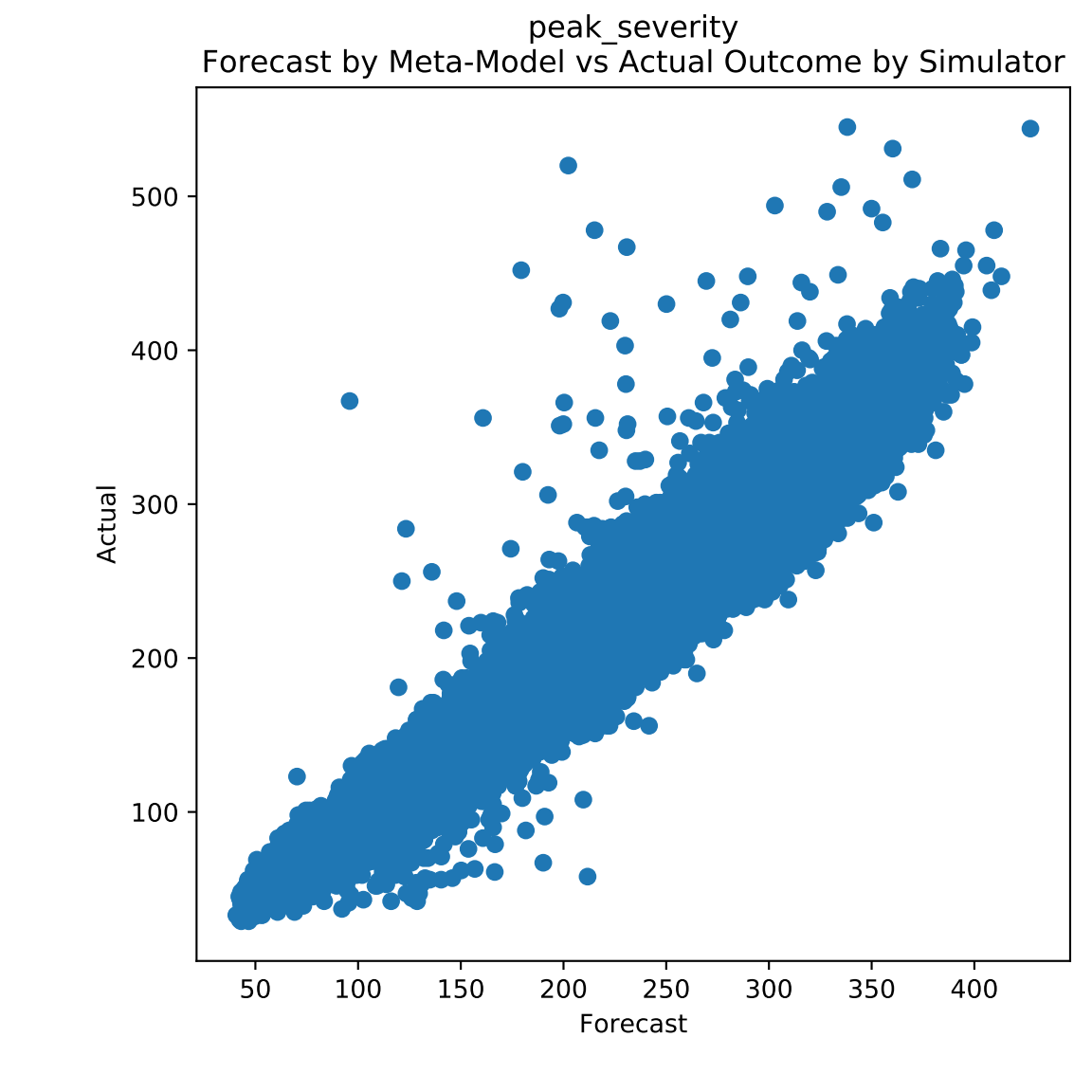
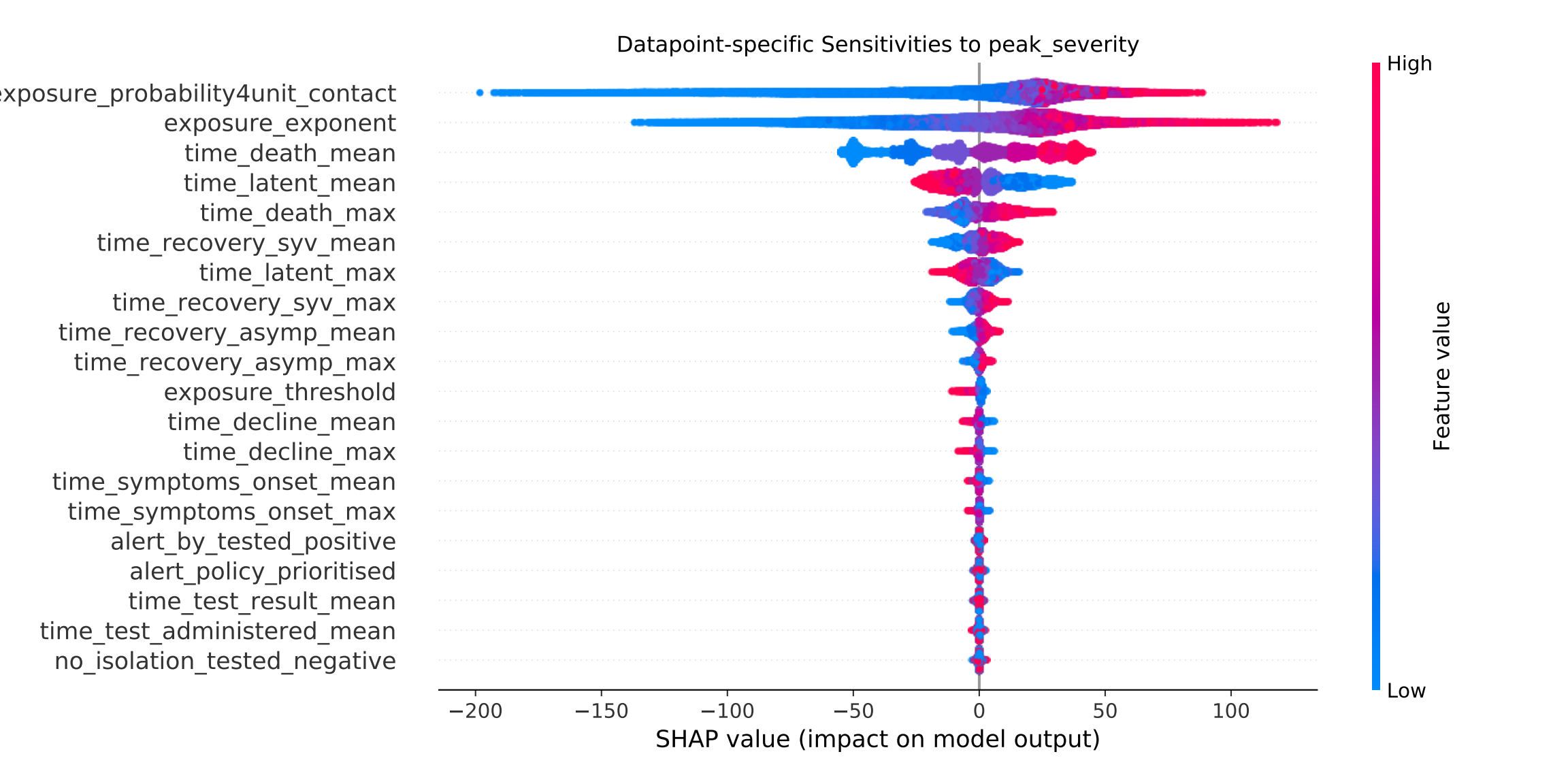
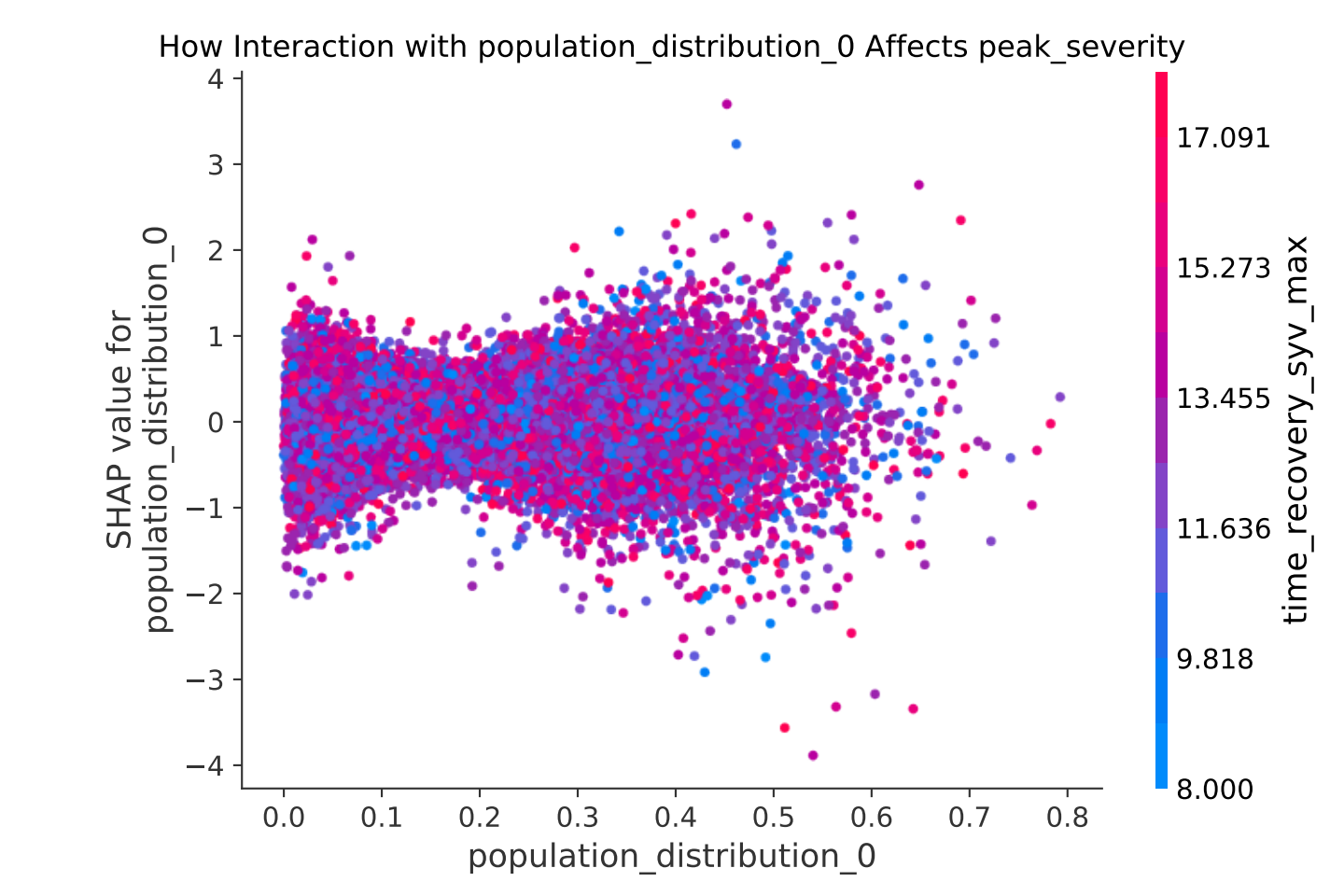
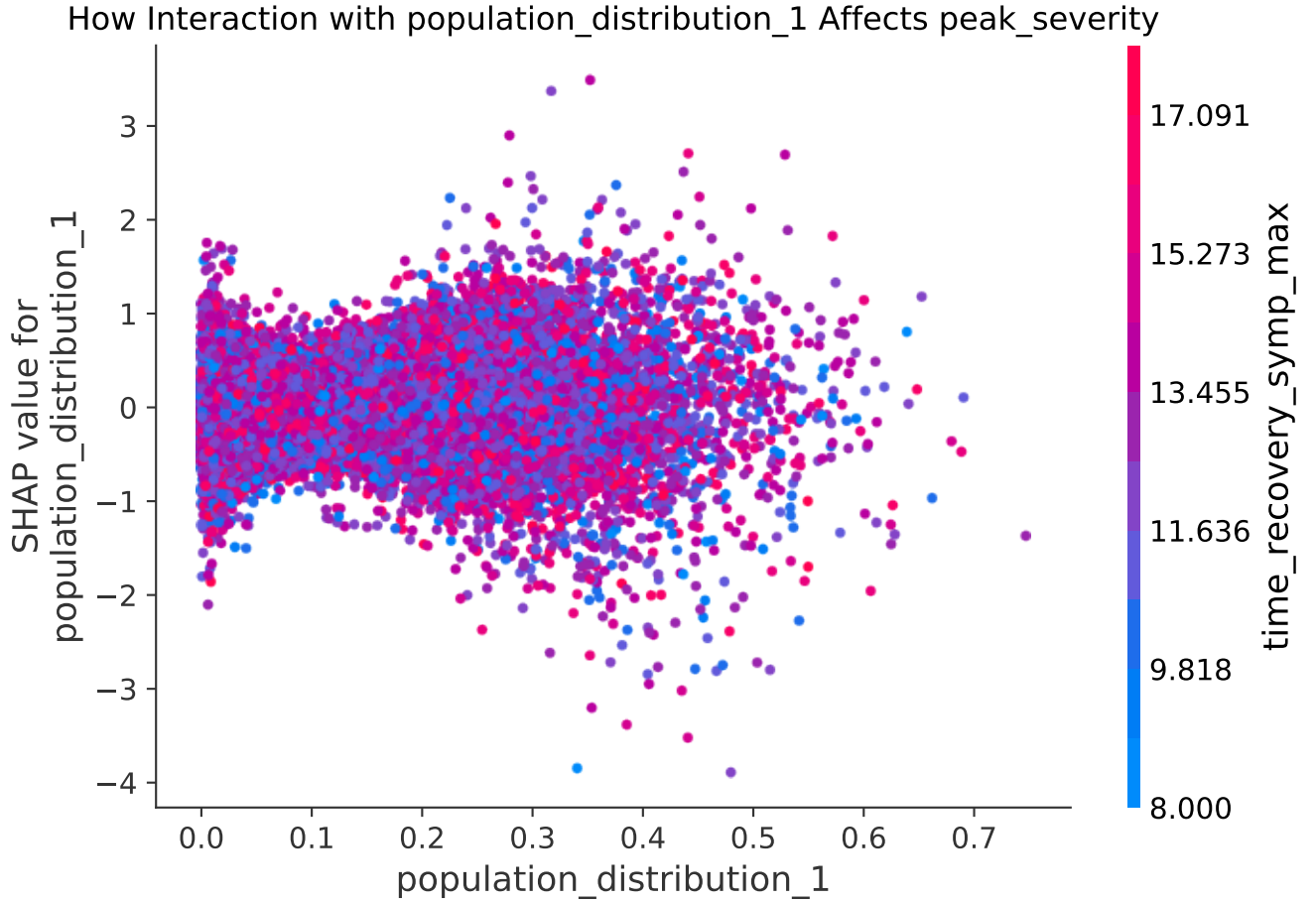
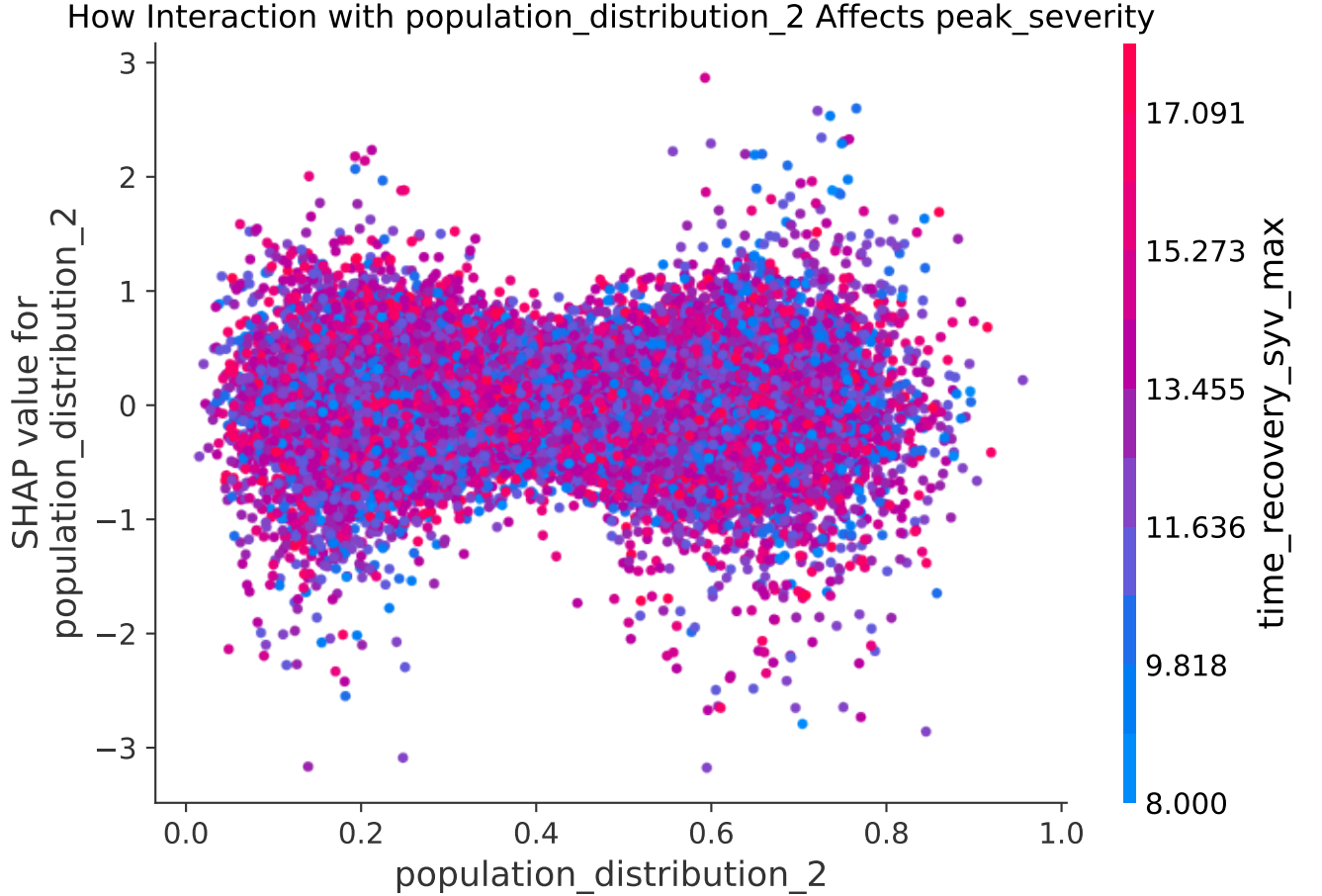
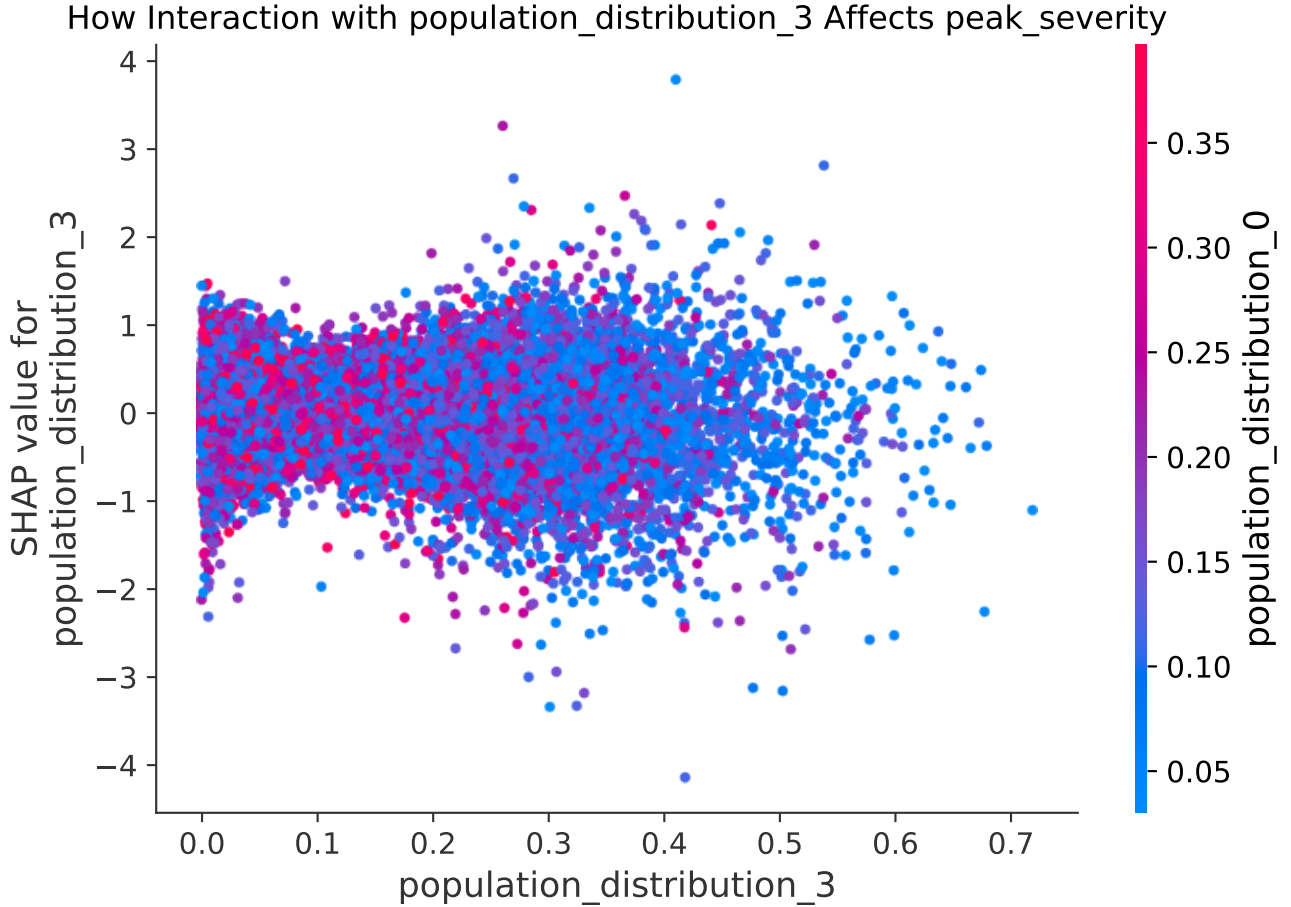

peak_severity
Forecast by Meta-Model vs Actual Outcome by Simulator
Actual
Forecast
100
200
300
400
500
50
100
150
200
250
300
350
400

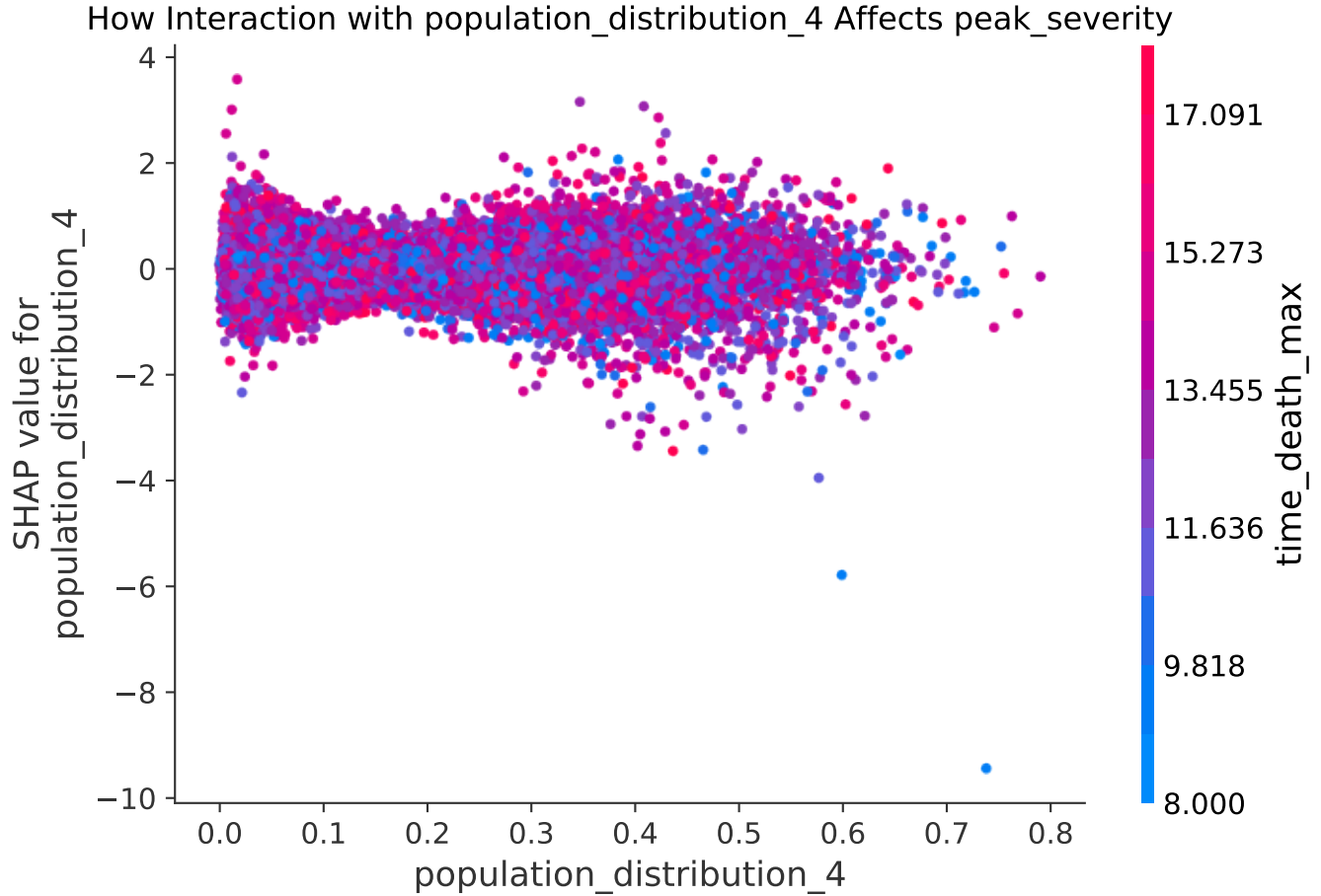

Datapoint-specific Sensitivities to peak_severity
exposure_probability4unit_contact
exposure_exponent
time_death_mean
time_latent_mean
time_death_max
time_recovery_syv_mean
time_latent_max
time_recovery_syv_max
time_recovery_asymp_mean
time_recovery_asymp_max
exposure_threshold
time_decline_mean
time_decline_max
time_symptoms_onset_mean
time_symptoms_onset_max
alert_by_tested_positive
alert_policy_prioritised
time_test_result_mean
time_test_administered_mean
no_isolation_tested_negative
−200
−150
−100
−50
0
50
100
SHAP value (impact on model output)
High
Feature value
Low

