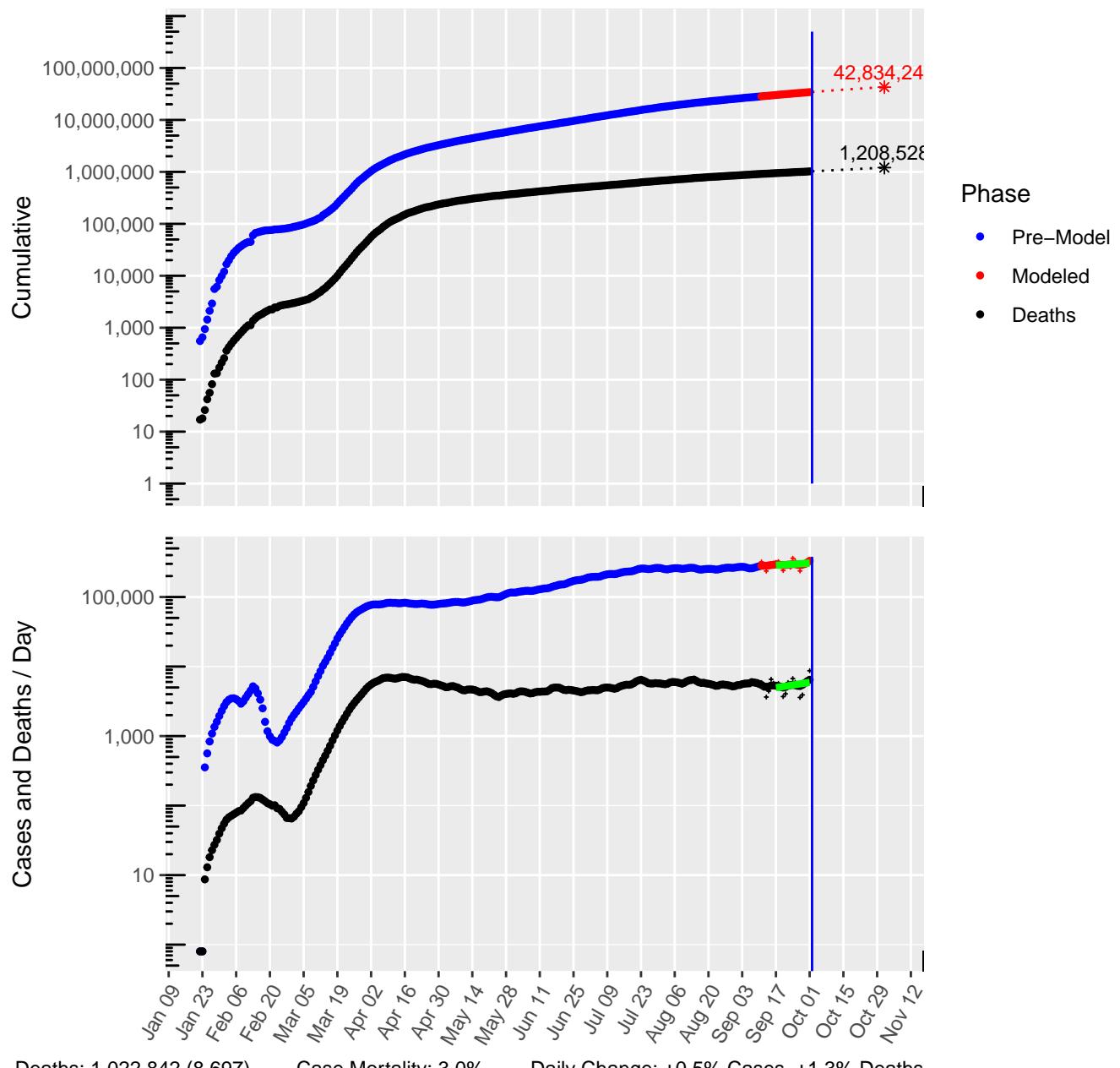
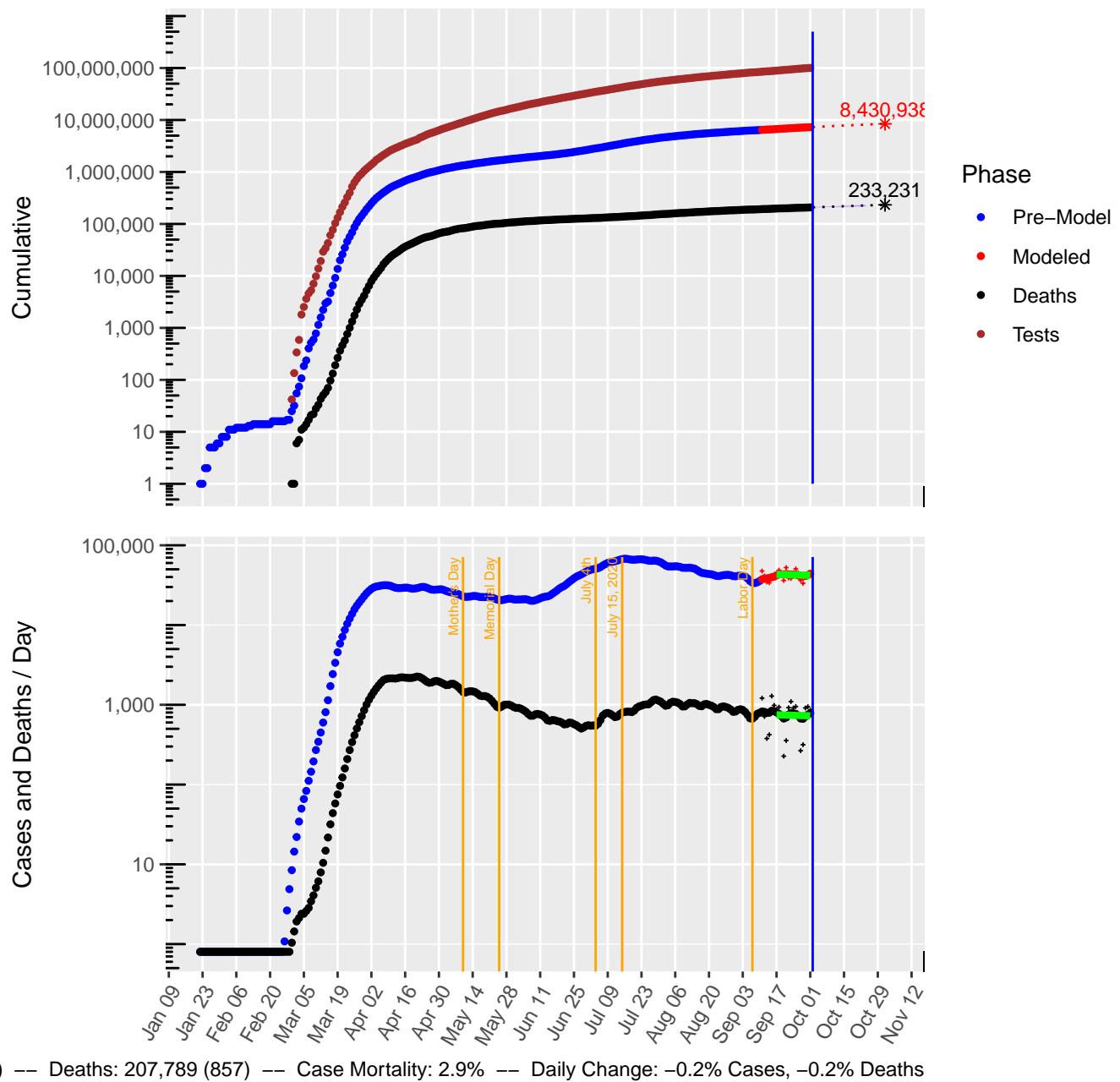


Worldwide projection as of 2020-10-02

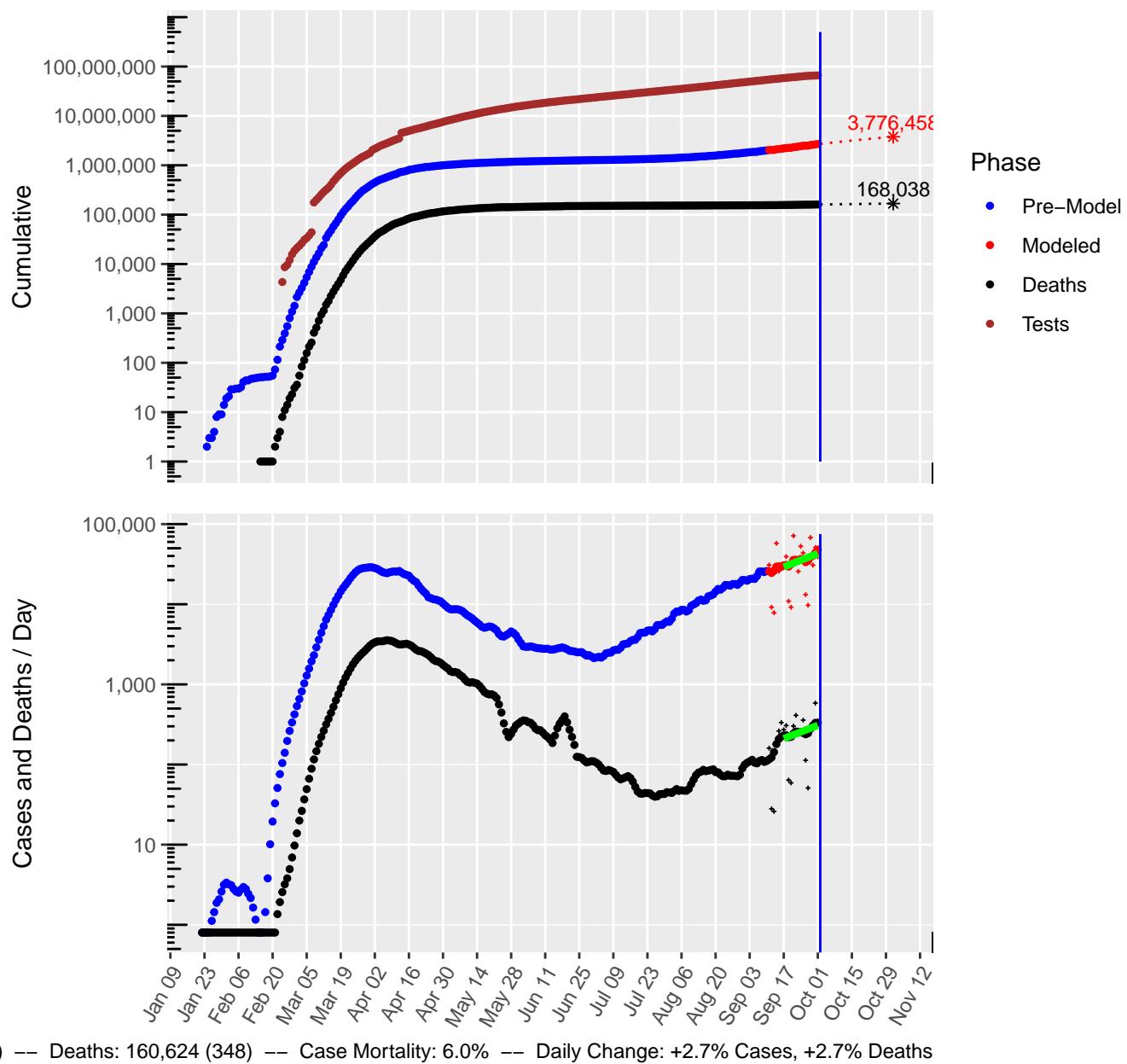


USA projection as of 2020-10-02



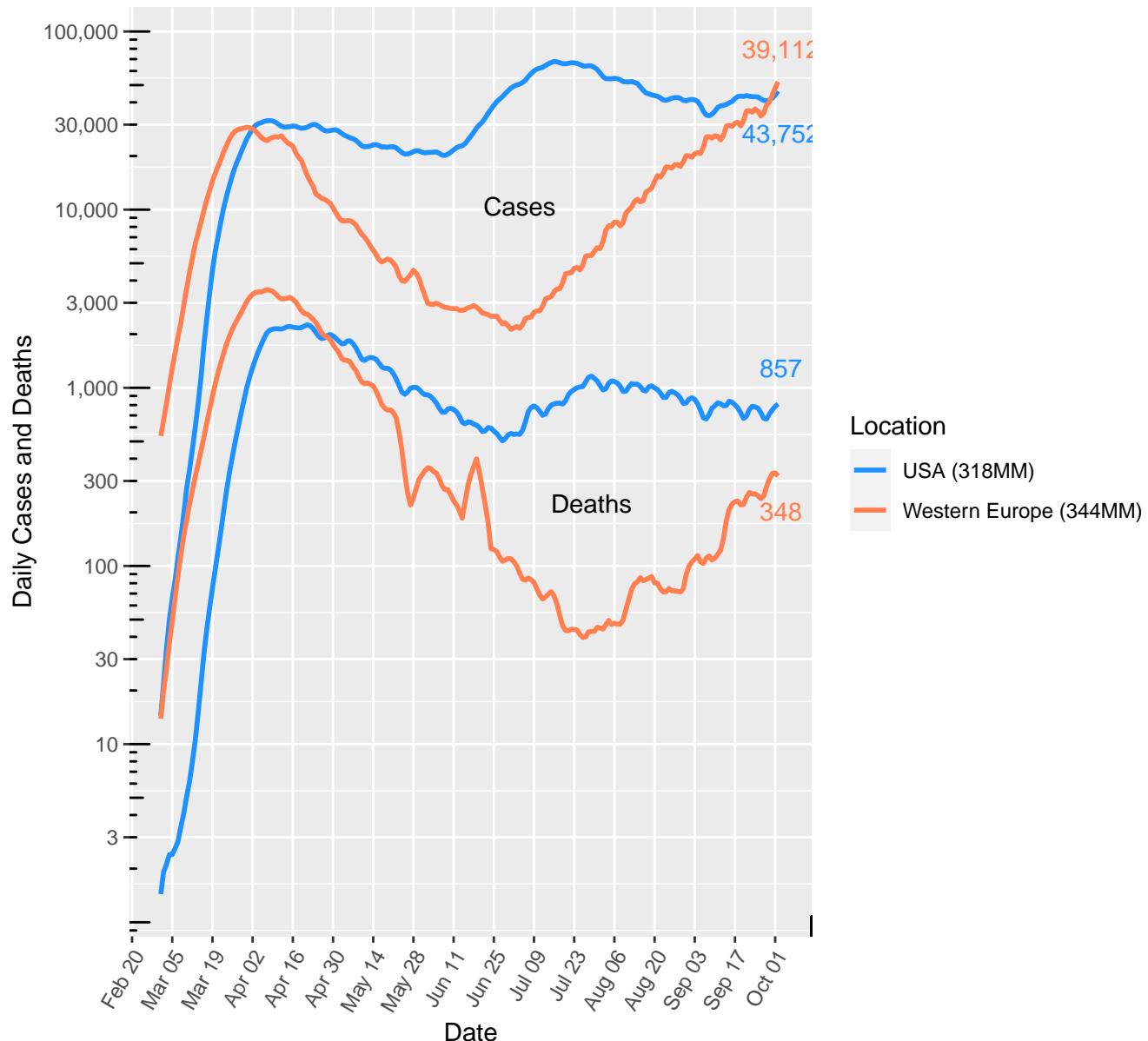
Western Europe projection as of 2020-10-02

Belgium, France, Germany, Greece, Italy, Portugal, Spain, Netherlands, Luxembourg, and the UK (Population = 344MM)



