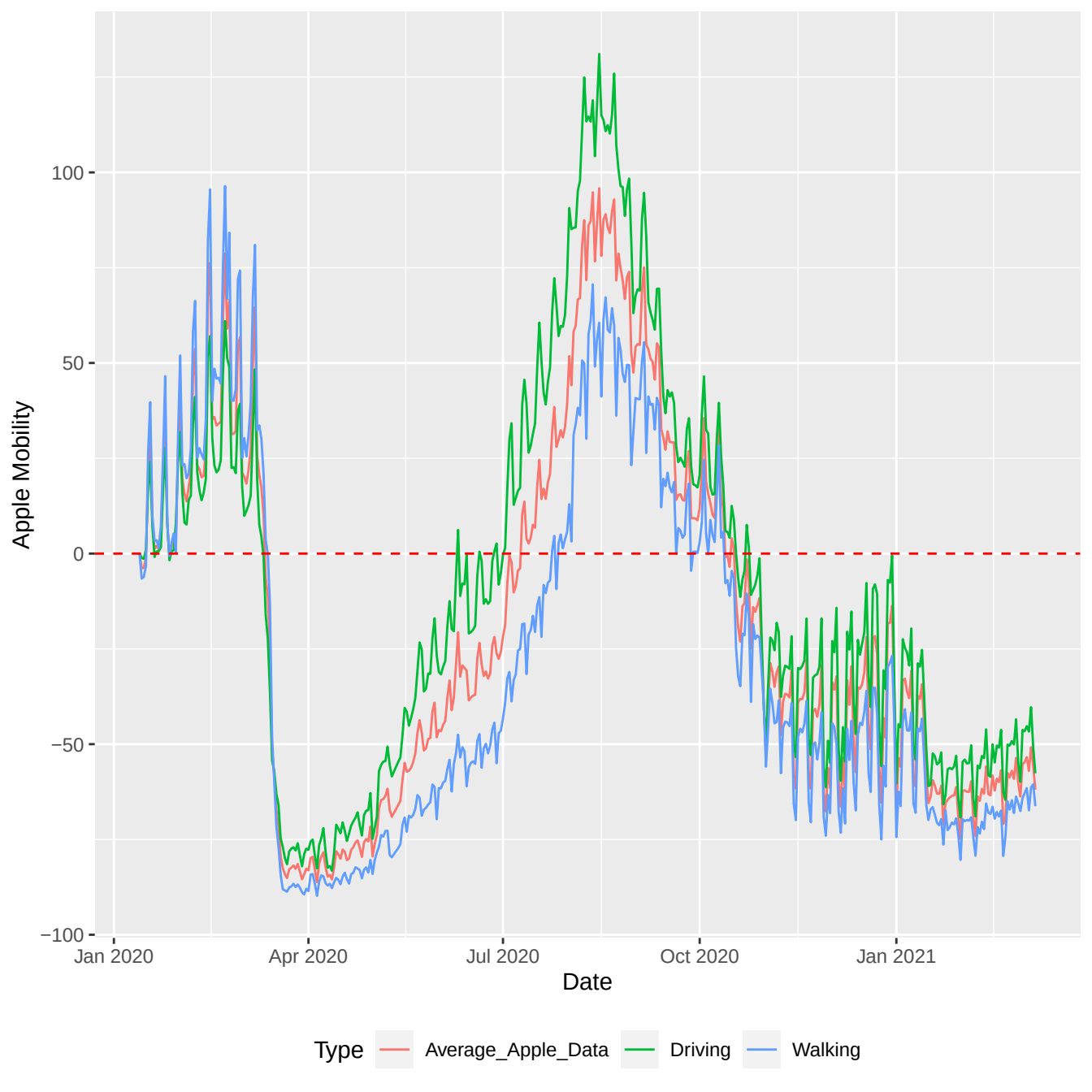
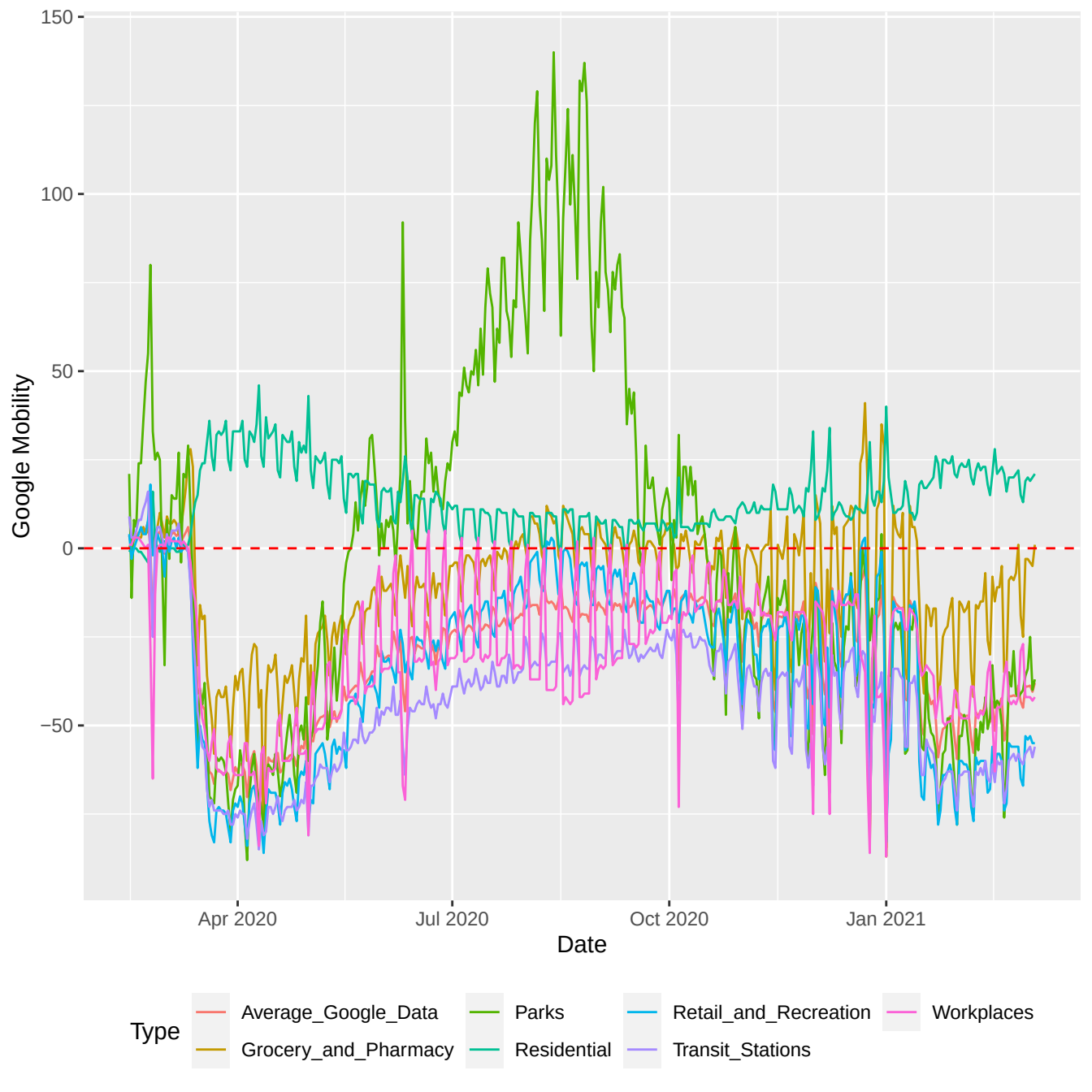