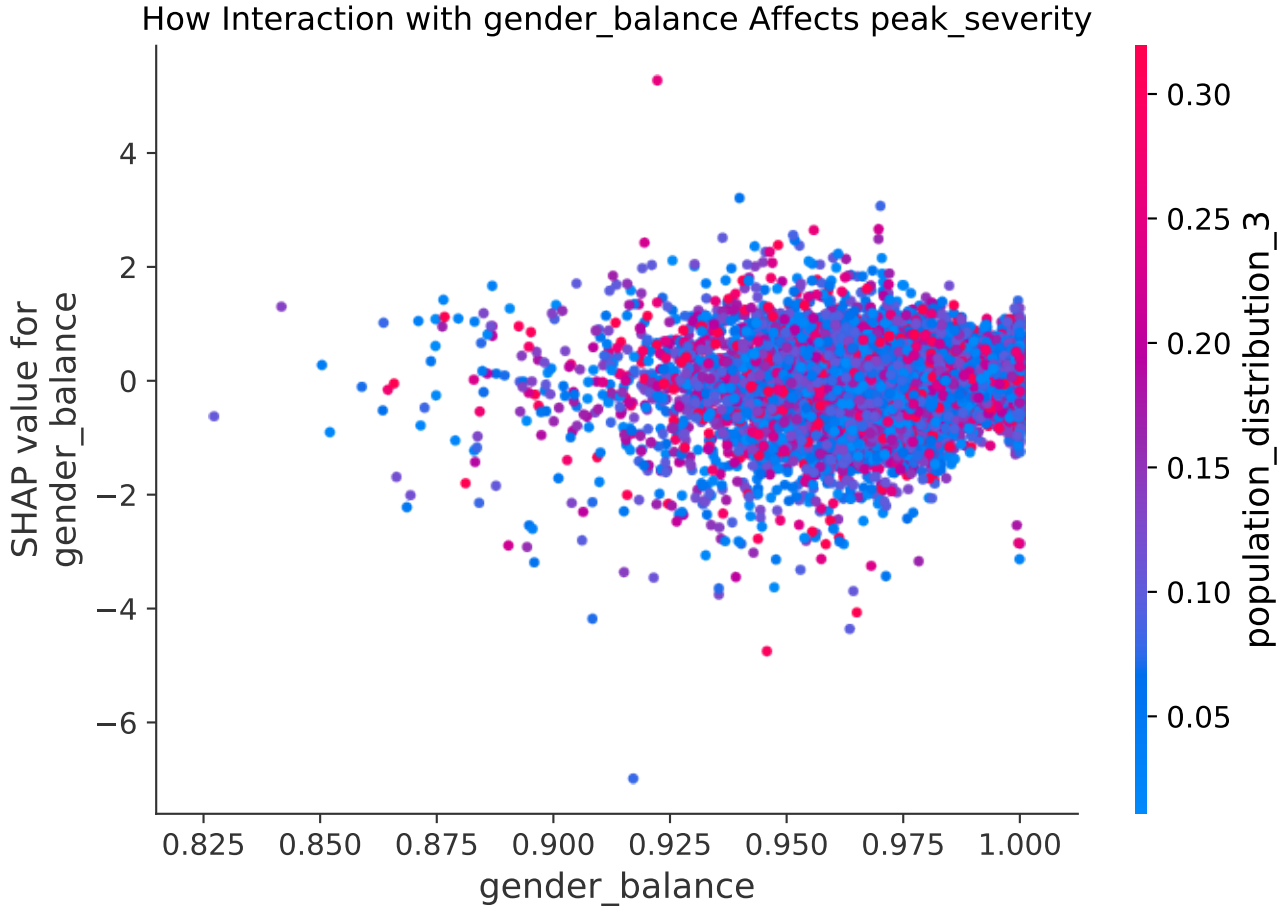

How Interaction with population_distribution_0 Affects peak_severity
SHAP value for population_distribution_0
population_distribution_0
time_recovery_syv_max
17.091
15.273
13.455
11.636
9.818
8.000
4
3
2
1
0
−1
−2
−3
−4
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

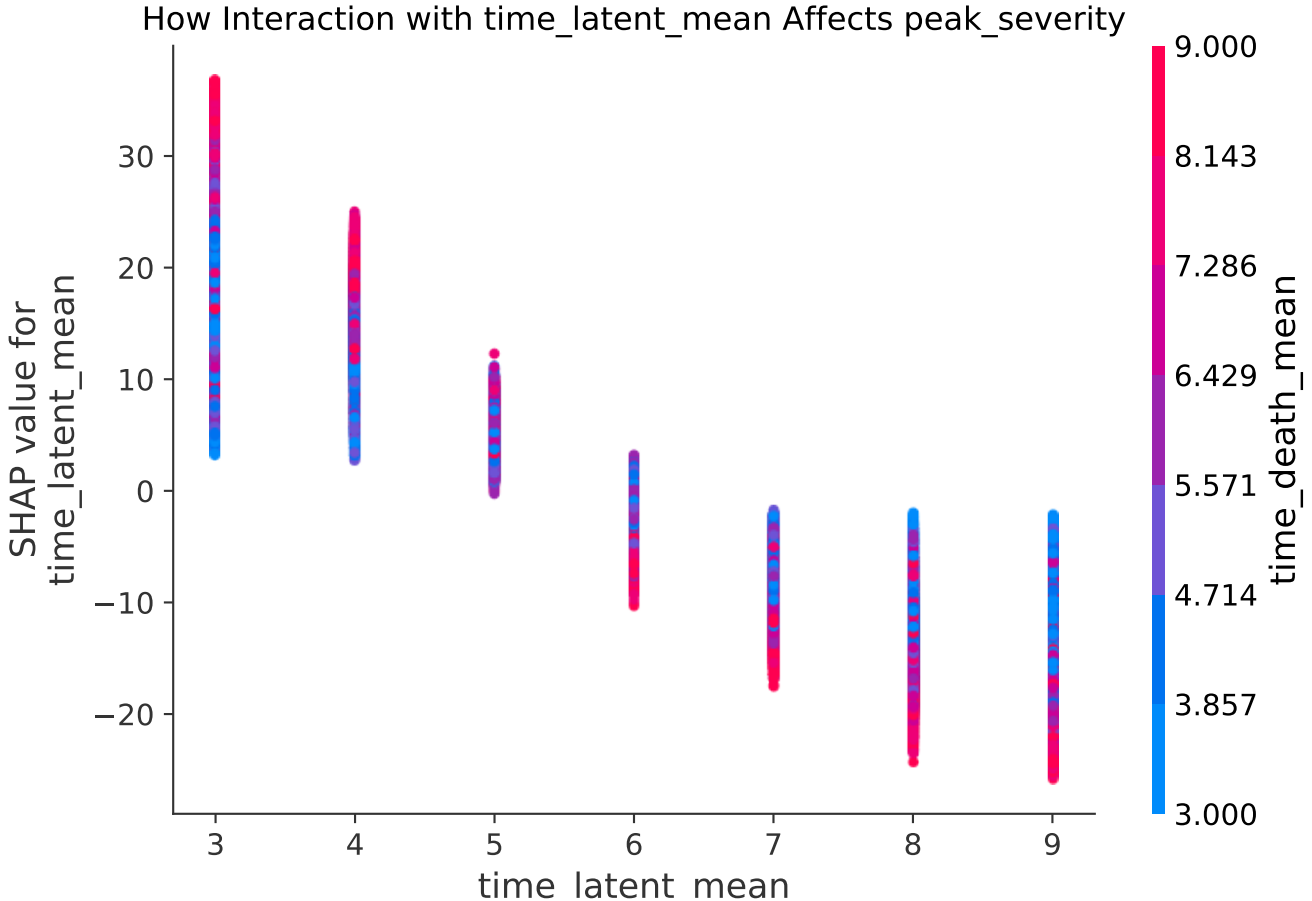

How Interaction with population_distribution_1 Affects peak_severity
SHAP value for population_distribution_1
population_distribution_1
time_recovery_symp_max
17.091
15.273
13.455
11.636
9.818
8.000
3
2
1
0
−1
−2
−3
−4
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

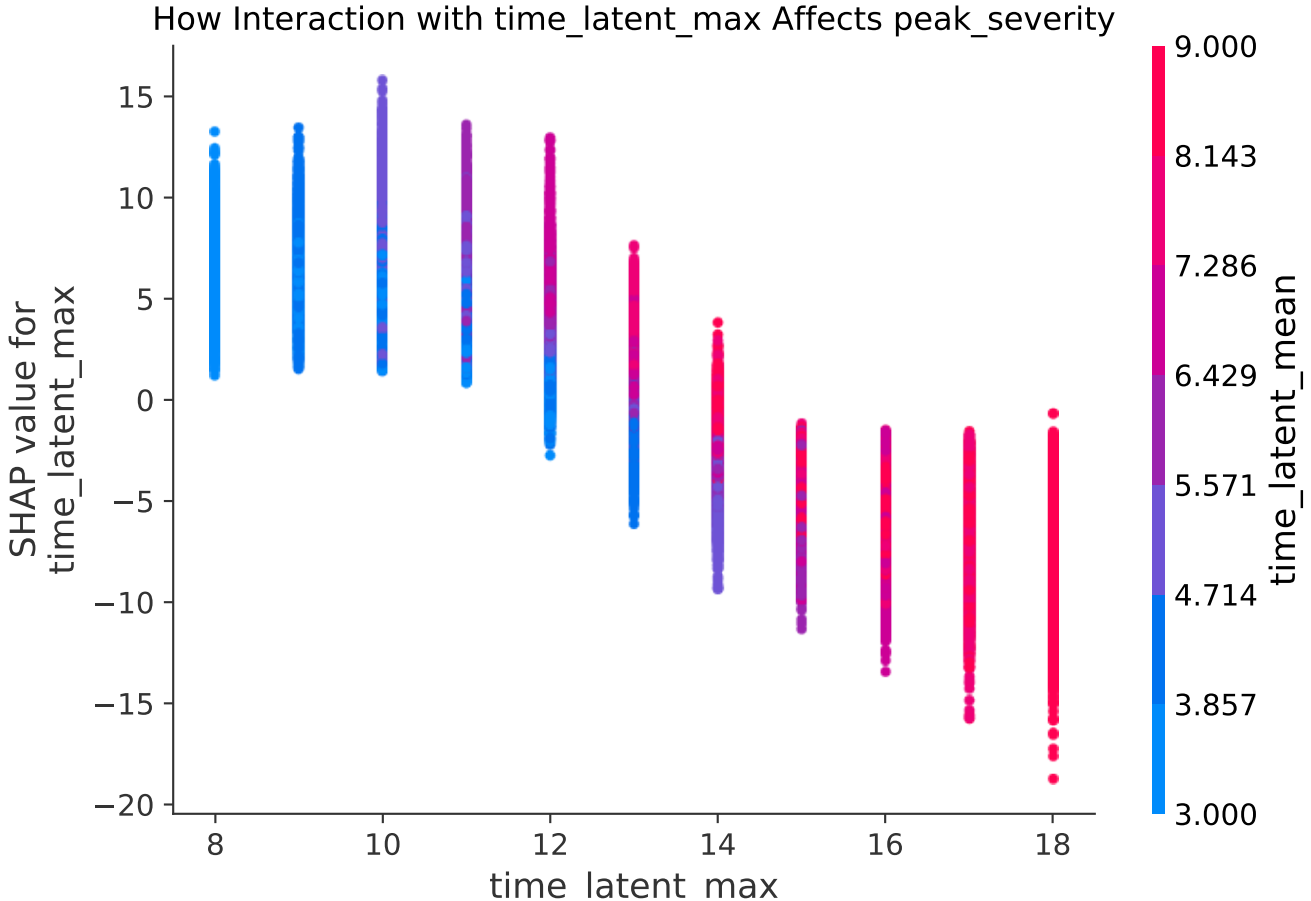

How Interaction with population_distribution_2 Affects peak_severity
SHAP value for population_distribution_2
population_distribution_2
time_recovery_syv_max
3
2
1
0
−1
−2
−3
0.0
0.2
0.4
0.6
0.8
1.0
17.091
15.273
13.455
11.636
9.818
8.000

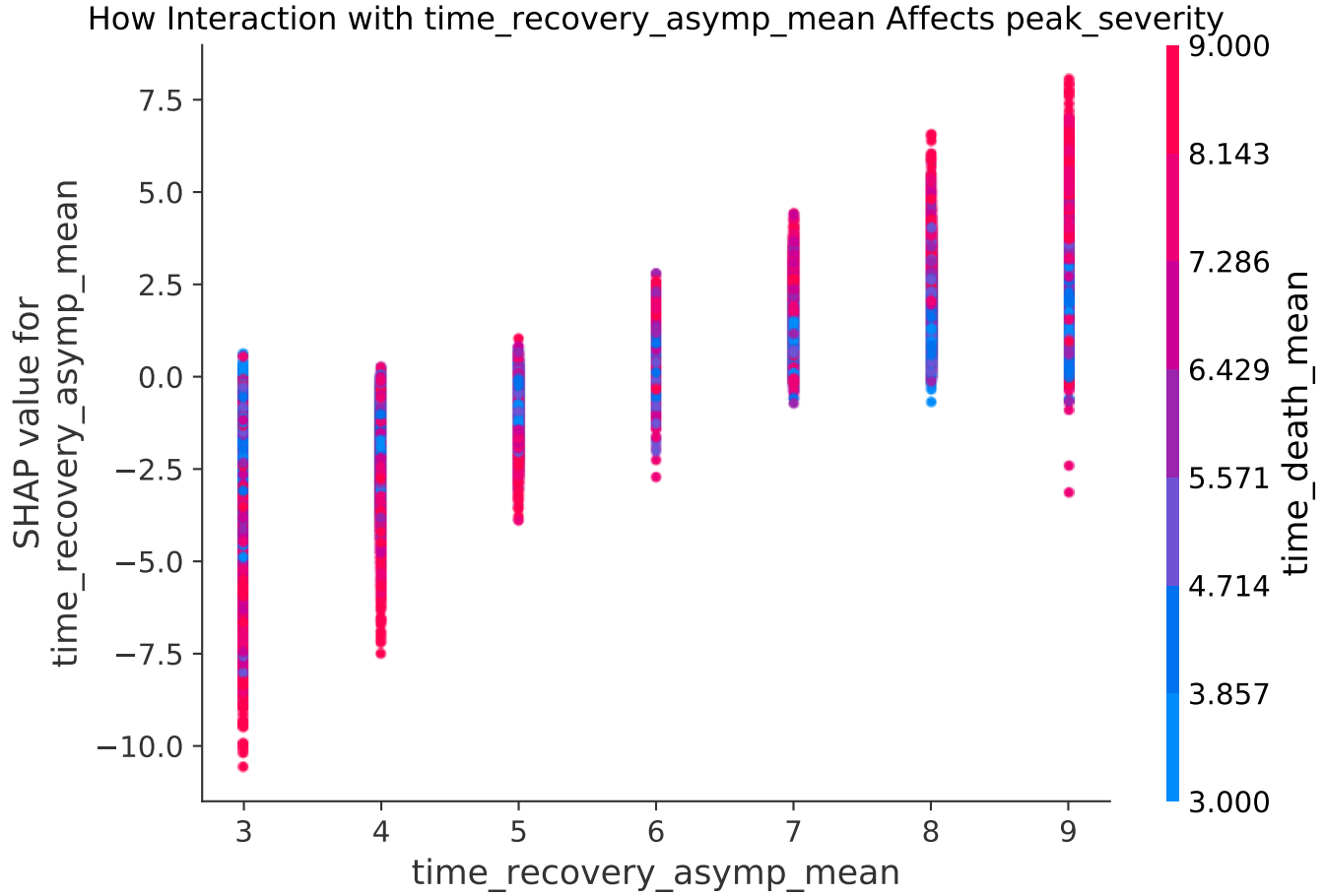

How Interaction with population_distribution_3 Affects peak_severity
SHAP value for population_distribution_3
population_distribution_3
population_distribution_0
4
3
2
1
0
−1
−2
−3
−4
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.35
0.30
0.25
0.20
0.15
0.10
0.05

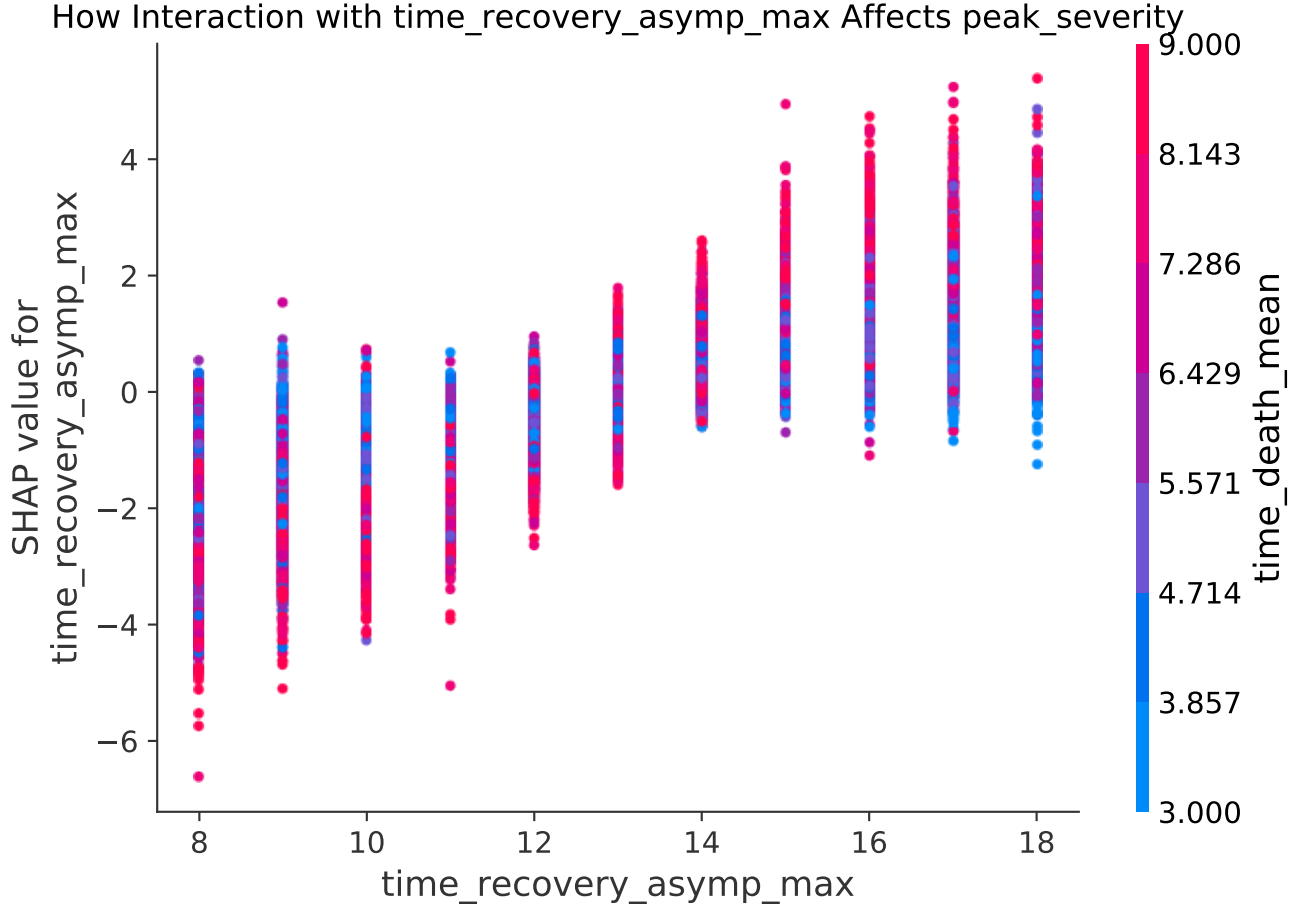

How Interaction with population_distribution_4 Affects peak_severity
SHAP value for population_distribution_4
population_distribution_4
time_death_max
4
2
0
−2
−4
−6
−8
−10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
17.091
15.273
13.455
11.636
9.818
8.000

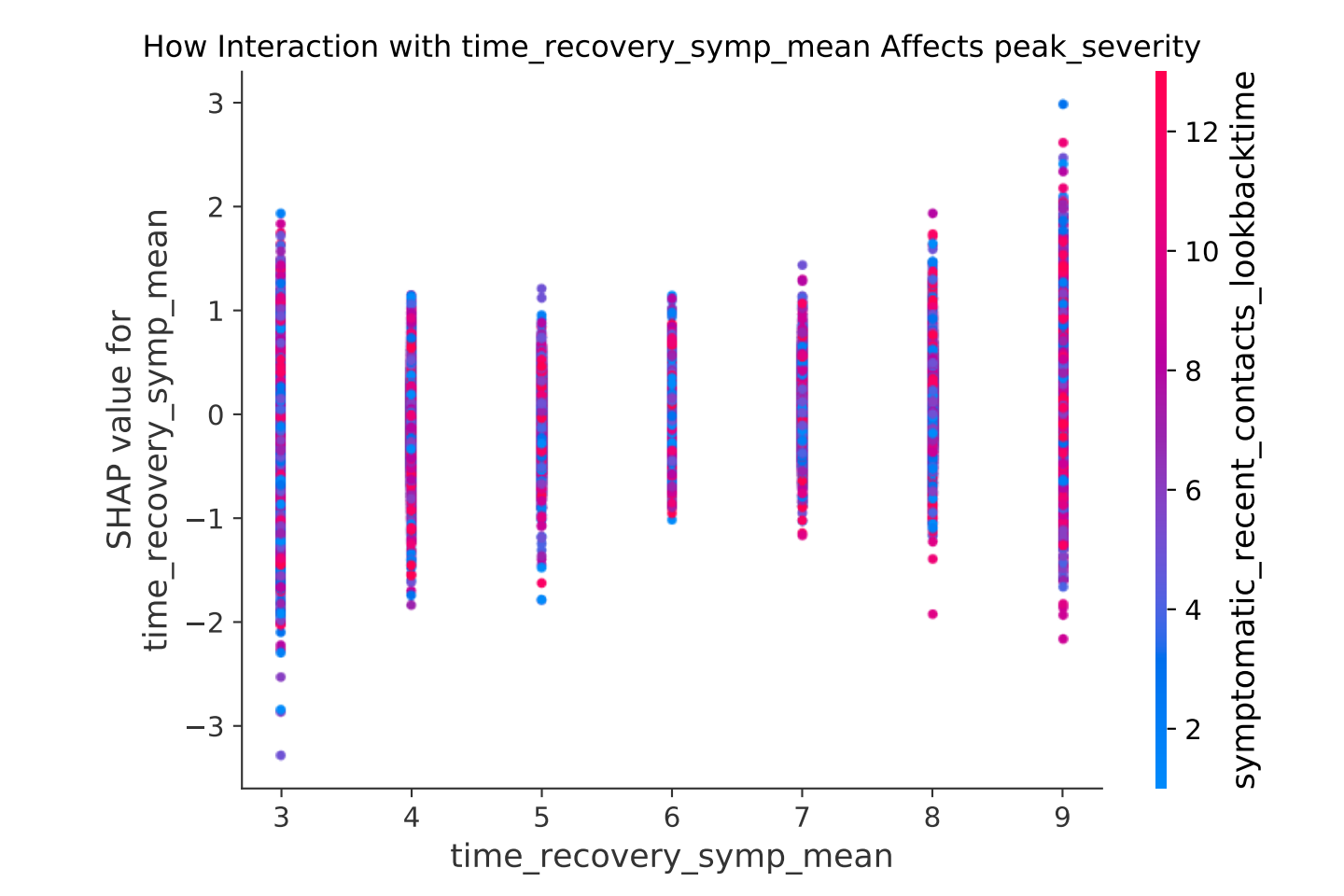

How Interaction with gender_balance Affects peak_severity
SHAP value for gender_balance
4
2
0
−2
−4
−6
0.825
0.850
0.875
0.900
0.925
0.950
0.975
1.000
gender_balance
0.30
0.25
0.20
0.15
0.10
0.05
population_distribution_3

