

The roles of meteorological variables, demographic factors, and policy response measures in the variation of COVID-19 daily cases: Evidence from different climate zones

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Table S1 Information of nations included in the study

Climate zone	City/county counts
Temperate	129
Tropical	89
Arid	65
Cold	88
Polar	2
Nation	
Belgium	4
Brazil	1
Chile	1
China	1
Germany	3
India	125
Italy	2
Japan	47
Mexico	1
Netherlands	3
Pakistan	3
Peru	1
Russia	2
Spain	1
Sweden	4
Thailand	1
Ukraine	2
United Kingdom	9
United states	162
Total	373

Table S2 Description of policy response measures

Category	Name	Content	Description
Containment measures	Restrictions on gatherings	Record limits on gatherings	0 - no restrictions 1 - restrictions on very large gatherings (the limit is above 1000 people) 2 - restrictions on gatherings between 101-1000 people 3 - restrictions on gatherings between 11-100 people 4 - restrictions on gatherings of 10 people or less Blank - no data
	Restrictions on international movements	Record restrictions on internal movement between cities/regions	0 - no measures 1 - recommend not to travel between regions/cities 2 - internal movement restrictions in place Blank - no data
	Close public transport	Record closing of public transport	0 - no measures 1 - recommend closing (or significantly reduce volume/route/means of transport available) 2 - require closing (or prohibit most citizens from using it) Blank - no data
	Stay at home requirements	Record orders to "shelter-in-place" and otherwise confine to the home	0 - no measures 1 - recommend not leaving house 2 - require not leaving house with exceptions for daily

exercise, grocery shopping, and 'essential' trips
3 - require not leaving house with minimal exceptions (eg
allowed to leave once a week, or only one person can leave
at a time, etc)
Blank - no data

Economic measures

Income support

Record if the government is
providing direct cash payments to
people who lose their jobs or cannot
work.

0 - no income support
1 - government is replacing less than 50% of lost salary (or if
a flat sum, it is less than 50% median salary)
2 - government is replacing 50% or more of lost salary (or if
a flat sum, it is greater than 50% median salary)
Blank - no data

Note: only includes payments to
firms if explicitly linked to
payroll/salaries

Debt contract relief

Record if the government is freezing
financial obligations for households
(eg, stopping loan repayments,
preventing services like water from
stopping, or banning evictions)

0 - no debt/contract relief
1 - narrow relief, specific to one kind of contract
2 - broad debt/contract relief

Health measures

Testing policy	Record government policy on who has access to testing Note: this records policies about testing for current infection (PCR tests) not testing for immunity (antibody test)	0 - no testing policy 1 - only those who both (a) have symptoms AND (b) meet specific criteria (eg key workers, admitted to hospital, came into contact with a known case, returned from overseas) 2 - testing of anyone showing Covid-19 symptoms 3 - open public testing (eg "drive through" testing available to asymptomatic people) Blank - no data
Facial coverings	Record policies on the use of facial coverings outside the home	0 - No policy 1 - Recommended 2 - Required in some specified shared/public spaces outside the home with other people present, or some situations when social distancing not possible 3 - Required in all shared/public spaces outside the home with other people present or all situations when social distancing not possible 4 - Required outside the home at all times regardless of location or presence of other people
Protections of elderly people	Record policies for protecting elderly people (as defined locally) in Long Term Care Facilities and/or the community and home setting	0 - no measures 1 - Recommended isolation, hygiene, and visitor restriction measures in LTCFs and/or elderly people to stay at home 2 - Narrow restrictions for isolation, hygiene in LTCFs, some limitations on external visitors and/or restrictions protecting elderly people at home 3 - Extensive restrictions for isolation and hygiene in LTCFs, all non-essential external visitors prohibited, and/or all

elderly people required to stay at home and not leave the
home with minimal exceptions, and receive no external
visitors
Blank - no data