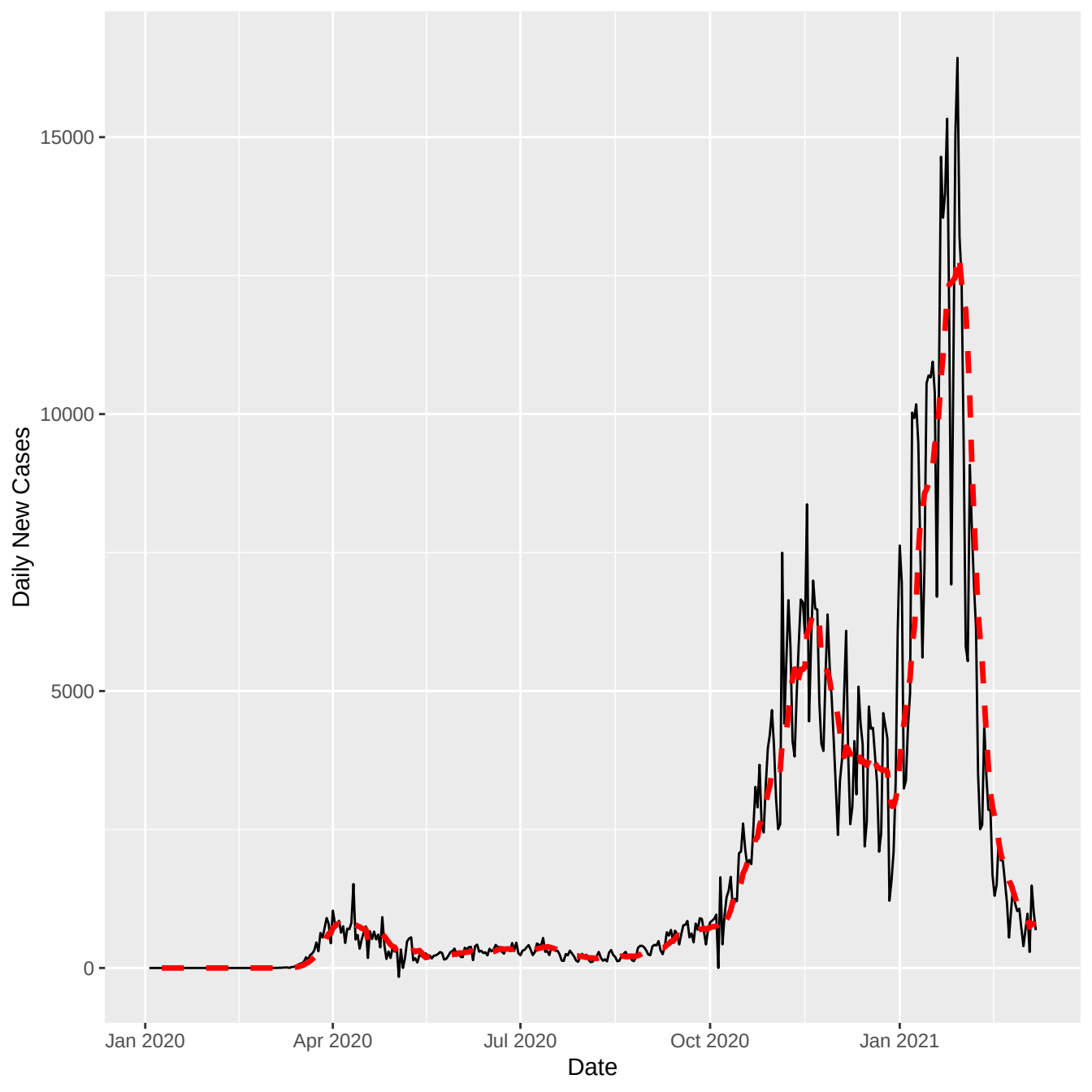