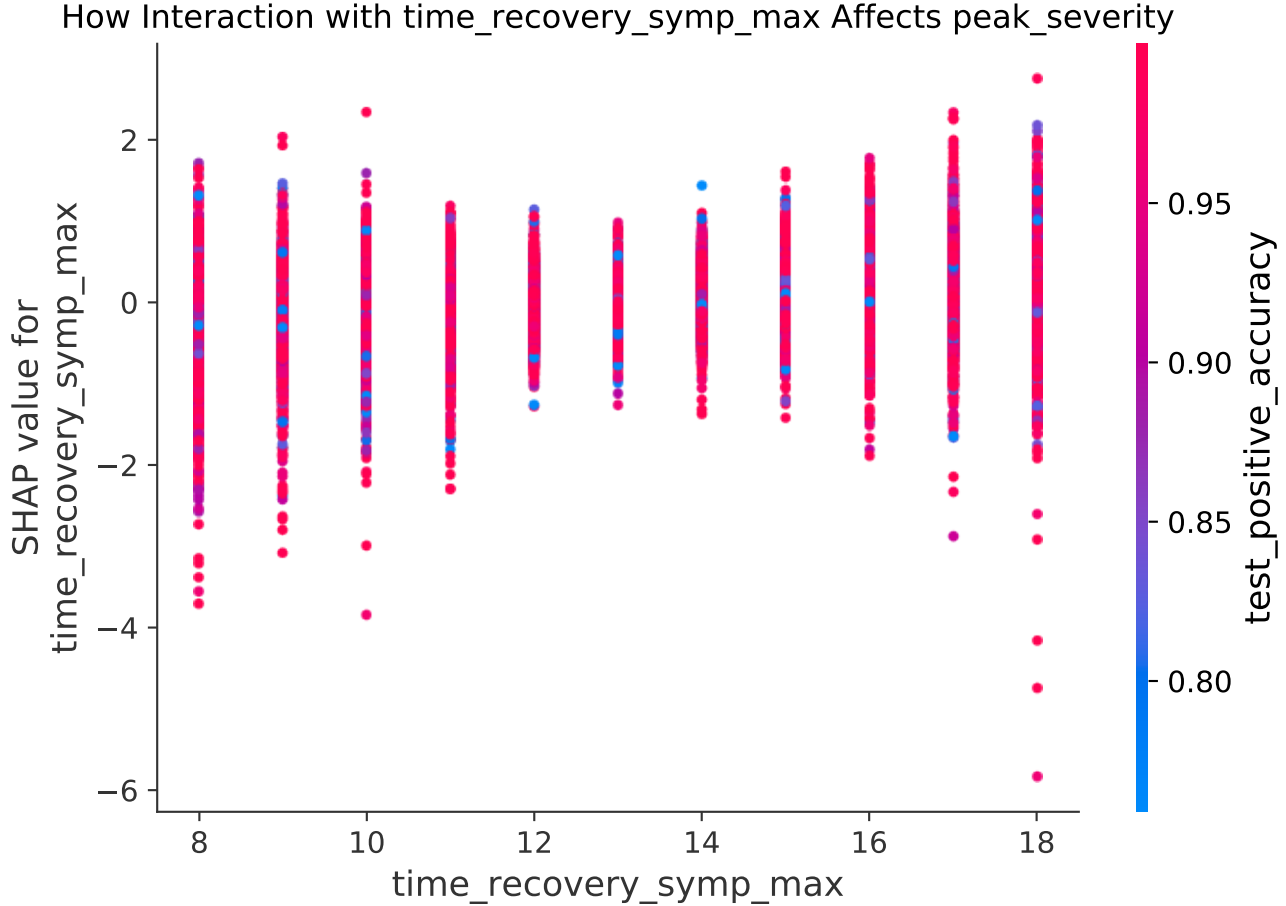

How Interaction with time_latent_mean Affects peak_severity
SHAP value for time_latent_mean
30
20
10
0
−10
−20
3
4
5
6
7
8
9
time_latent_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

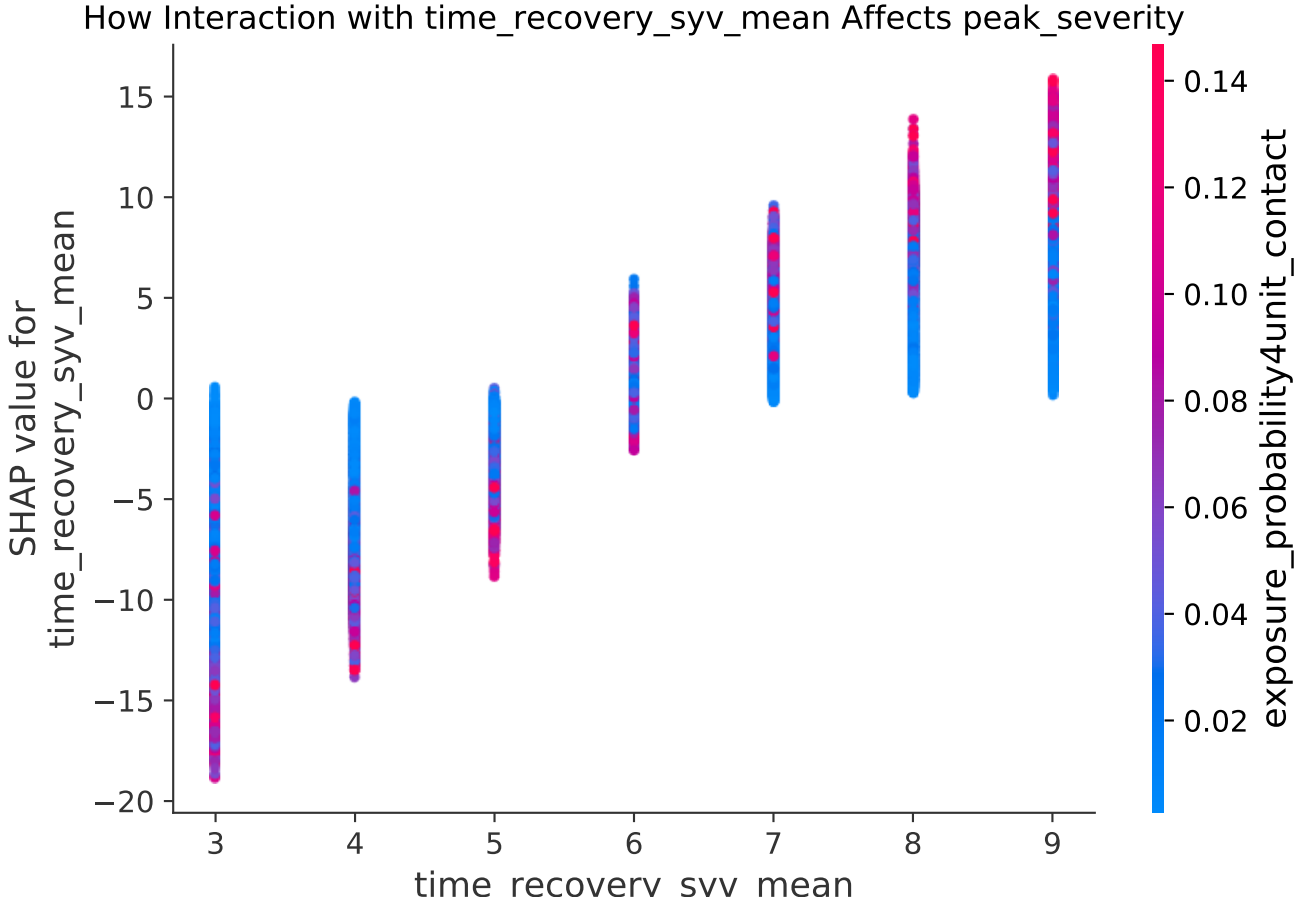

How Interaction with time_latent_max Affects peak_severity
SHAP value for time_latent_max
time_latent_max
time_latent_mean
15
10
5
0
−5
−10
−15
−20
8
10
12
14
16
18
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

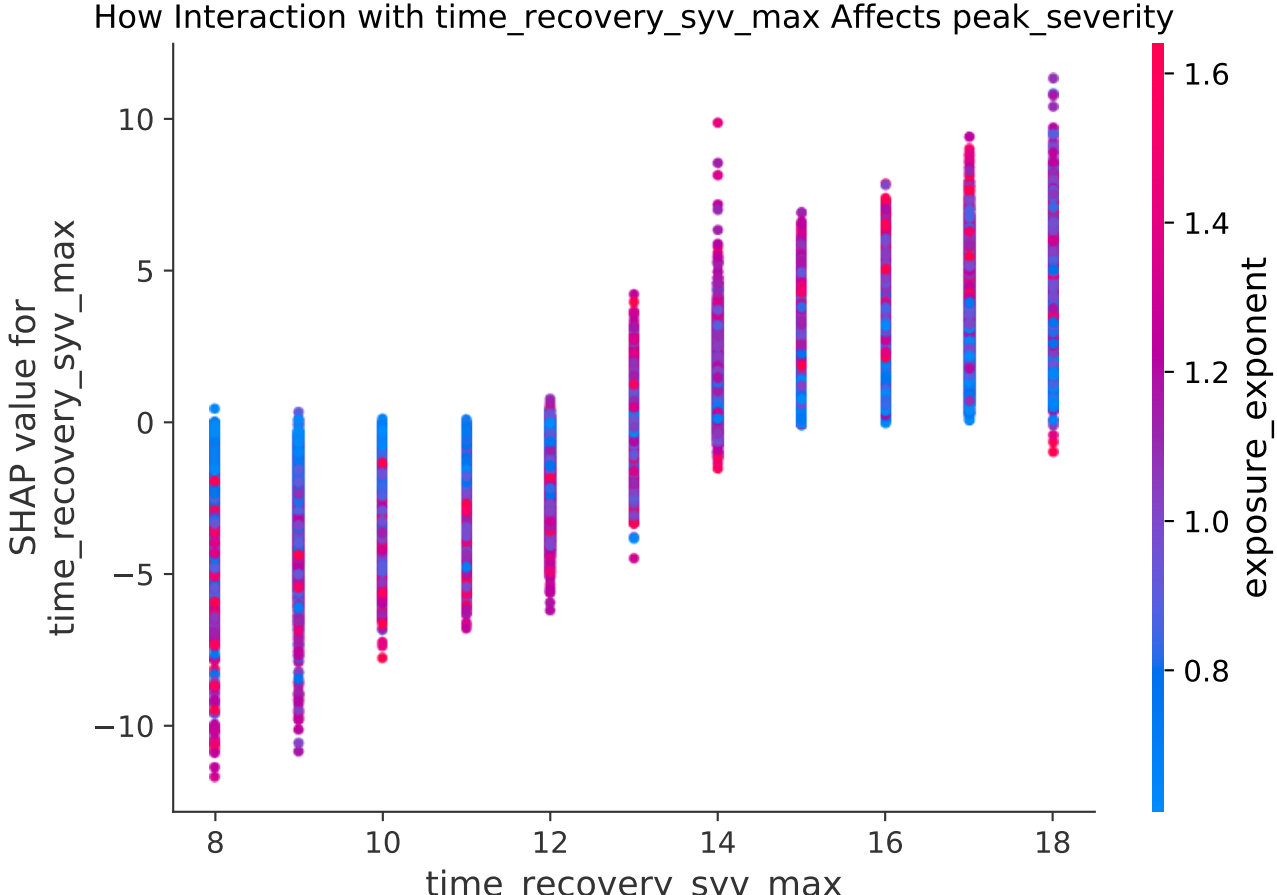

How Interaction with time_recovery_asymp_mean Affects peak_severity
SHAP value for time_recovery_asymp_mean
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
3
4
5
6
7
8
9
time_recovery_asymp_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

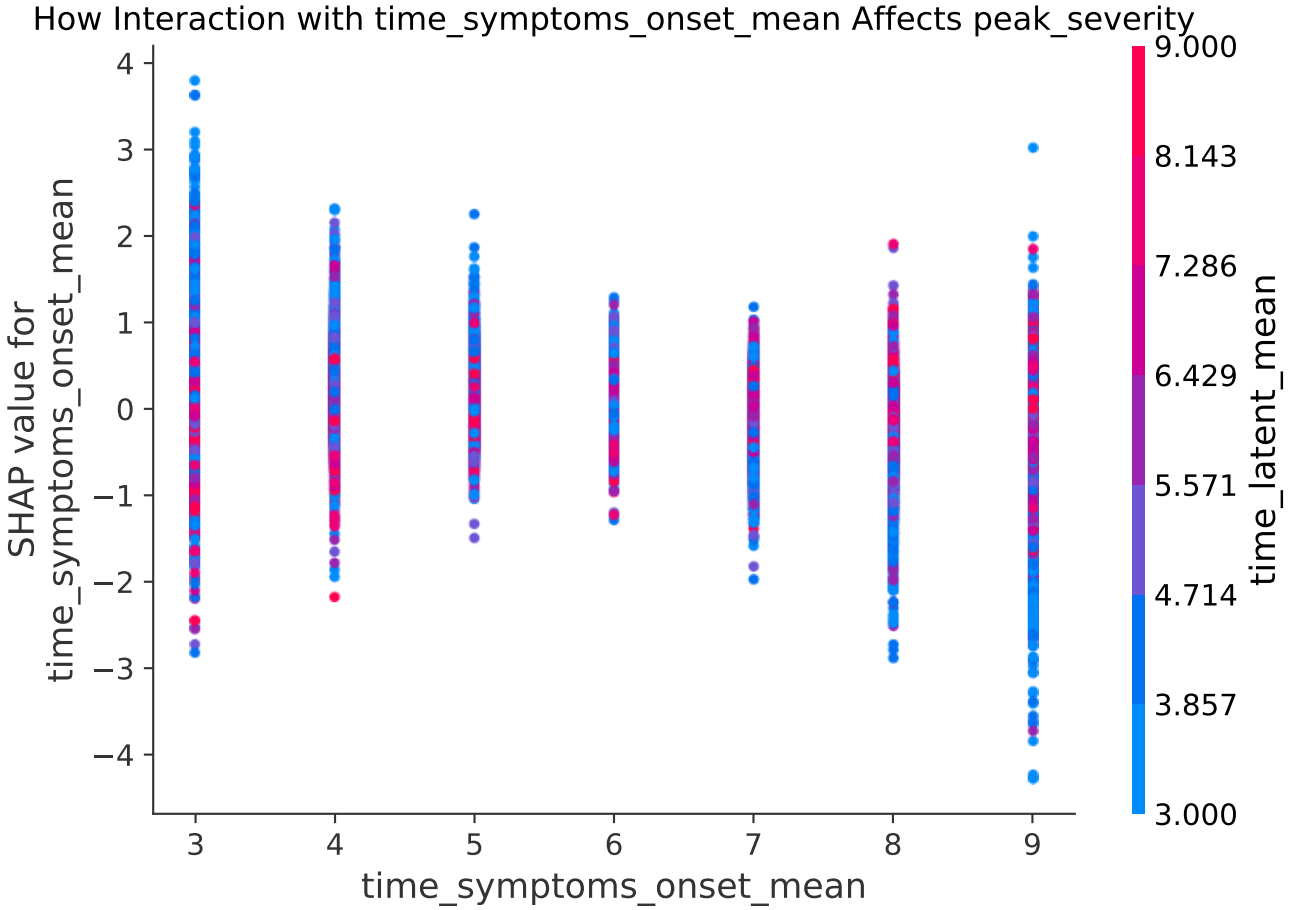

How Interaction with time_recovery_asymp_max Affects peak_severity
SHAP value for time_recovery_asymp_max
time_recovery_asymp_max
time_death_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
4
2
0
−2
−4
−6
8
10
12
14
16
18

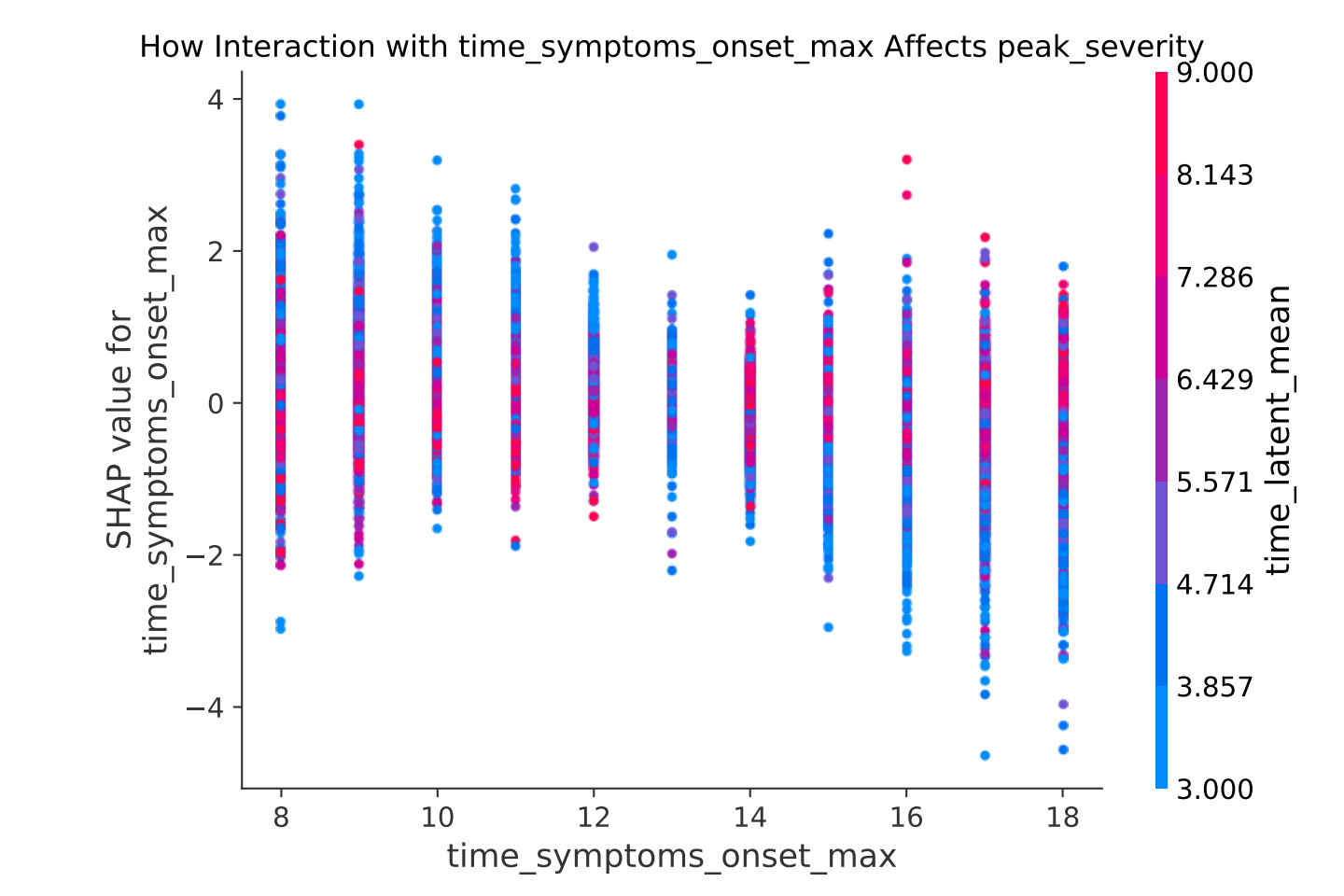

How Interaction with time_recovery_symp_mean Affects peak_severity
SHAP value for time_recovery_symp_mean
time_recovery_symp_mean
symptomatic_recent_contacts_lookbacktime
3
2
1
0
−1
−2
−3
4
5
6
7
8
9
10
12

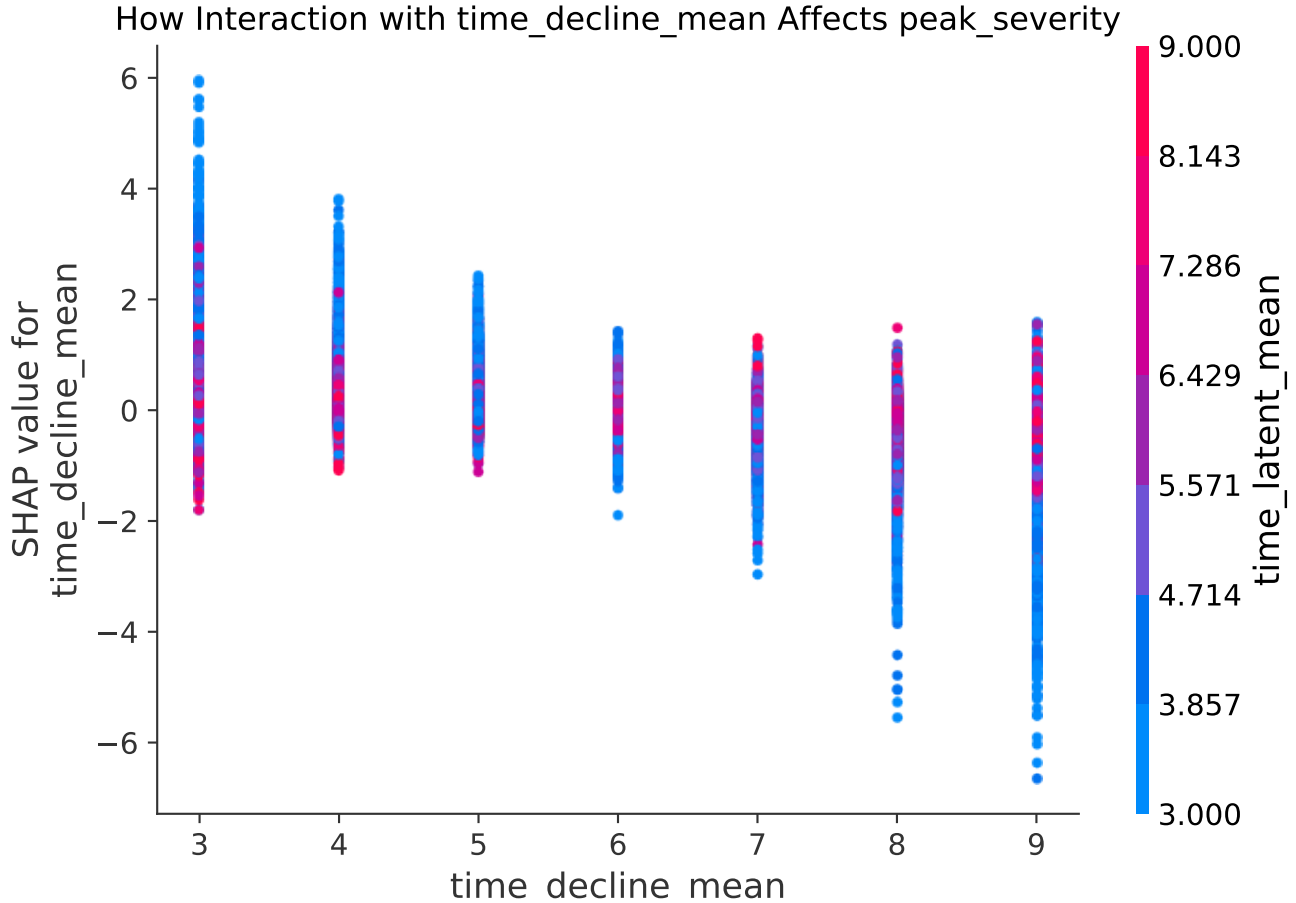

How Interaction with time_recovery_symp_max Affects peak_severity
SHAP value for time_recovery_symp_max
2
0
−2
−4
−6
8
10
12
14
16
18
time_recovery_symp_max
test_positive_accuracy
0.95
0.90
0.85
0.80