Comparison of COVID-19 Cases & Deaths between US & Europe

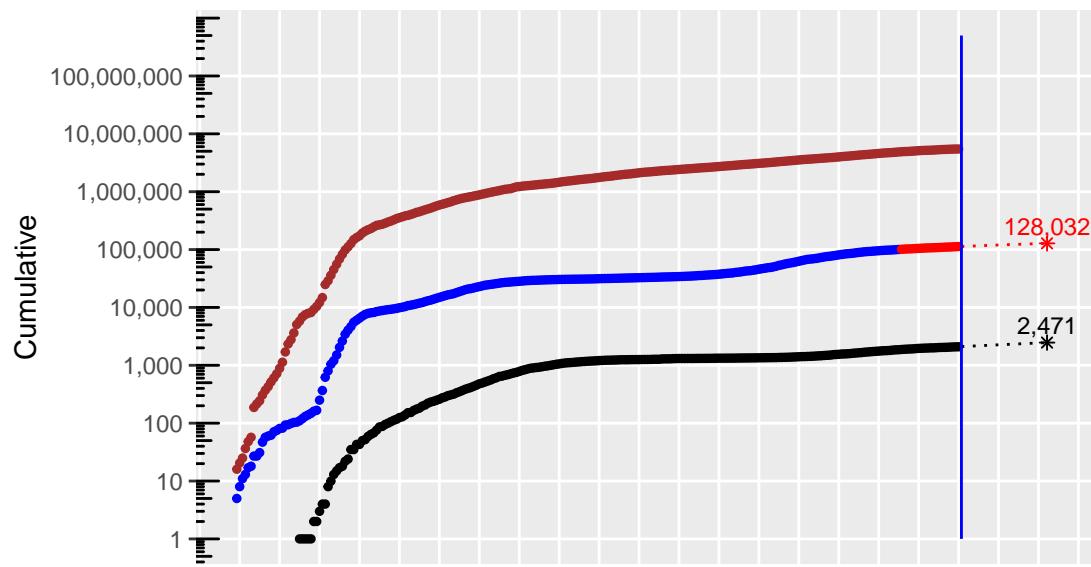
Log plot of 7 day average



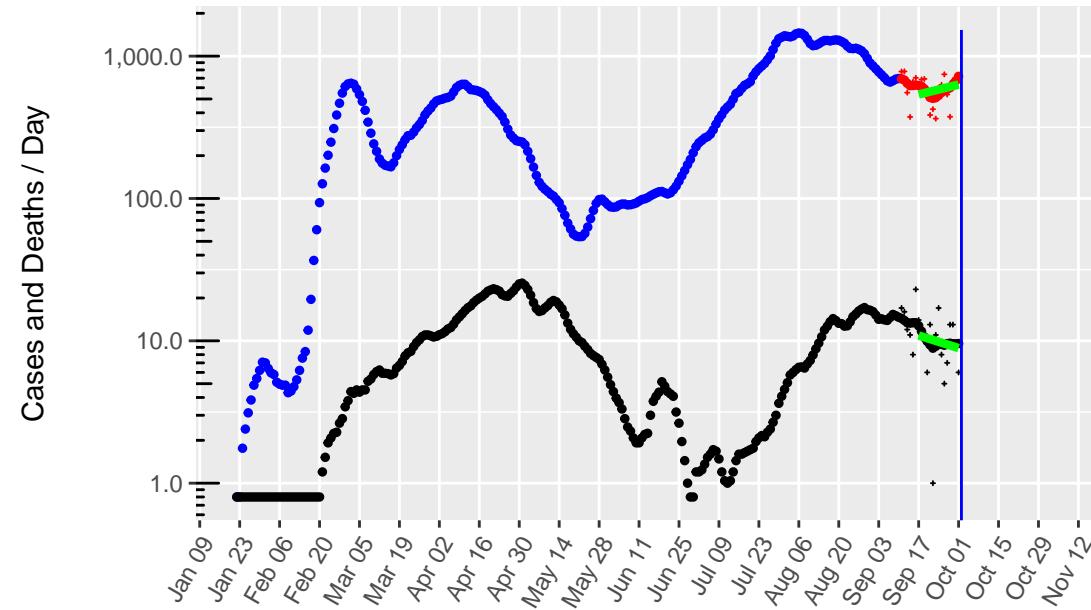
Numbers on the right are yesterday's figures, and will differ a bit from the plotted rolling mean

Non-authoritarian Asian ensemble projection as of 2020-10-02

Japan, South Korea, Thailand, and Vietnam (Population = 328 MM)



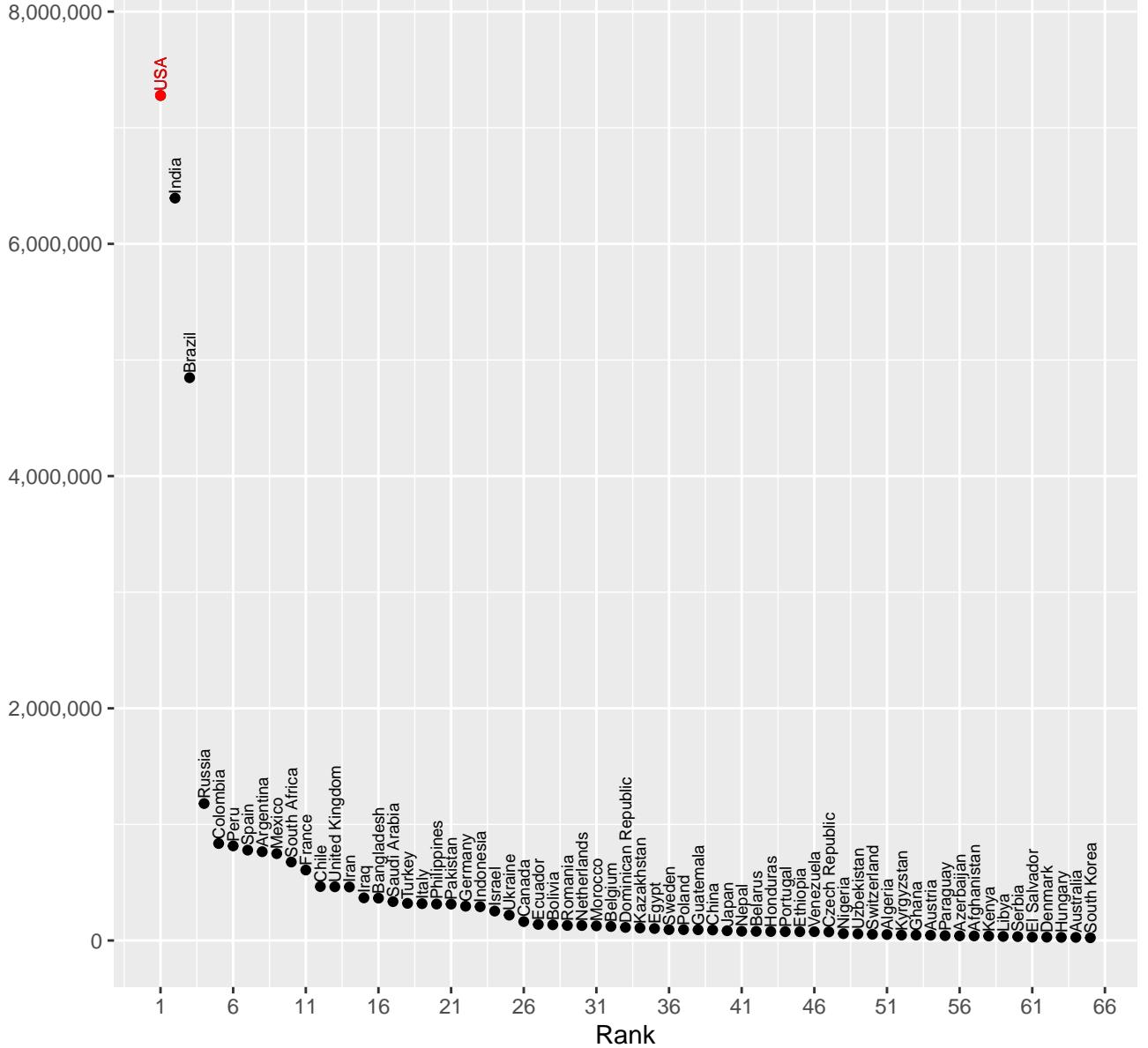
- Phase
- Pre-Model
 - Modeled
 - Deaths
 - Tests



(723) -- Deaths: 2,090 (6) -- Case Mortality: 1.9% -- Daily Change: +1.1% Cases, -1.4% Deaths