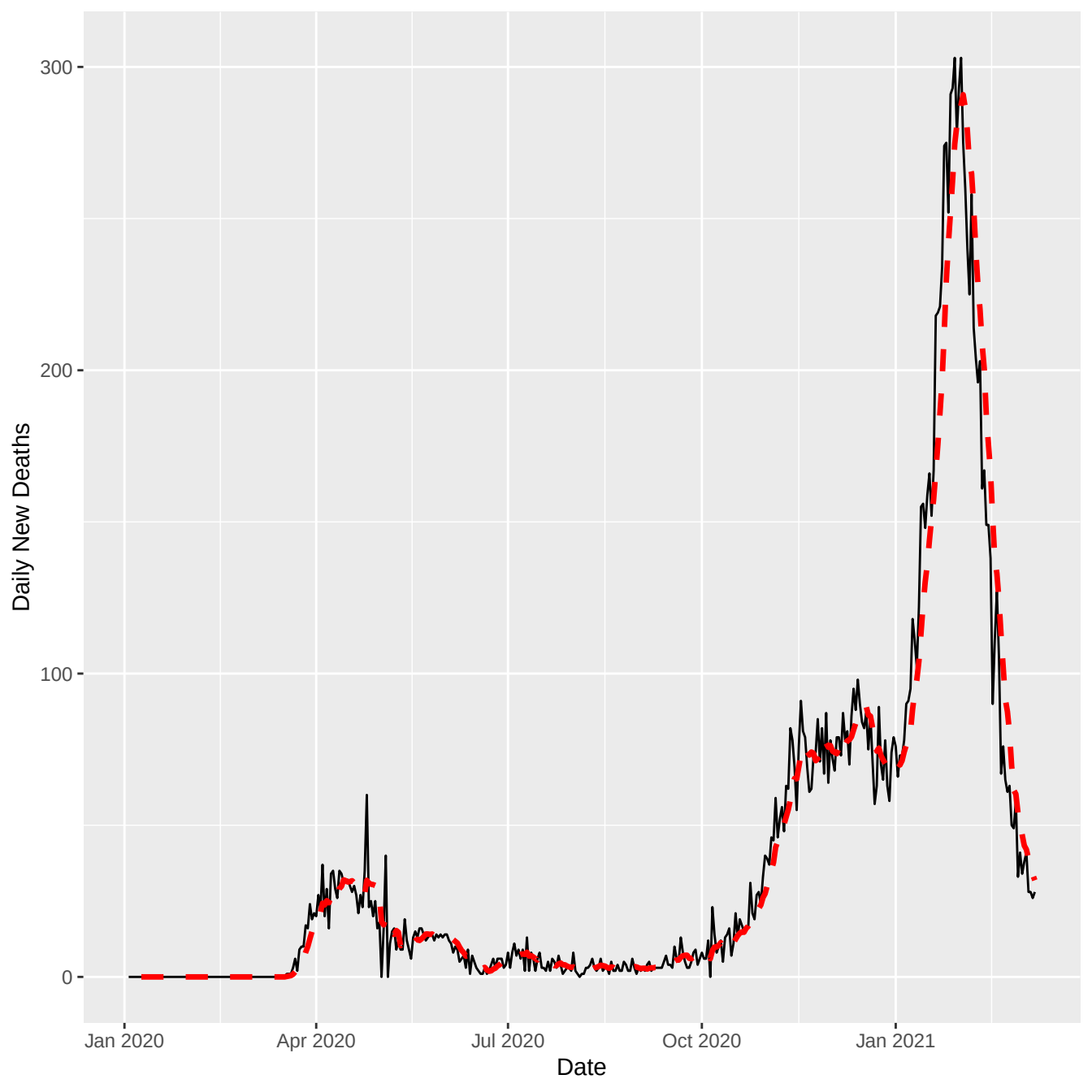
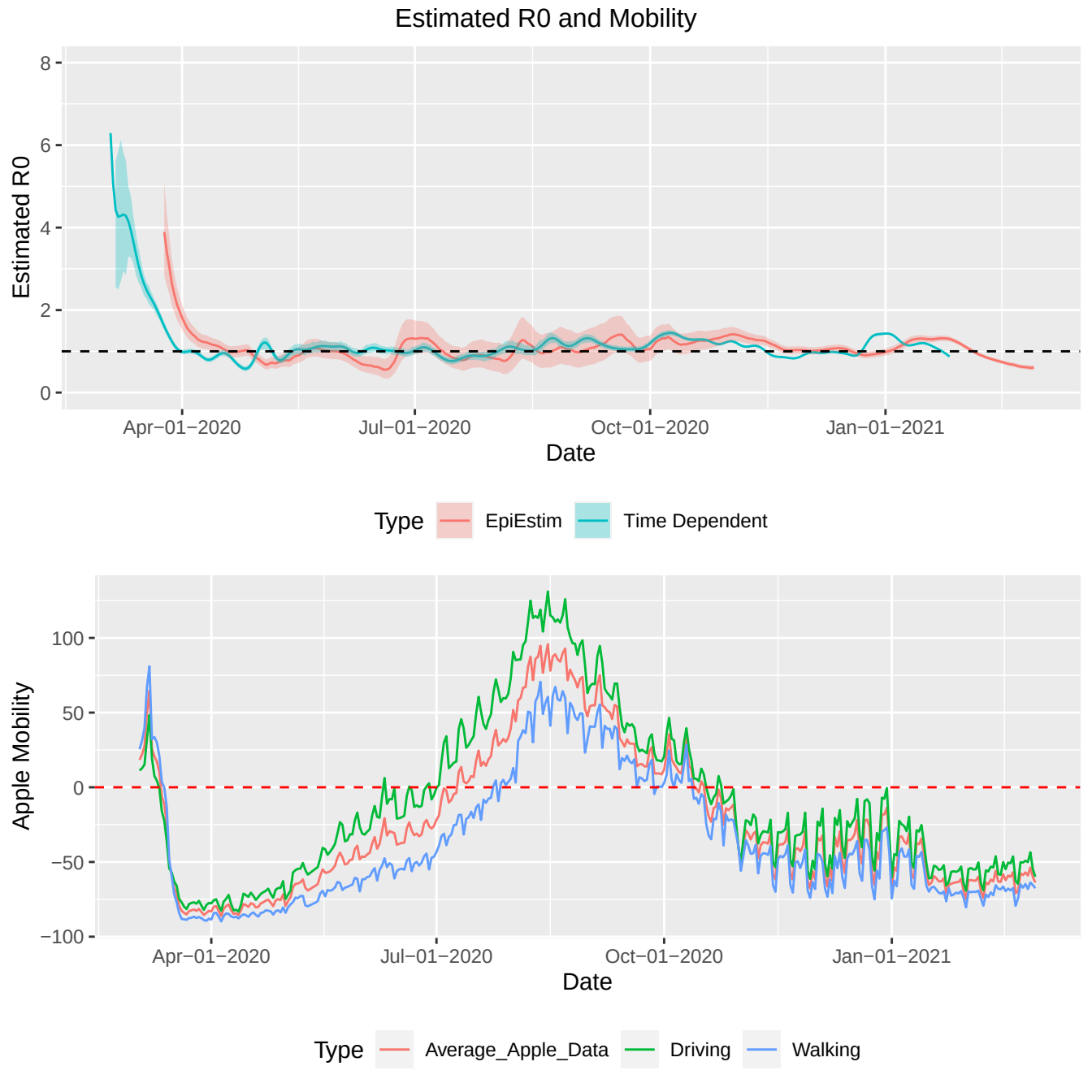