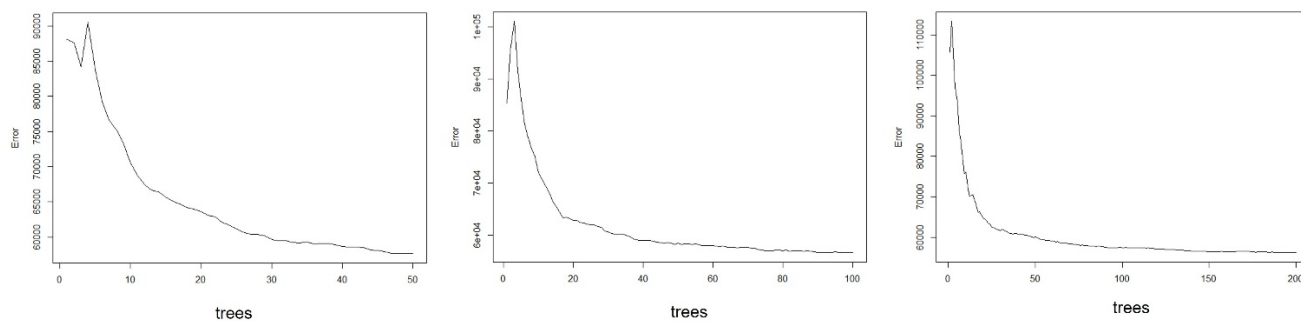


Fig. S1 Model internal error with different numbers of decision trees in RF algorithm

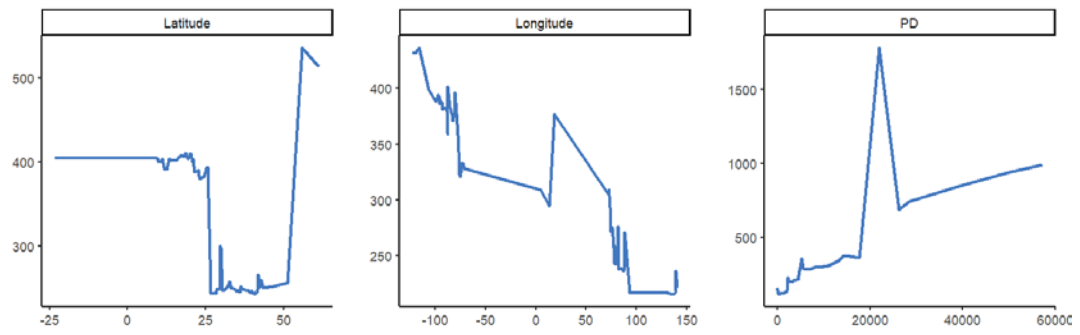


Fig. S2 Partial dependence plots of regional attributes on daily confirmed COVID-19 cases in the overall RF model