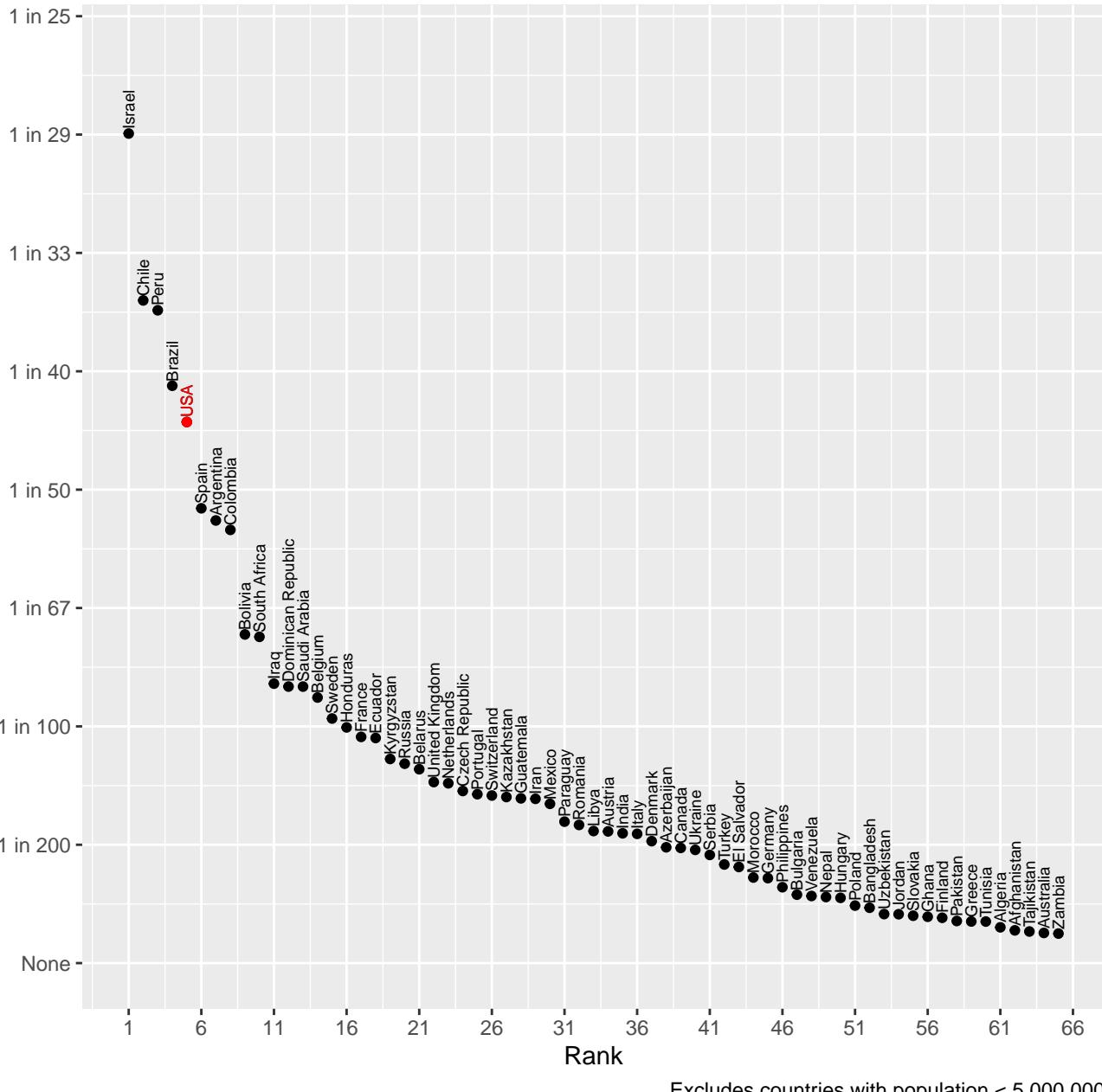
Worldwide cases

Total cases to date

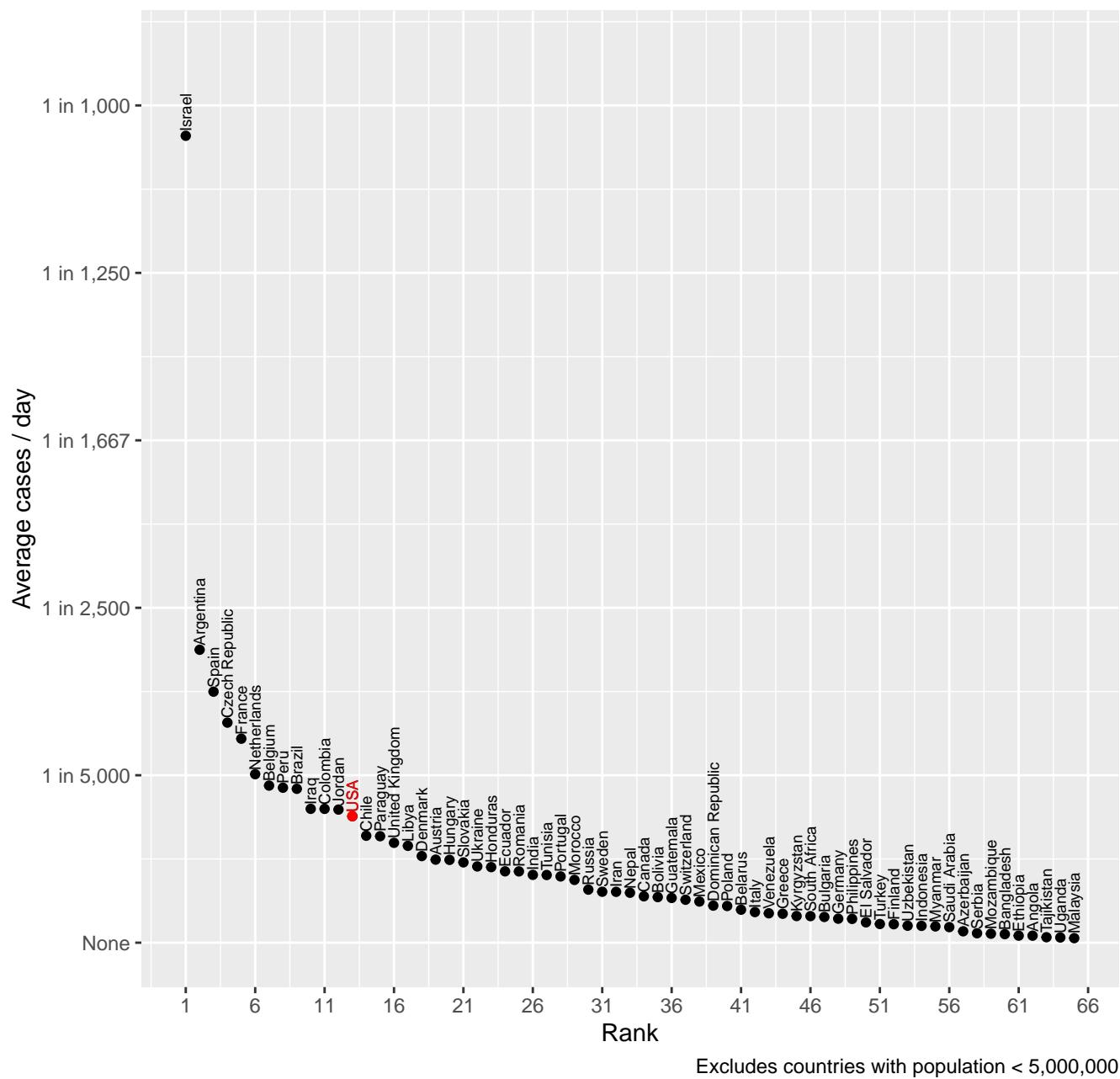


Excludes countries with population < 5,000,000

Worldwide cases

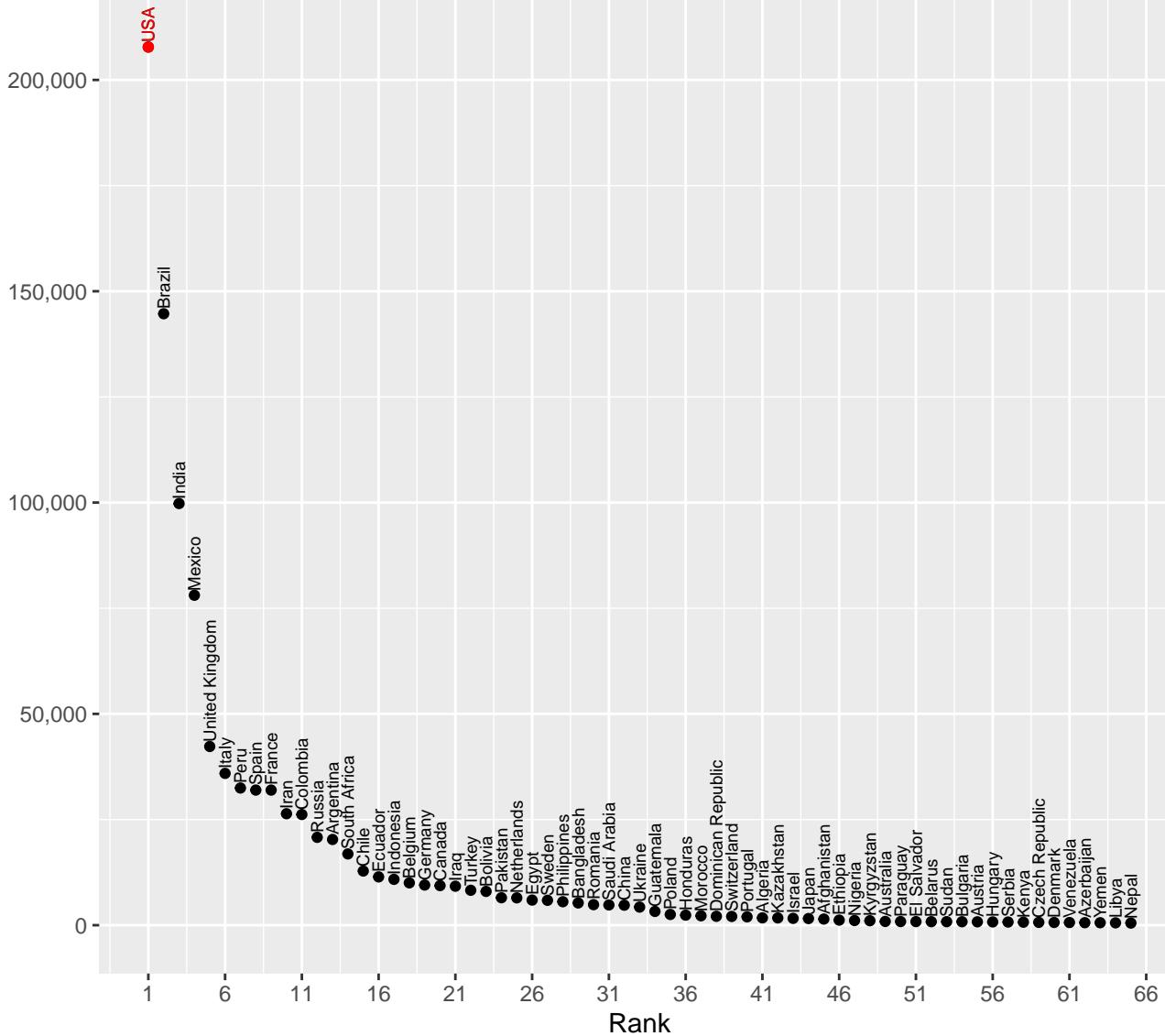


Average new cases over past 7 days



Worldwide deaths

Total deaths to date



Excludes countries with population < 5,000,000

Worldwide deaths

Total deaths to date

1 in 833 -

Peru

Belgium

Bolivia

Spain

Ecuador

Chile

Brazil

Mexico

United Kingdom

USA

Sweden

Italy

Colombia

France

Argentina

Iran

Netherlands

South Africa

Honduras

Canada

Iraq

Switzerland

Guatemala

Israel

Romania

Dominican Republic

Kyrgyzstan

Saudi Arabia

Portugal

Russia

Paraguay

El Salvador

Denmark

Germany

Bulgaria

Kazakhstan

Turkey

Serbia

Austria

Ukraine

Libya

India

Belarus

Hungary

Azerbaijan

Egypt

Czech Republic

Poland

Finland

Morocco

Philippines

Afghanistan

Algeria

Indonesia

Australia

Pakistan

Greece

Bangladesh

Sudan

Zambia

Nicaragua

Haiti

Tunisia

Venezuela

1

6

11

16

21

26

31

36

41

46

51

56

61

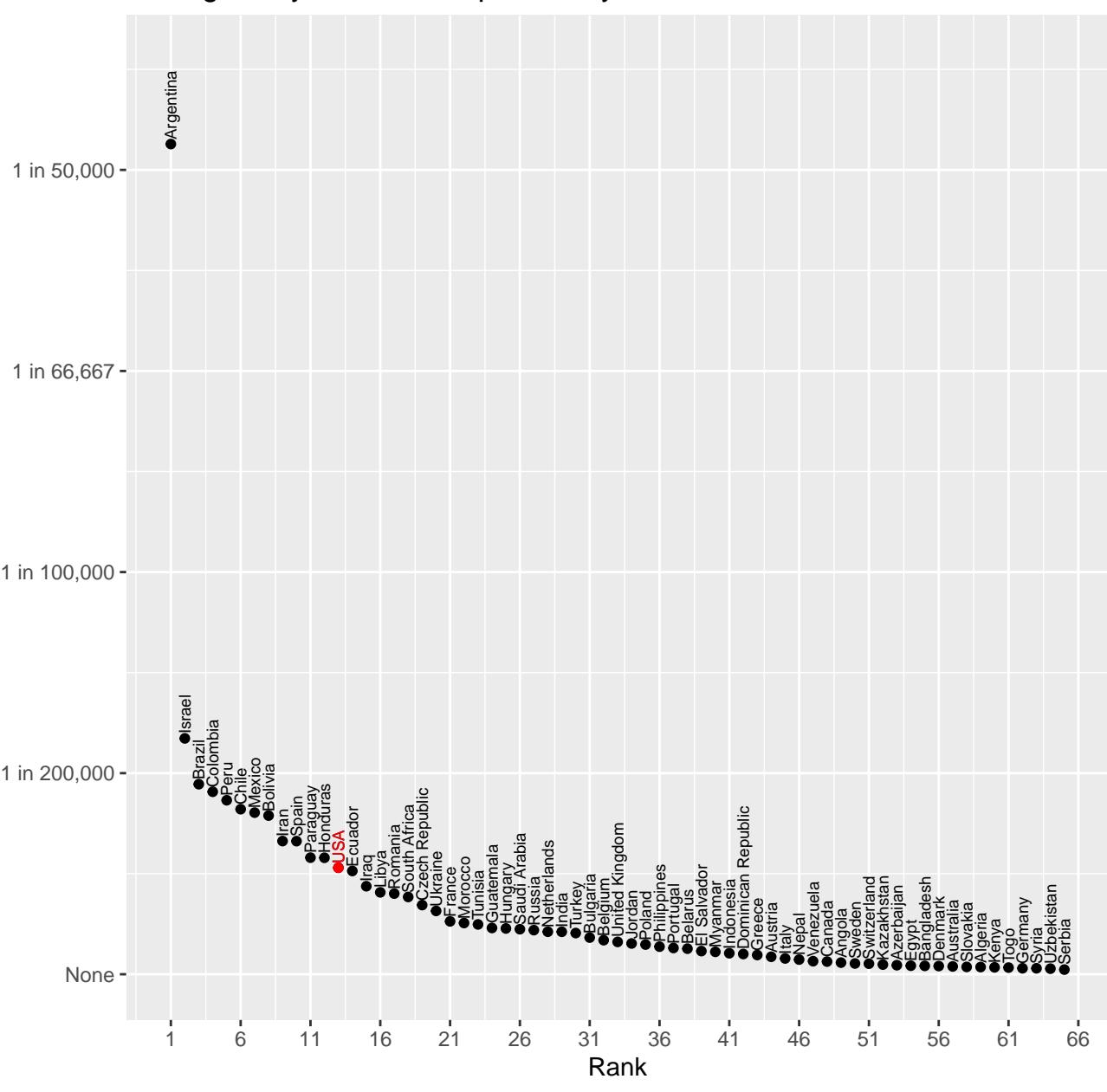
66

Rank

Excludes countries with population < 5,000,000

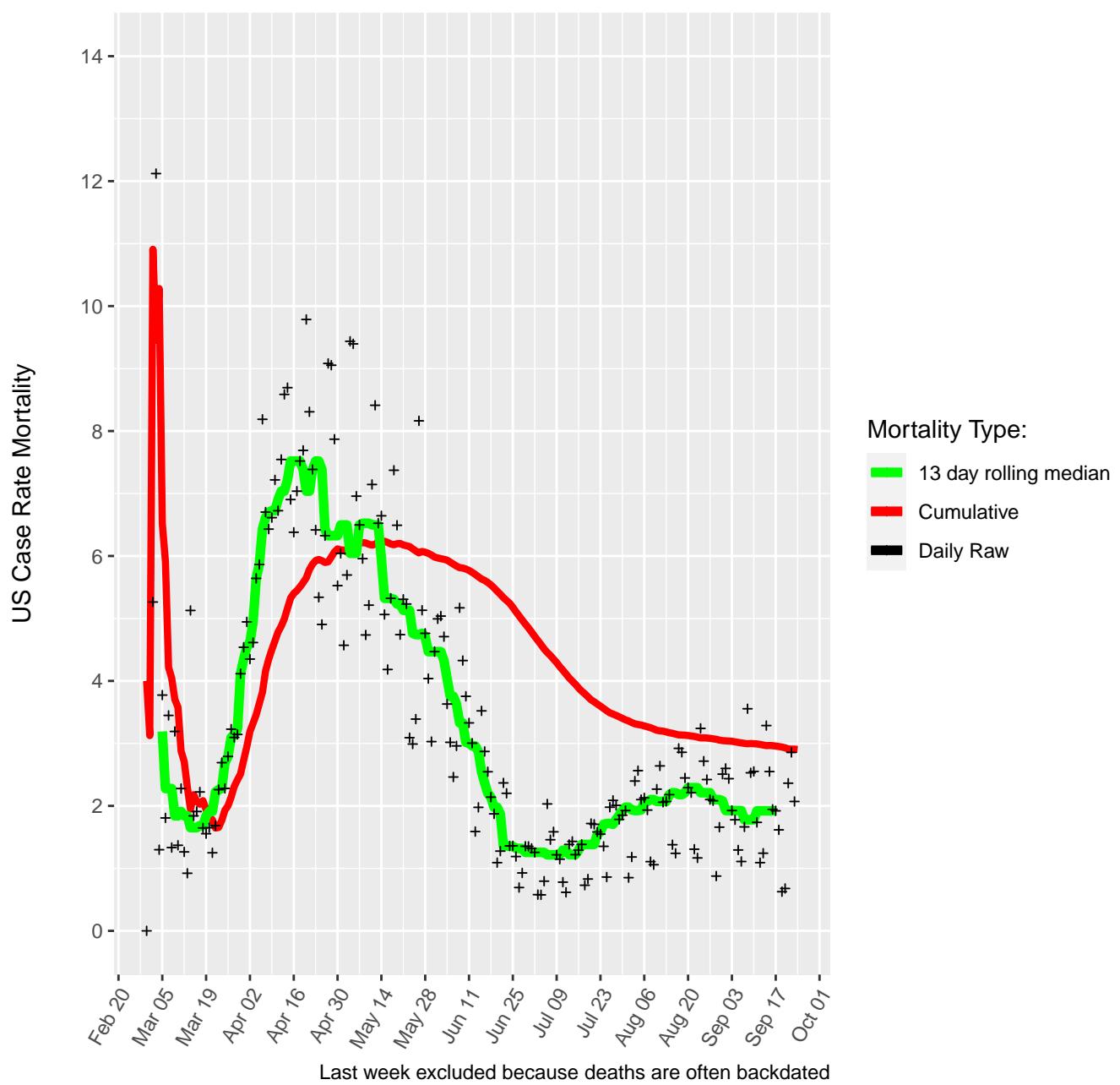
Average daily deaths over past 7 days

Average deaths / day

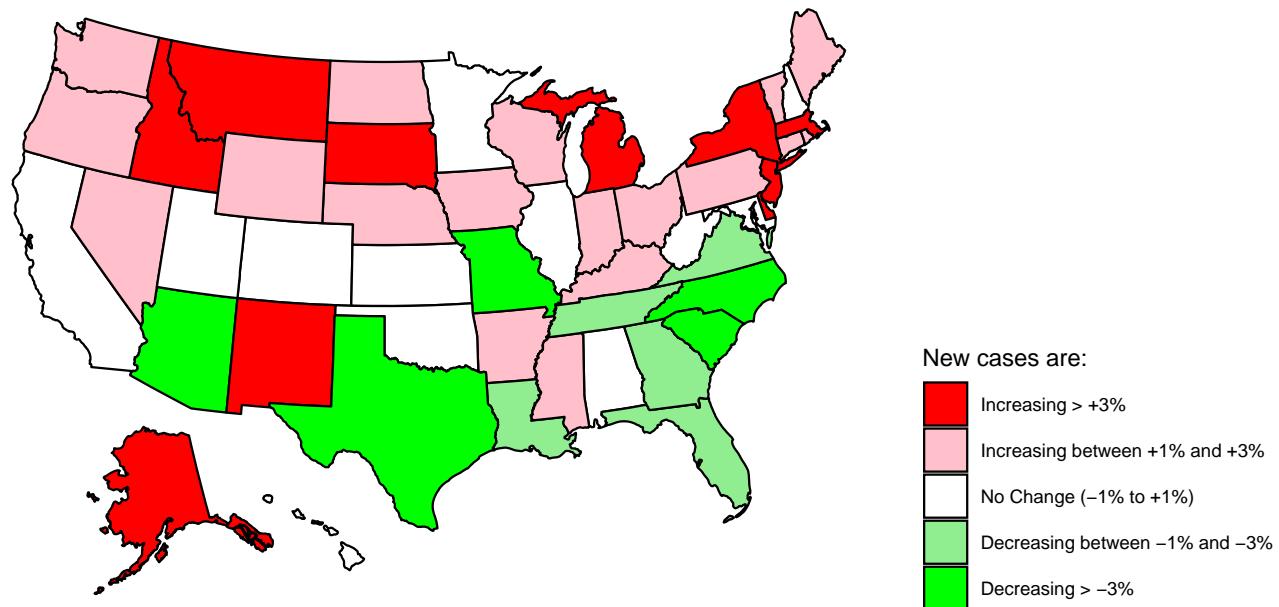


Excludes countries with population < 5,000,000

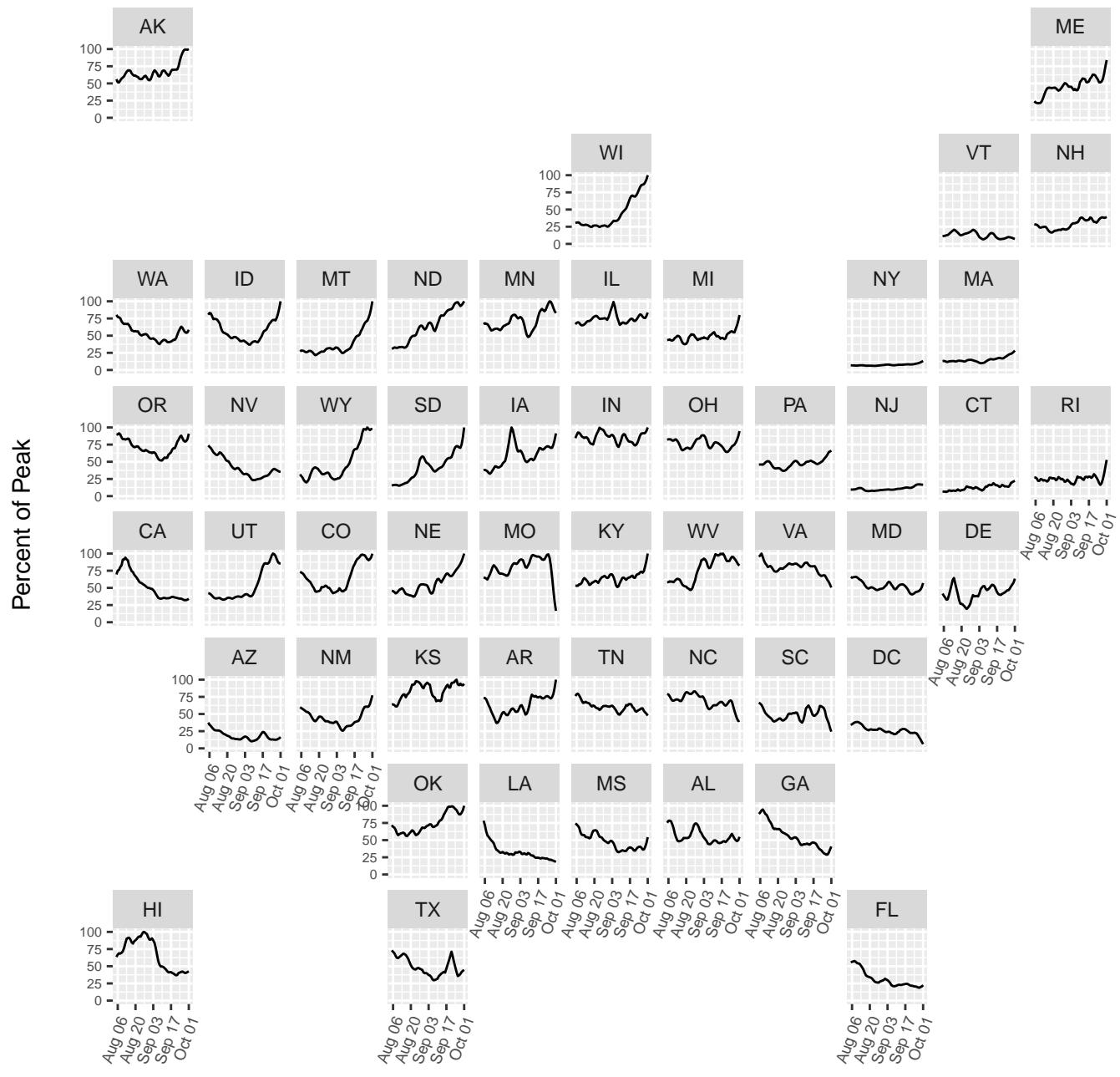
Daily vs. Cumulative US Case Rate Mortality