100
50
0
−50
−100
Apple Mobility
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Date
Type
Average_Apple_Data
Driving
Walking

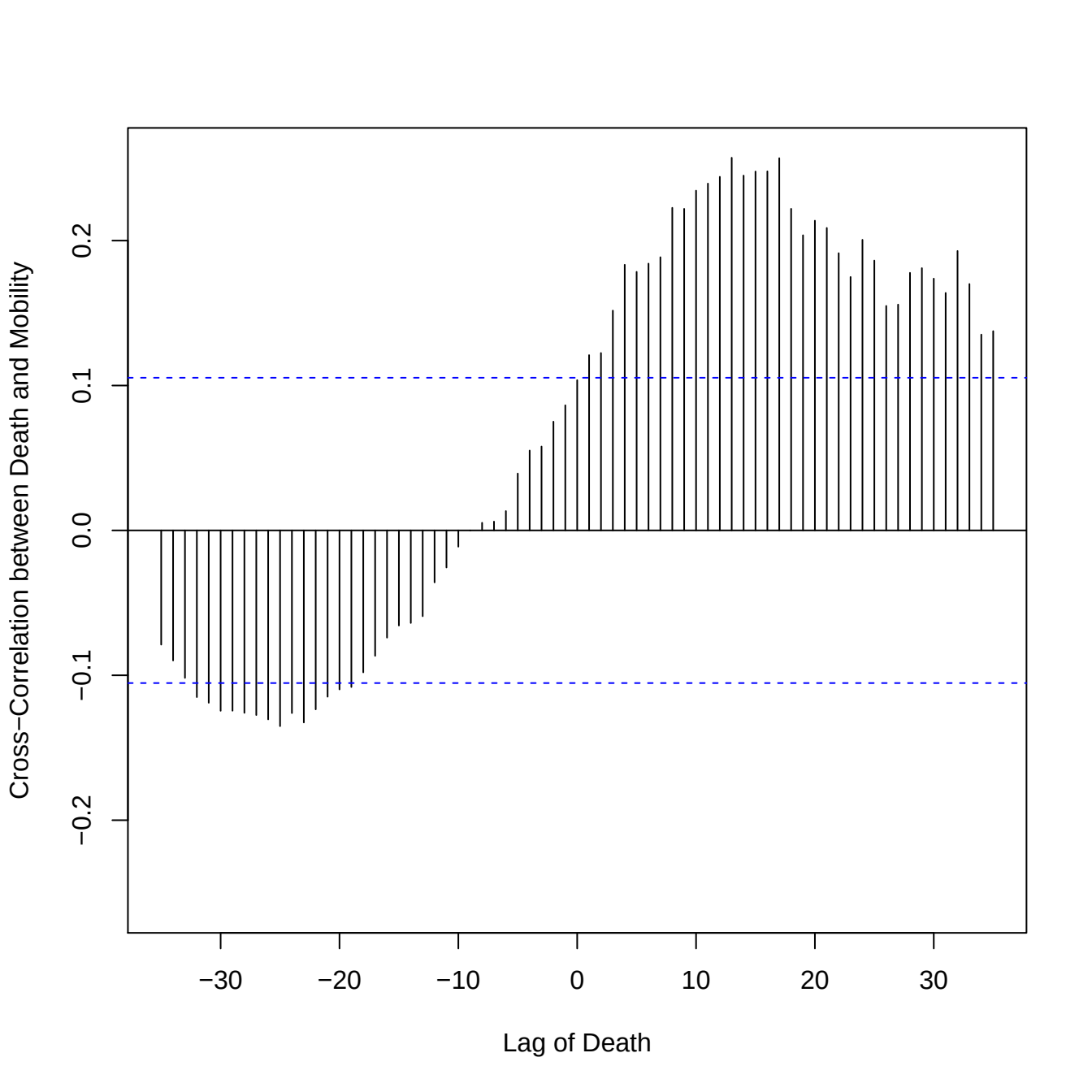

150
100
50
0
−50
Google Mobility
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Date
Type
Average_Google_Data
Grocery_and_Pharmacy
Parks
Residential
Retail_and_Recreation
Transit_Stations
Workplaces