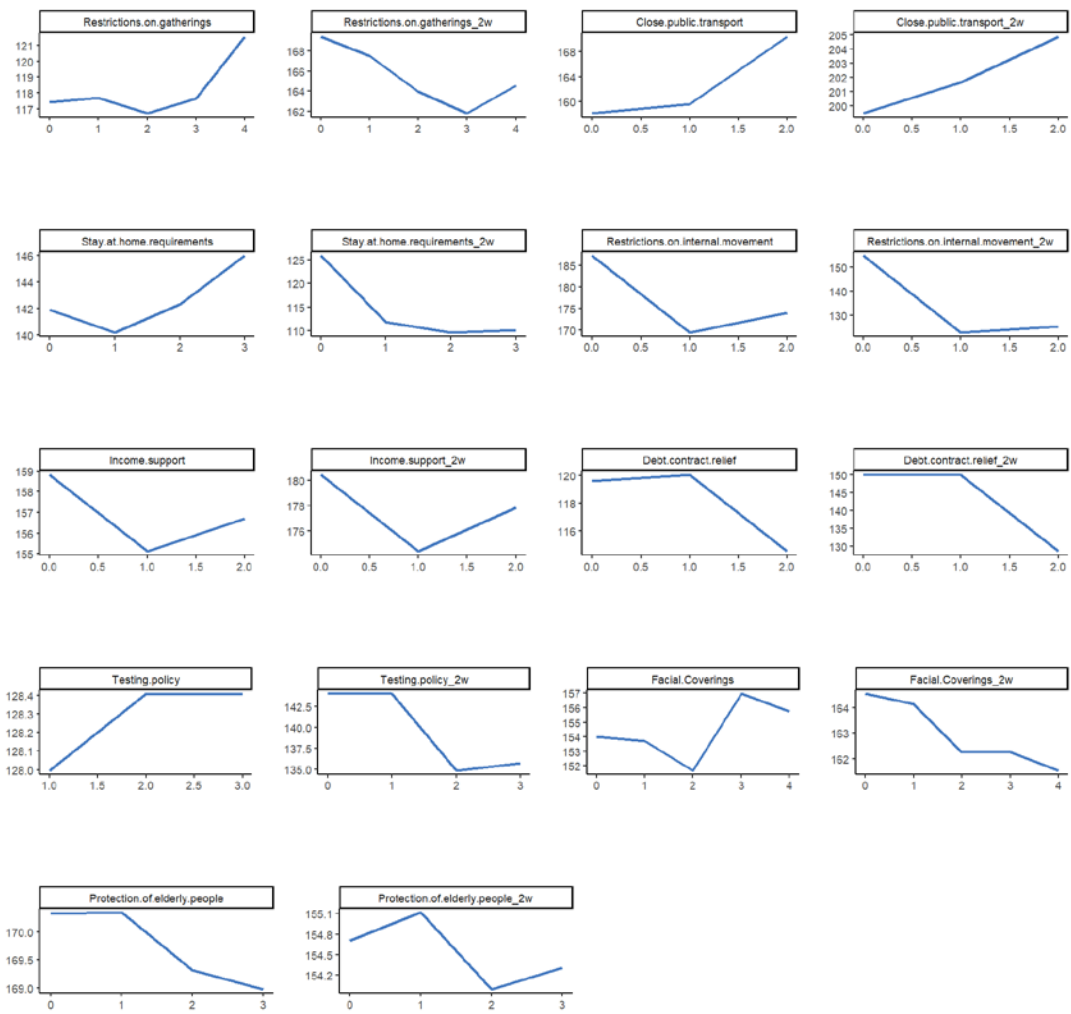


Fig. S3 Partial dependence plots of policy response measures and corresponding lag effect in the temperate zone model