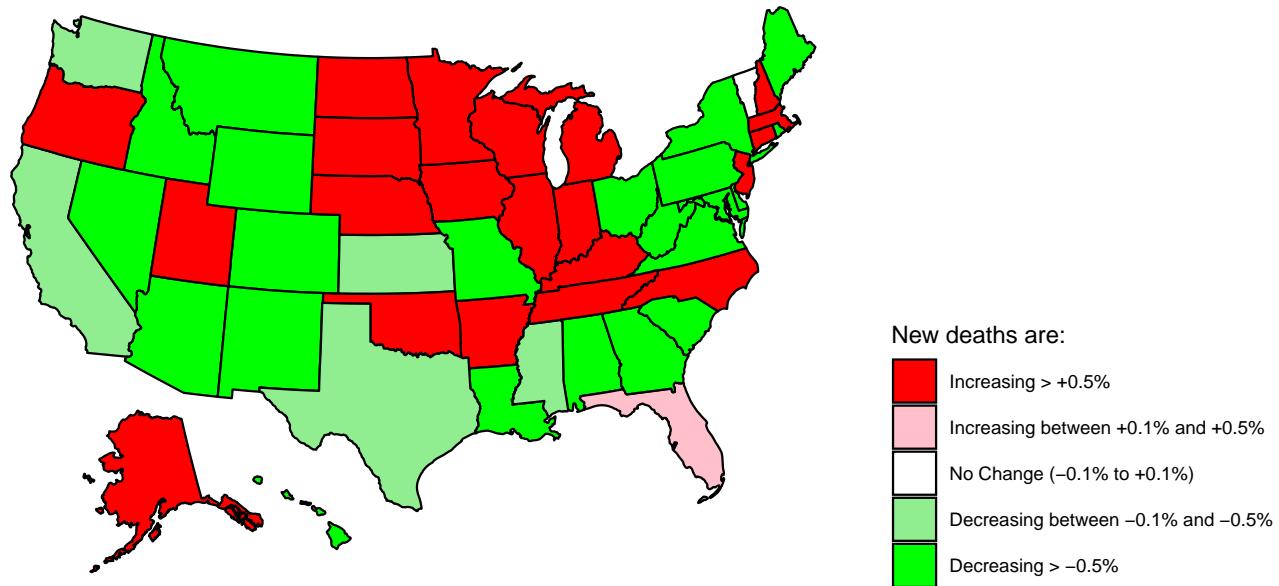
New cases by state as of 2020-10-02



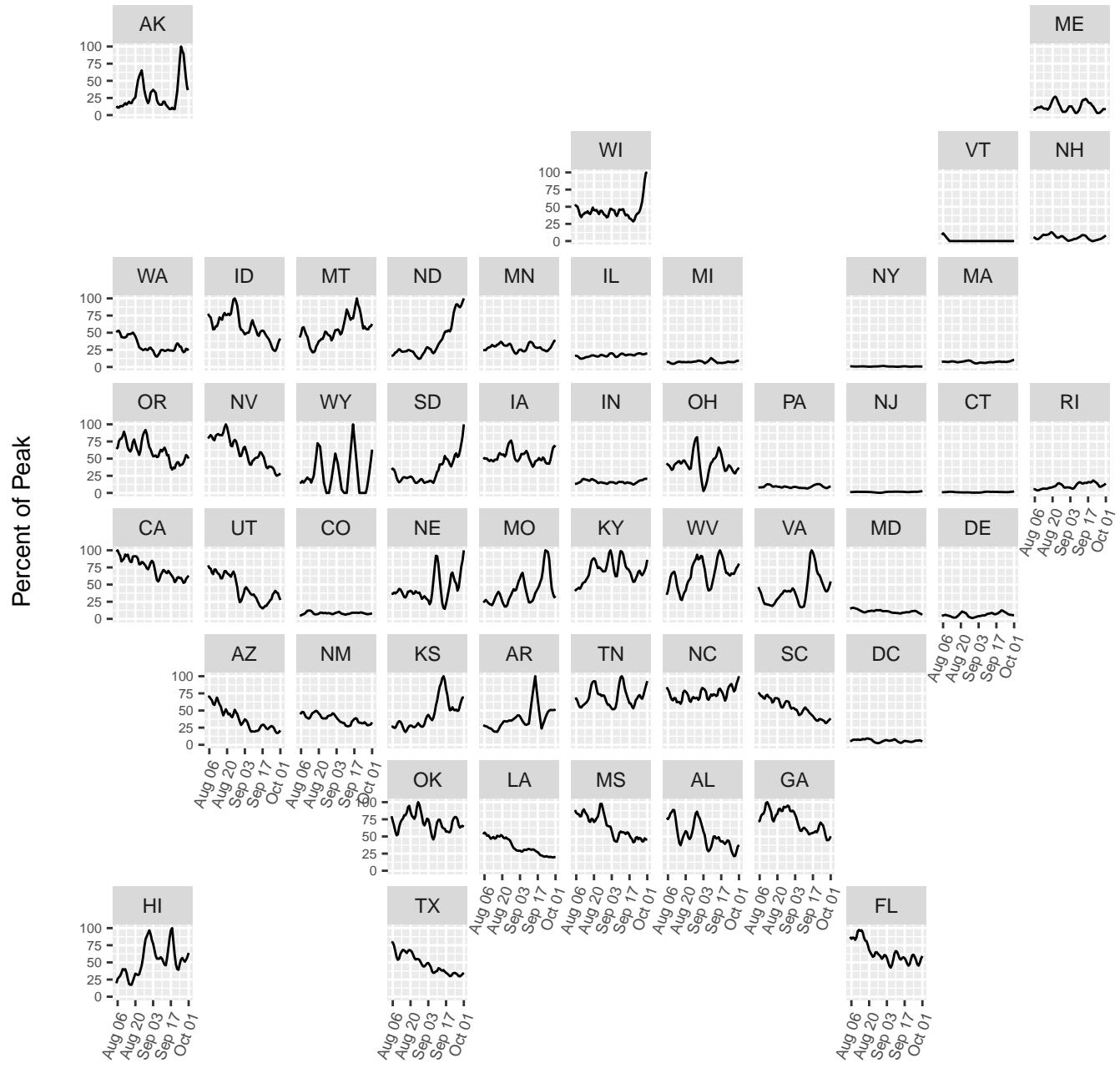
Daily Cases as a Percent of Peak Cases



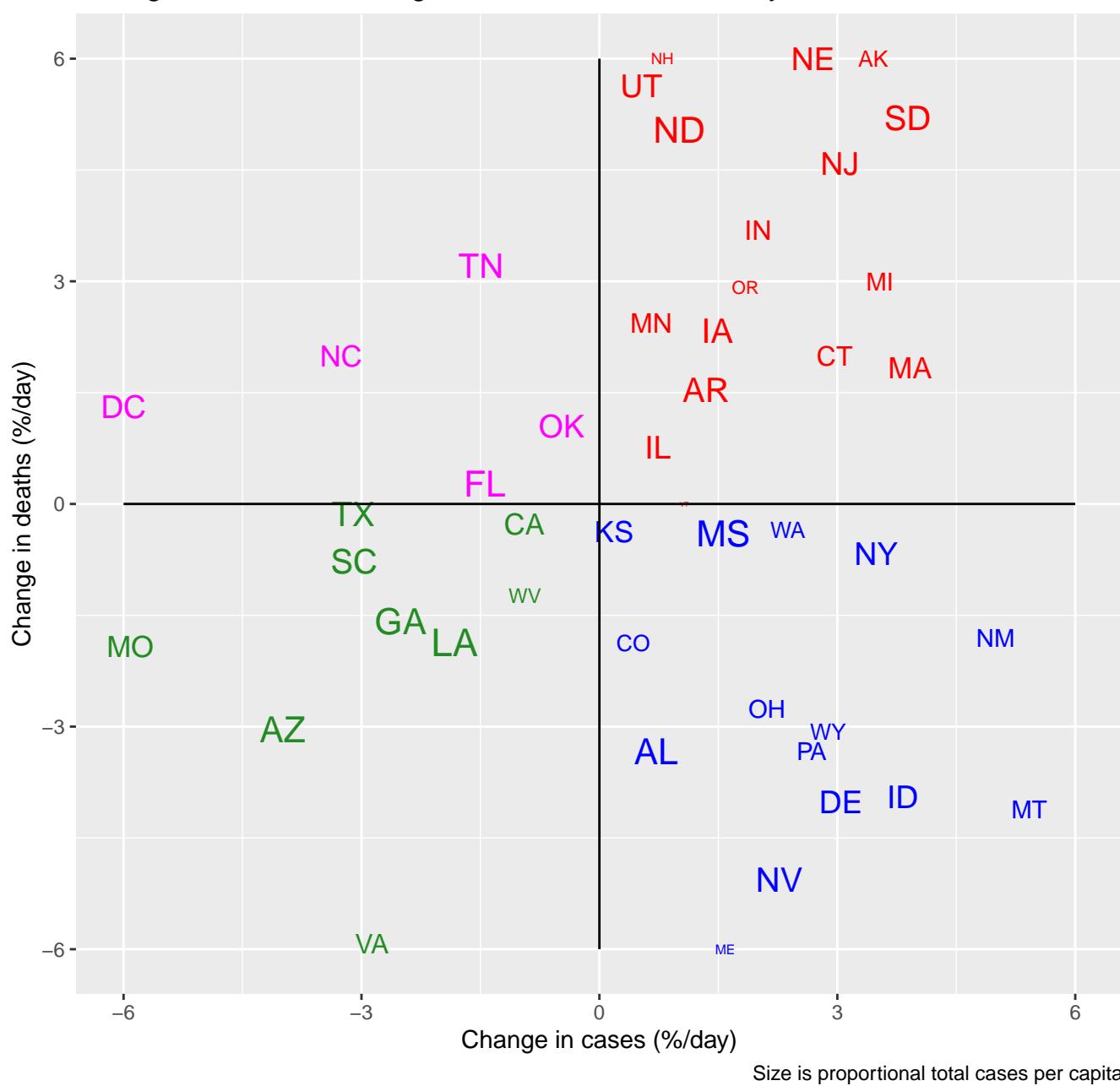
New deaths by state as of 2020-10-02



Daily Deaths as a Percent of Peak Deaths

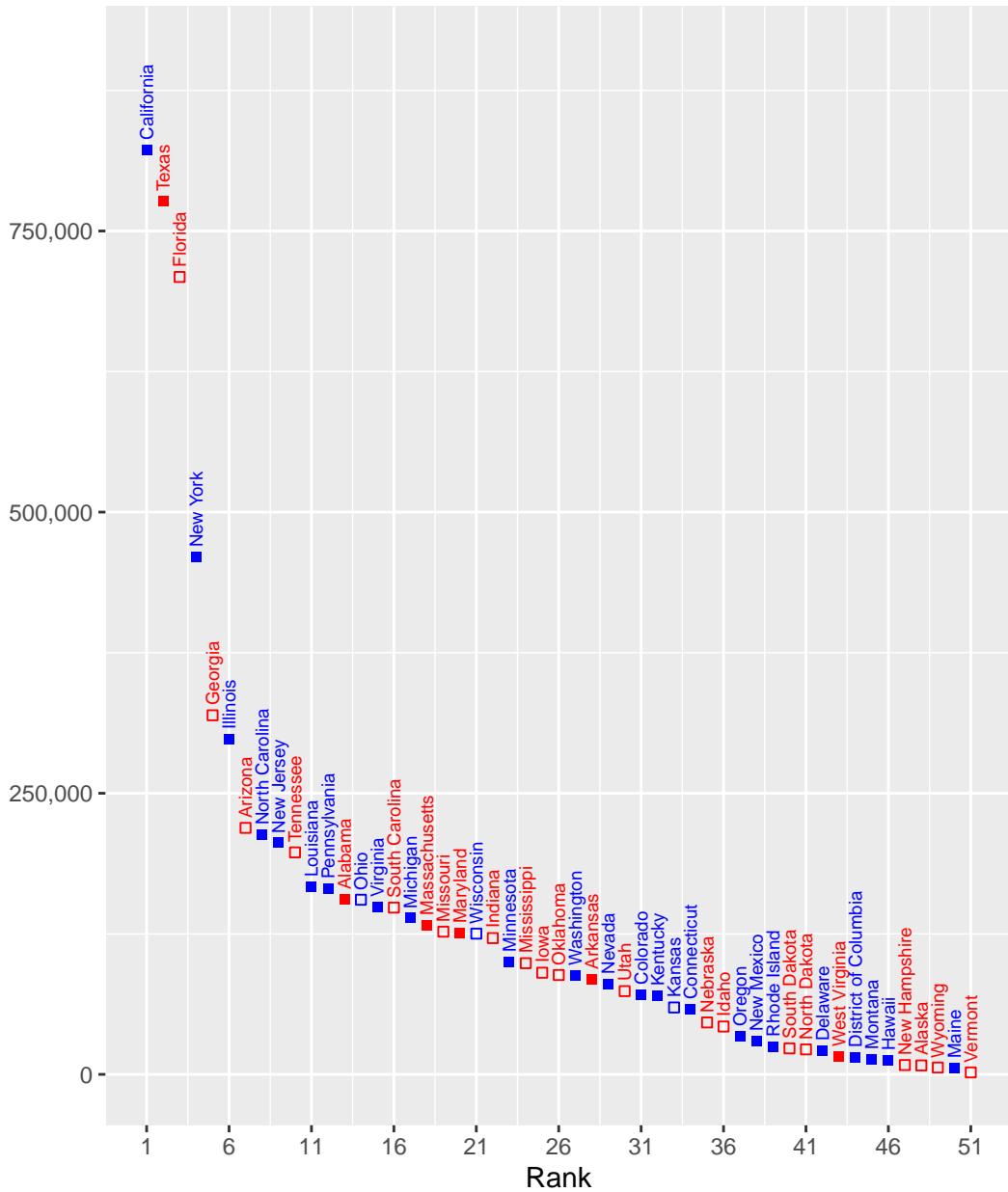


Change in cases vs. change in deaths over last 14 days as of 2020-10-02



Total US COVID-19 Cases

Total cases



Masks

- No
- Yes

Governor

- Democratic
- Republican

p masks as of July 20, 2020: 0.58, p governor: 0.89. NB: association != causation.

Total US COVID-19 Cases

Total Cases

1 in 25

1 in 33

1 in 50

1 in 100

None

Rank

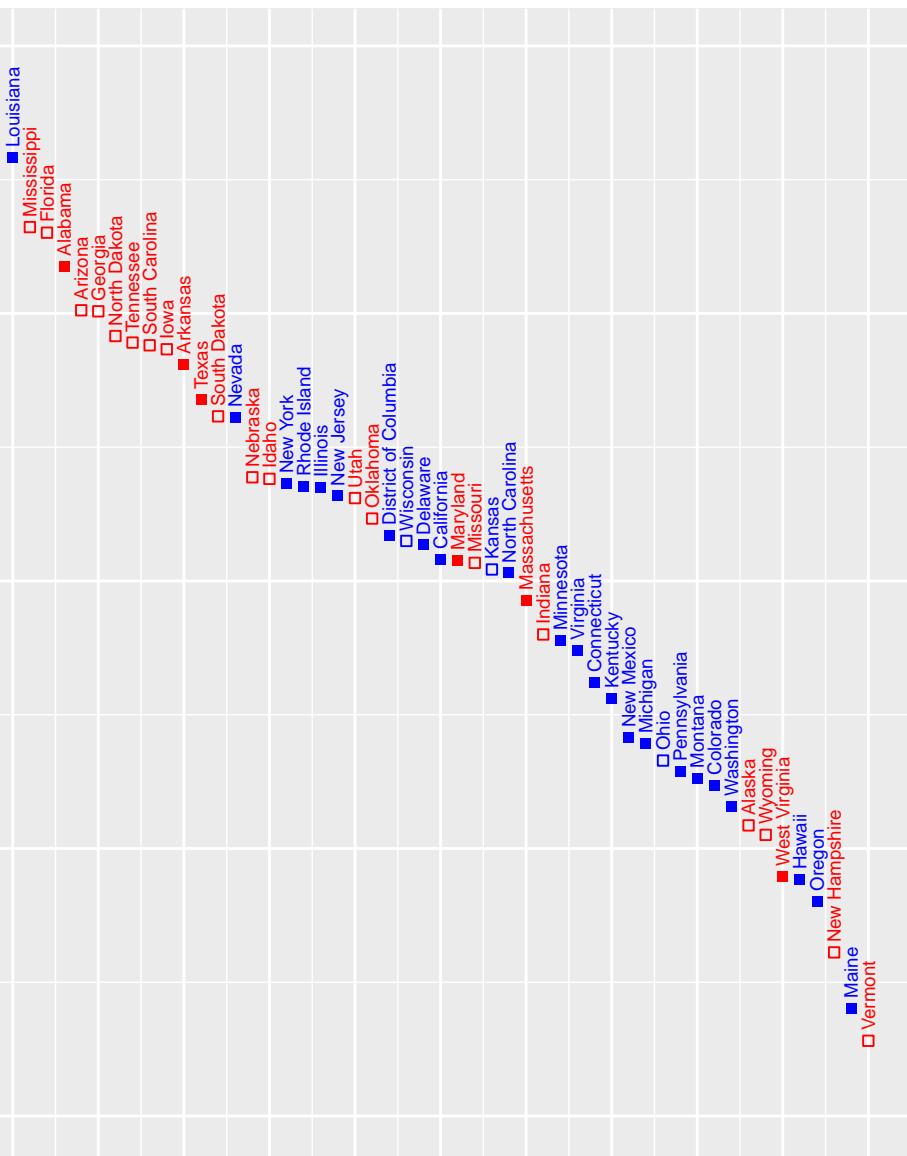
p masks as of July 20, 2020: 0.075, p governor: 0.012. NB: association != causation.