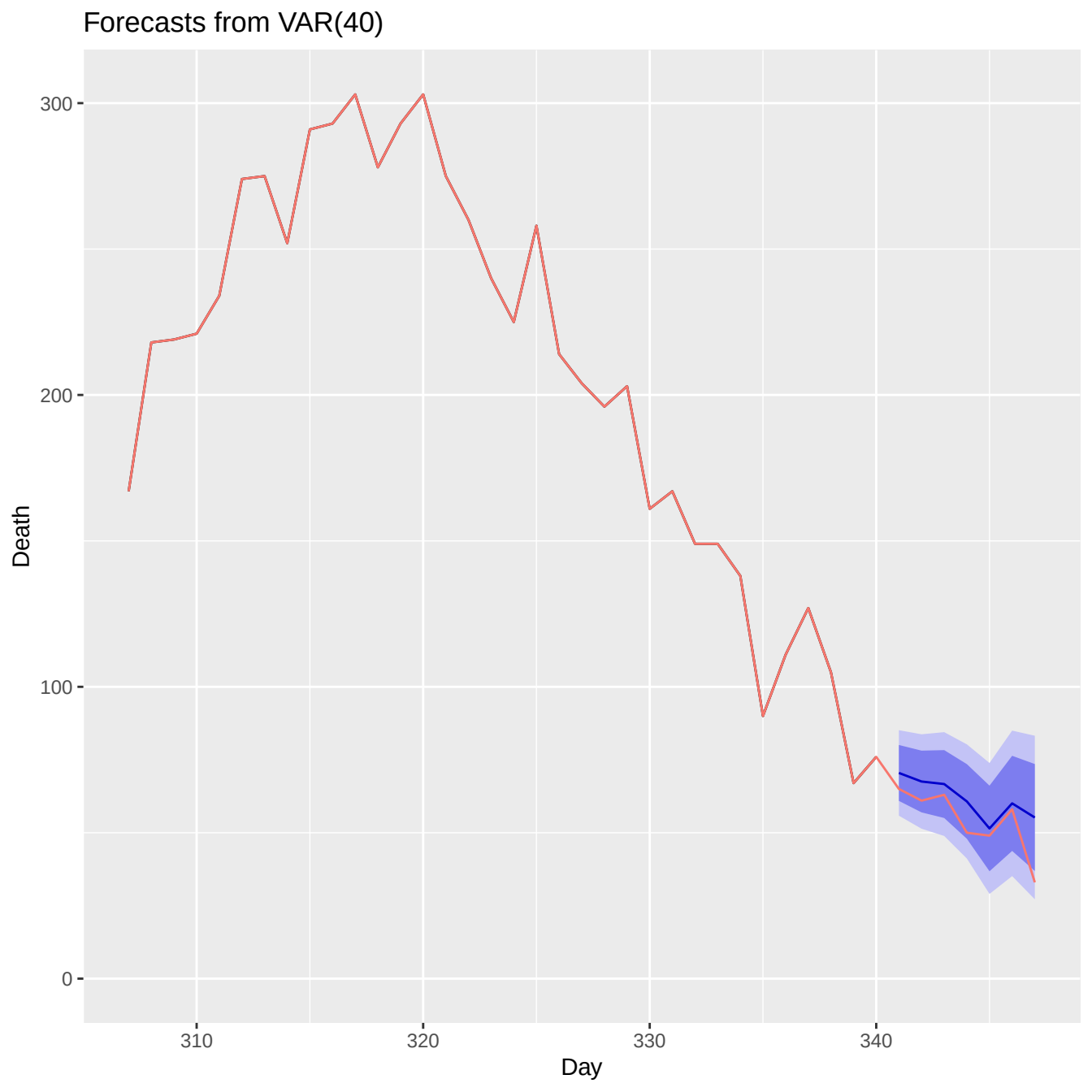

15000
10000
5000
0
Daily New Cases
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Date