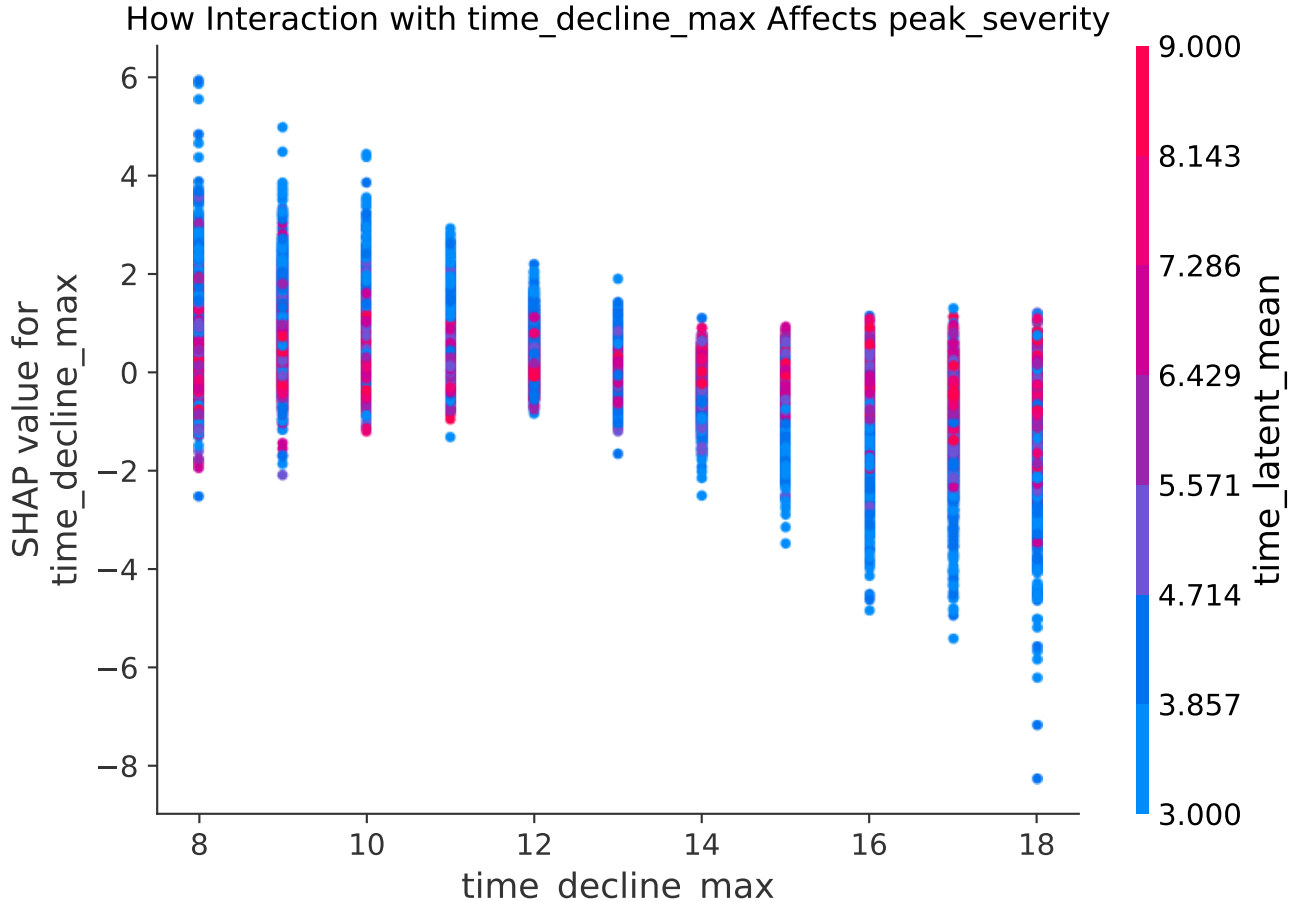

How Interaction with time_recovery_syv_mean Affects peak_severity
SHAP value for time_recovery_syv_mean
time_recovery_syv_mean
exposure_probability4unit_contact
15
10
5
0
−5
−10
−15
−20
3
4
5
6
7
8
9
0.14
0.12
0.10
0.08
0.06
0.04
0.02

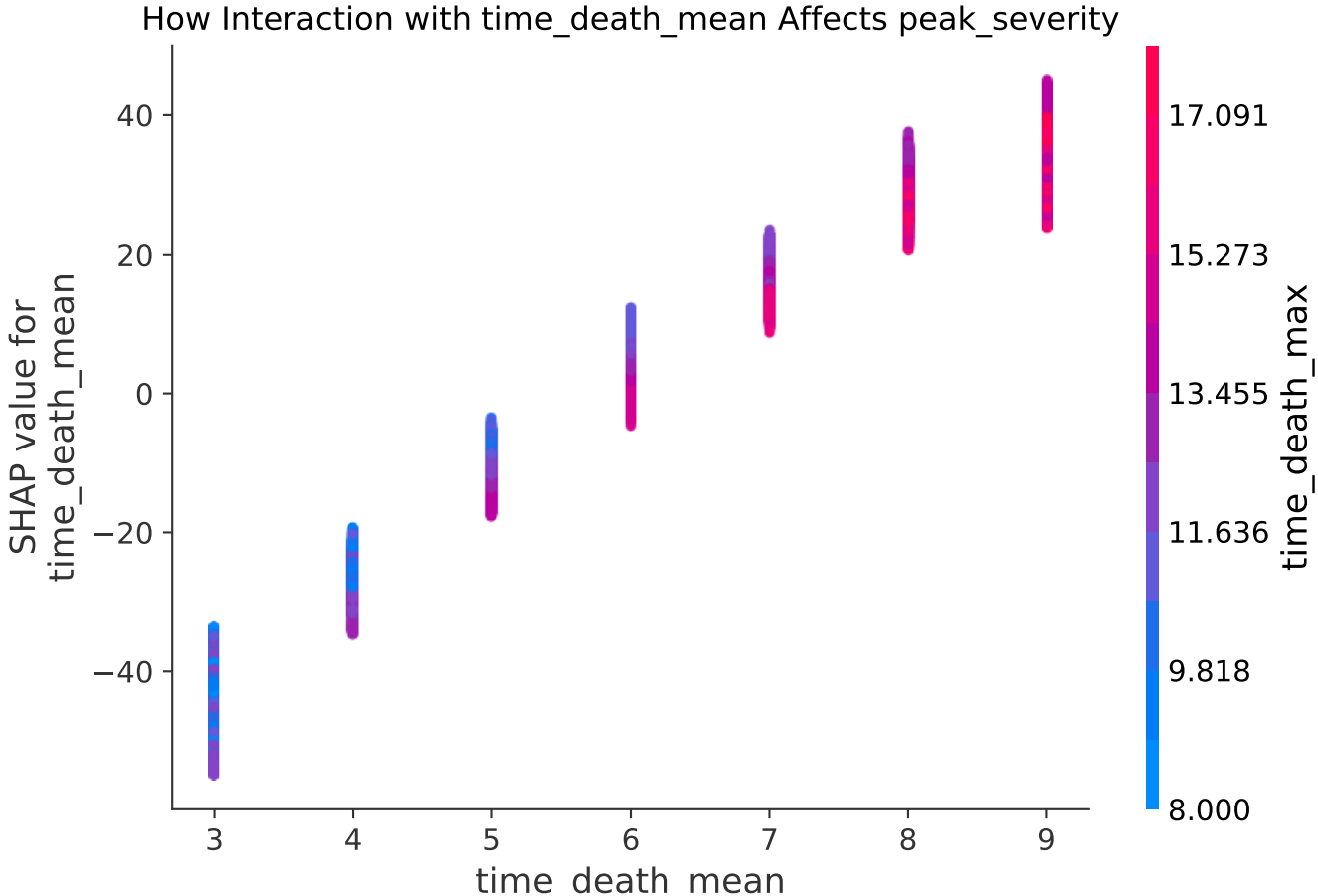

How Interaction with time_recovery_syv_max Affects peak_severity
SHAP value for time_recovery_syv_max
time_recovery_syv_max
exposure_exponent
10
5
0
−5
−10
8
10
12
14
16
18
1.6
1.4
1.2
1.0
0.8

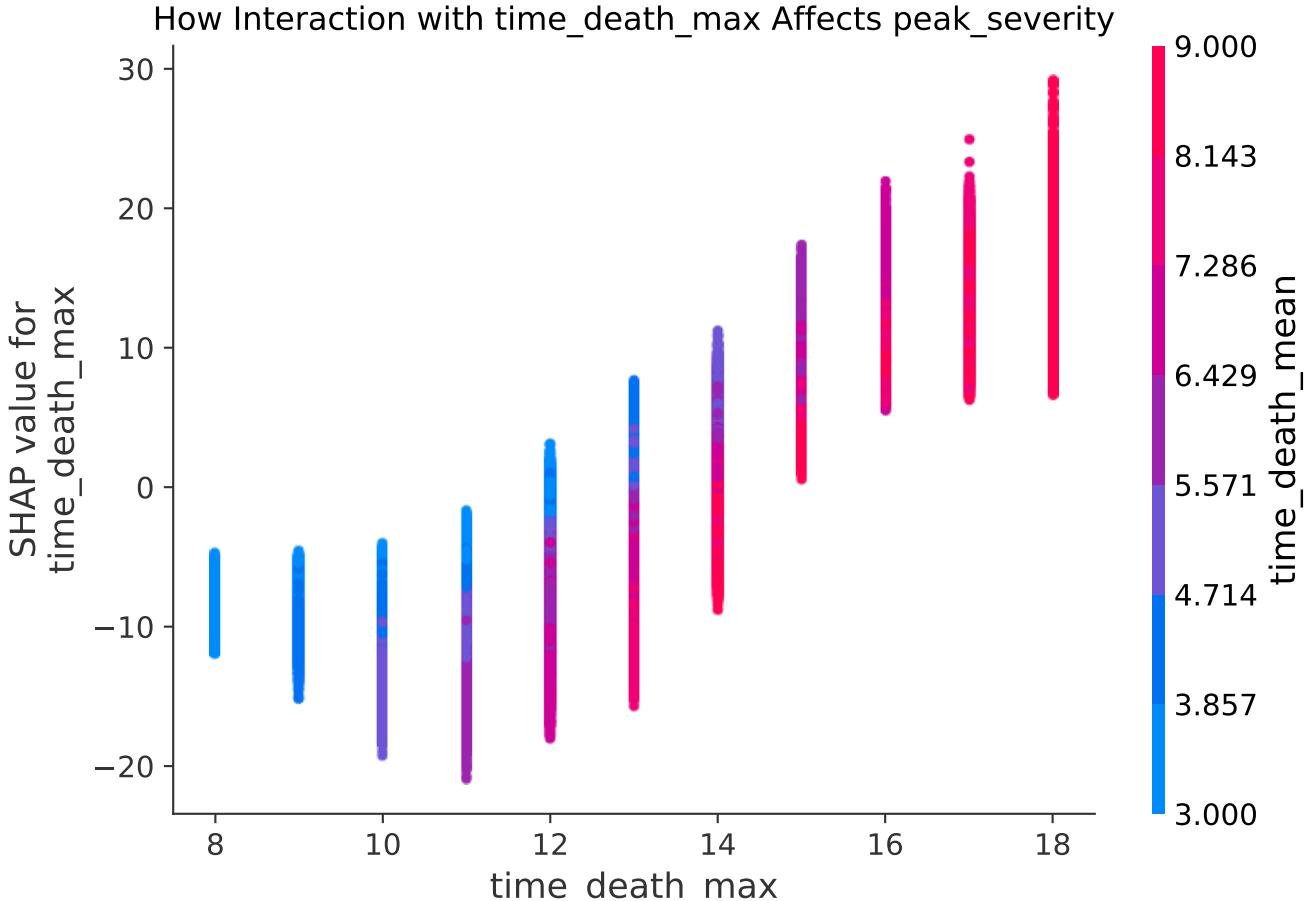

How Interaction with time_symptoms_onset_mean Affects peak_severity
SHAP value for time_symptoms_onset_mean
time_symptoms_onset_mean
time_latent_mean
4
3
2
1
0
−1
−2
−3
−4
3
4
5
6
7
8
9
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

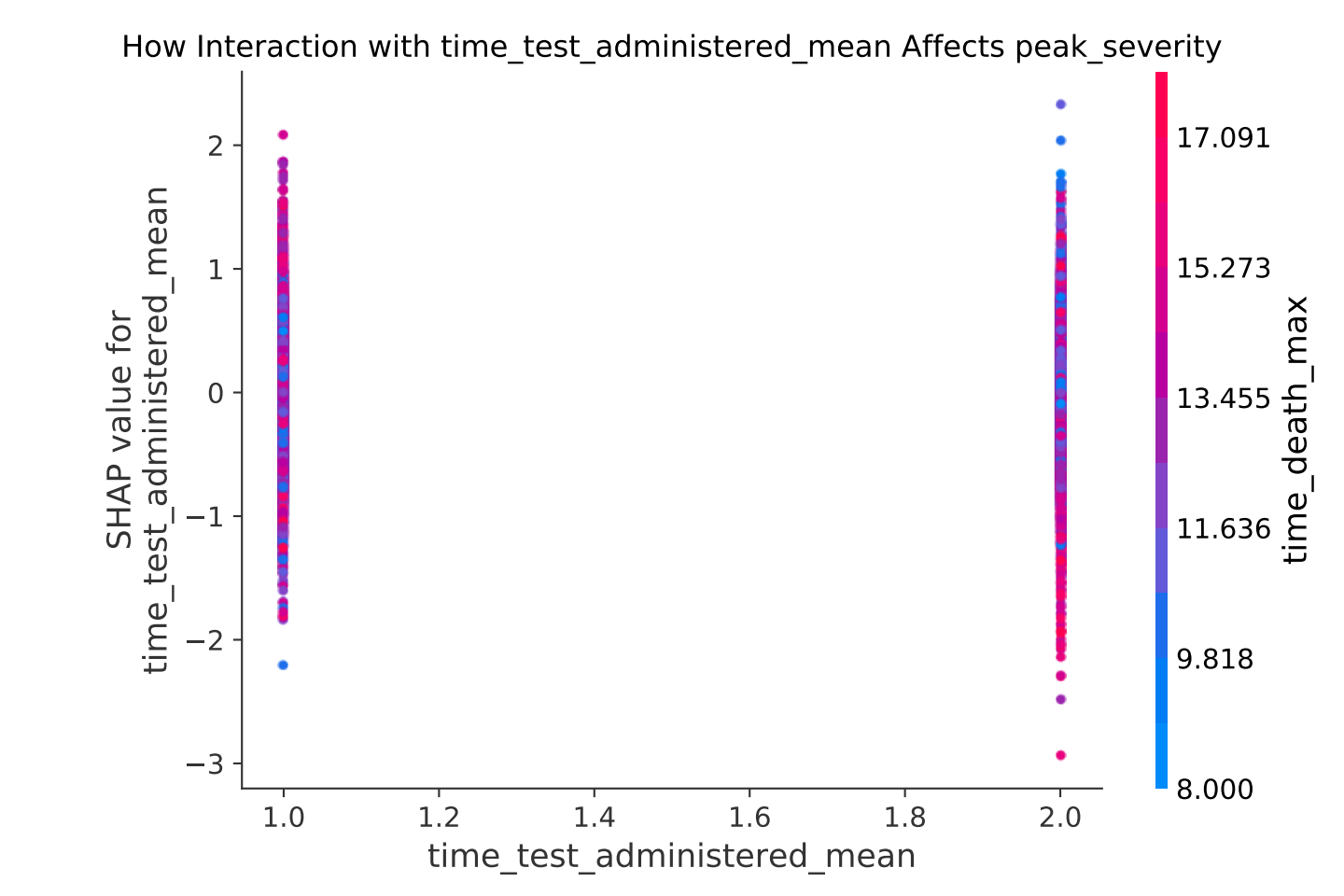

How Interaction with time_symptoms_onset_max Affects peak_severity
SHAP value for time_symptoms_onset_max
time_symptoms_onset_max
time_latent_mean
4
2
0
−2
−4
8
10
12
14
16
18
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

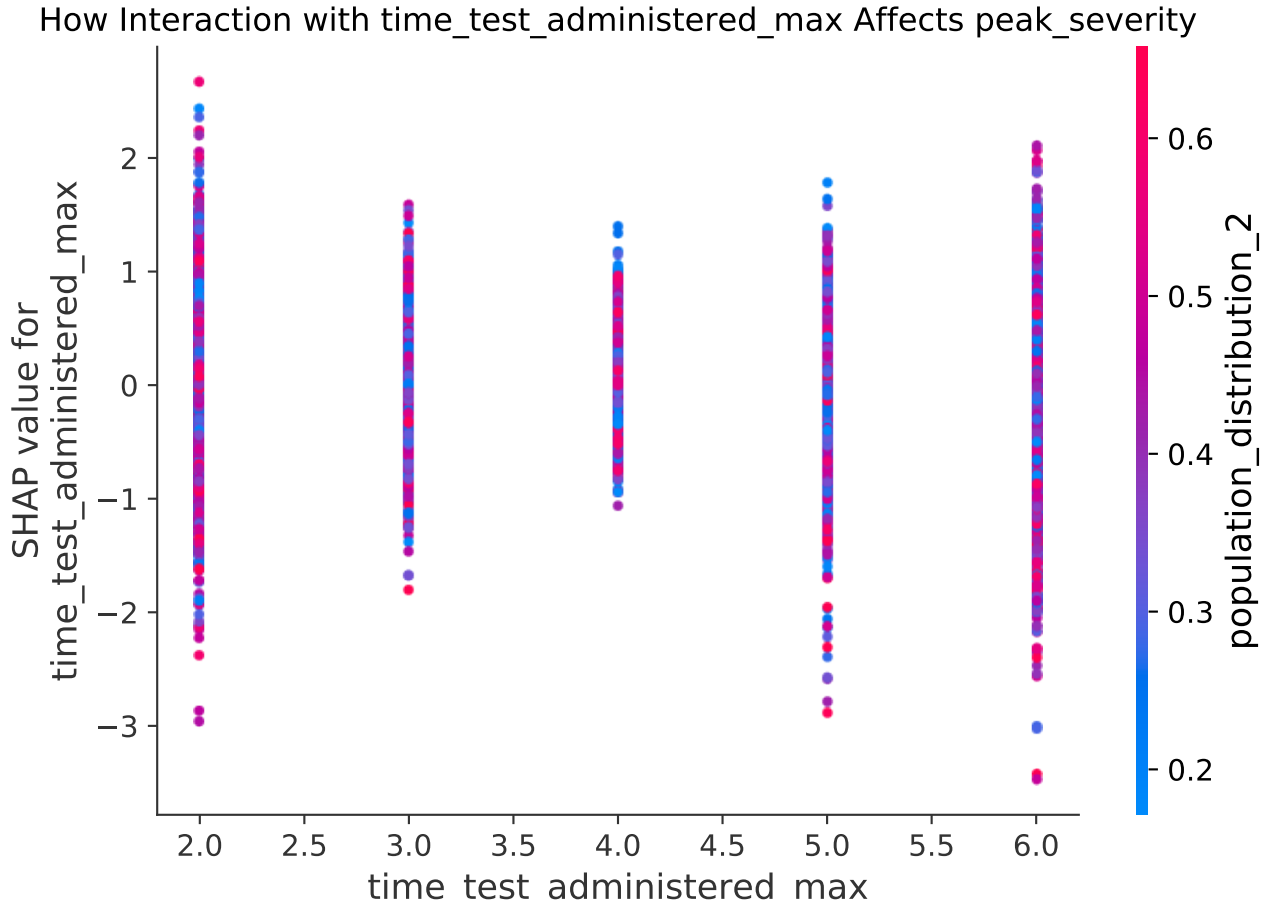

How Interaction with time_decline_mean Affects peak_severity
SHAP value for time_decline_mean
time_decline_mean
time_latent_mean
6
4
2
0
−2
−4
−6
3
4
5
6
7
8
9
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

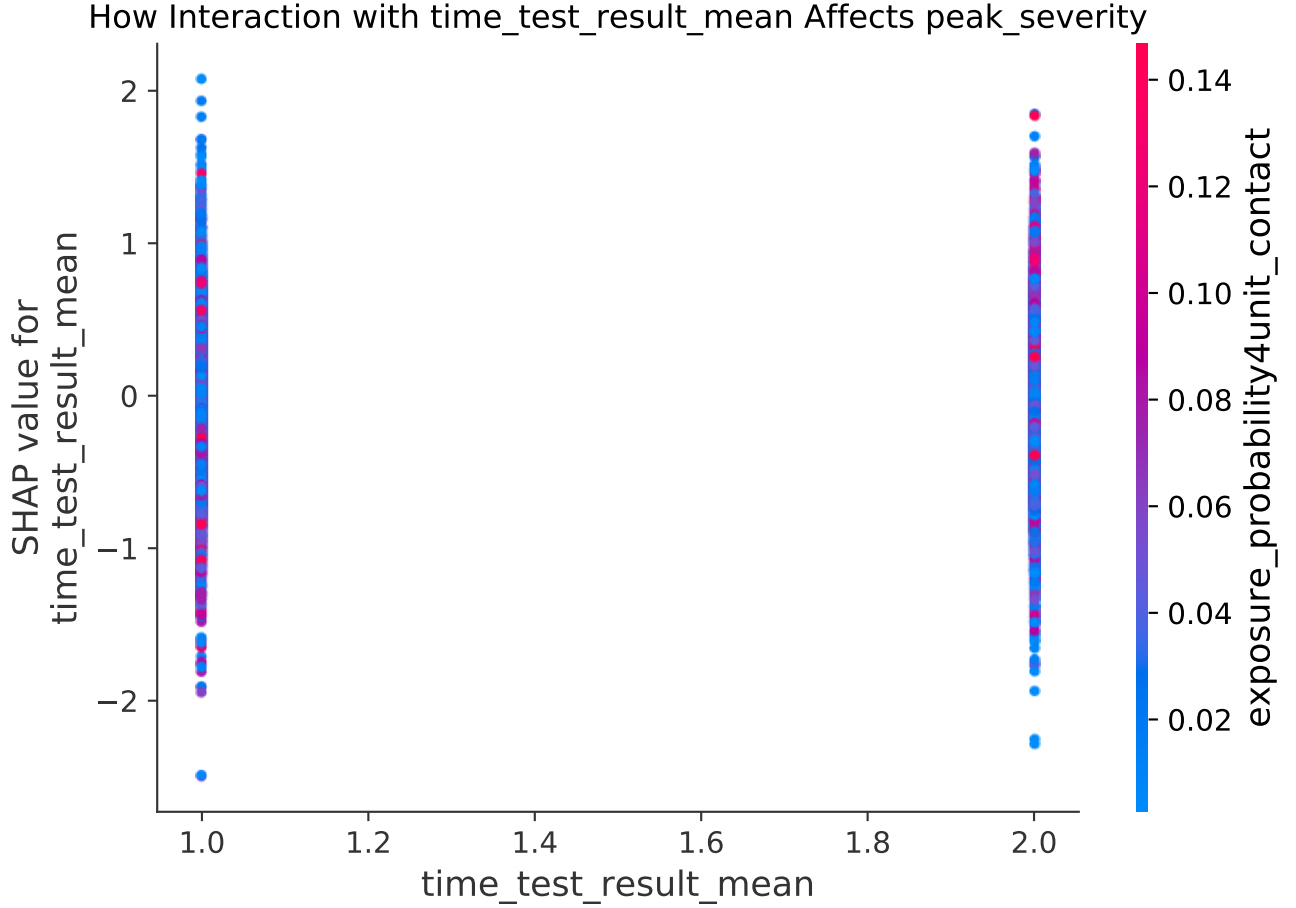

How Interaction with time_decline_max Affects peak_severity
SHAP value for time_decline_max
time_decline_max
time_latent_mean
6
4
2
0
−2
−4
−6
−8
8
10
12
14
16
18
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

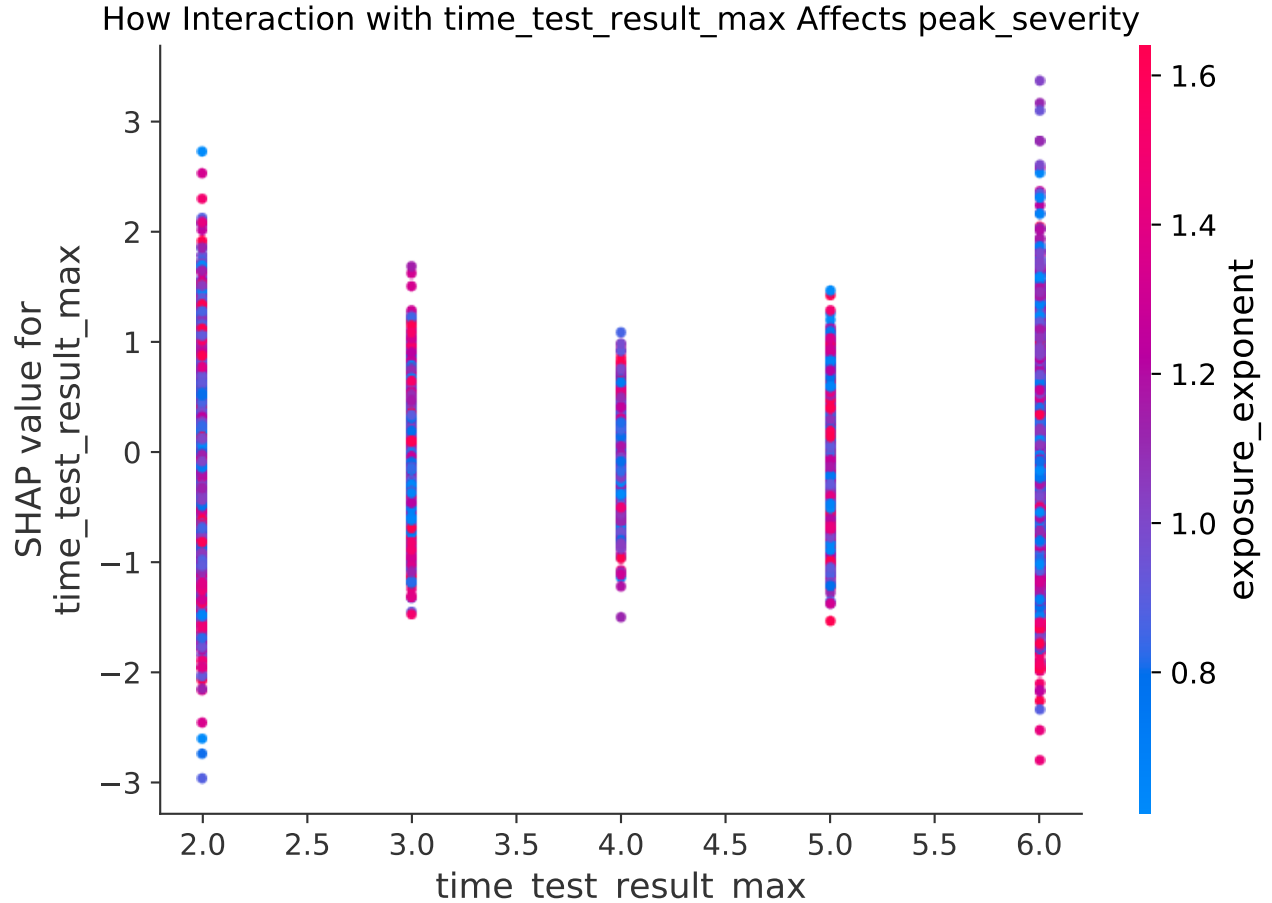

How Interaction with time_death_mean Affects peak_severity
SHAP value for time_death_mean
40
20
0
−20
−40
3
4
5
6
7
8
9
time_death_mean
17.091
15.273
13.455
11.636
9.818
8.000
time_death_max

