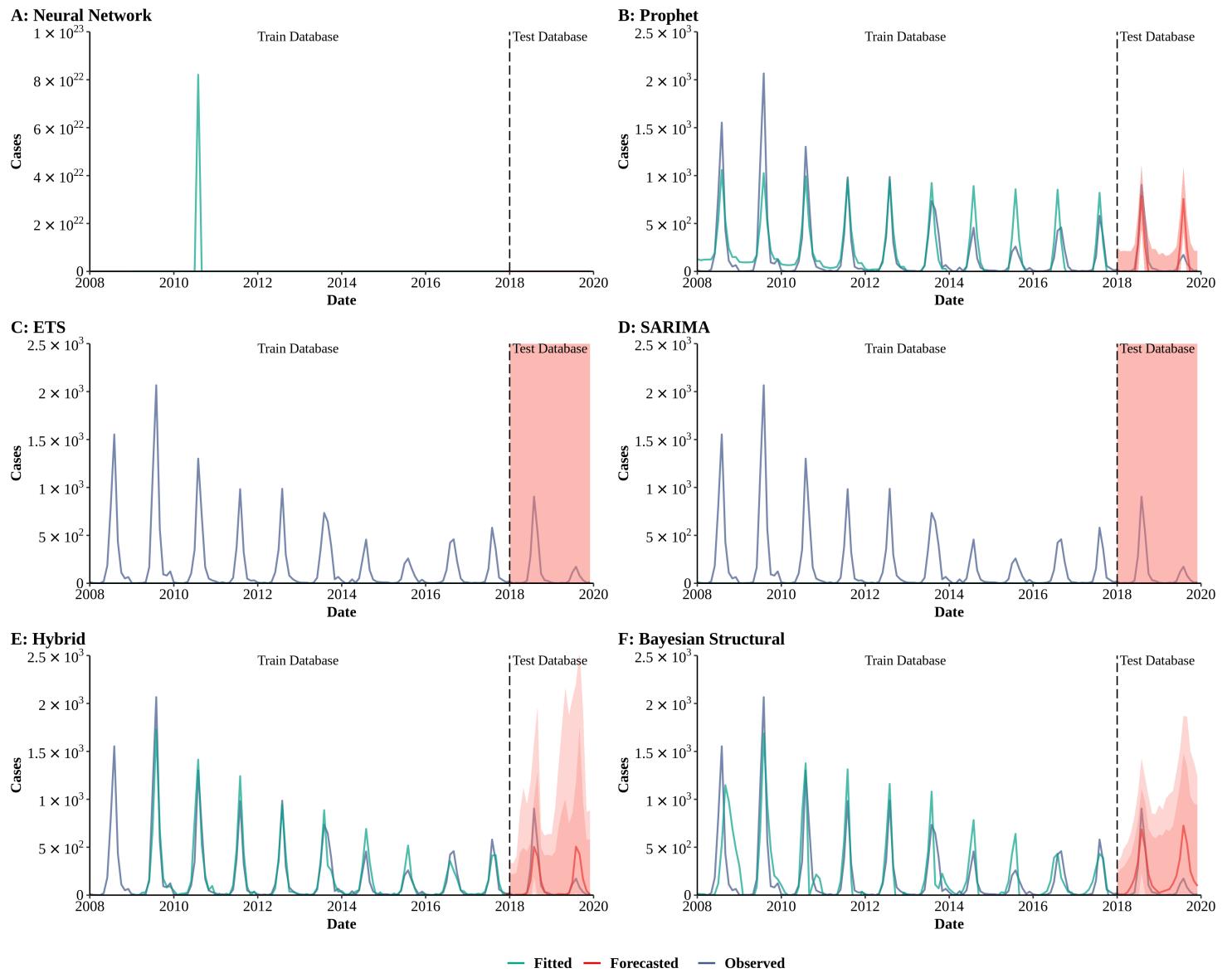
J : R-squared of Models

Method	Train	Test	All
Neural Network	0.75	0.50	0.75
Prophet	0.63	0.80	0.64
ETS		0.49	
SARIMA		0.60	
Hybrid*	0.8	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.



ISE of Models

H : SMAPE of Models

I : MASE of Models

J : R-squared of Models

Model	Train	Test	All	Method	Train	Test	All	Method	Train	Test	All	Method	Train	Test	All
Neural Network	7.89987168153572e+21	227.45	7.1457027980749e+21	Neural Network	199.86	200	199.86	Neural Network	0.5	5.44223834967596e+50	0.5	Neural Network	0.12	0.19	0.12
Prophet	173.93	182.4	175.37	Prophet	115.31	165.91	123.74	Prophet	0.66	0.95	0.72	Prophet	0.72	0.63	0.69
ETS	372.19	227.45	352.23	ETS	200	200	200	ETS	1.08	Inf	1.00657255156489e+91	ETS	0	0	0
SARIMA	371.73	227.02	351.77	SARIMA	162.17	160.33	161.86	SARIMA	Inf	Inf	Inf	SARIMA			
Hybrid*	102.42	136.92	109.5	Hybrid*	82.39	76.13	81.25	Hybrid*	0.37	0.79	0.4	Hybrid*	0.89	0.56	0.86
Structural	240.71	184.14	232.24	Bayesian Structural	122.15	128.8	126.6	Bayesian Structural	0.89	1.07	0.77	Bayesian Structural	0.56	0.53	0.55

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

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

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

*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.