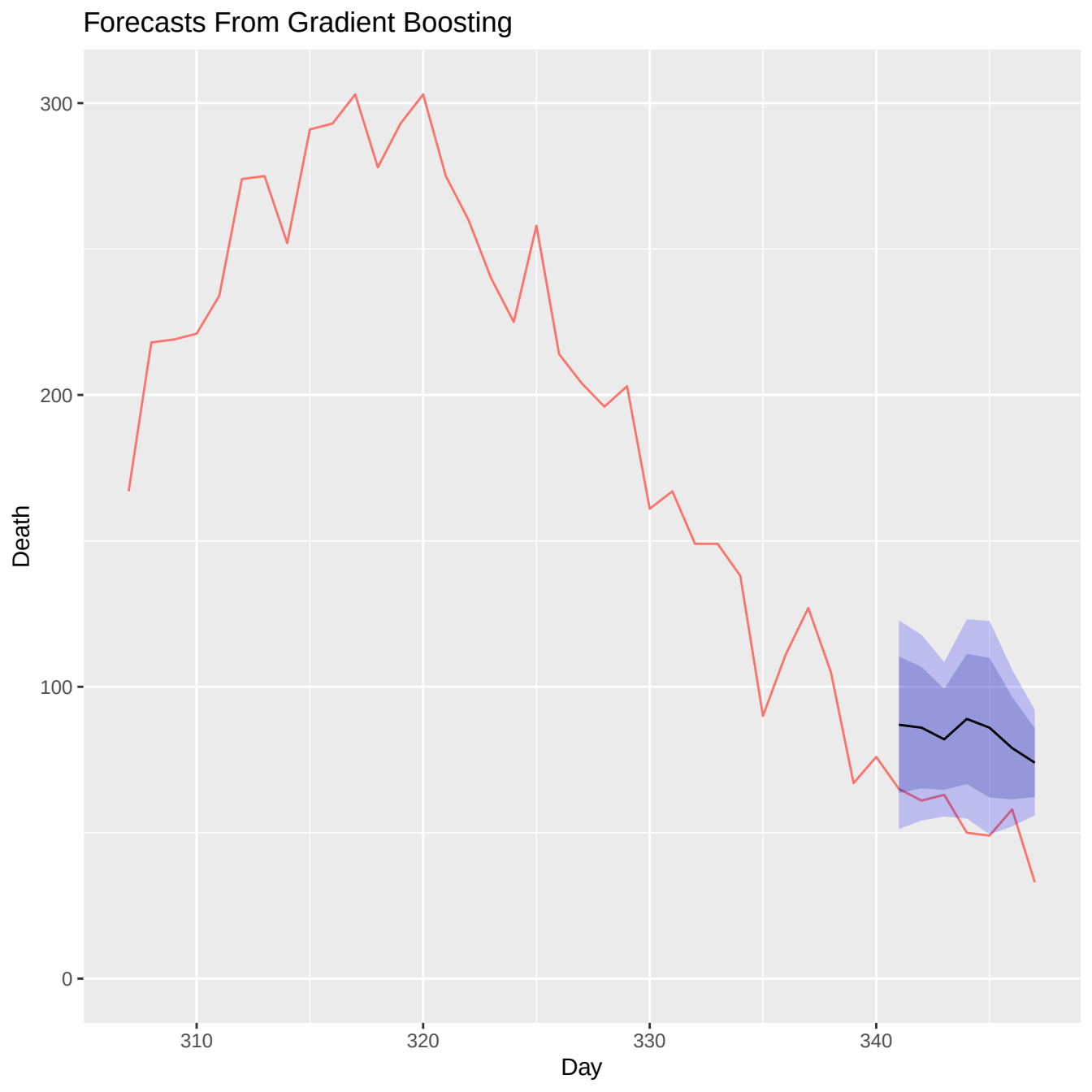

300
200
100
0
Daily New Deaths
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Date

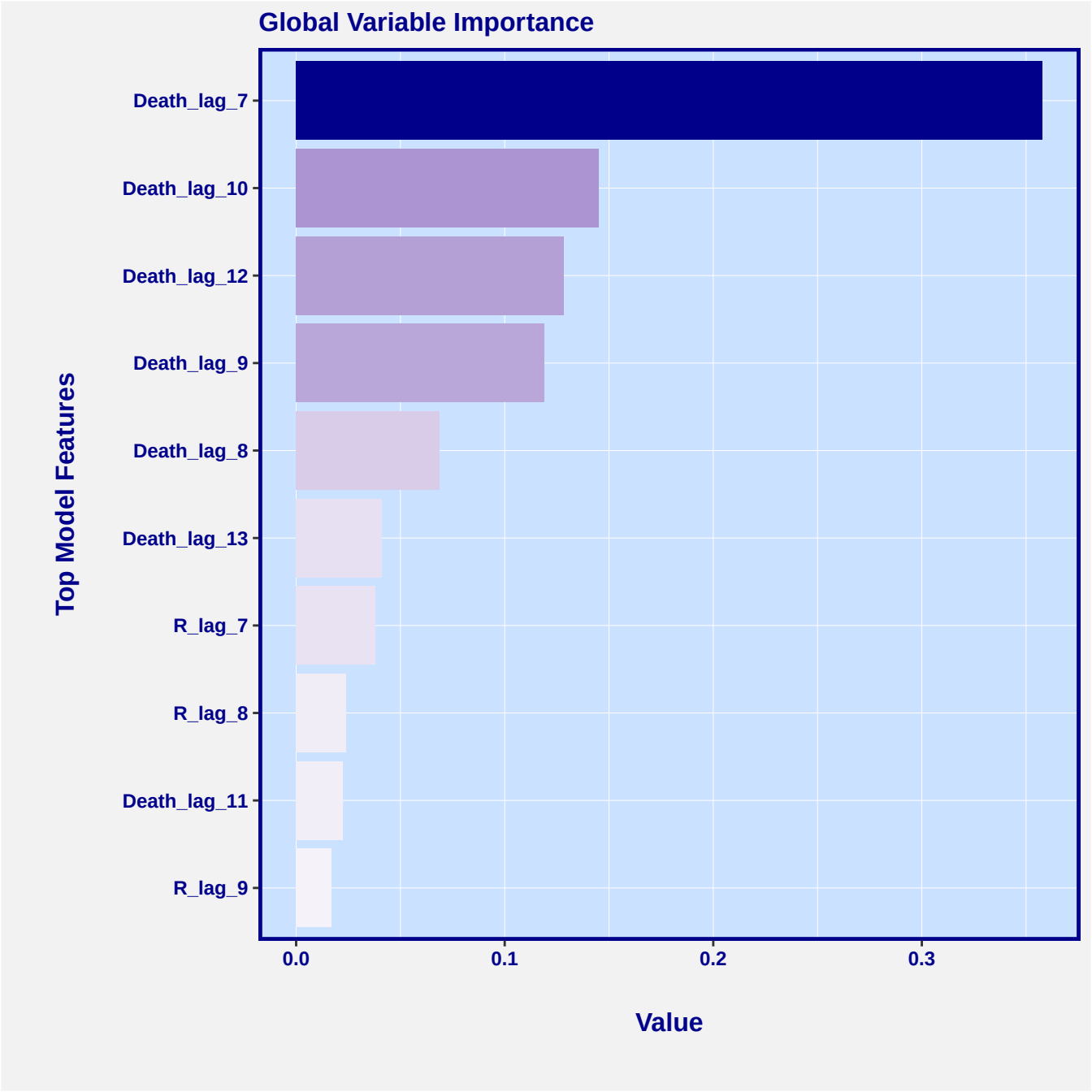
	RMSE	MAE	Death_obs (last week)	Death_pred (this week)	Model
1	10.037354	8	379	432	VAR
2	8.715181	8	379	418	ARIMAX
3	15.464244	14	379	477	Ensemble
4	30.430248	29	379	583	Boosting