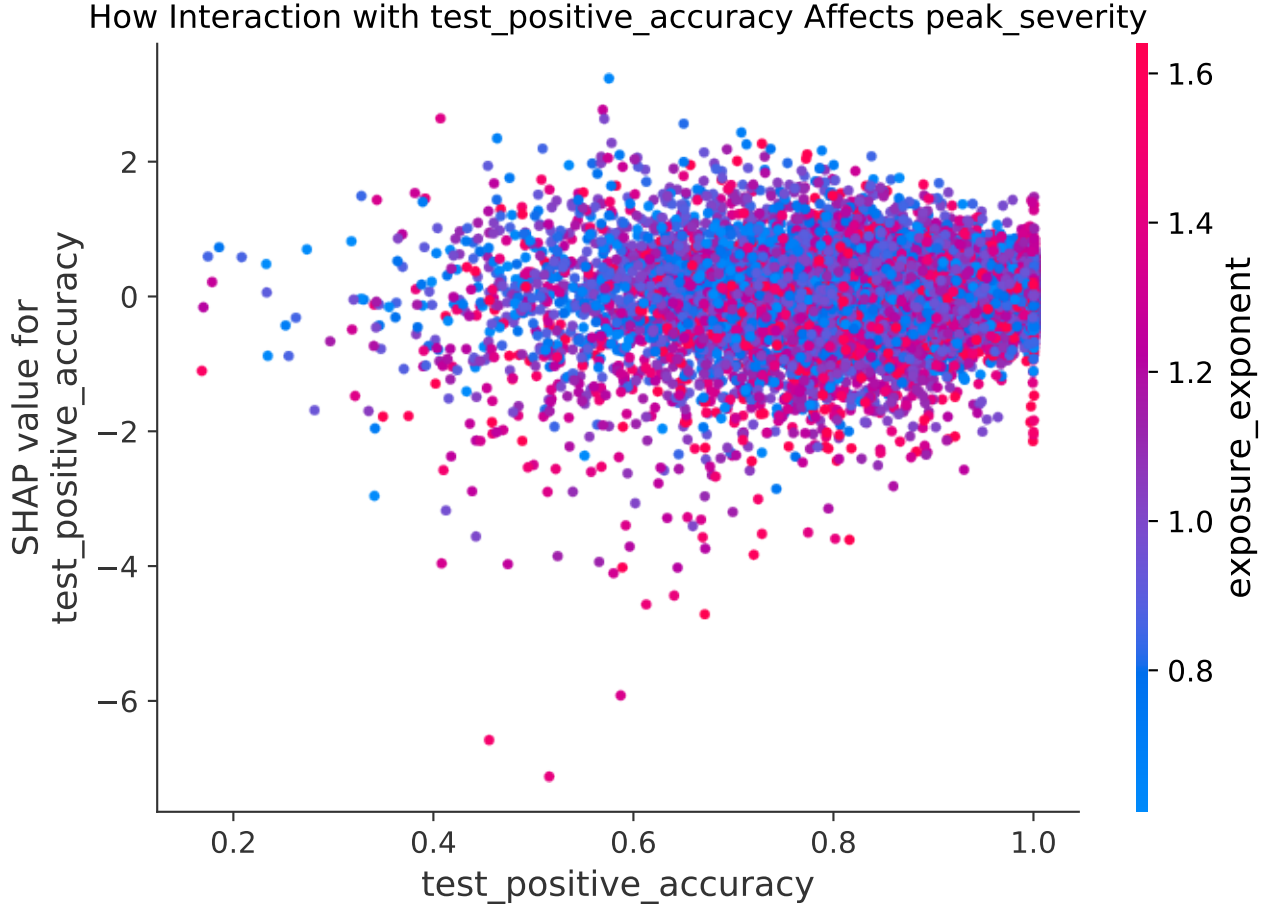

How Interaction with time_death_max Affects peak_severity
SHAP value for time_death_max
time_death_max
time_death_mean
30
20
10
0
−10
−20
8
10
12
14
16
18
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000

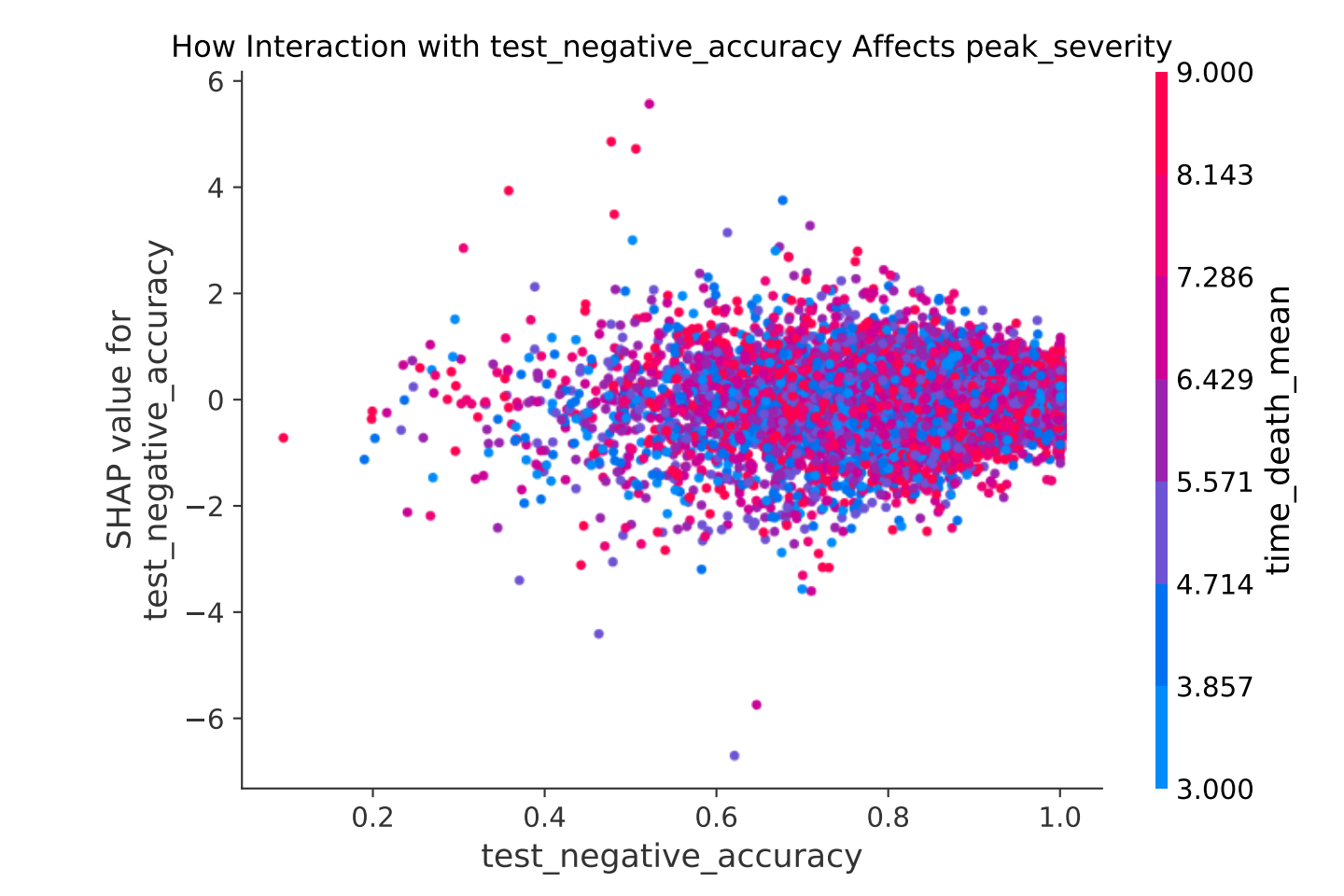

How Interaction with time_test_administered_mean Affects peak_severity
SHAP value for time_test_administered_mean
2
1
0
−1
−2
−3
1.0
1.2
1.4
1.6
1.8
2.0
time_test_administered_mean
17.091
15.273
13.455
11.636
9.818
8.000
time_death_max

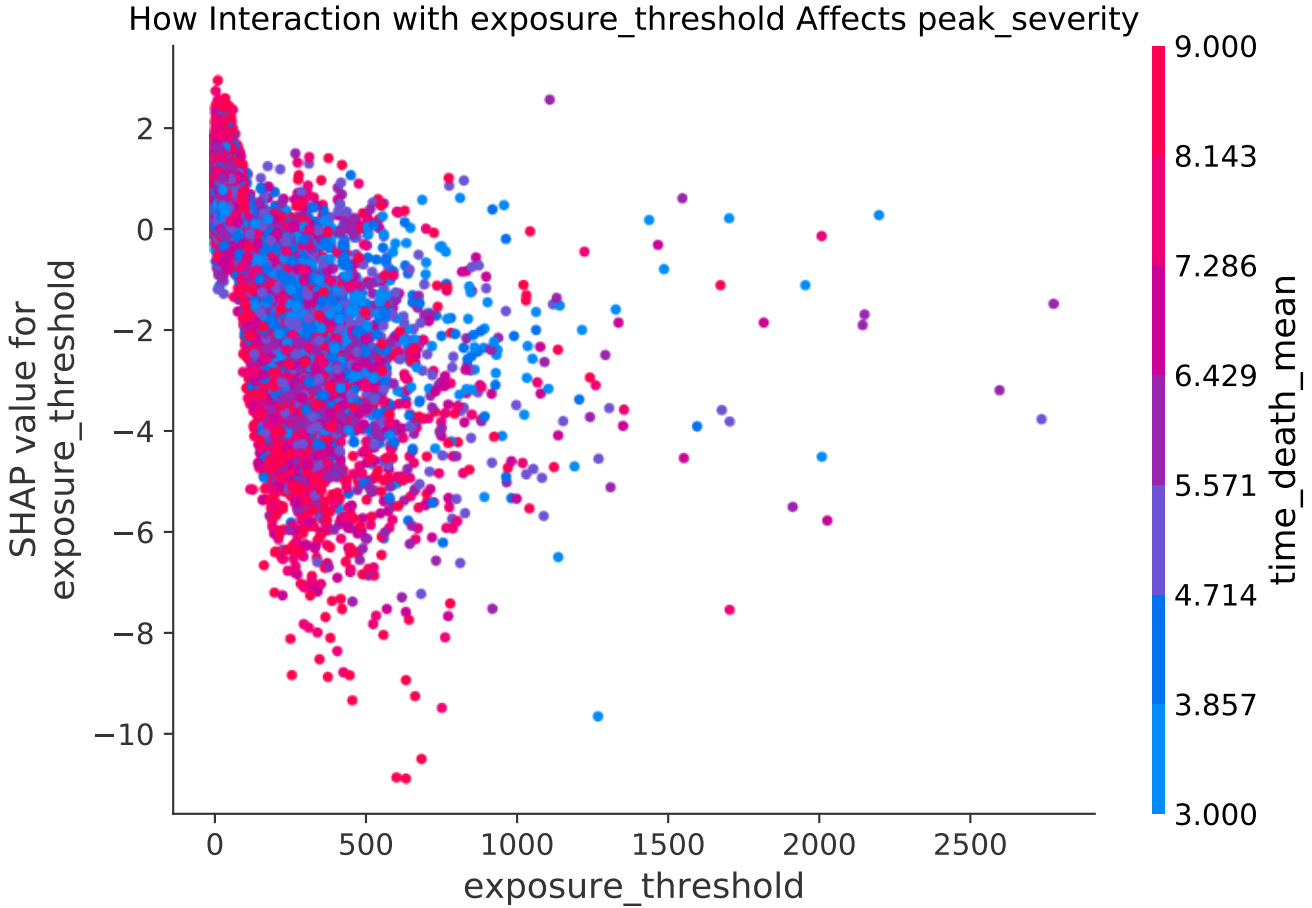

How Interaction with time_test_administered_max Affects peak_severity
SHAP value for time_test_administered_max
2
1
0
−1
−2
−3
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
time_test_administered_max
population_distribution_2
0.6
0.5
0.4
0.3
0.2

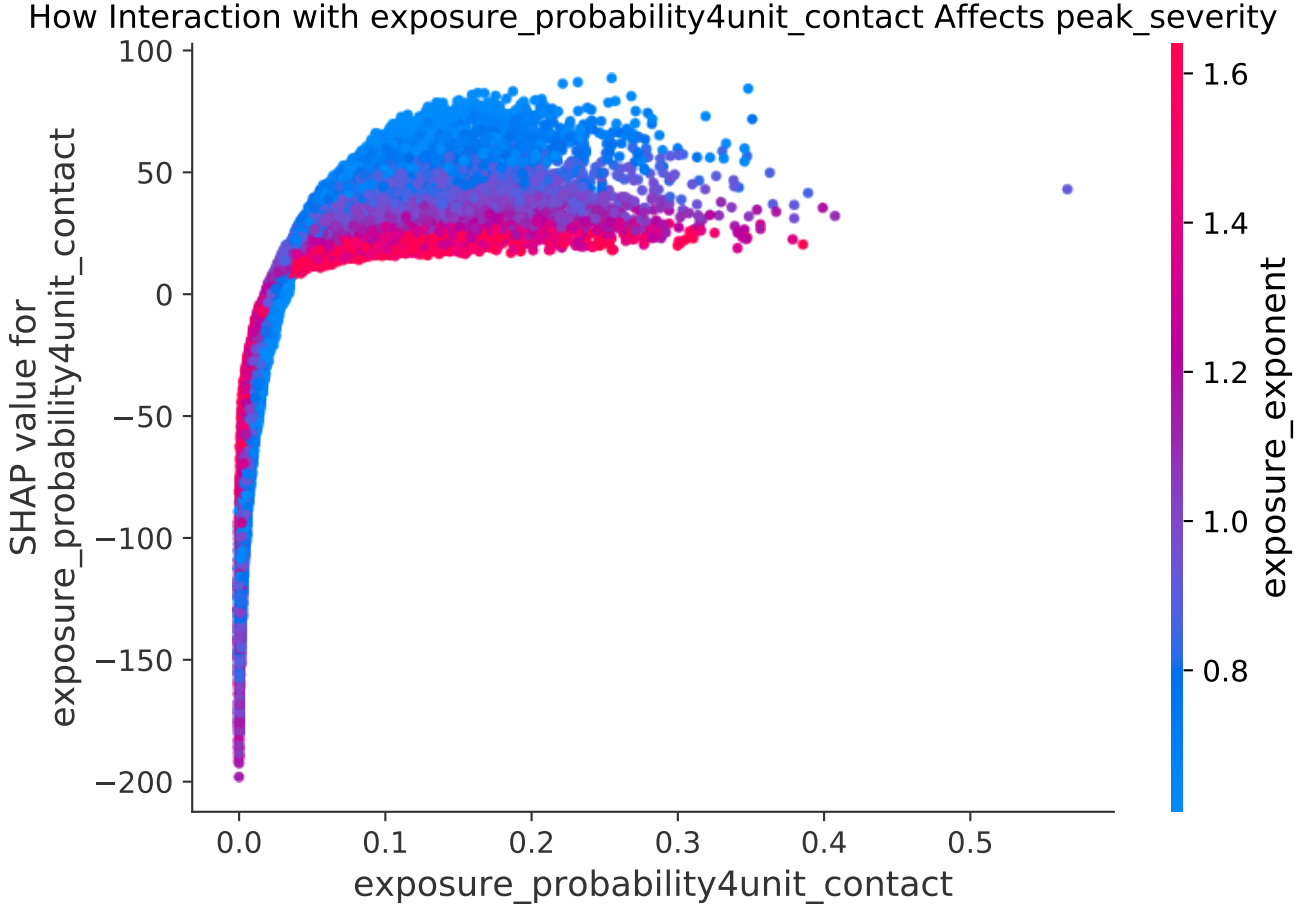

How Interaction with time_test_result_mean Affects peak_severity
SHAP value for time_test_result_mean
time_test_result_mean
exposure_probability4unit_contact
2
1
0
−1
−2
1.0
1.2
1.4
1.6
1.8
2.0
0.14
0.12
0.10
0.08
0.06
0.04
0.02

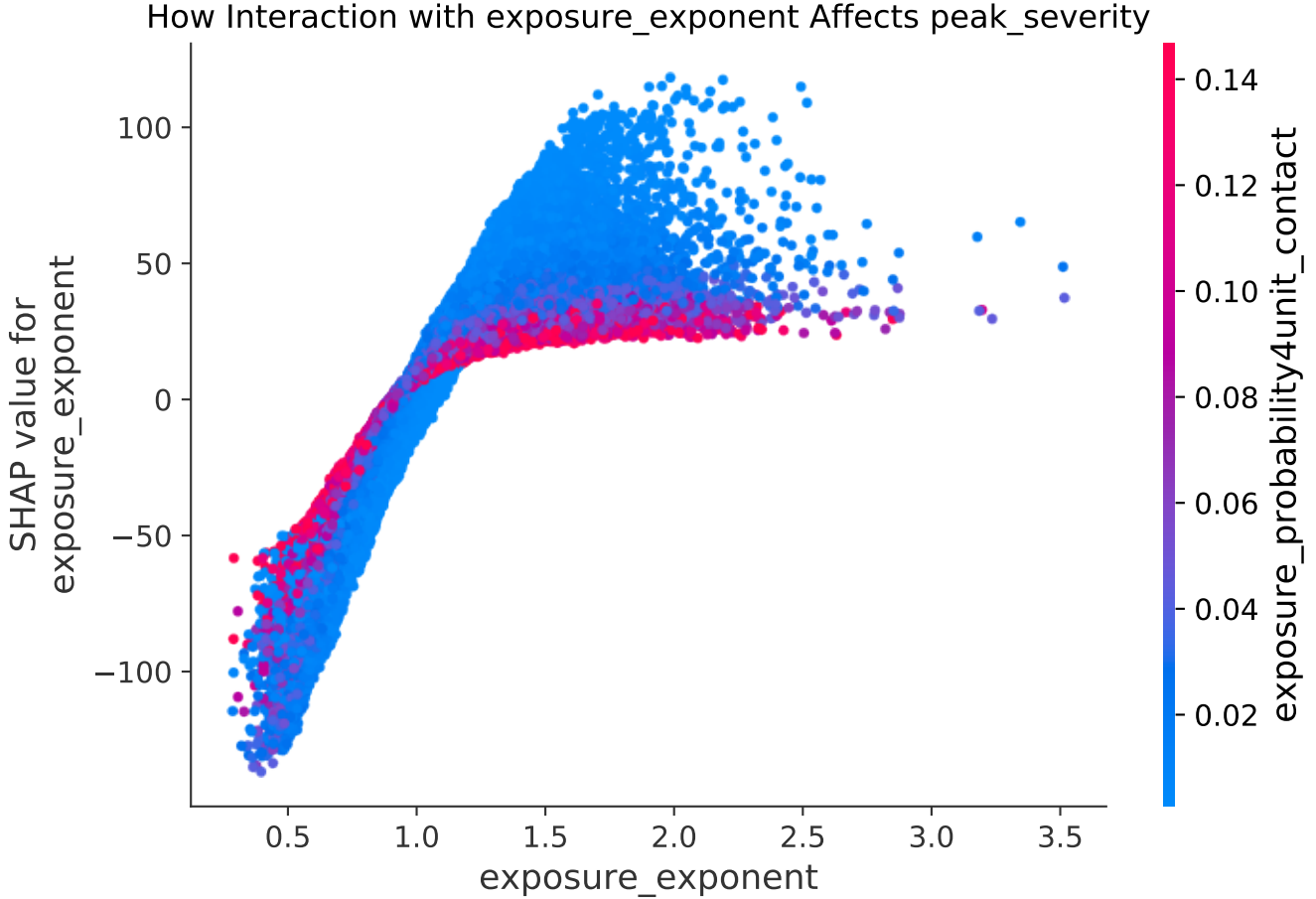

How Interaction with time_test_result_max Affects peak_severity
SHAP value for time_test_result_max
time_test_result_max
exposure_exponent
3
2
1
0
−1
−2
−3
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
1.6
1.4
1.2
1.0
0.8

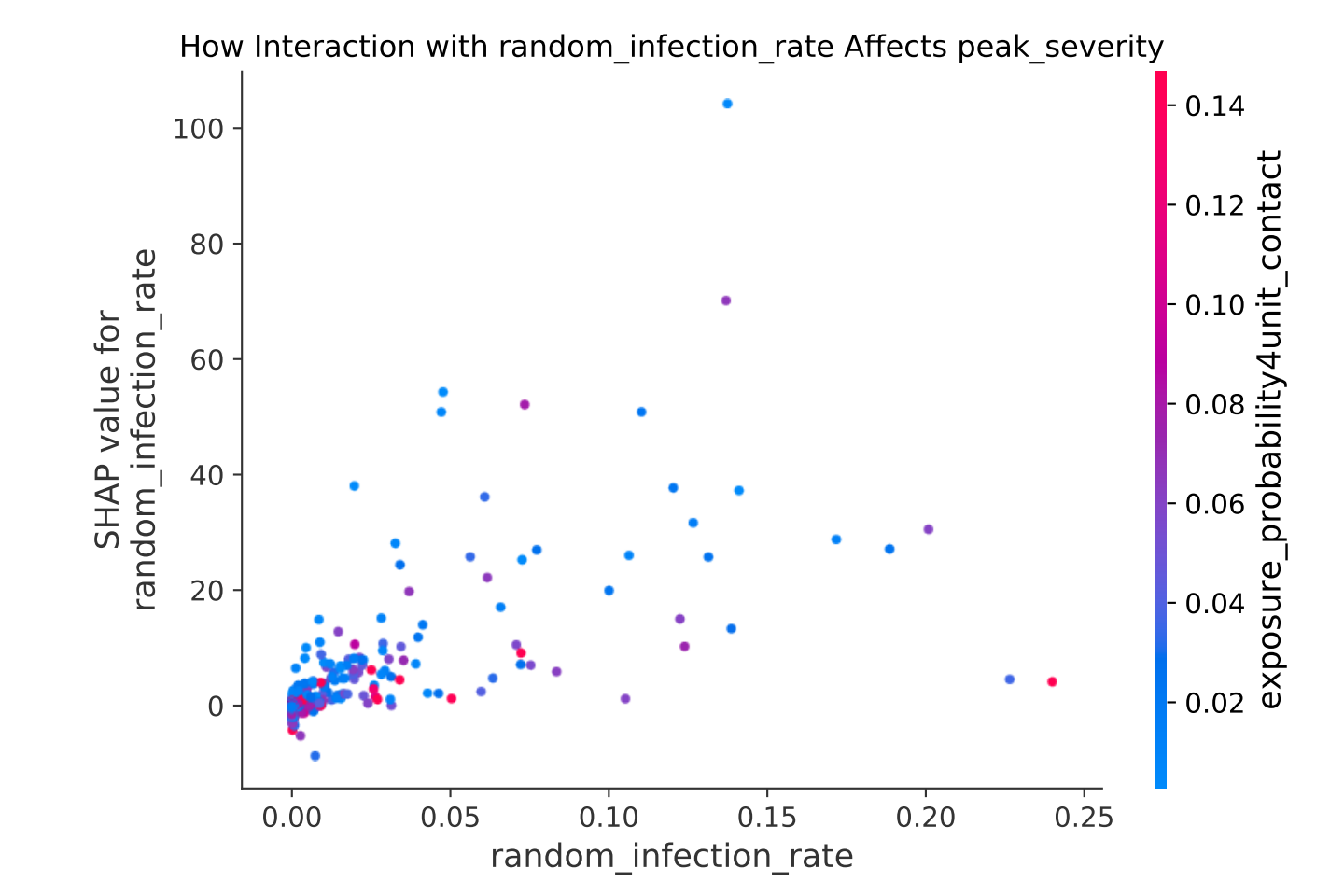

How Interaction with test_positive_accuracy Affects peak_severity
SHAP value for test_positive_accuracy
2
0
−2
−4
−6
0.2
0.4
0.6
0.8
1.0
test_positive_accuracy
1.6
1.4
1.2
1.0
0.8
exposure_exponent