Masks

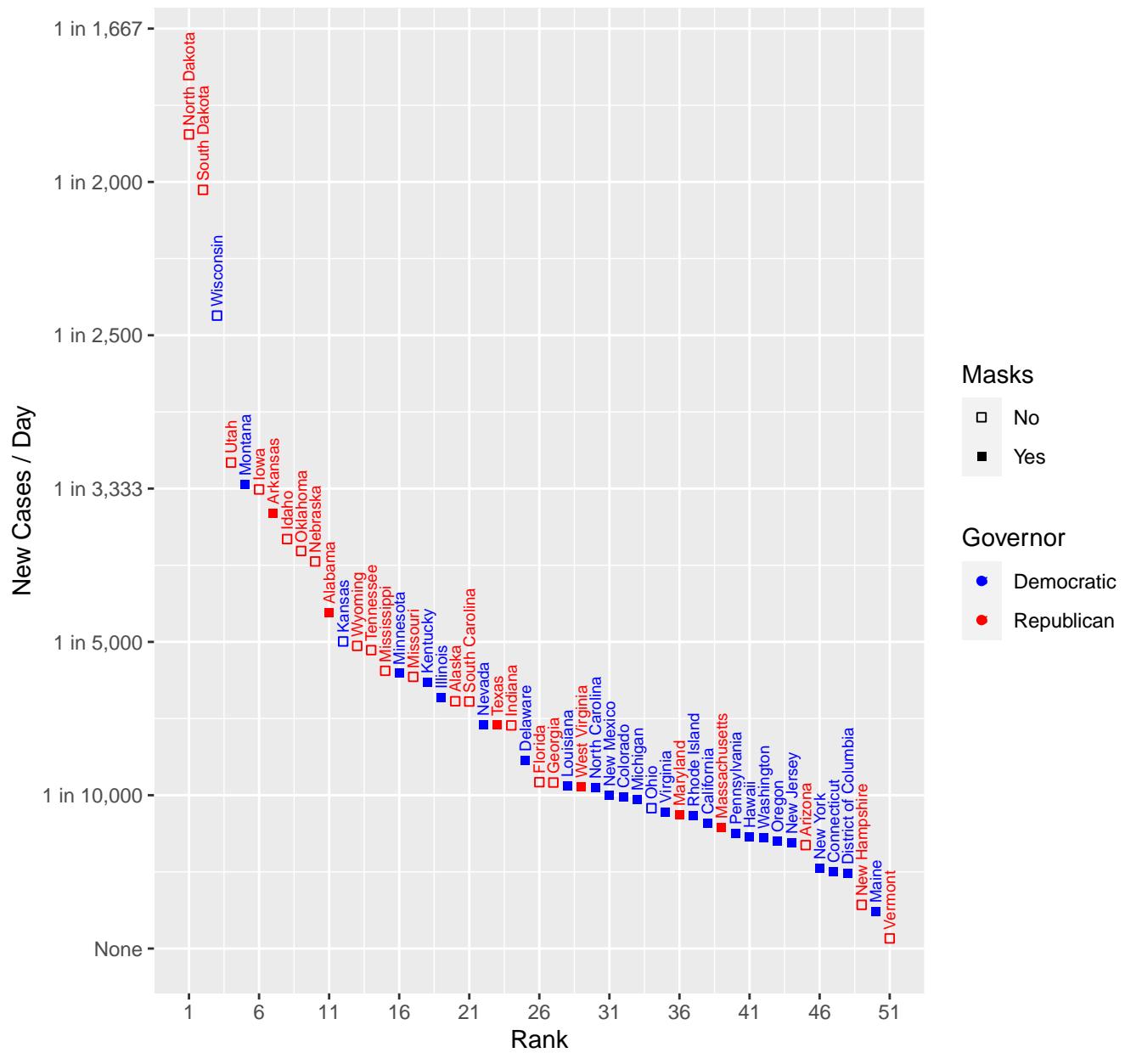
- No
- Yes

Governor

- Democratic
- Republican



Average US COVID–19 cases over the past 7 days



Total US COVID-19 Deaths

Total Deaths

30,000

20,000

10,000

0

1

6

11

16

21

26

31

36

41

46

51

Rank

p masks as of July 20, 2020: 0.069, p governor: 0.3. NB: association != causation.