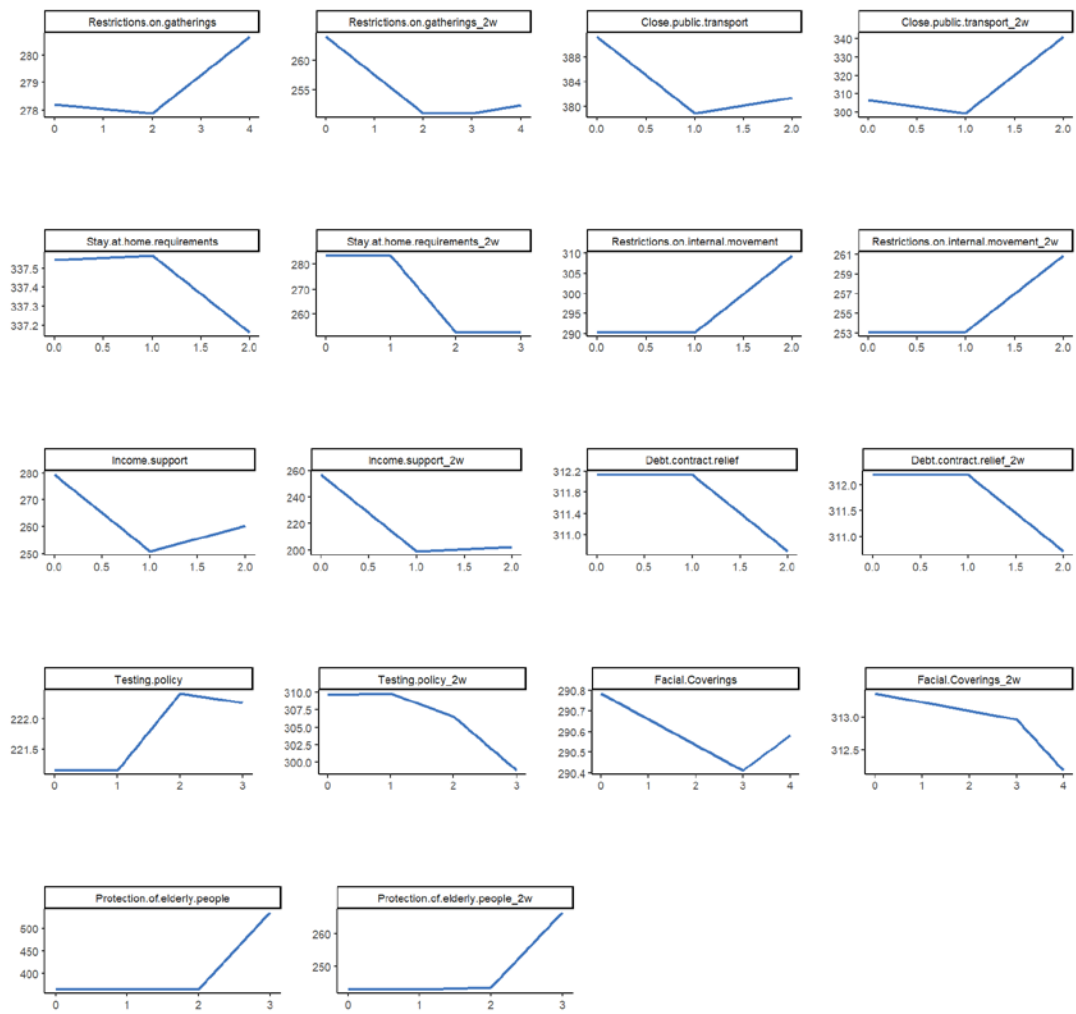


Fig. S4 Partial dependence plots of policy response measures and corresponding lag effect in the tropical zone model