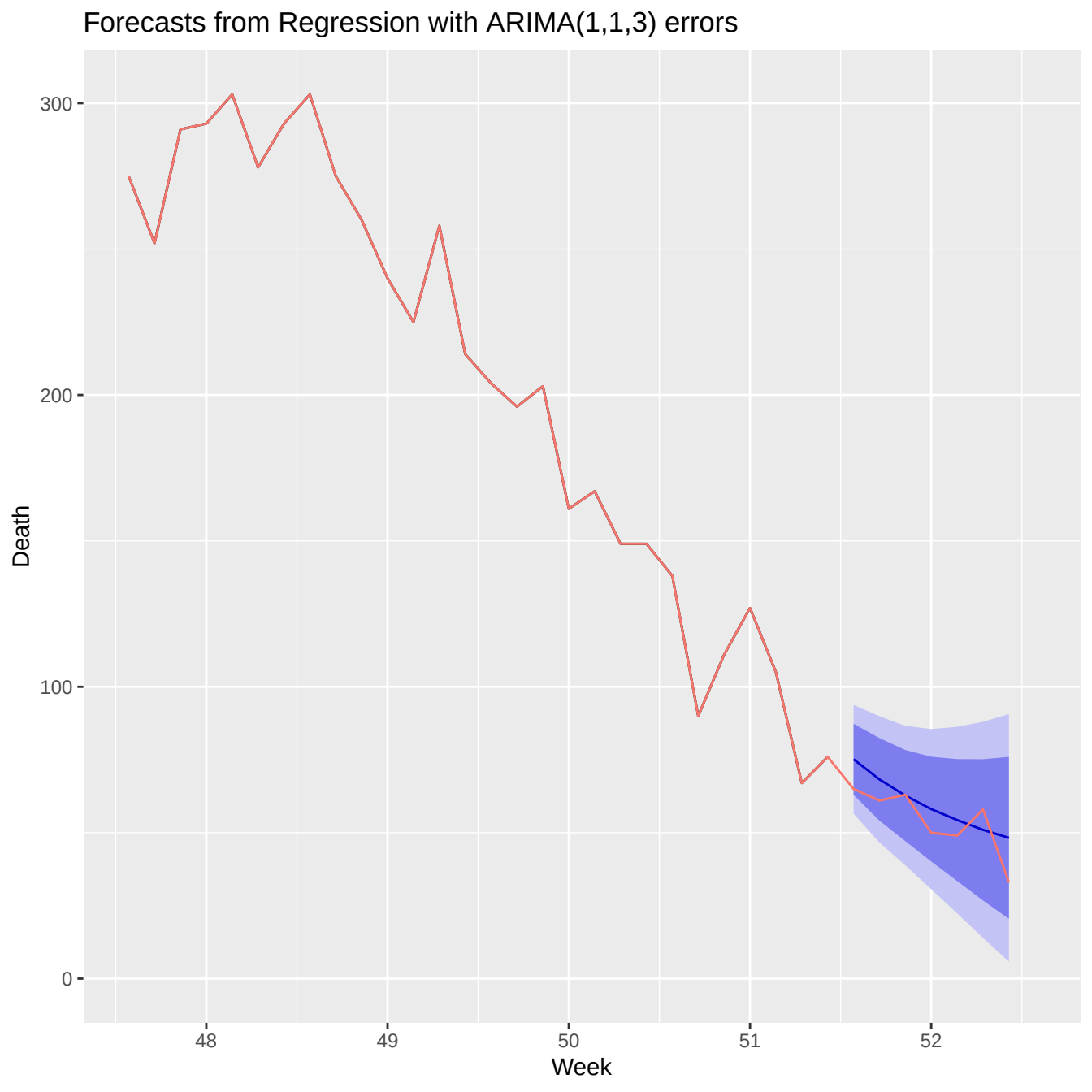

Estimated R0 and Mobility
Estimated R0
8
6
4
2
0
Apr−01−2020
Jul−01−2020
Oct−01−2020
Jan−01−2021
Date
Type
EpiEstim
Time Dependent
Apple Mobility
100
50
0
−50
−100
Apr−01−2020
Jul−01−2020
Oct−01−2020
Jan−01−2021
Date
Type
Average_Apple_Data
Driving
Walking