New York

New Jersey

Texas

Massachusetts

Illinois

Pennsylvania

Michigan

Arizona

Louisiana

Ohio

Connecticut

Indiana

North Carolina

South Carolina

Virginia

Mississippi

Alabama

Tennessee

Washington

Minnesota

Missouri

Colorado

Nevada

Arkansas

Iowa

Wisconsin

Kentucky

Rhode Island

Oklahoma

New Mexico

Kansas

Delaware

District of Columbia

Oregon

Nebraska

Idaho

Utah

New Hampshire

West Virginia

North Dakota

South Dakota

Montana

Maine

Hawaii

Alaska

Vermont

Wyoming

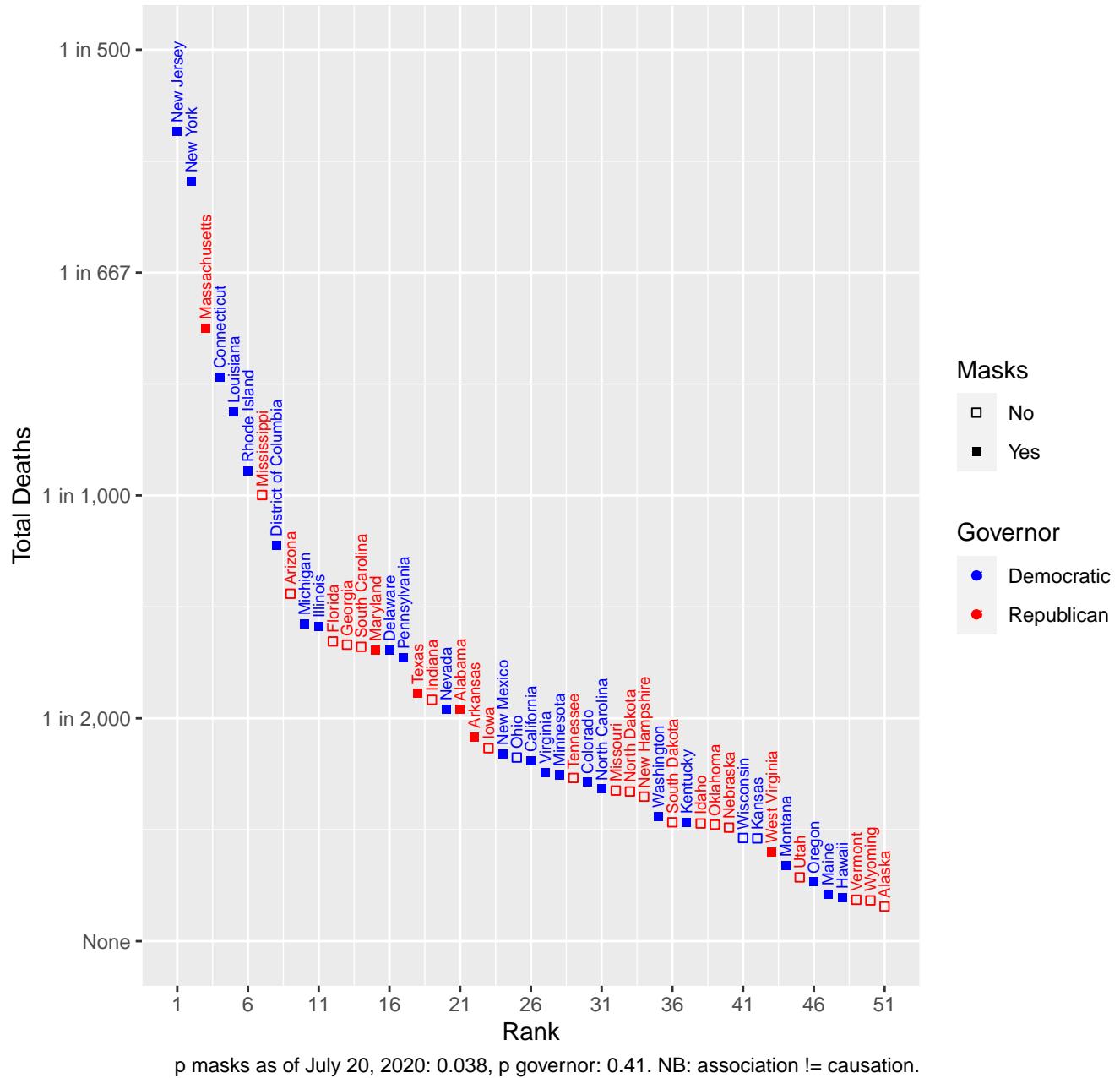
Masks

- No
- Yes

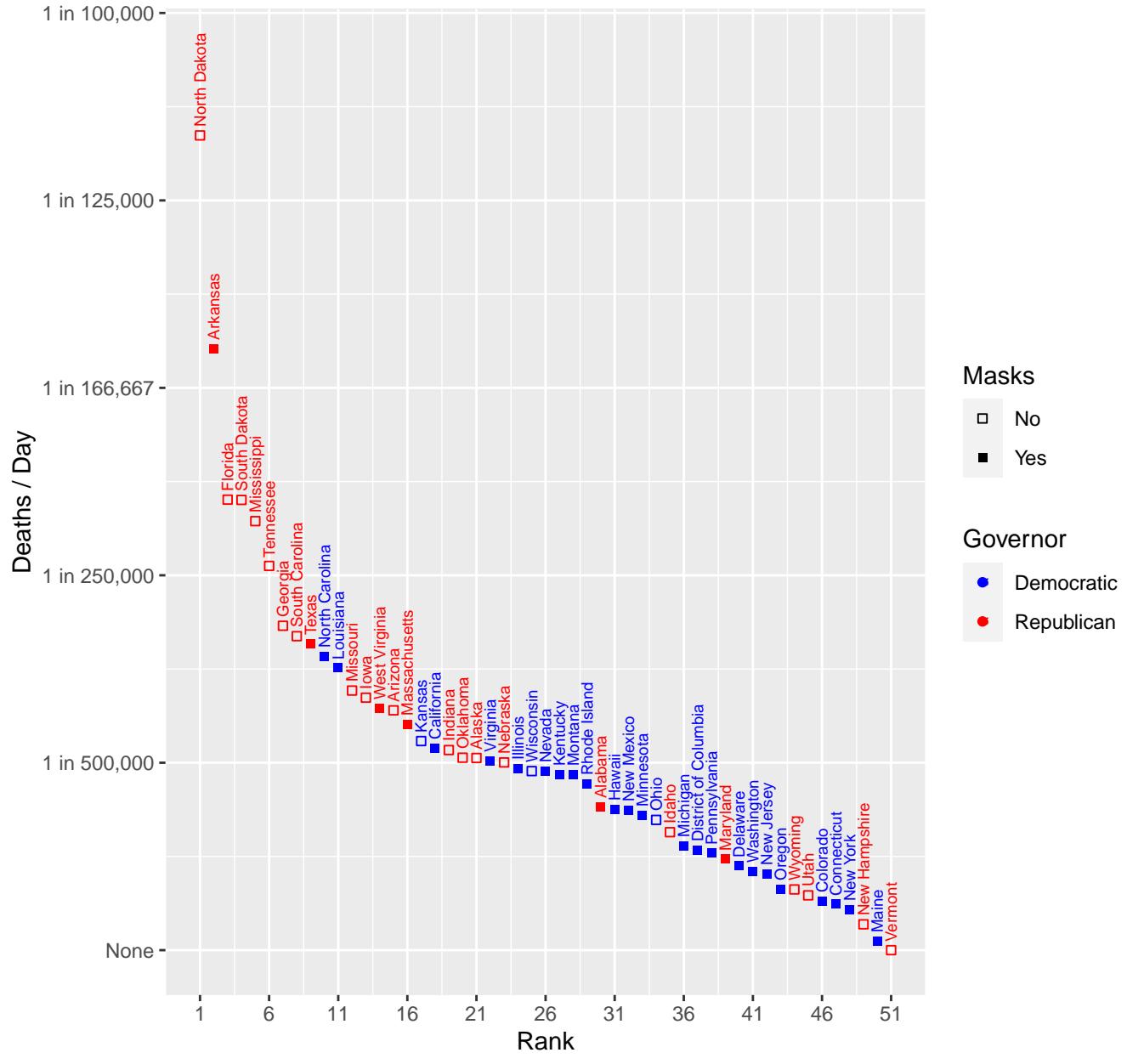
Governor

- Democratic
- Republican

Total US COVID-19 Deaths

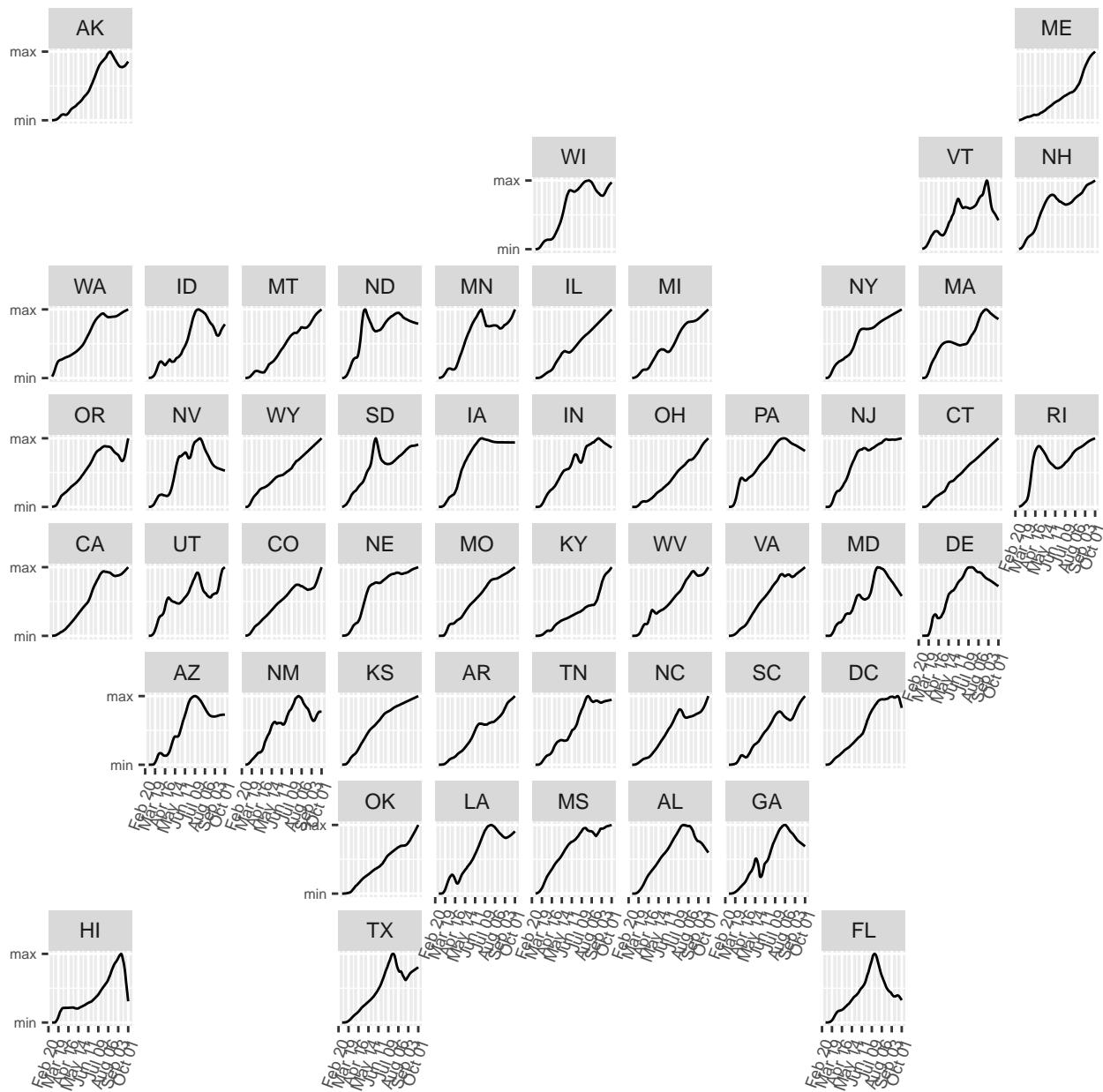


Average US COVID-19 deaths over the past 7 days



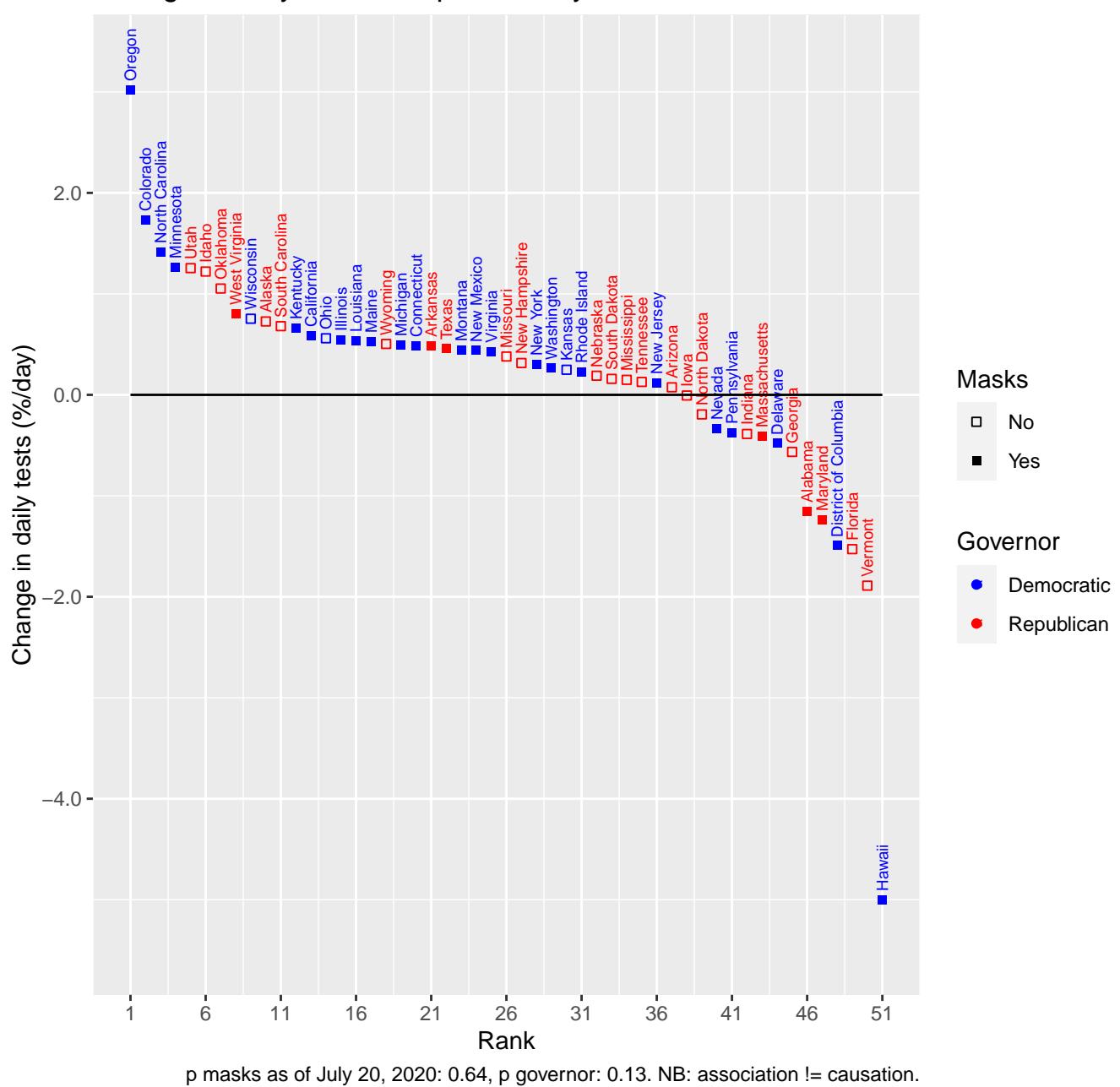
Daily testing trends from min to max

Daily testing from min to max

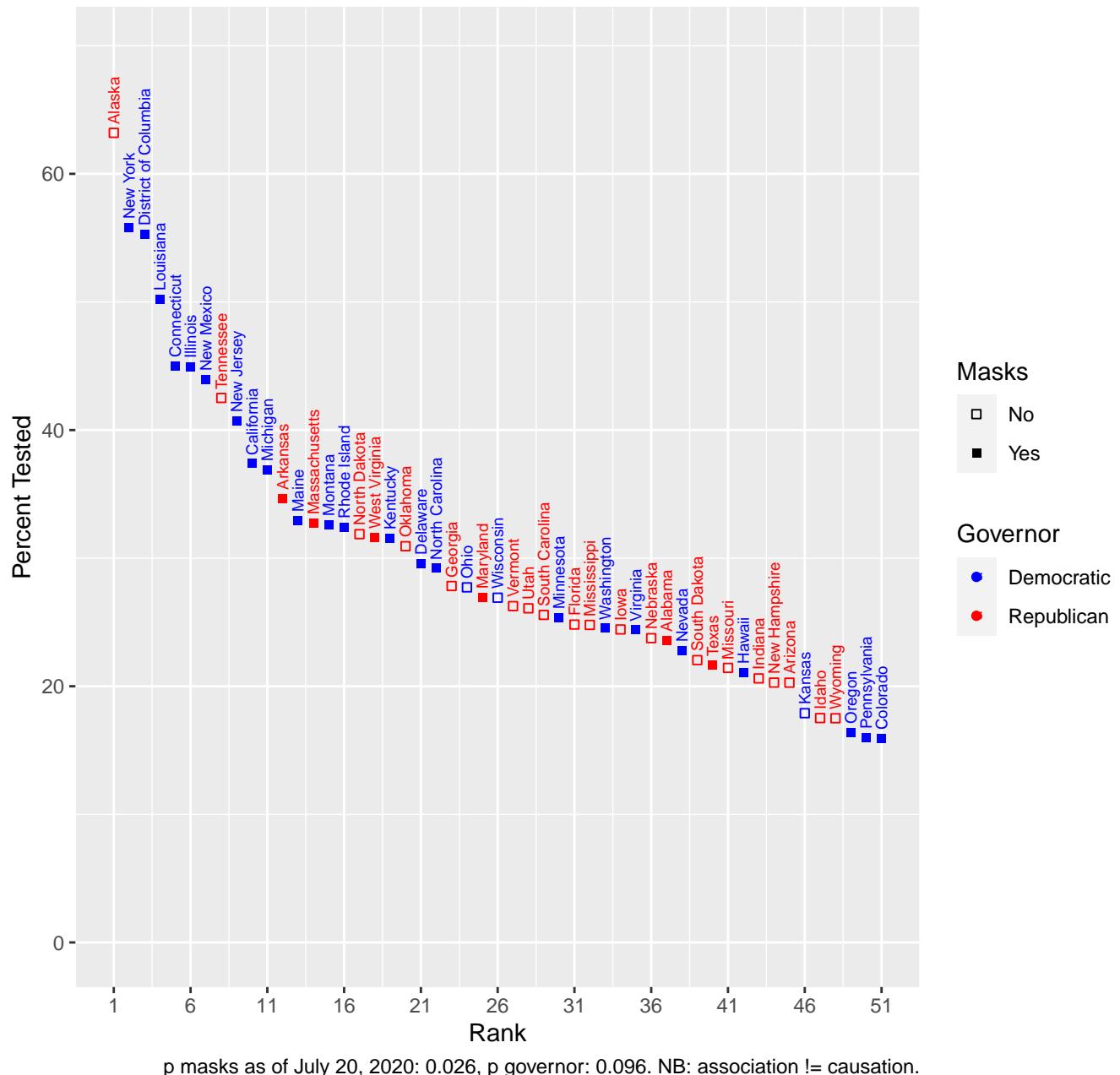


Line = Friedman's supersmooter

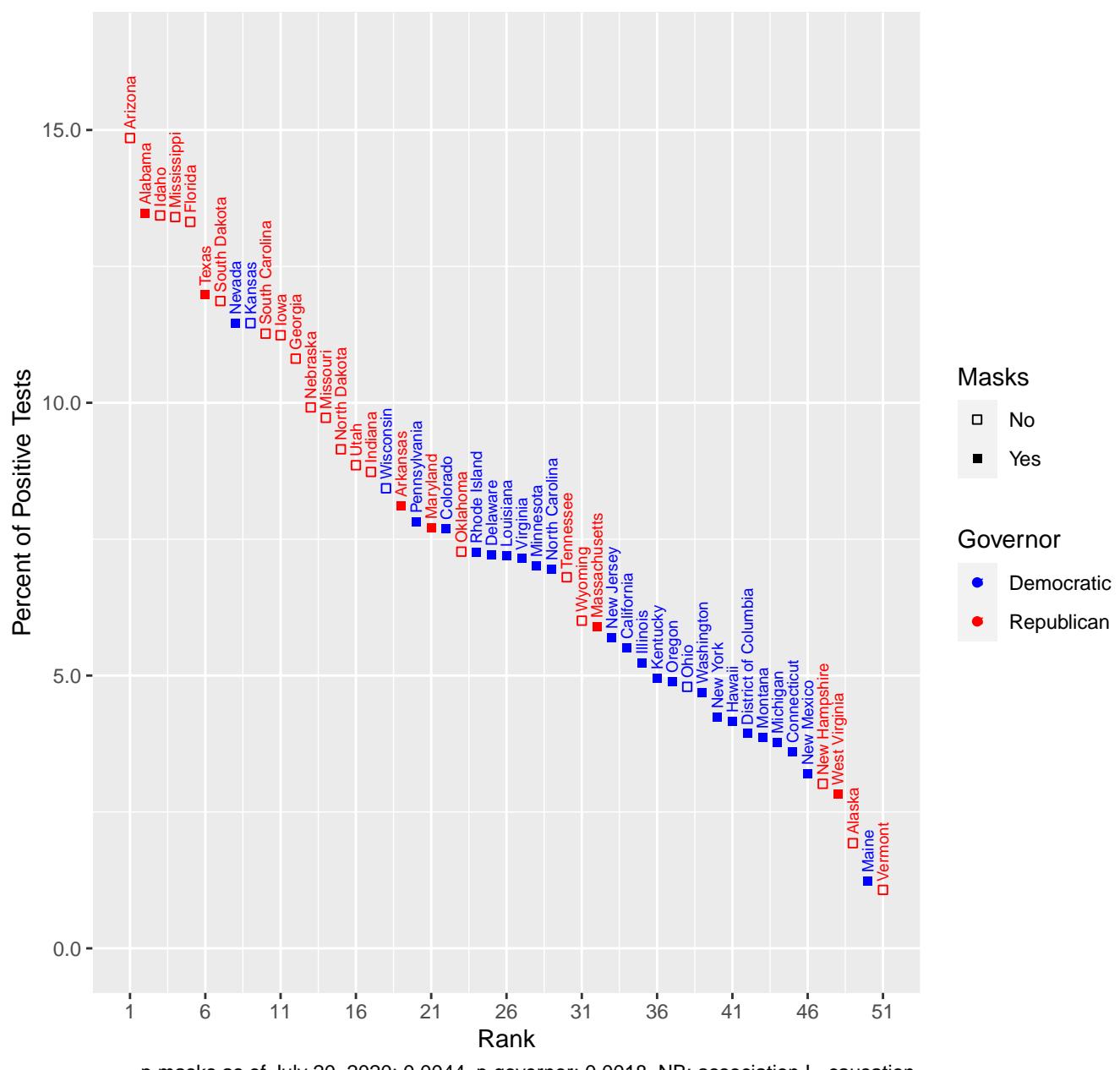
Change in daily tests over past 14 days



Percent Tested

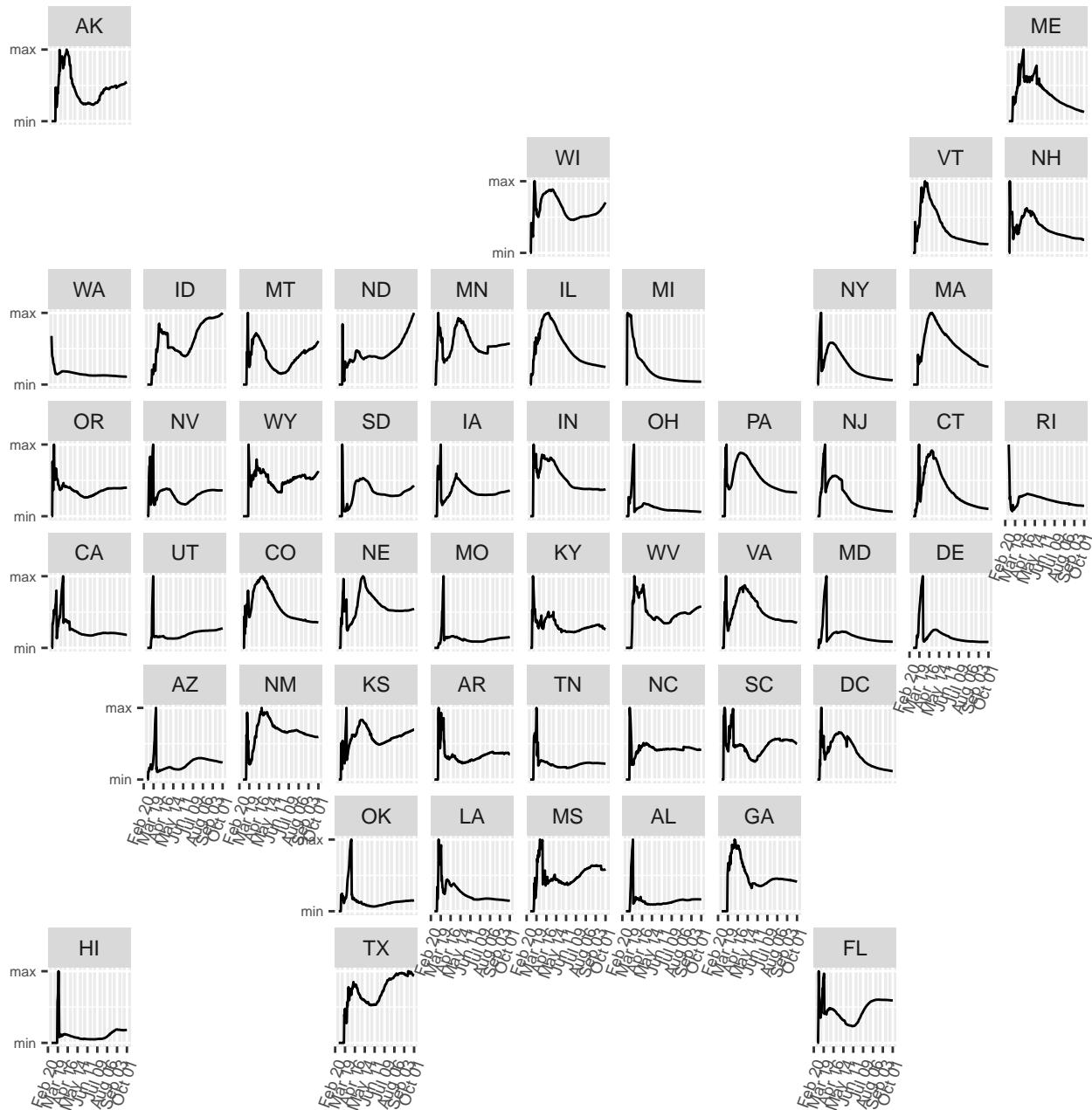


Percent of Positive COVID Tests



Positive fraction trends from min to max

Fraction positive from min to max



Change in positive tests over past 14 days

Change in positive tests (%/day)