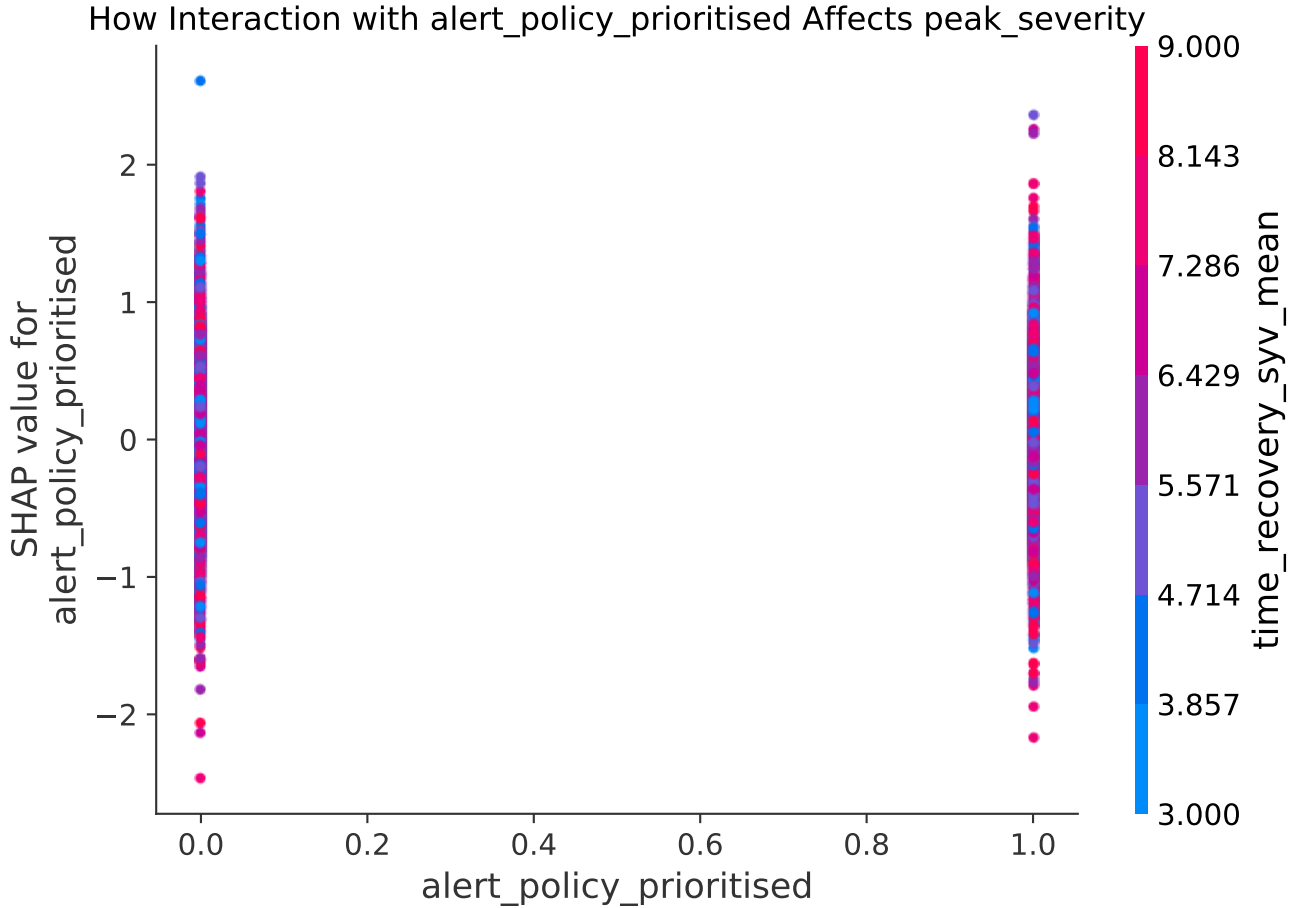

How Interaction with test_negative_accuracy Affects peak_severity
SHAP value for test_negative_accuracy
6
4
2
0
−2
−4
−6
0.2
0.4
0.6
0.8
1.0
test_negative_accuracy
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

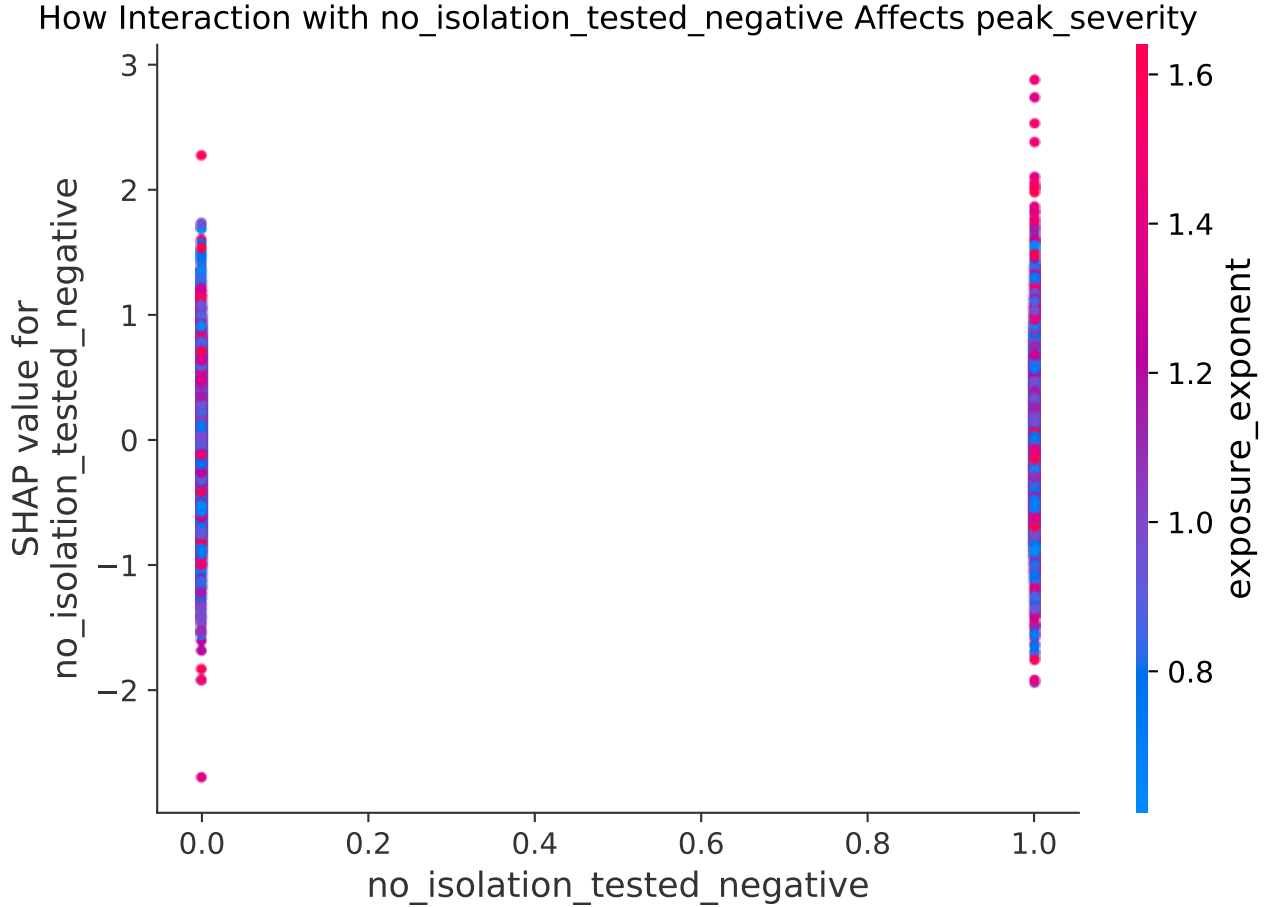

How Interaction with exposure_threshold Affects peak_severity
SHAP value for exposure_threshold
2
0
−2
−4
−6
−8
−10
0
500
1000
1500
2000
2500
exposure_threshold
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

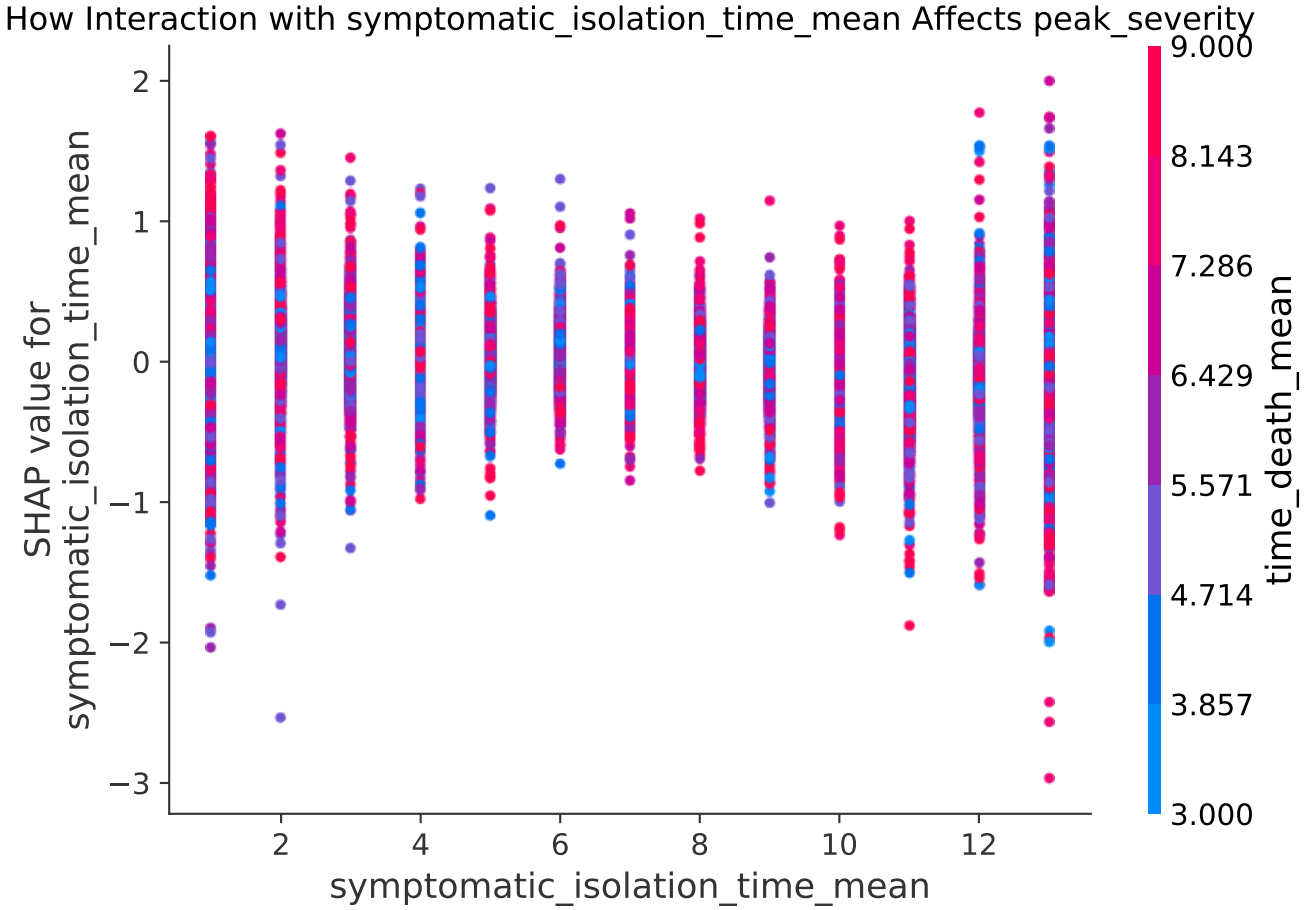

How Interaction with exposure_probability4unit_contact Affects peak_severity
SHAP value for exposure_probability4unit_contact
100
50
0
−50
−100
−150
−200
0.0
0.1
0.2
0.3
0.4
0.5
exposure_probability4unit_contact
exposure_exponent
1.6
1.4
1.2
1.0
0.8

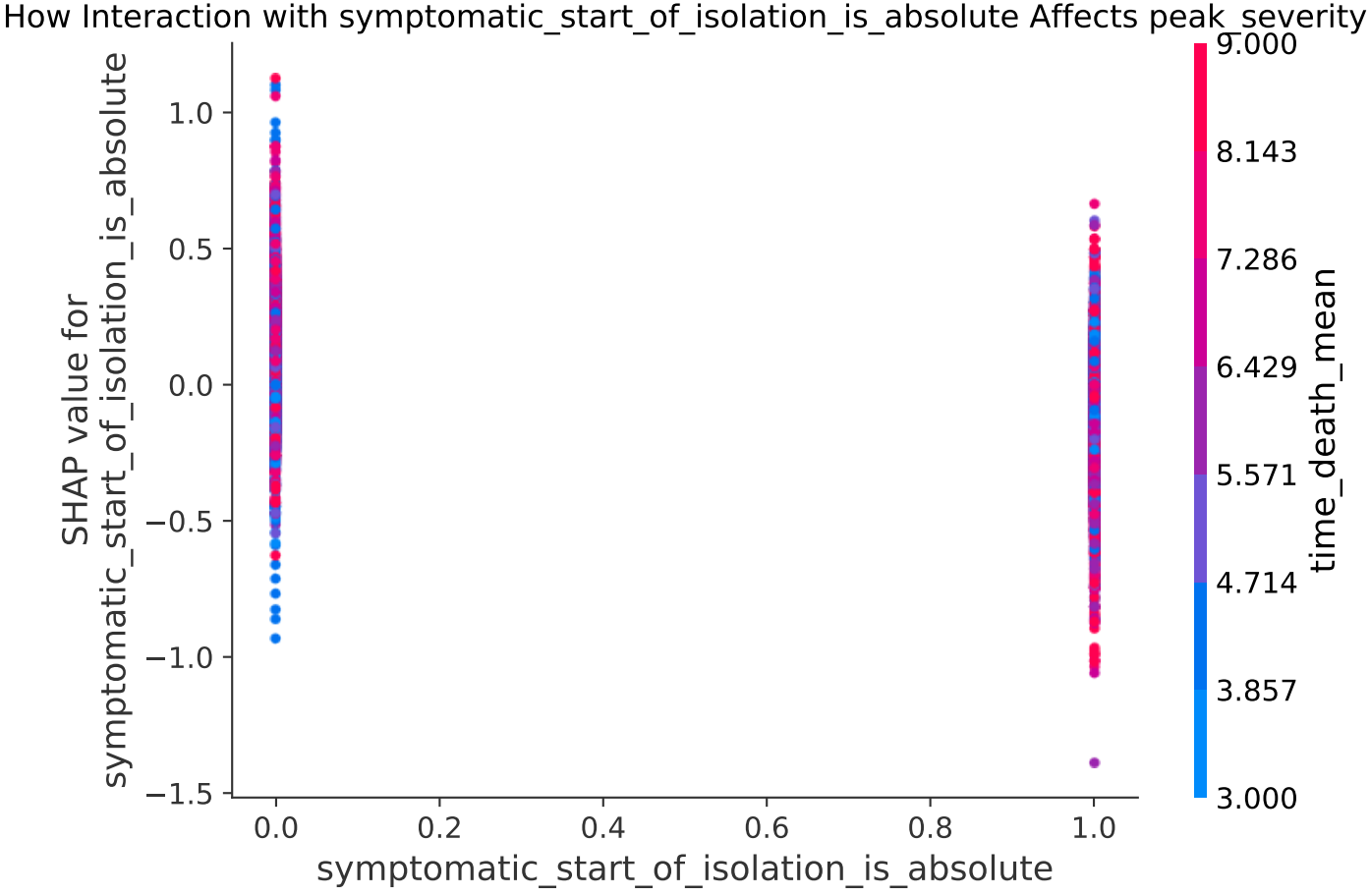

How Interaction with exposure_exponent Affects peak_severity
SHAP value for exposure_exponent
100
50
0
−50
−100
0.5
1.0
1.5
2.0
2.5
3.0
3.5
exposure_exponent
0.14
0.12
0.10
0.08
0.06
0.04
0.02
exposure_probability4unit_contact

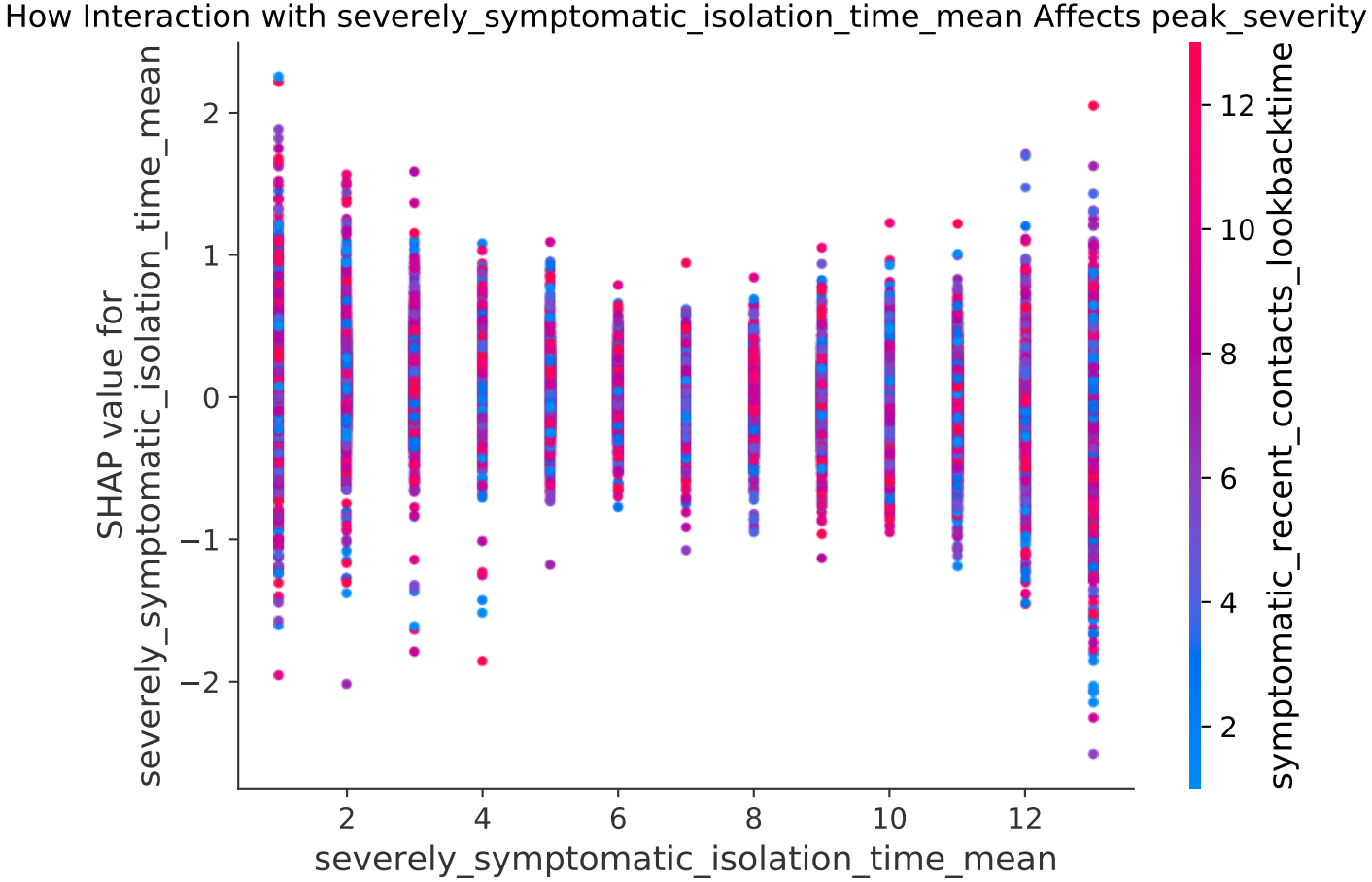

How Interaction with random_infection_rate Affects peak_severity
SHAP value for random_infection_rate
100
80
60
40
20
0
0.00
0.05
0.10
0.15
0.20
0.25
random_infection_rate
0.14
0.12
0.10
0.08
0.06
0.04
0.02
exposure_probability4unit_contact

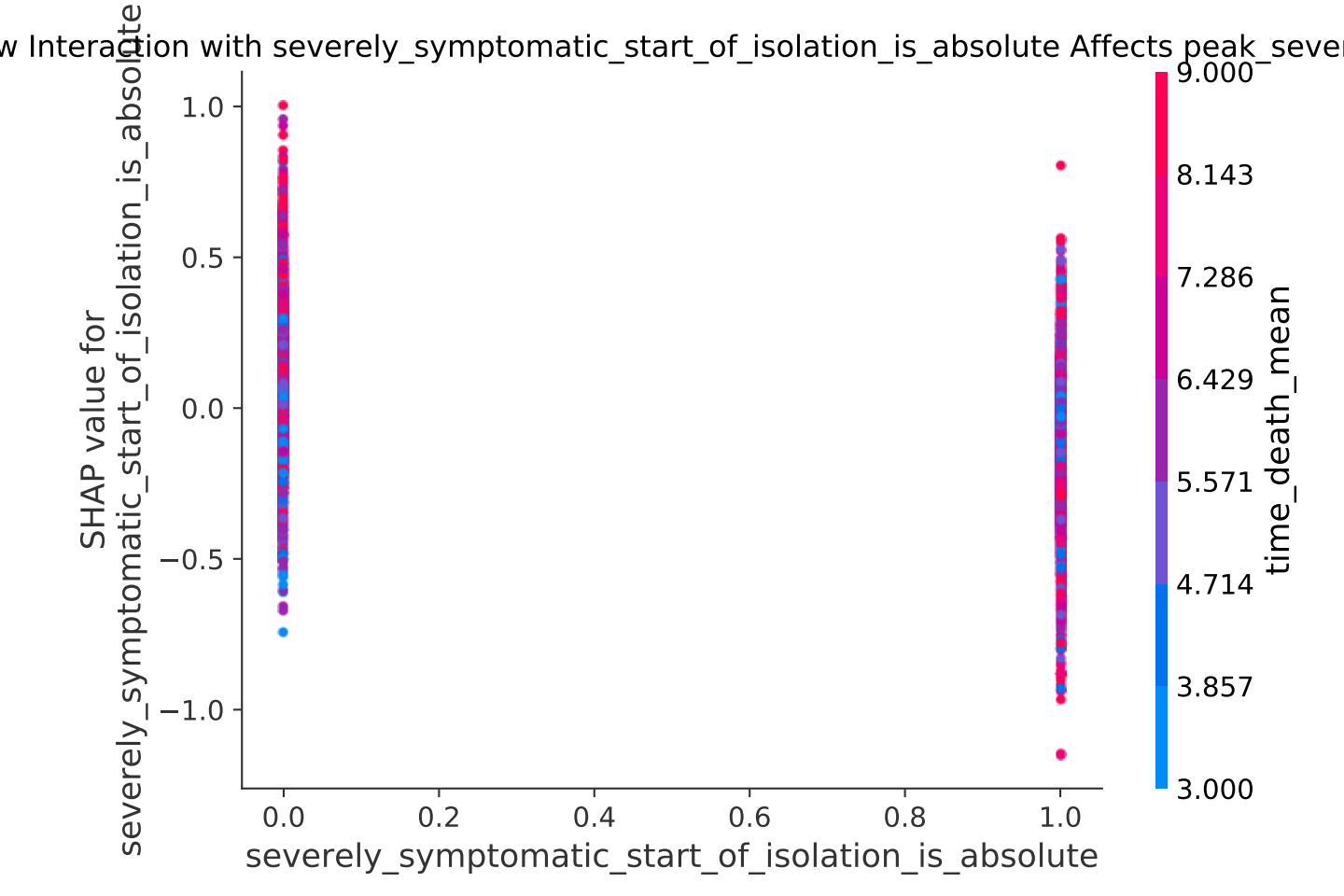

How Interaction with alert_policy_prioritised Affects peak_severity
SHAP value for alert_policy_prioritised
alert_policy_prioritised
time_recovery_syv_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
2
1
0
−1
−2
0.0
0.2
0.4
0.6
0.8
1.0

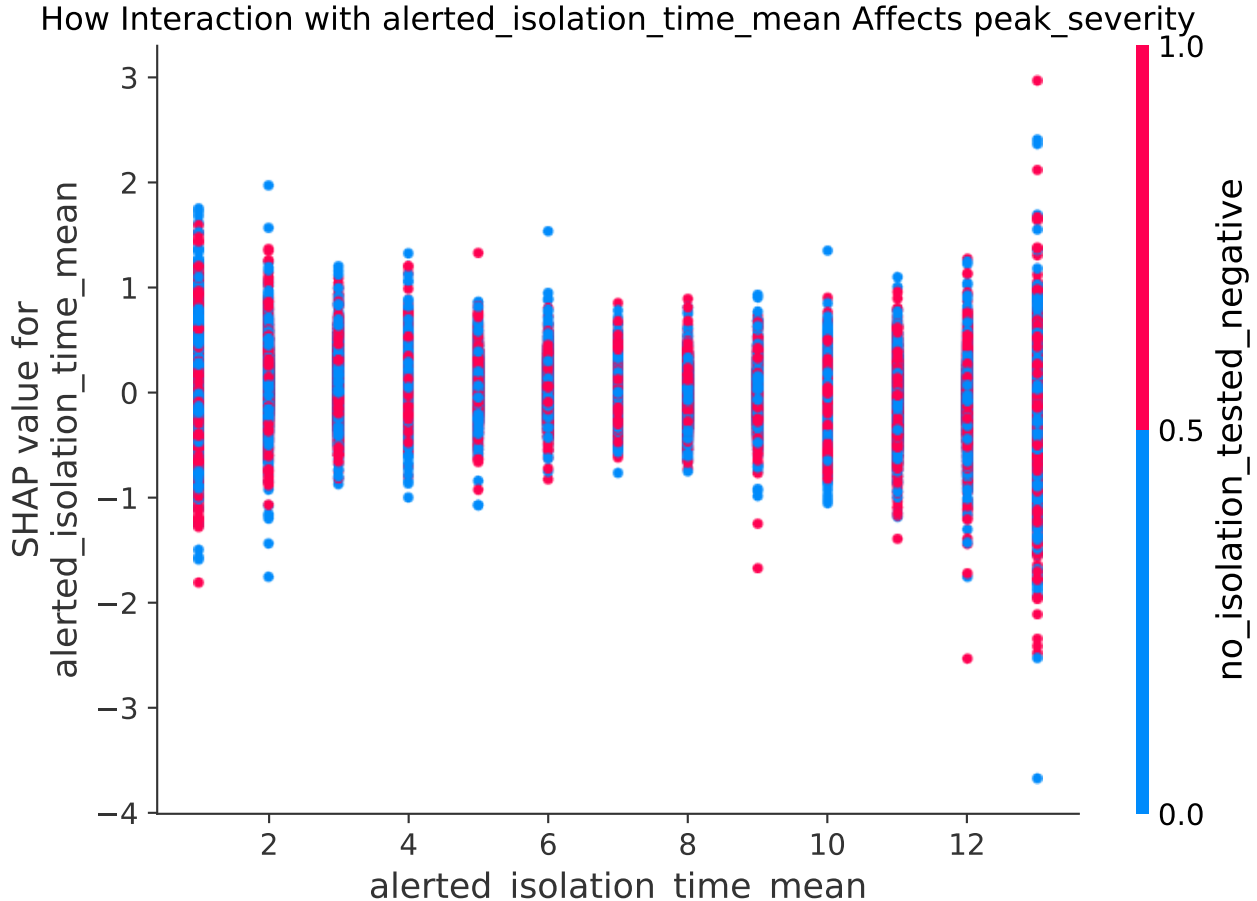

How Interaction with no_isolation_tested_negative Affects peak_severity
SHAP value for
no_isolation_tested_negative
3
2
1
0
−1
−2
0.0
0.2
0.4
0.6
0.8
1.0
no_isolation_tested_negative
1.6
1.4
1.2
1.0
0.8
exposure_exponent