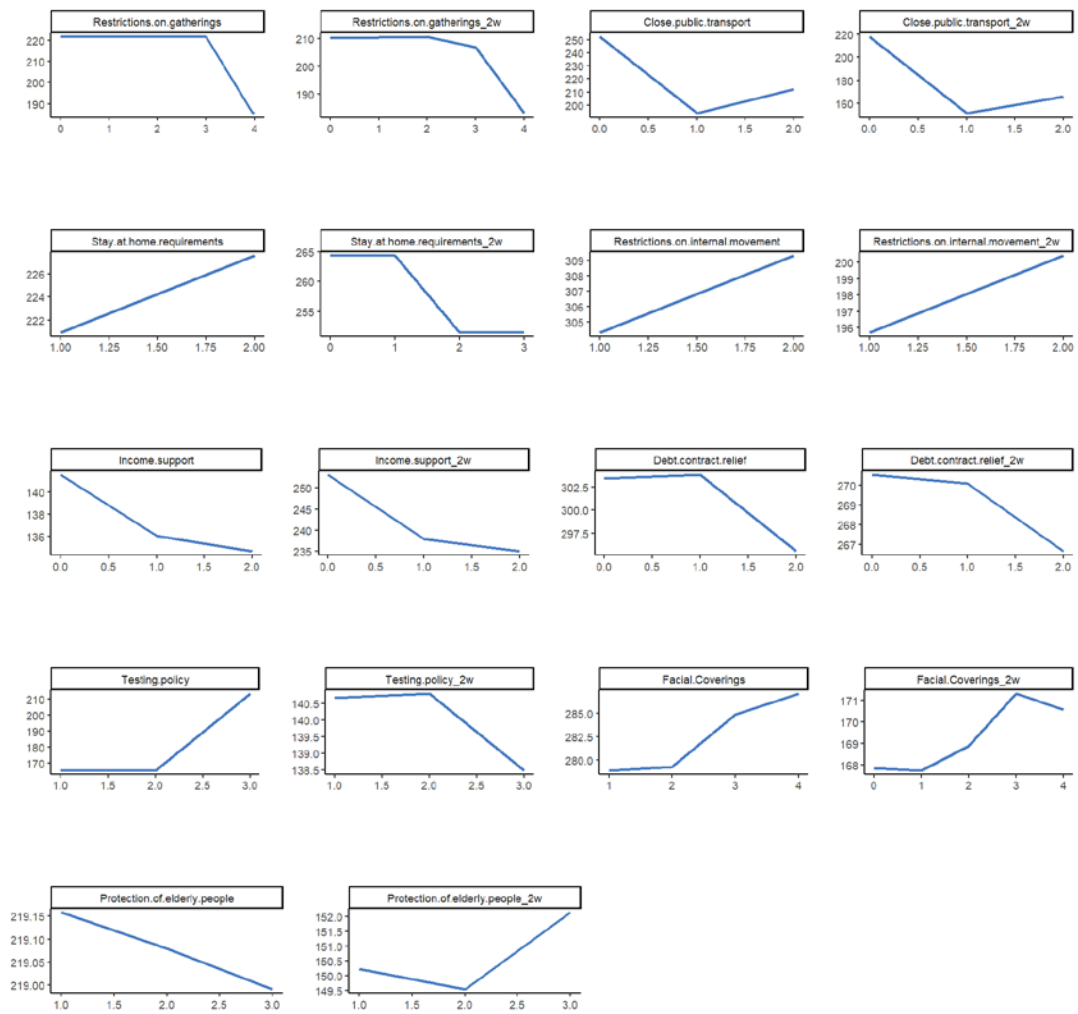


Fig. S5 Partial dependence plots of policy response measures and corresponding lag effect in the arid zone model