Masks

- No
- Yes

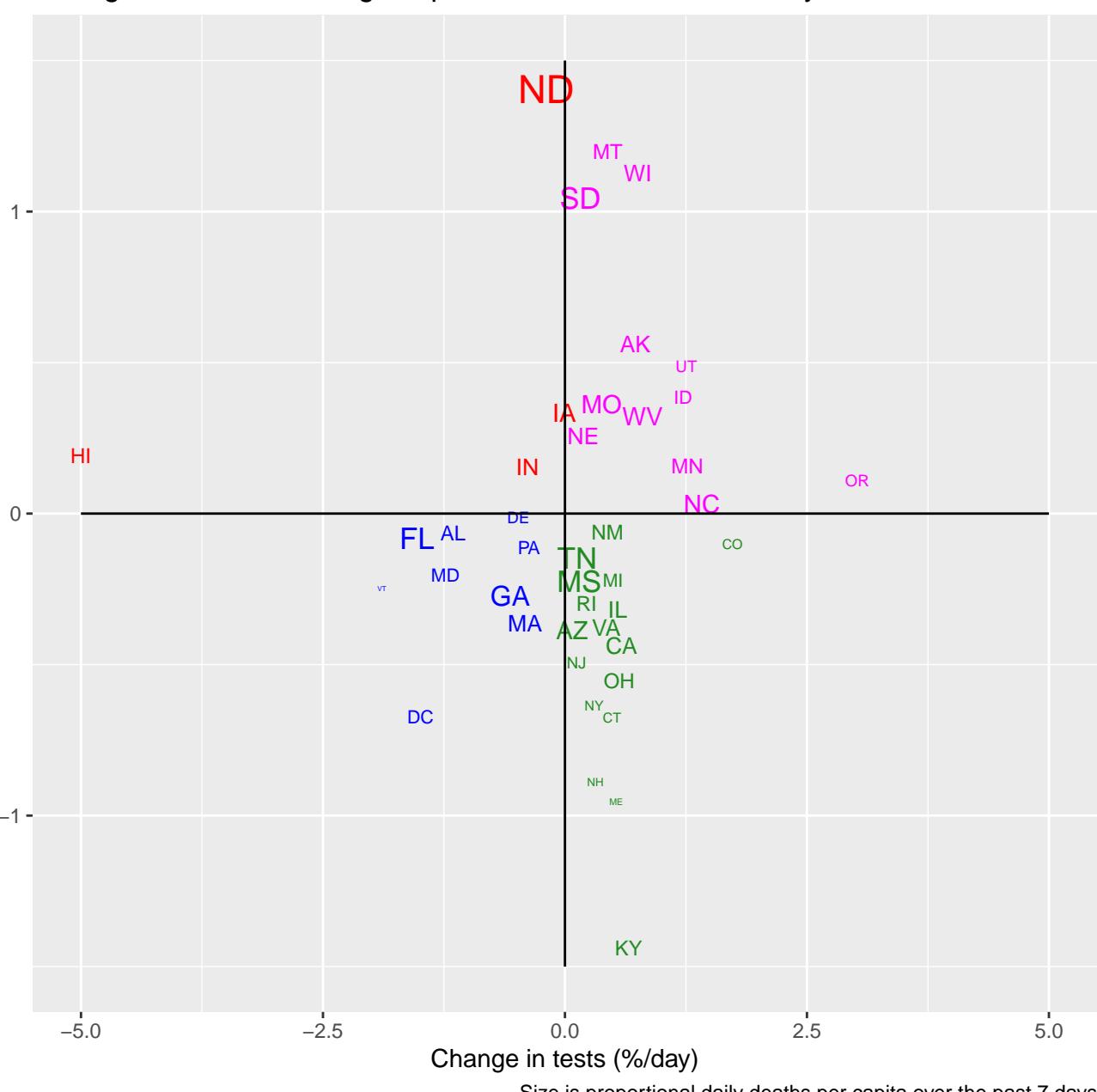
Governor

- Democratic
- Republican

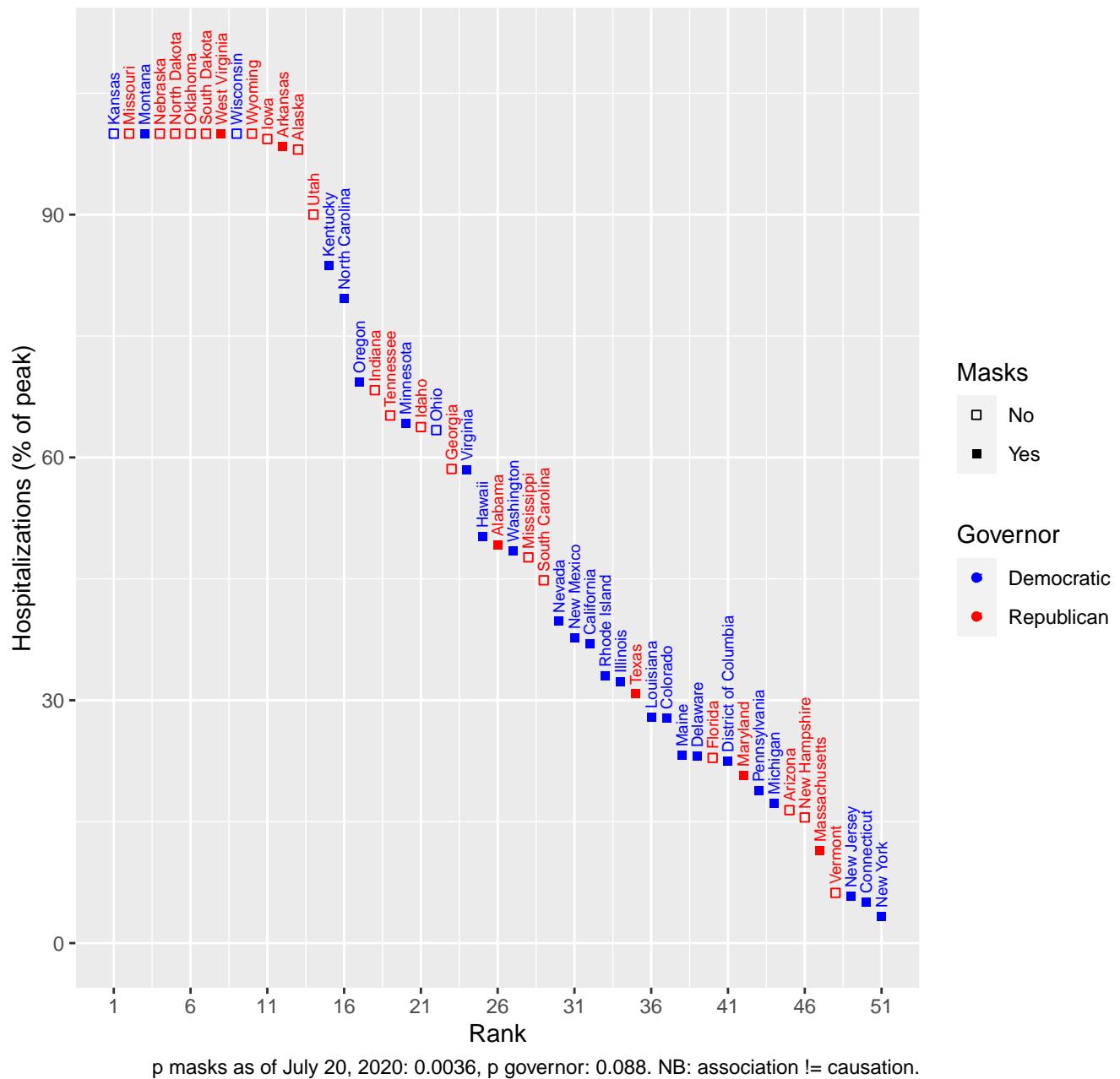
p masks as of July 20, 2020: 0.0097, p governor: 0.085. NB: association != causation.

Change in tests vs. change in positive tests over last 14 days as of 2020-10-02

Change in positive tests (%/day)