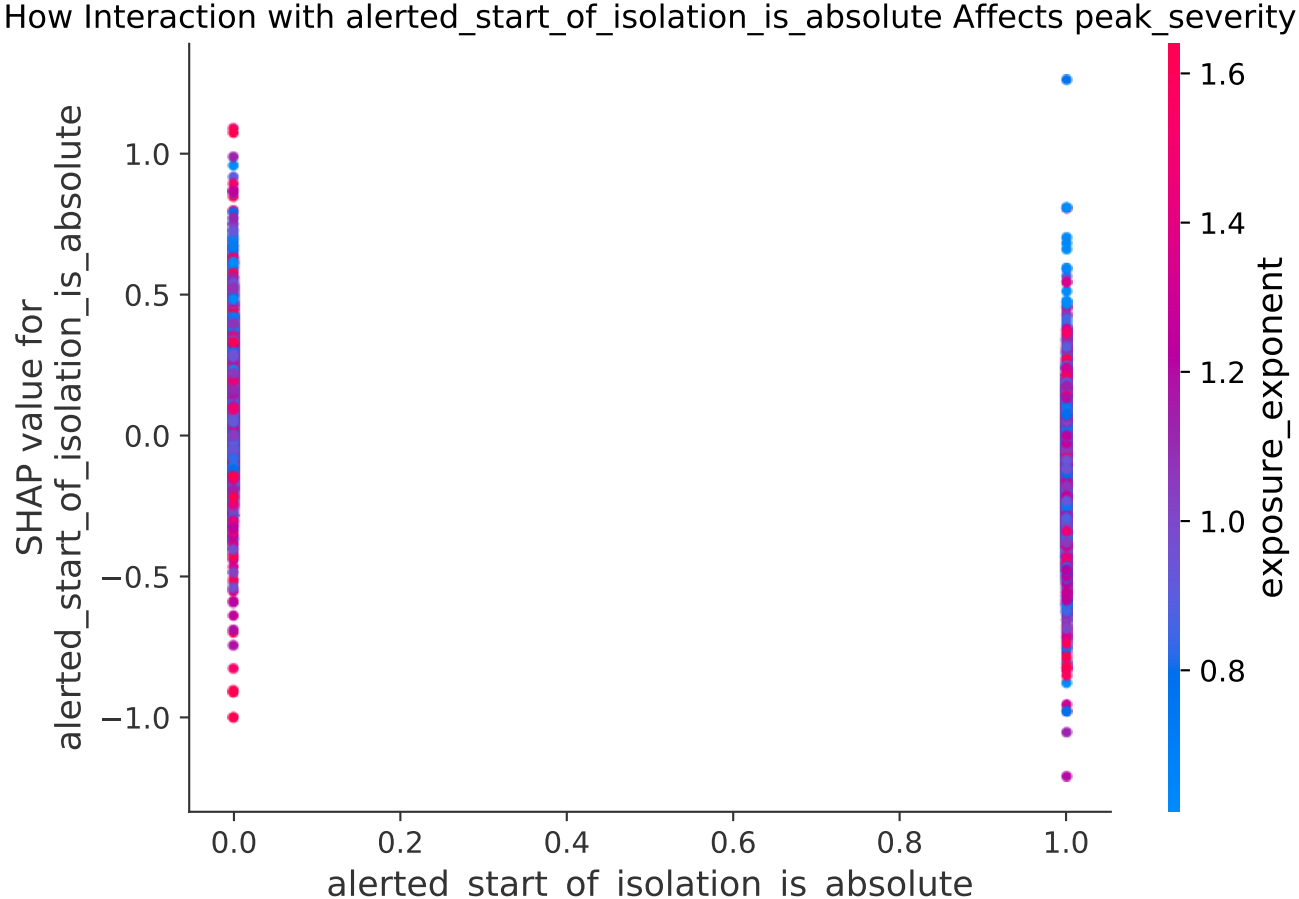

How Interaction with symptomatic_isolation_time_mean Affects peak_severity
SHAP value for symptomatic_isolation_time_mean
symptomatic_isolation_time_mean
time_death_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
2
1
0
−1
−2
−3
2
4
6
8
10
12

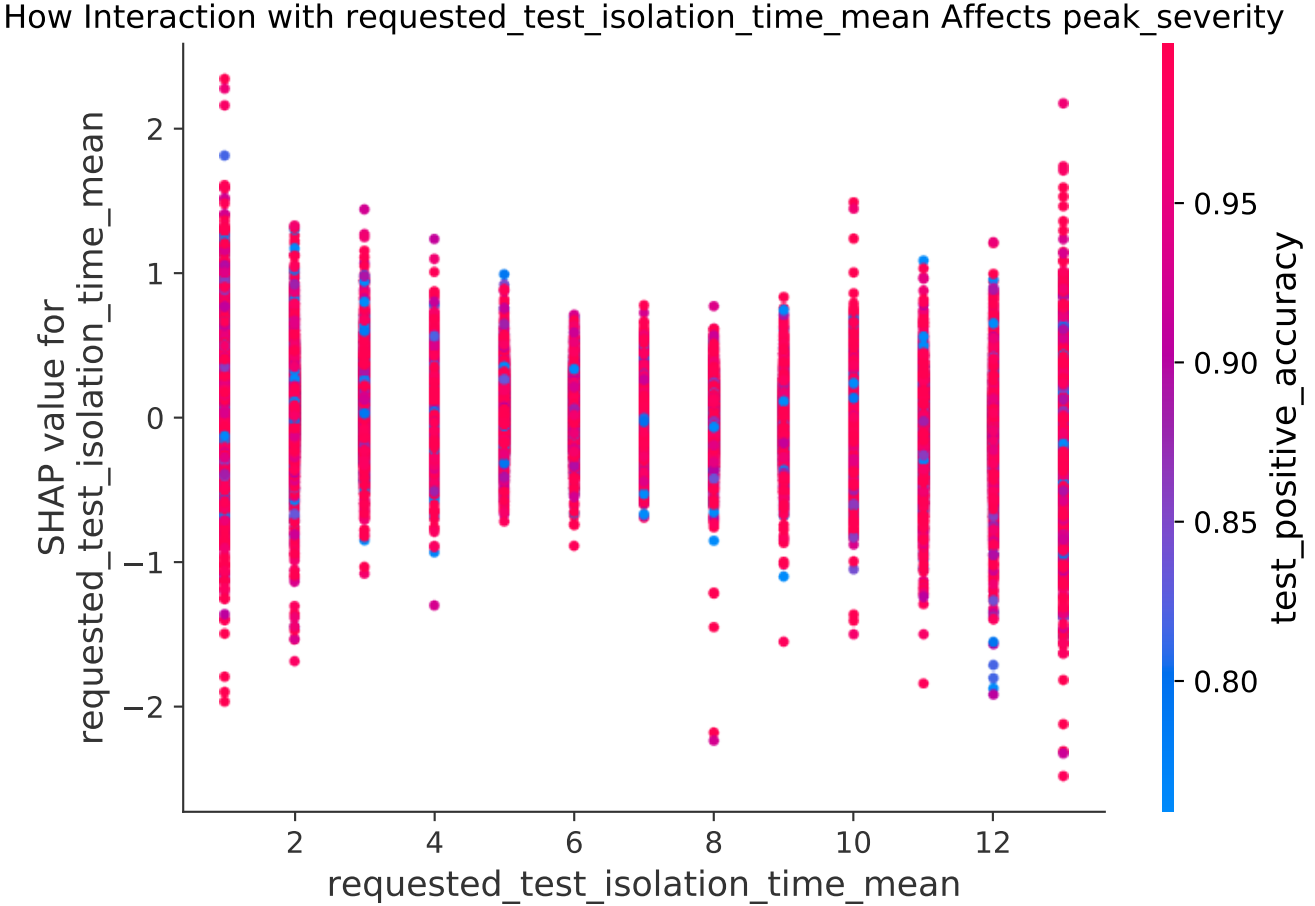

How Interaction with symptomatic_start_of_isolation_is_absolute Affects peak_severity
SHAP value for symptomatic_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
−1.5
0.0
0.2
0.4
0.6
0.8
1.0
symptomatic_start_of_isolation_is_absolute
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

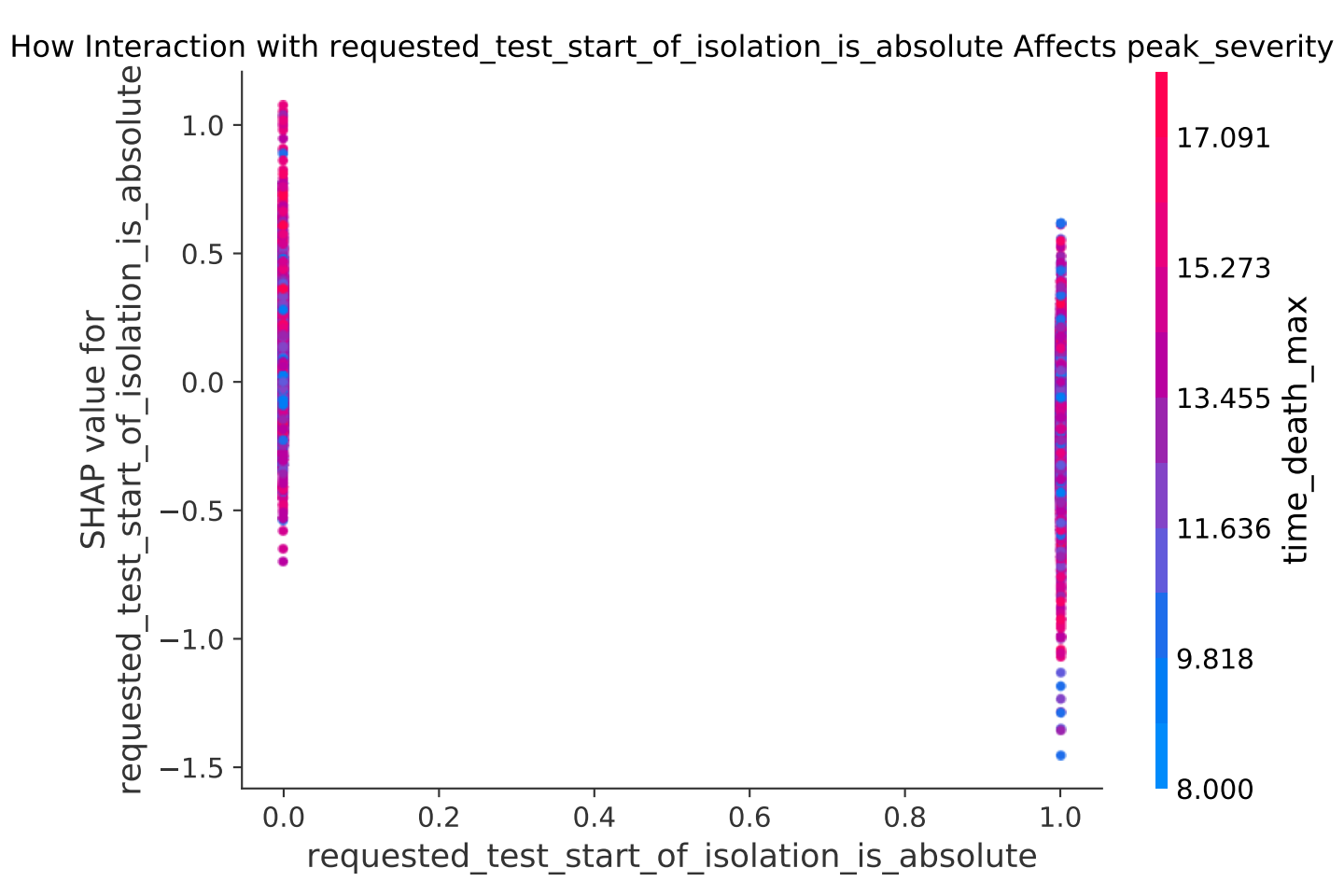

How Interaction with severely_symptomatic_isolation_time_mean Affects peak_severity
SHAP value for severely_symptomatic_isolation_time_mean
2
1
0
−1
−2
2
4
6
8
10
12
severely_symptomatic_isolation_time_mean
symptomatic_recent_contacts_lookbacktime
12
10
8
6
4
2

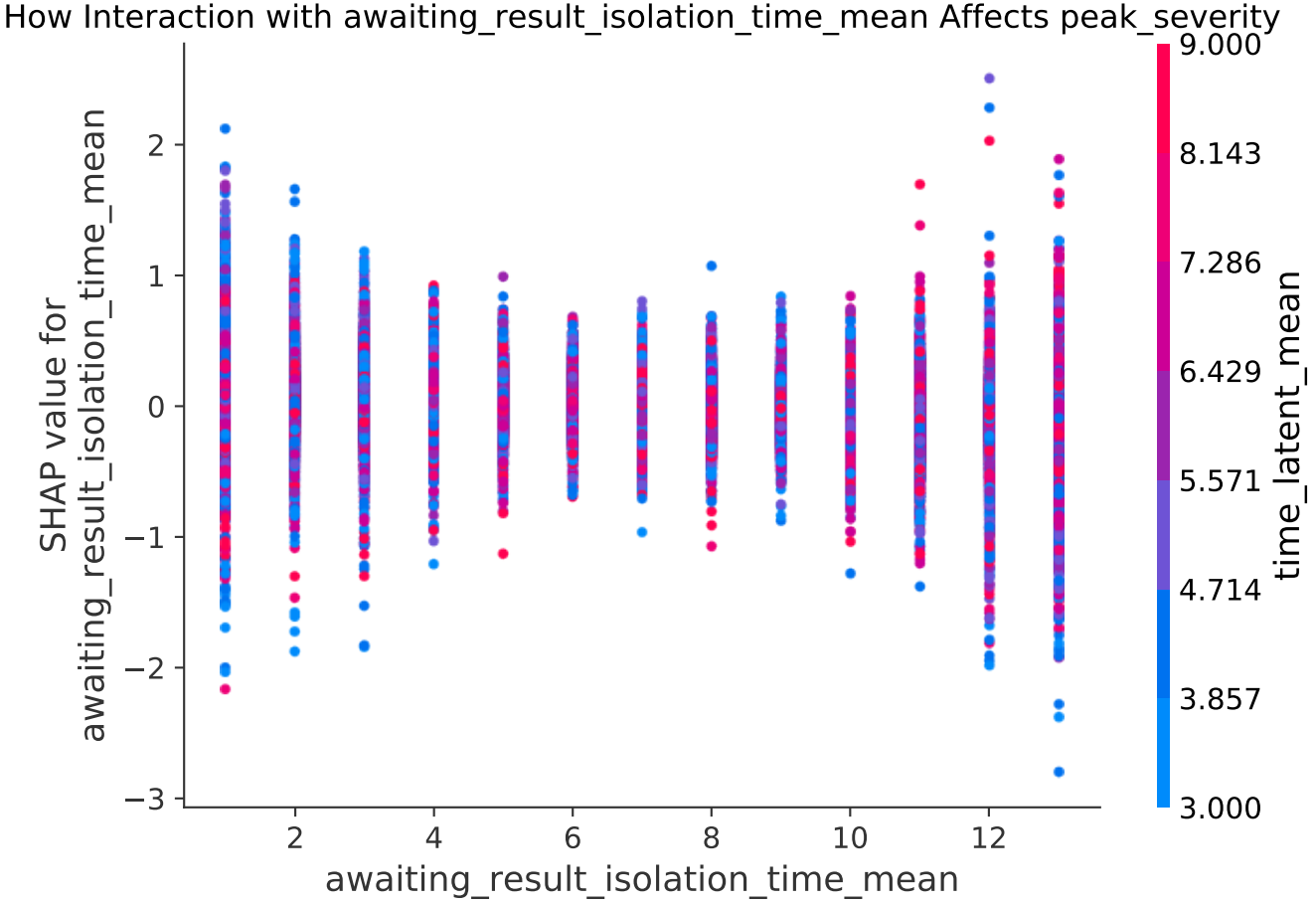

w Interaction with severely_symptomatic_start_of_isolation_is_absolute Affects peak_sever
SHAP value for severely_symptomatic_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
0.0
0.2
0.4
0.6
0.8
1.0
severely_symptomatic_start_of_isolation_is_absolute
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean

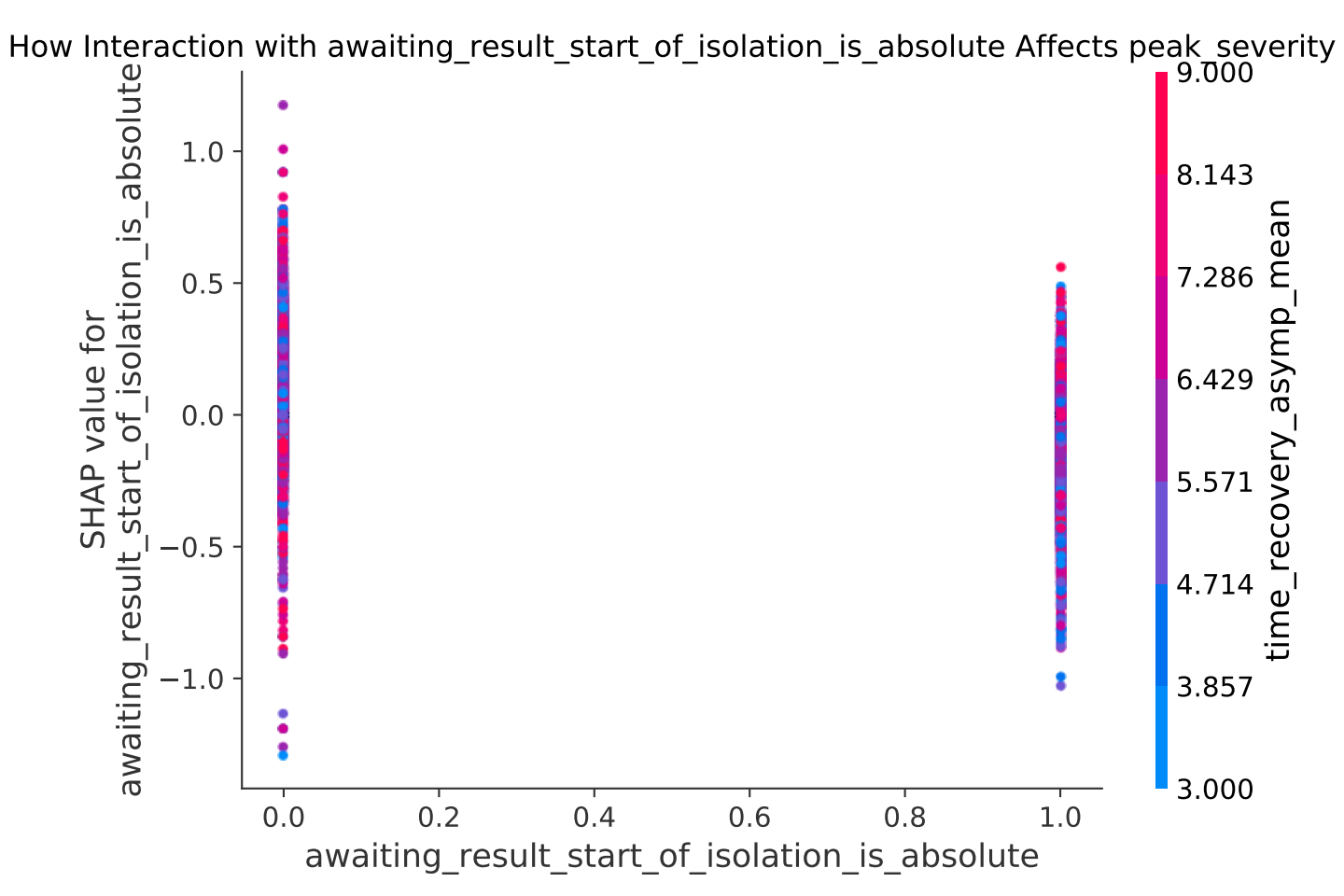

How Interaction with alerted_isolation_time_mean Affects peak_severity
SHAP value for alerted_isolation_time_mean
alerted_isolation_time_mean
no_isolation_tested_negative
3
2
1
0
−1
−2
−3
−4
2
4
6
8
10
12
1.0
0.5
0.0

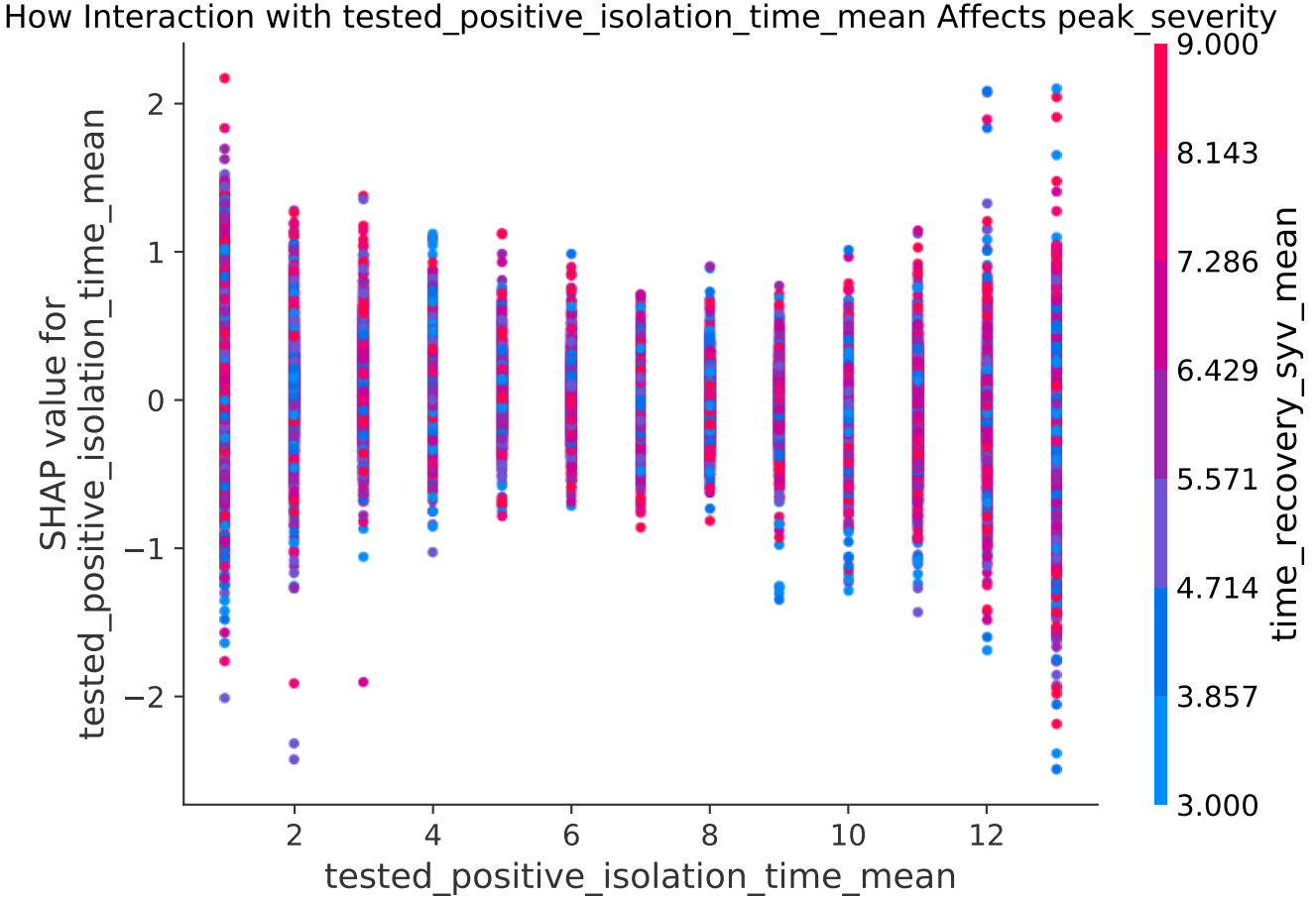

How Interaction with alerted_start_of_isolation_is_absolute Affects peak_severity
SHAP value for alerted_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
0.0
0.2
0.4
0.6
0.8
1.0
alerted_start_of_isolation_is_absolute
1.6
1.4
1.2
1.0
0.8
exposure_exponent