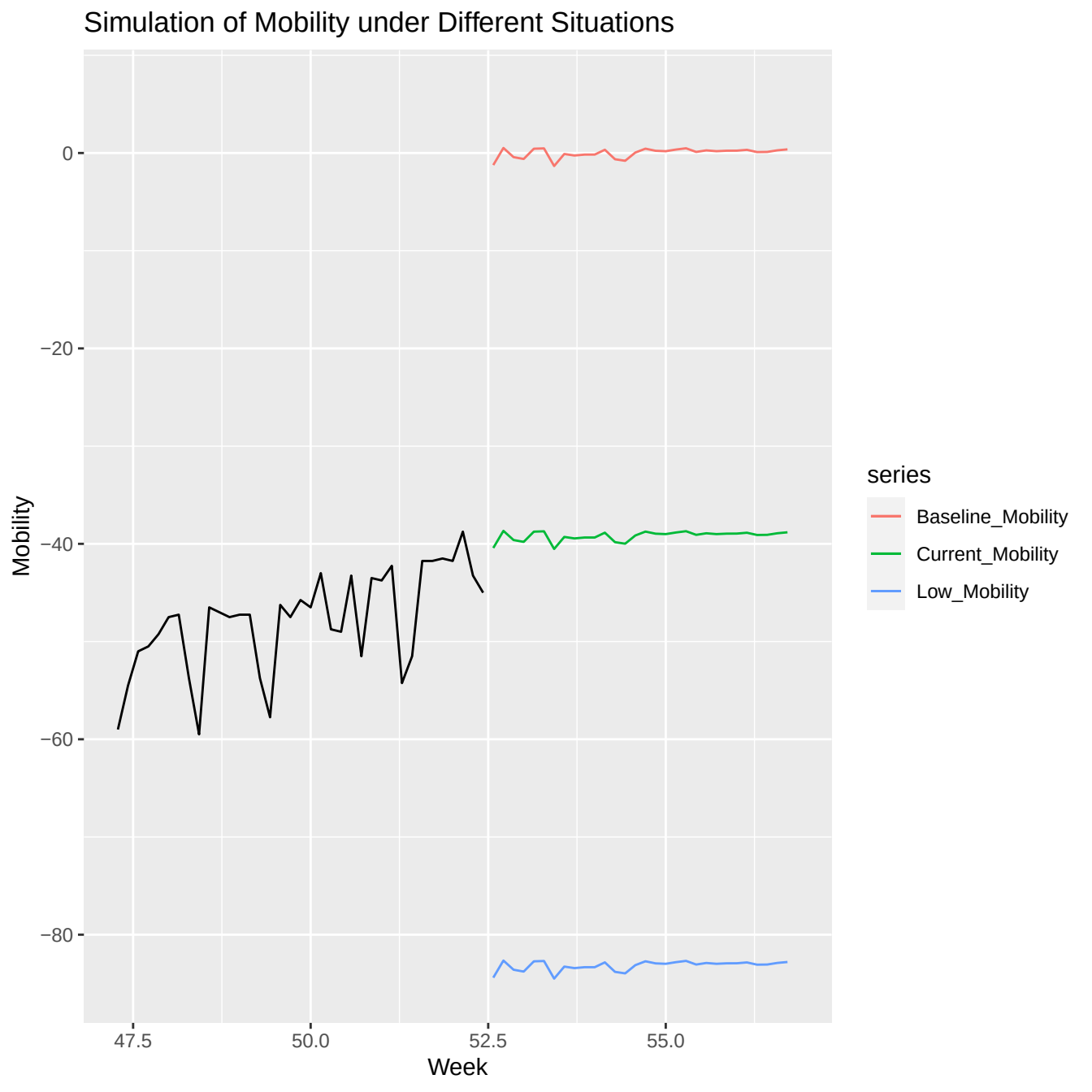

Cross−Correlation between Death and Mobility
0.2
0.1
0.0
−0.1
−0.2
−30
−20
−10
0
10
20
30
Lag of Death

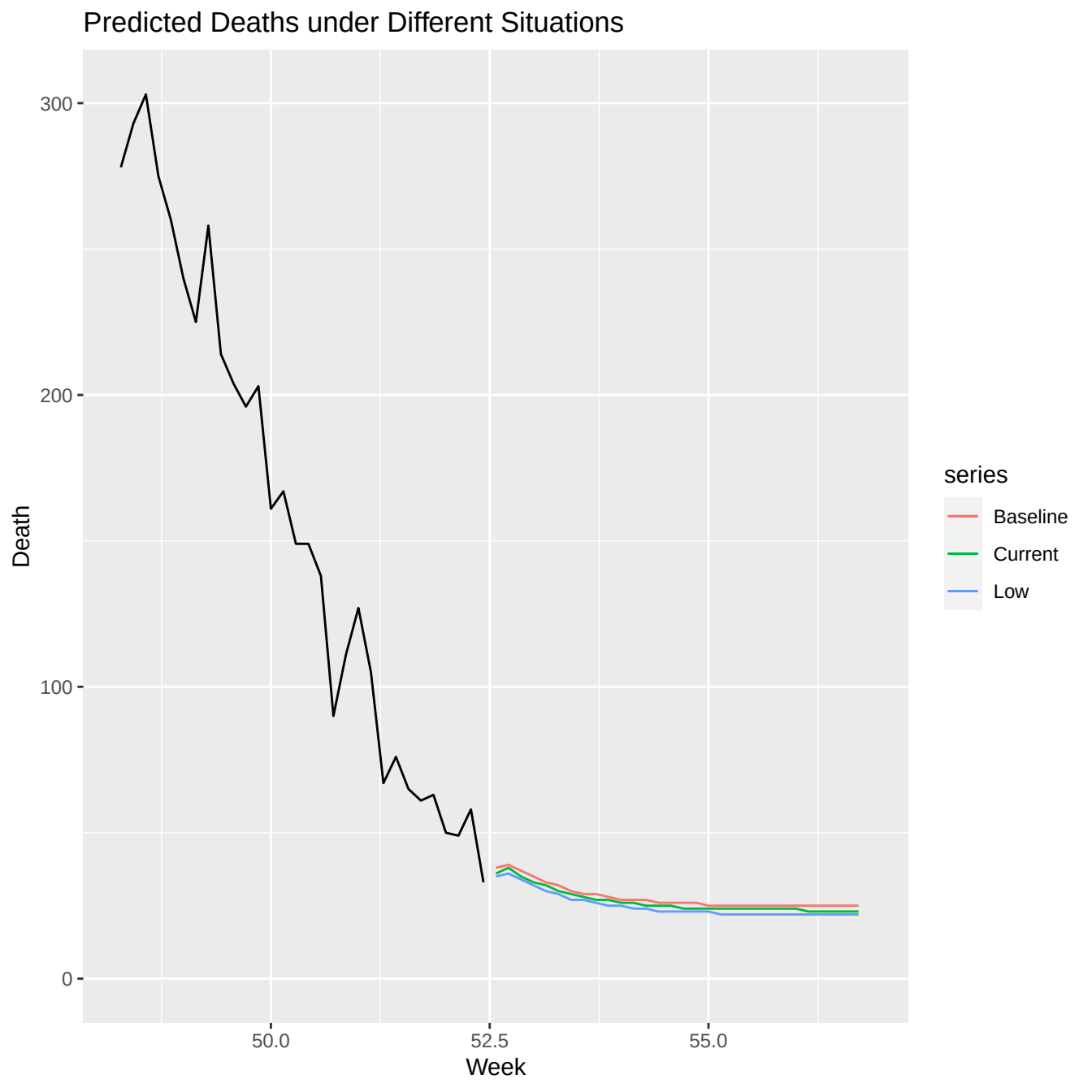

Forecasts from VAR(40)
300
200
100
0
Death
310
320
330
340
Day


Forecasts From Gradient Boosting
300
200
100
0
Death
310
320
330
340
Day


Global Variable Importance
Death_lag_7
Death_lag_10
Death_lag_12
Death_lag_9
Death_lag_8
Death_lag_13
R_lag_7
R_lag_8
Death_lag_11
R_lag_9
Top Model Features
0.0
0.1
0.2
0.3
Value


Forecasts from Regression with ARIMA(1,1,3) errors
300
200
100
0
Death
48
49
50
51
52
Week


Simulation of Mobility under Different Situations
0
−20
−40
−60
−80
Mobility
47.5
50.0
52.5
55.0
Week
series
Baseline_Mobility
Current_Mobility
Low_Mobility


Predicted Deaths under Different Situations
300
200
100
0
Death
50.0
52.5
55.0
Week
series
Baseline
Current
Low

	Type	Death
1	Baseline	840
2	Current	797
3	Low	753