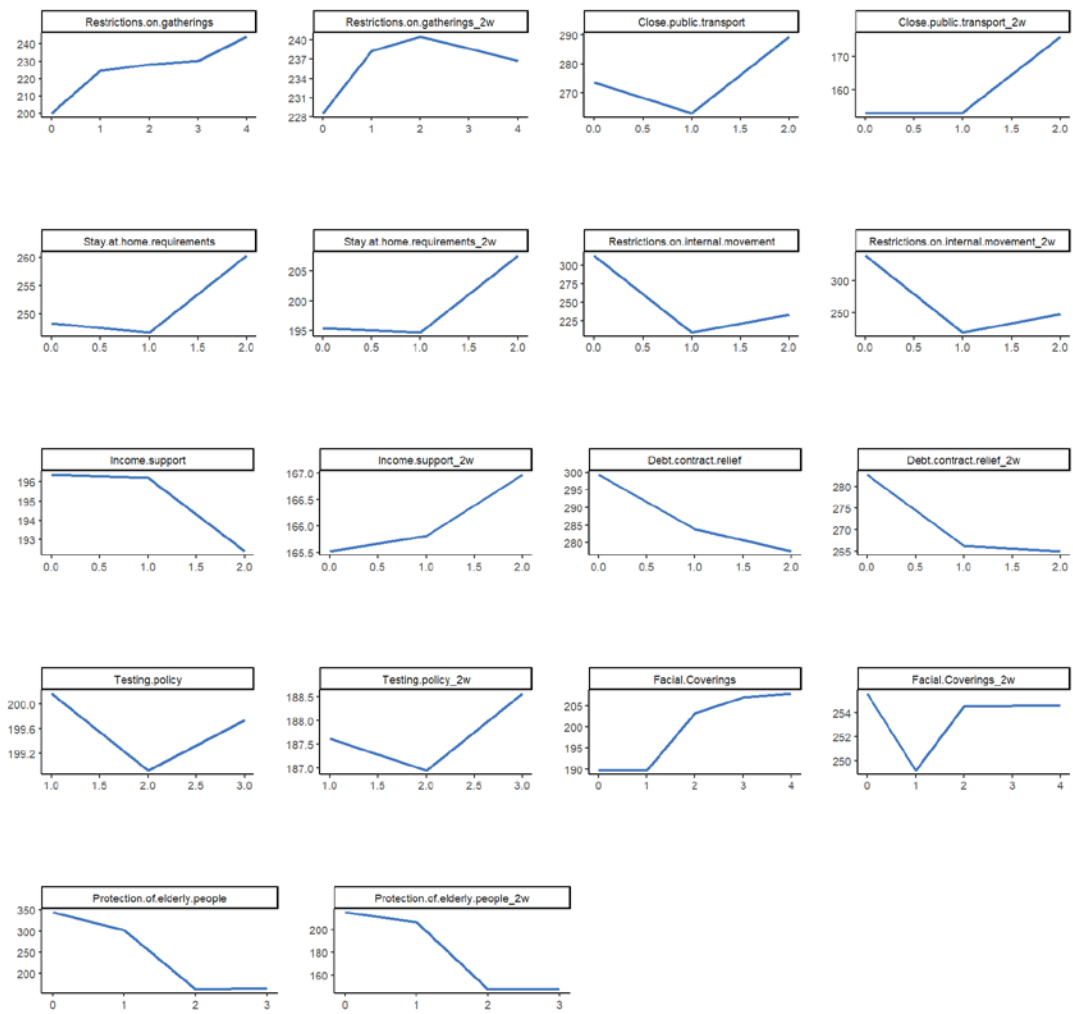


Fig. S6 Partial dependence plots of policy response measures and corresponding lag effect in the cold zone model

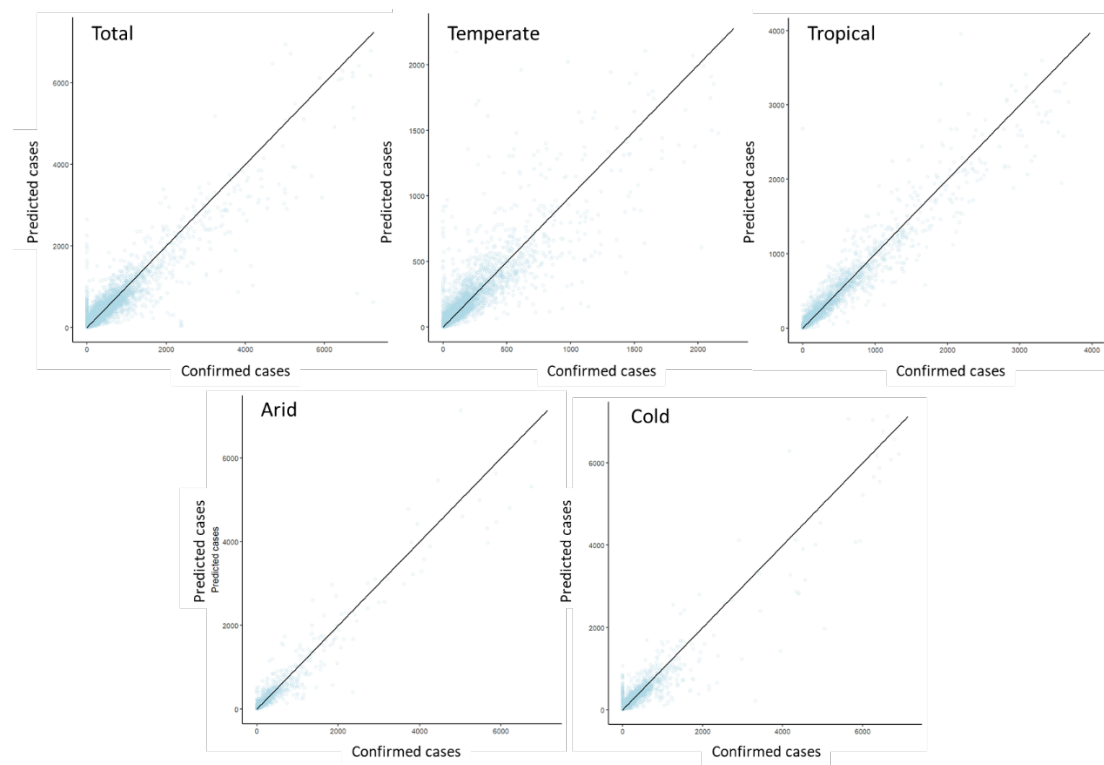


Fig. S7 Model validation plots