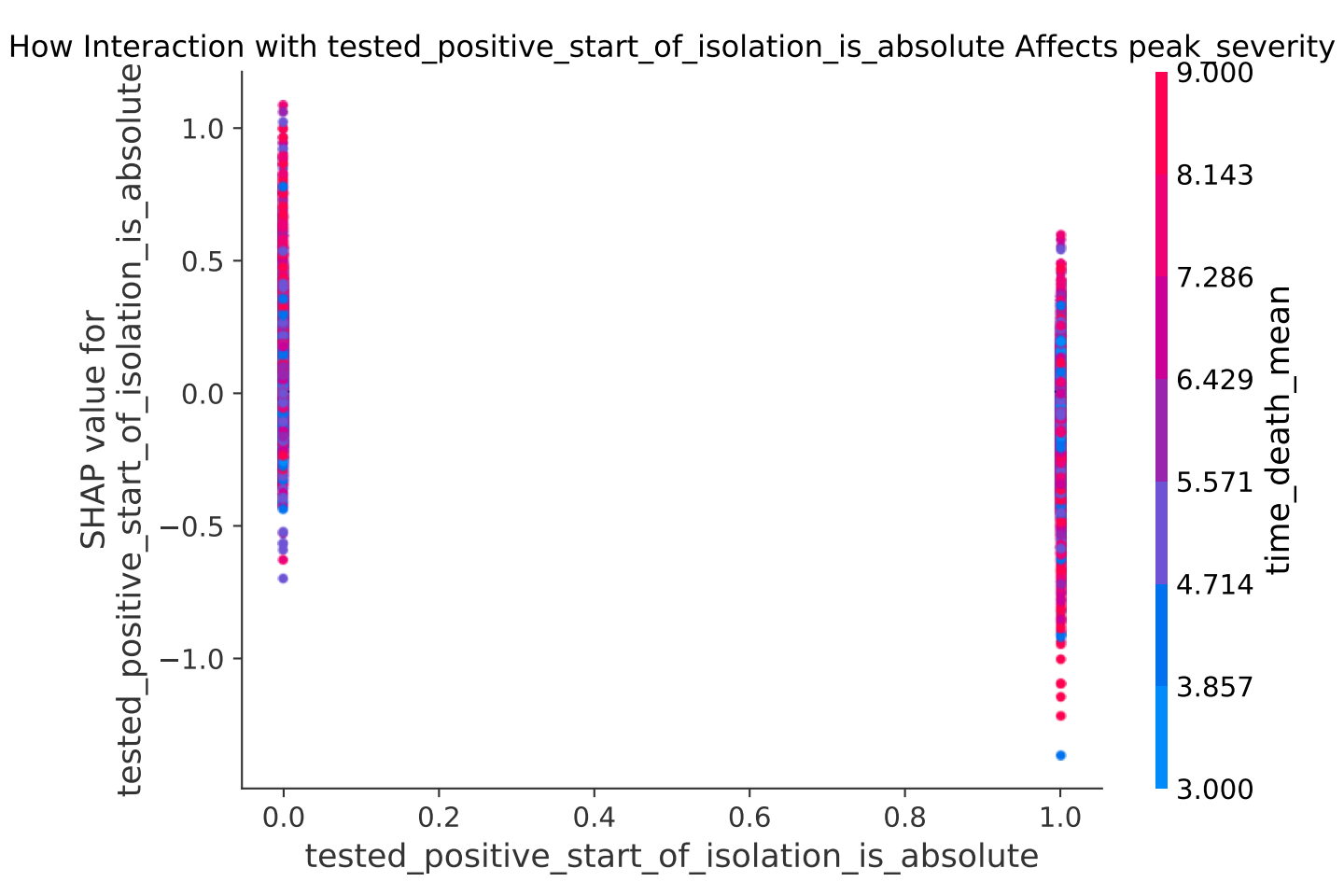

How Interaction with requested_test_isolation_time_mean Affects peak_severity
SHAP value for requested_test_isolation_time_mean
2
1
0
−1
−2
2
4
6
8
10
12
requested_test_isolation_time_mean
0.95
0.90
0.85
0.80
test_positive_accuracy

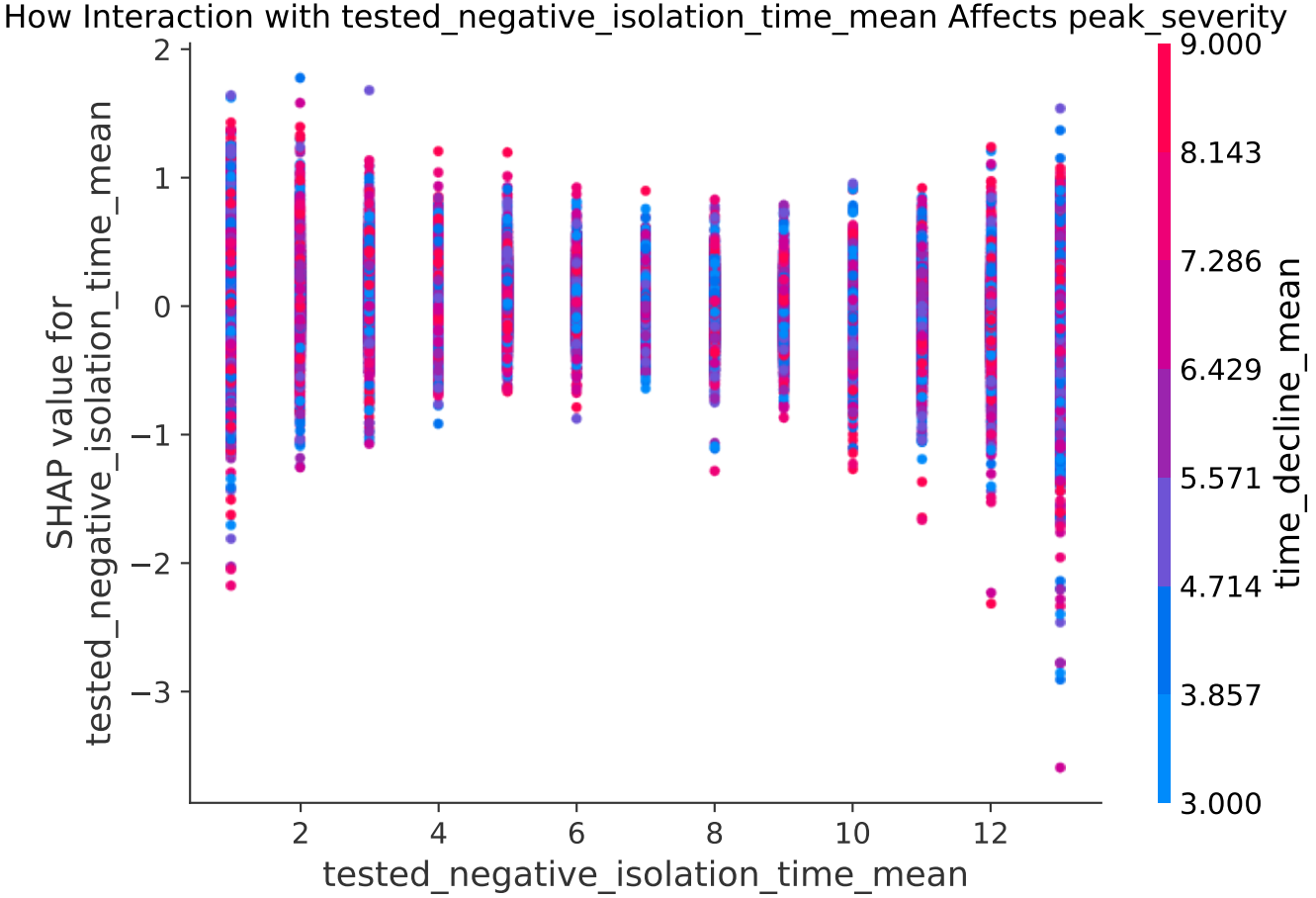

How Interaction with requested_test_start_of_isolation_is_absolute Affects peak_severity
SHAP value for requested_test_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
−1.5
0.0
0.2
0.4
0.6
0.8
1.0
requested_test_start_of_isolation_is_absolute
time_death_max
17.091
15.273
13.455
11.636
9.818
8.000

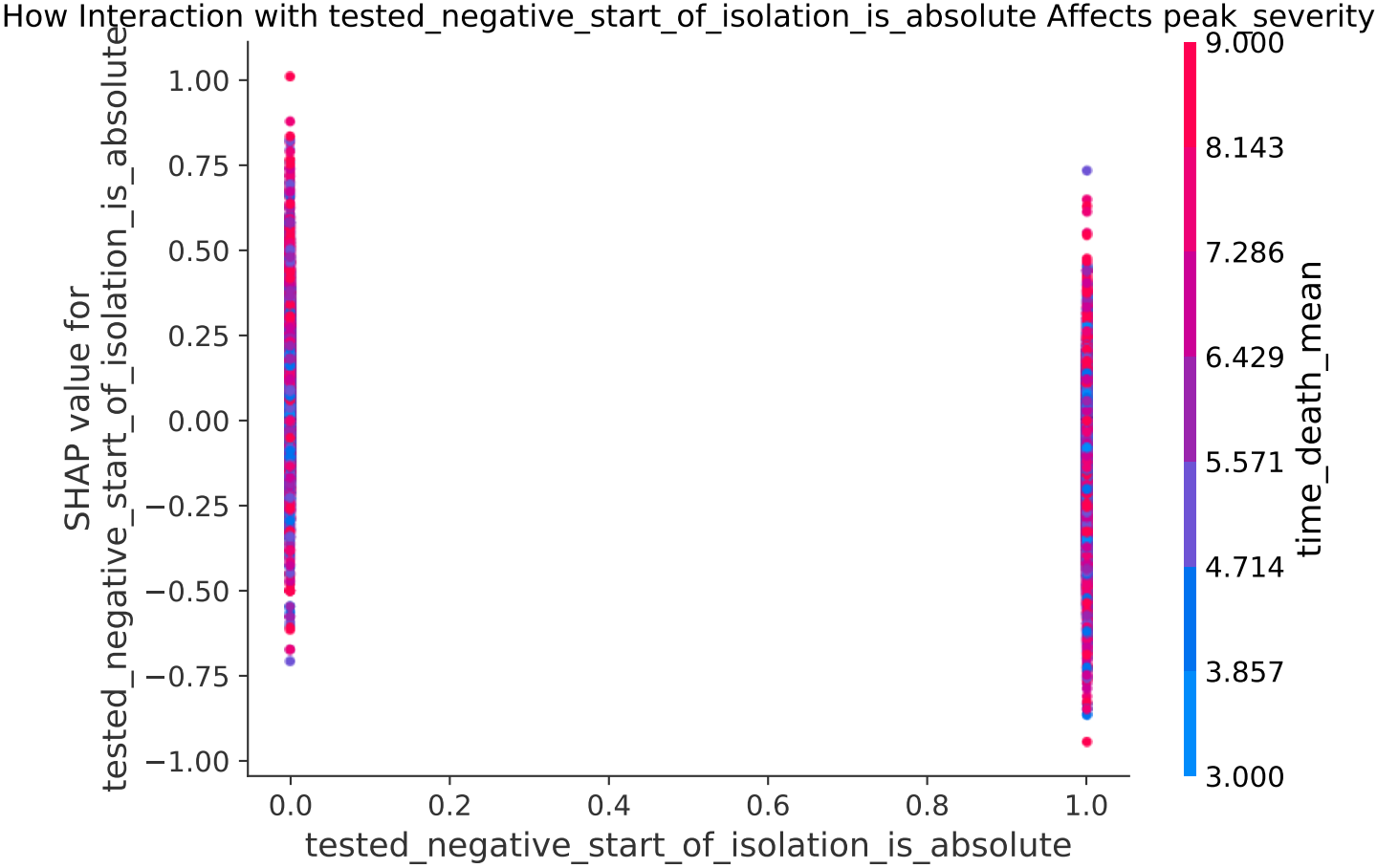

How Interaction with awaiting_result_isolation_time_mean Affects peak_severity
SHAP value for awaiting_result_isolation_time_mean
awaiting_result_isolation_time_mean
time_latent_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
2
1
0
−1
−2
−3
2
4
6
8
10
12

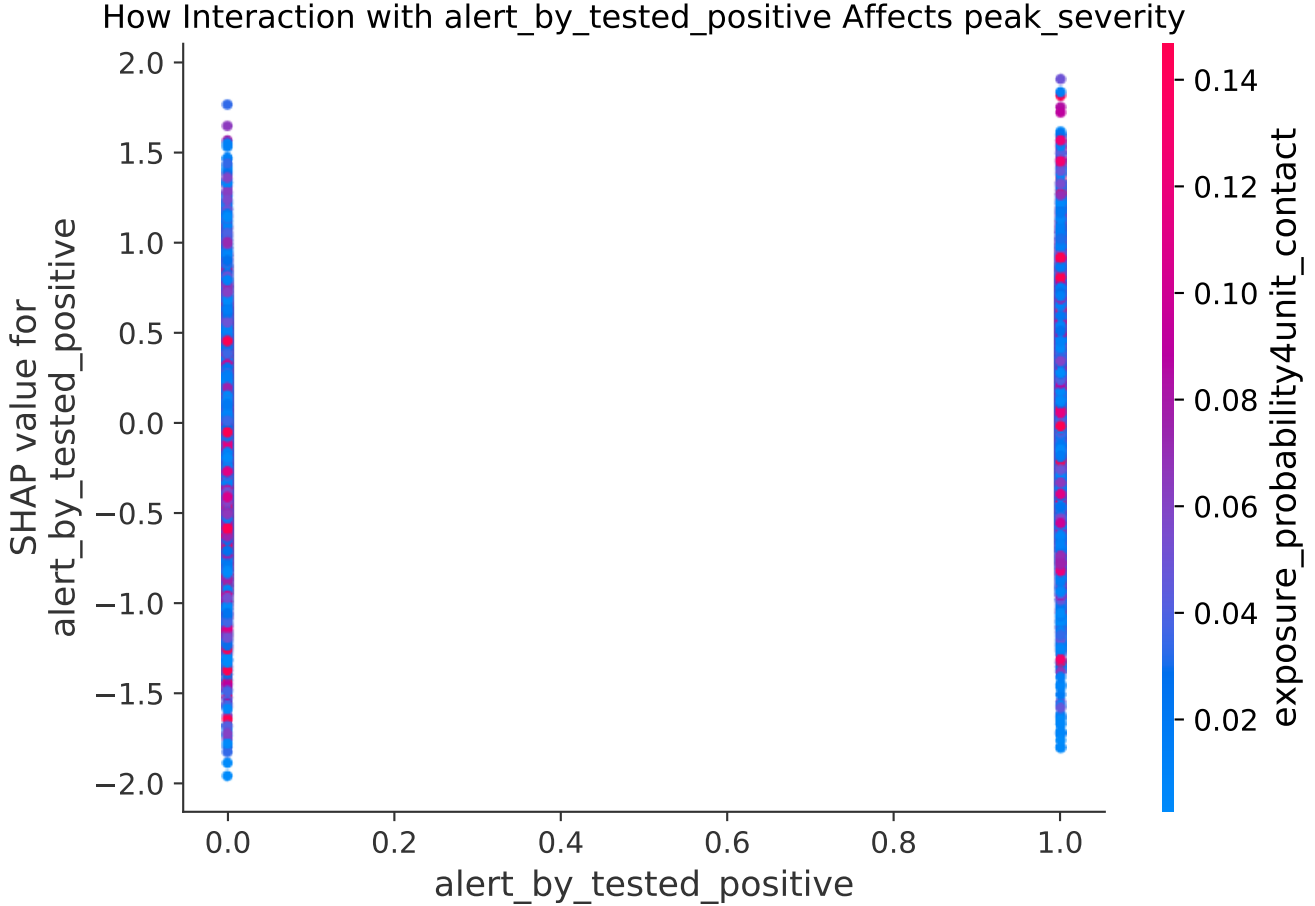

How Interaction with awaiting_result_start_of_isolation_is_absolute Affects peak_severity
SHAP value for awaiting_result_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
0.0
0.2
0.4
0.6
0.8
1.0
awaiting_result_start_of_isolation_is_absolute
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_recovery_asymp_mean

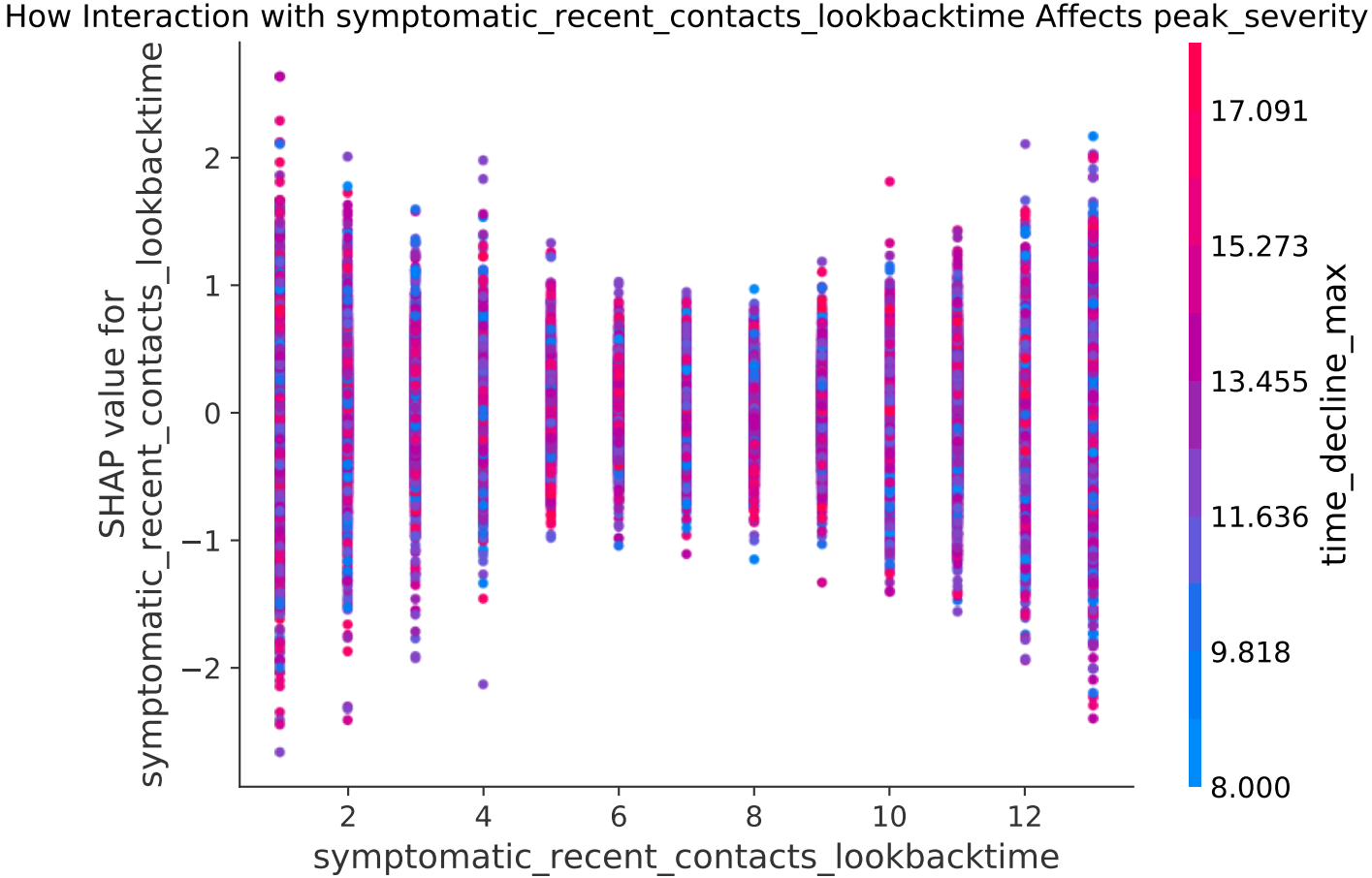

How Interaction with tested_positive_isolation_time_mean Affects peak_severity
SHAP value for tested_positive_isolation_time_mean
tested_positive_isolation_time_mean
time_recovery_syv_mean
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
2
1
0
−1
−2
2
4
6
8
10
12

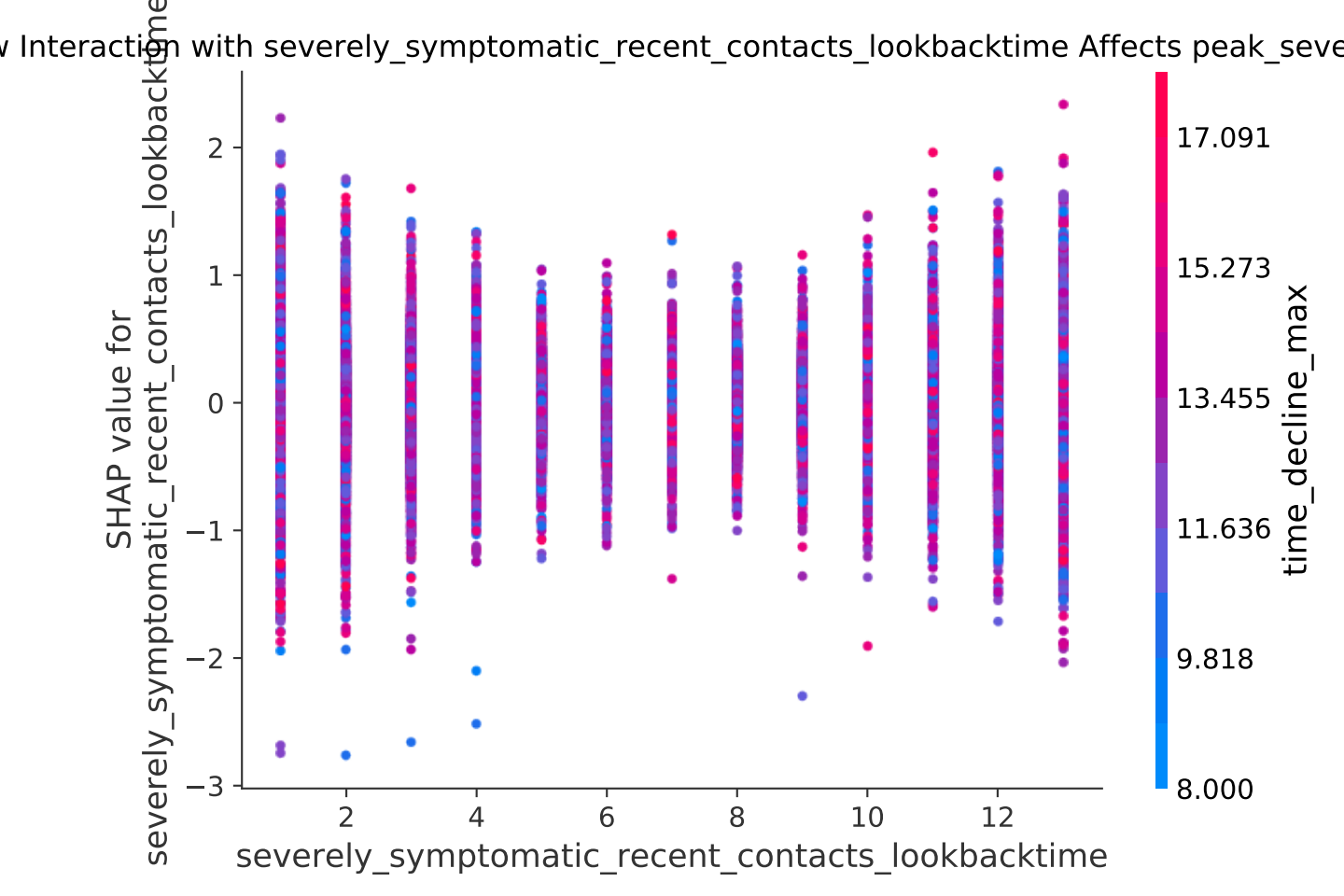

How Interaction with tested_positive_start_of_isolation_is_absolute Affects peak_severity
SHAP value for
tested_positive_start_of_isolation_is_absolute
1.0
0.5
0.0
−0.5
−1.0
0.0
0.2
0.4
0.6
0.8
1.0
tested_positive_start_of_isolation_is_absolute
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean


How Interaction with tested_negative_isolation_time_mean Affects peak_severity
SHAP value for tested_negative_isolation_time_mean
tested_negative_isolation_time_mean
time_decline_mean
2
1
0
−1
−2
−3
2
4
6
8
10
12
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000


How Interaction with tested_negative_start_of_isolation_is_absolute Affects peak_severity
SHAP value for tested_negative_start_of_isolation_is_absolute
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0.0
0.2
0.4
0.6
0.8
1.0
tested_negative_start_of_isolation_is_absolute
9.000
8.143
7.286
6.429
5.571
4.714
3.857
3.000
time_death_mean


How Interaction with alert_by_tested_positive Affects peak_severity
SHAP value for alert_by_tested_positive
alert_by_tested_positive
exposure_probability4unit_contact
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
0.0
0.2
0.4
0.6
0.8
1.0
0.14
0.12
0.10
0.08
0.06
0.04
0.02


How Interaction with symptomatic_recent_contacts_lookbacktime Affects peak_severity
SHAP value for symptomatic_recent_contacts_lookbacktime
2
1
0
−1
−2
2
4
6
8
10
12
symptomatic_recent_contacts_lookbacktime
17.091
15.273
13.455
11.636
9.818
8.000
time_decline_max


w Interaction with severely_symptomatic_recent_contacts_lookbacktime Affects peak_seve
SHAP value for severely_symptomatic_recent_contacts_lookbacktime
2
1
0
−1
−2
−3
2
4
6
8
10
12
severely_symptomatic_recent_contacts_lookbacktime
17.091
15.273
13.455
11.636
9.818
8.000
time_decline_max