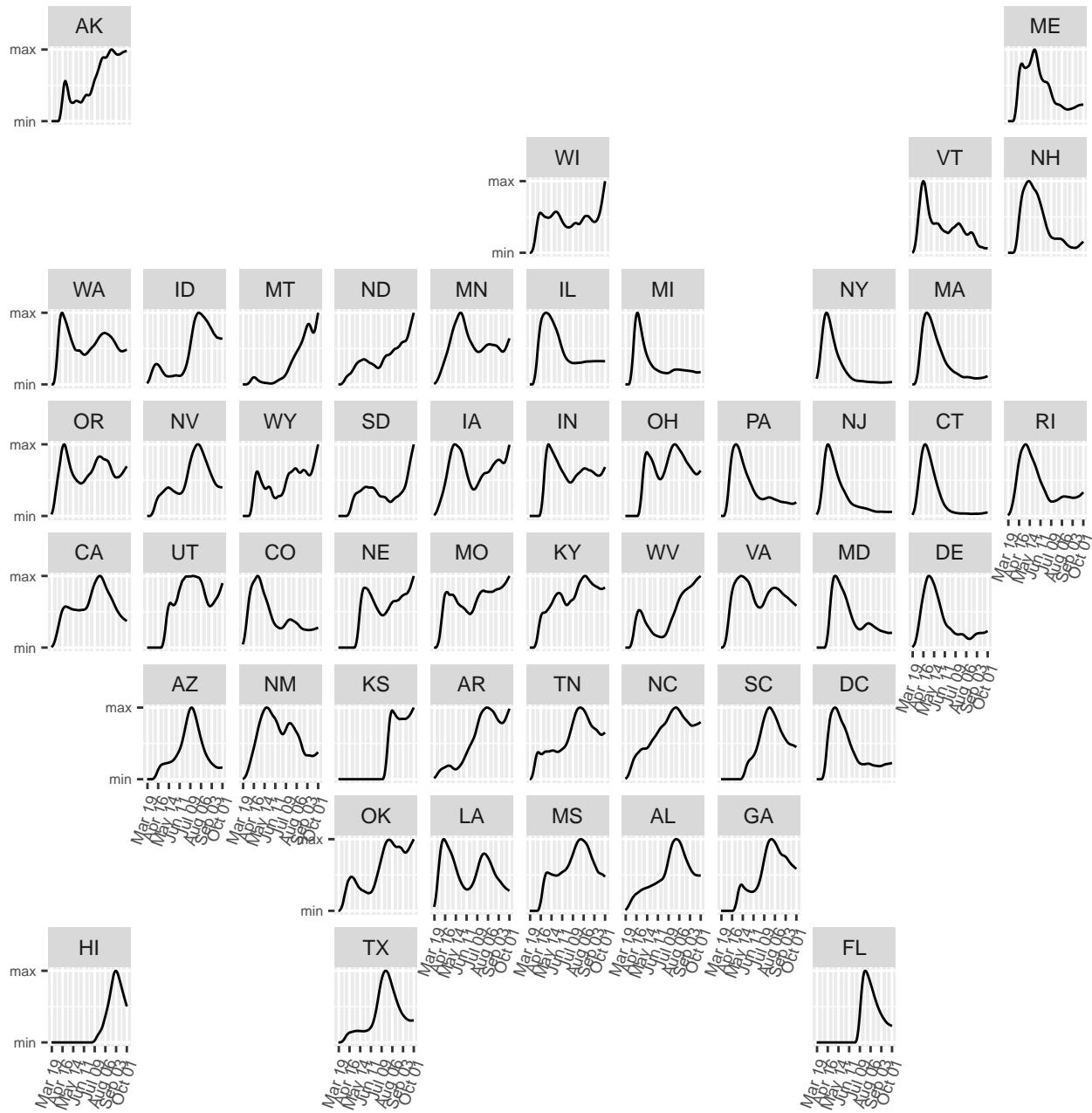


Current hospitalizations as a percent of peak since February

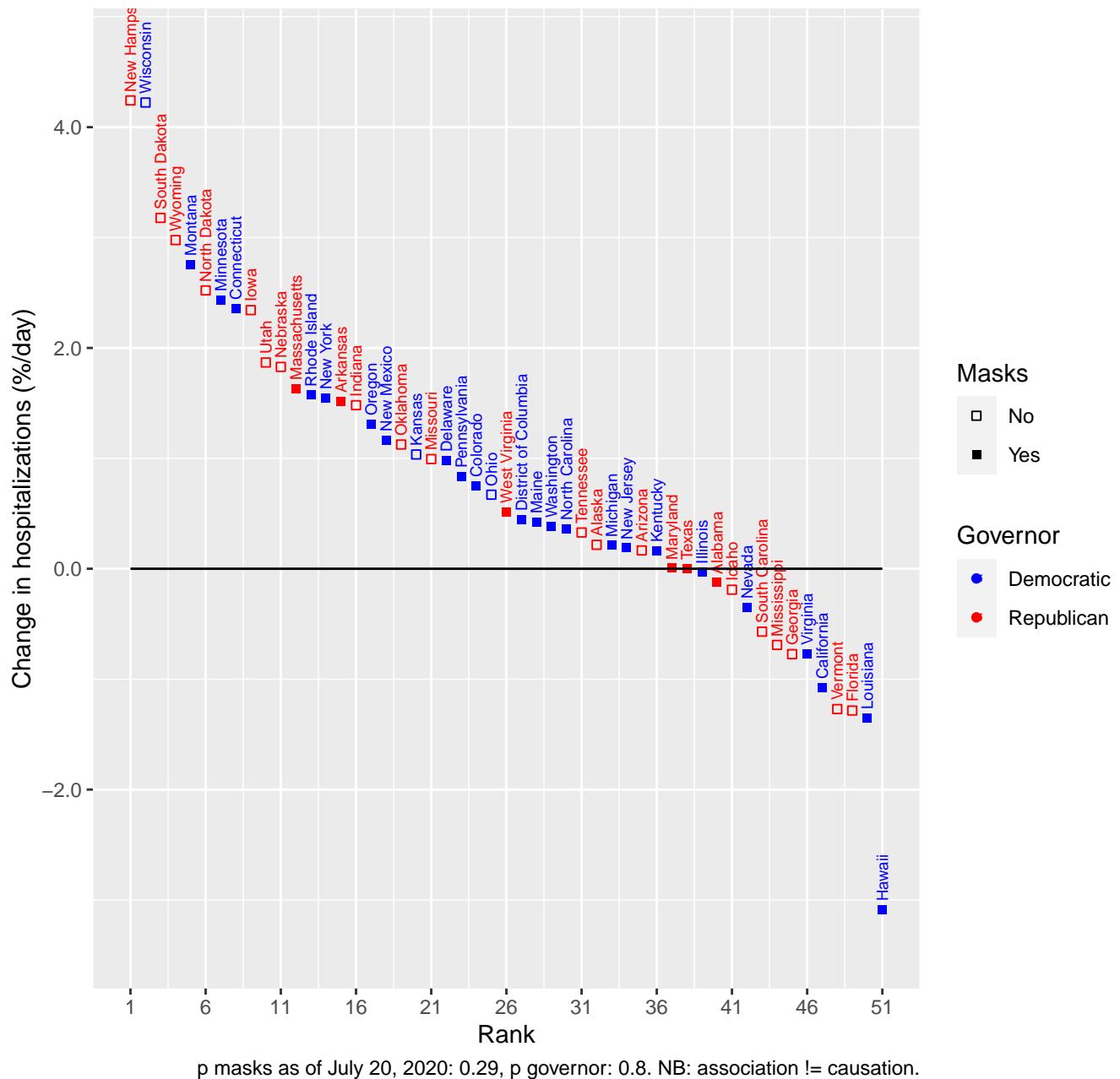


Hospitalizations trends from min to max

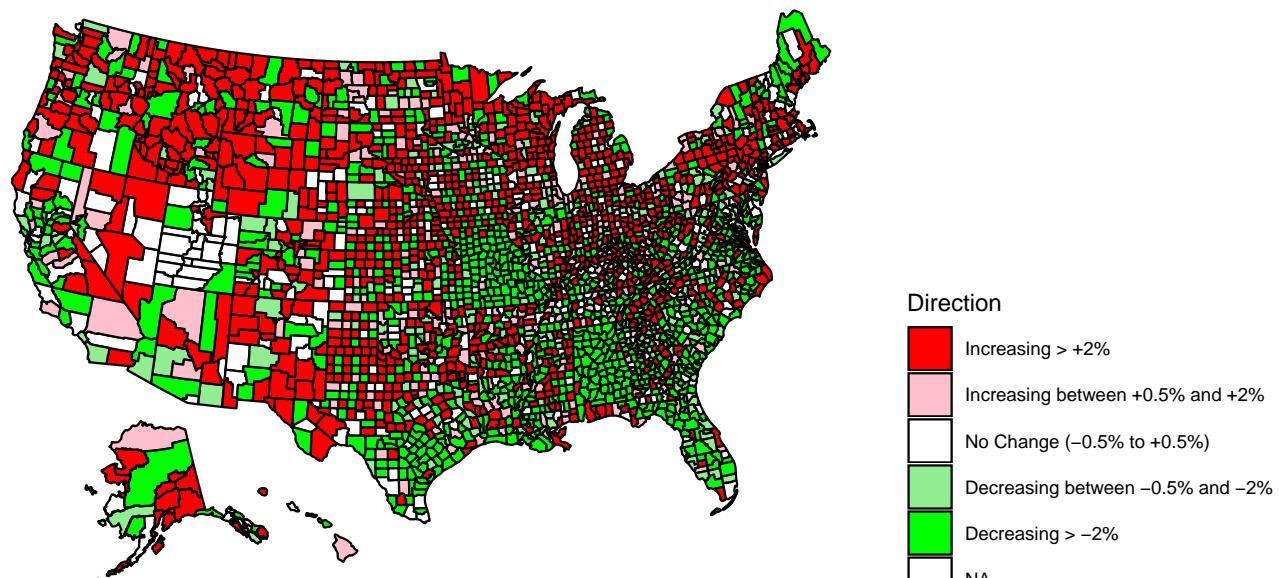
Hospitalizations from min to max



Change in hospitalizations over past 14 days

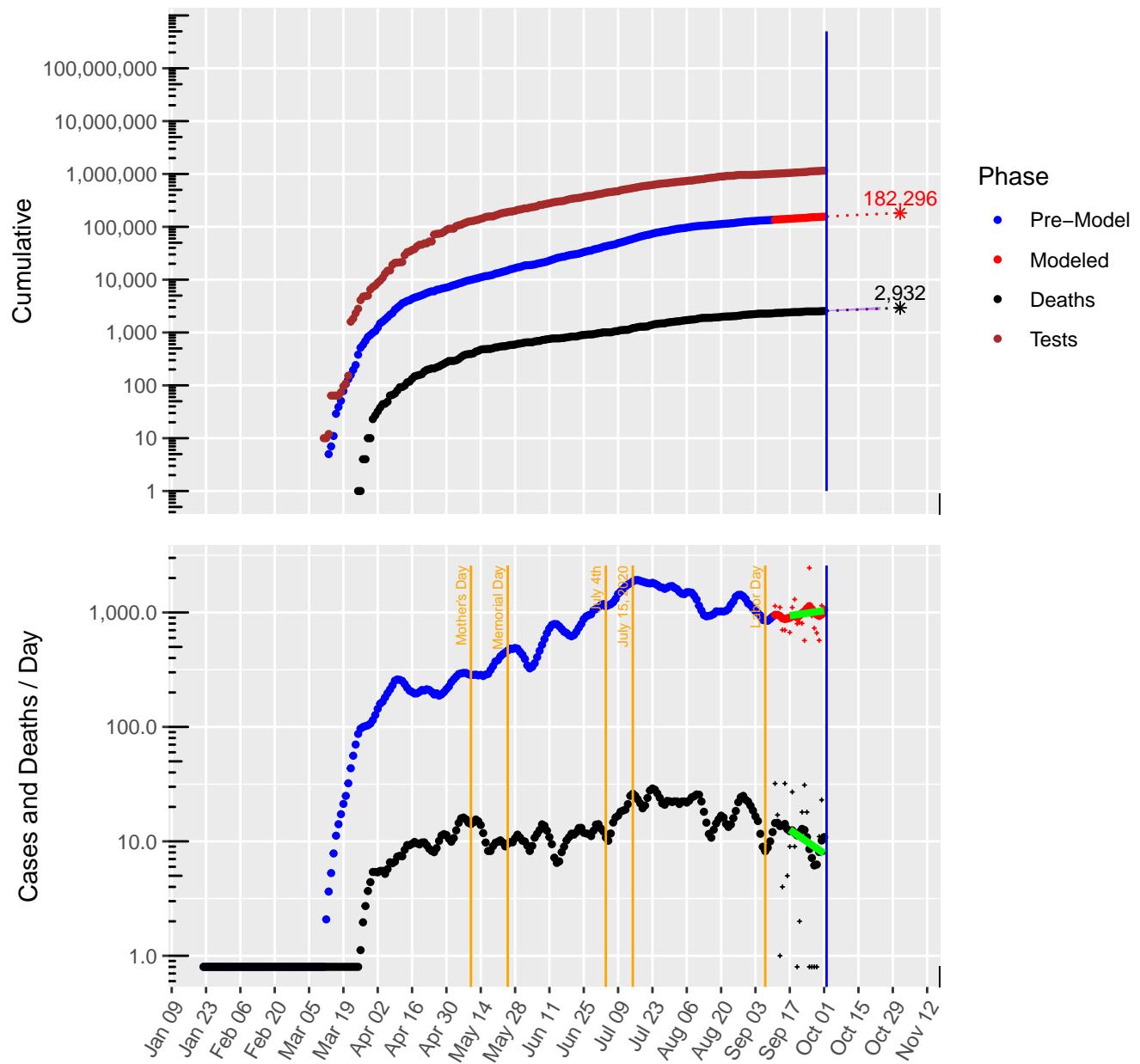


Trends by county as of 2020-10-02

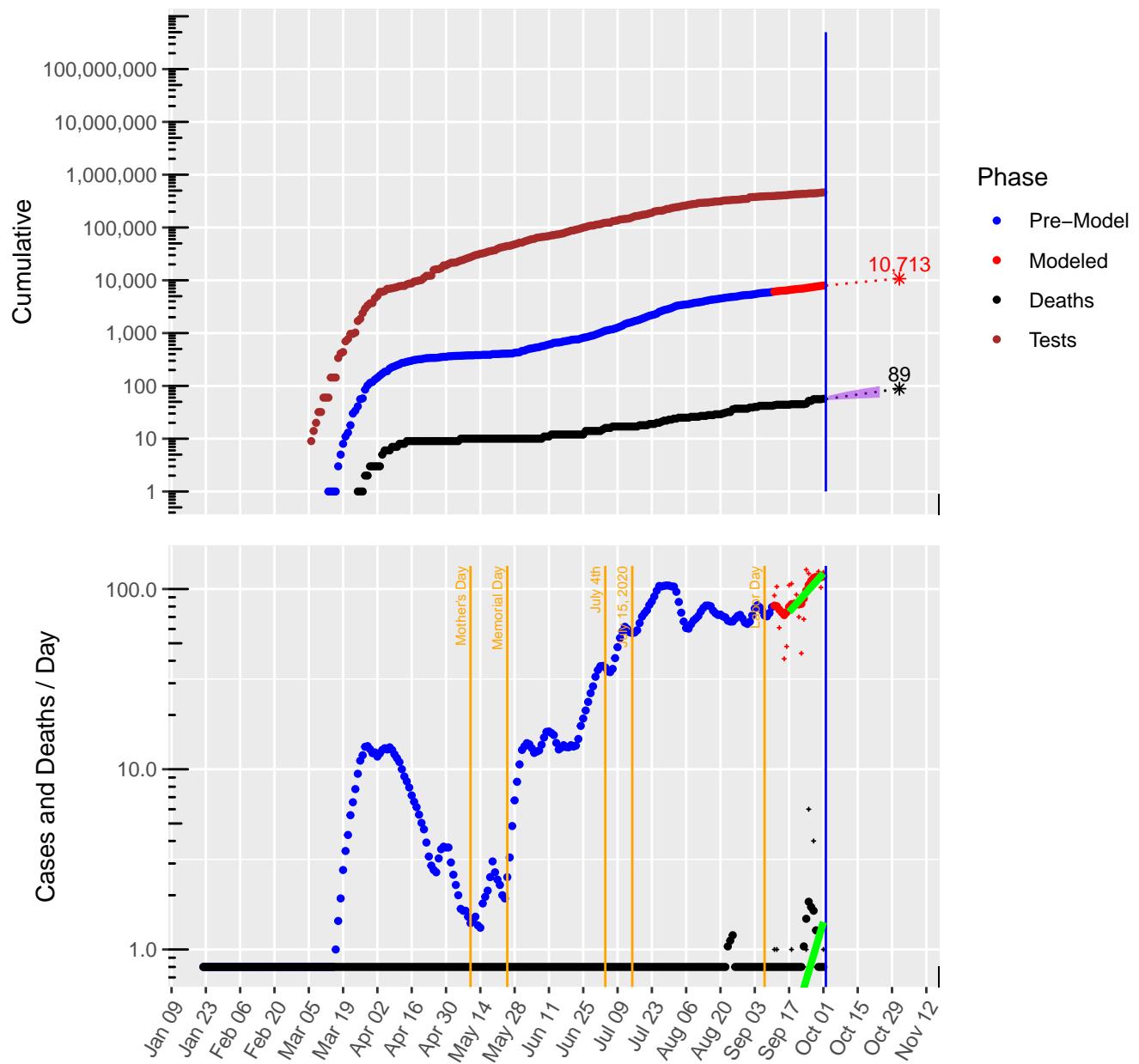


NA = Inadequate data

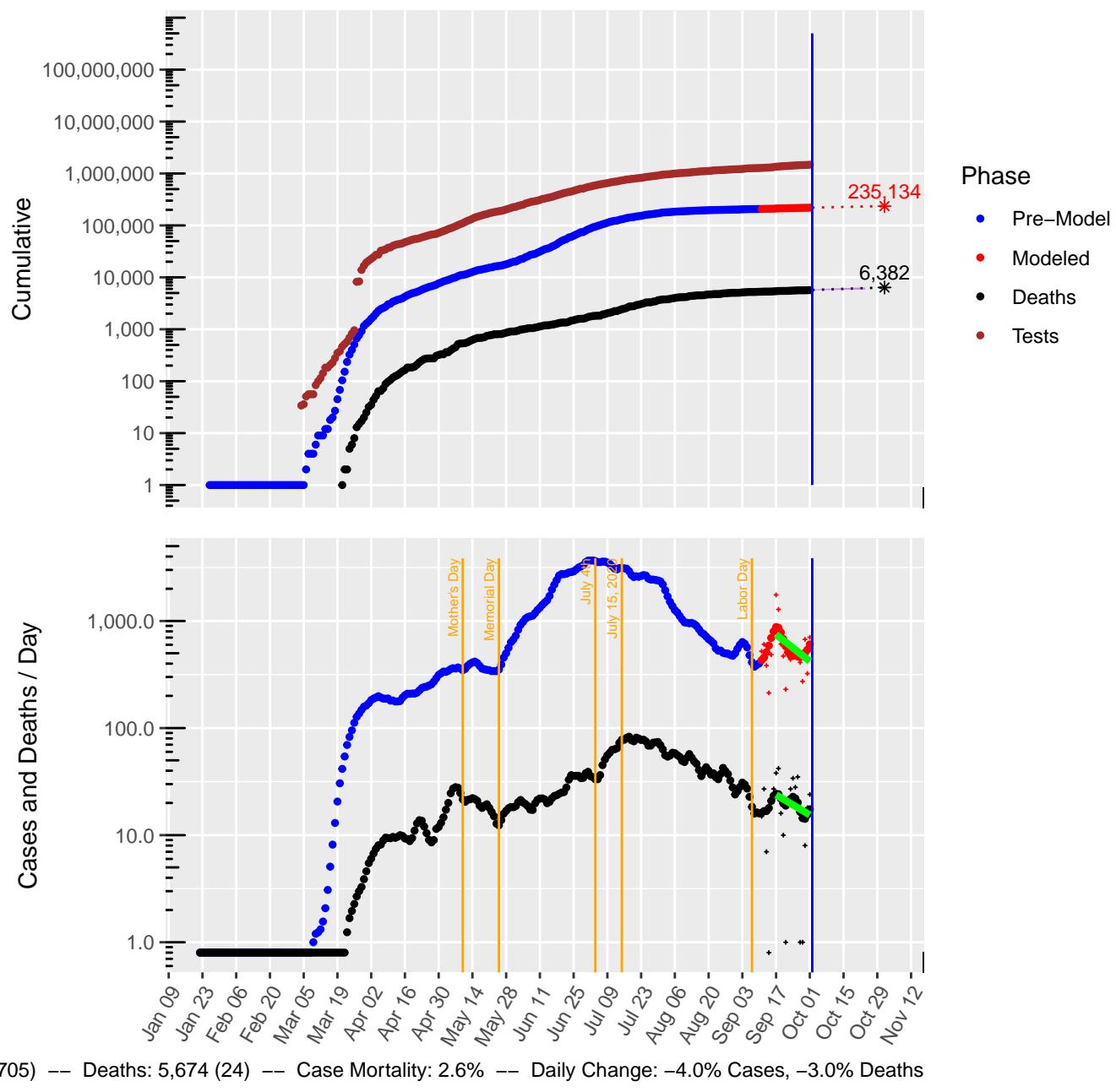
Alabama projection as of 2020-10-02



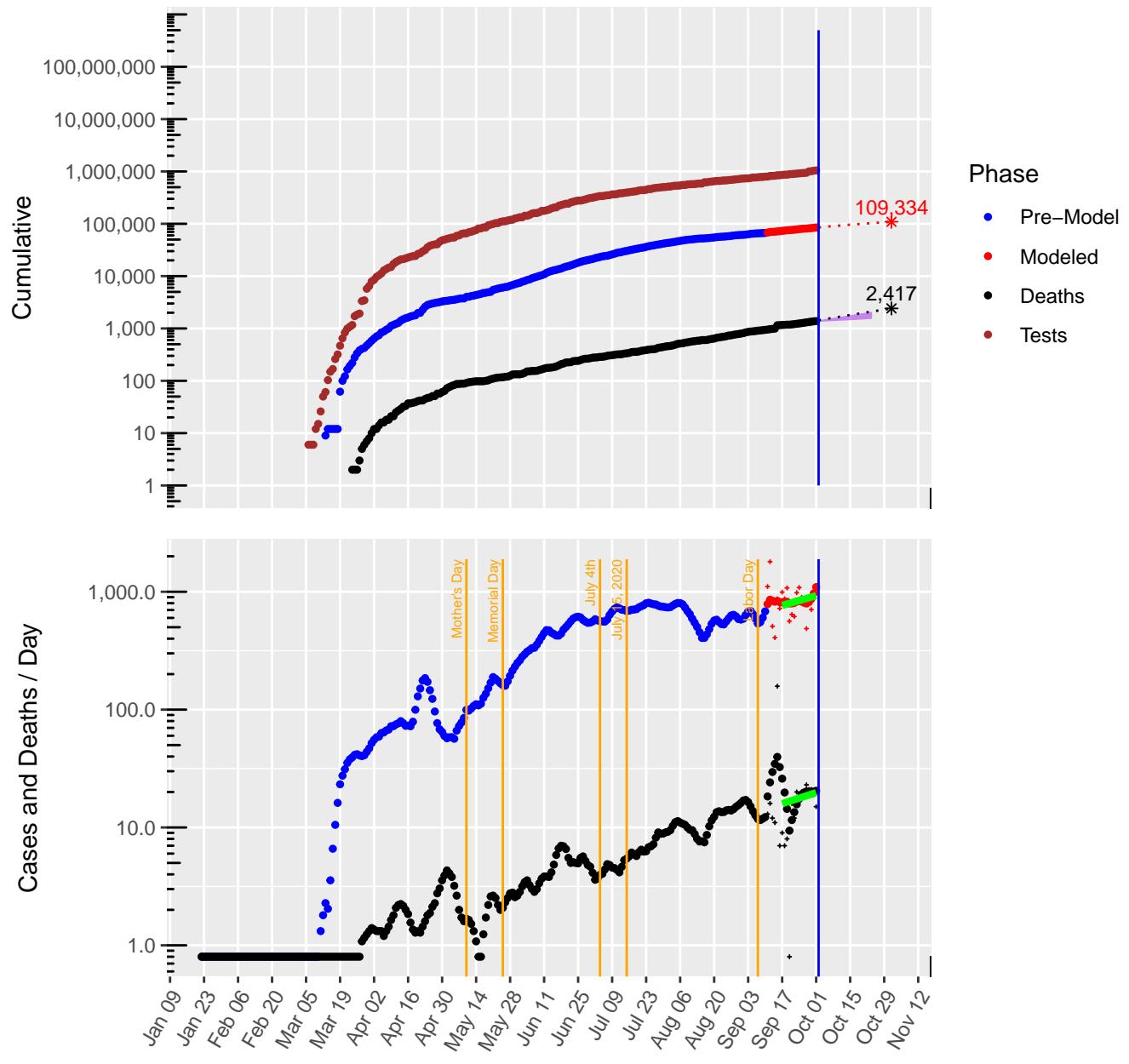
Alaska projection as of 2020-10-02



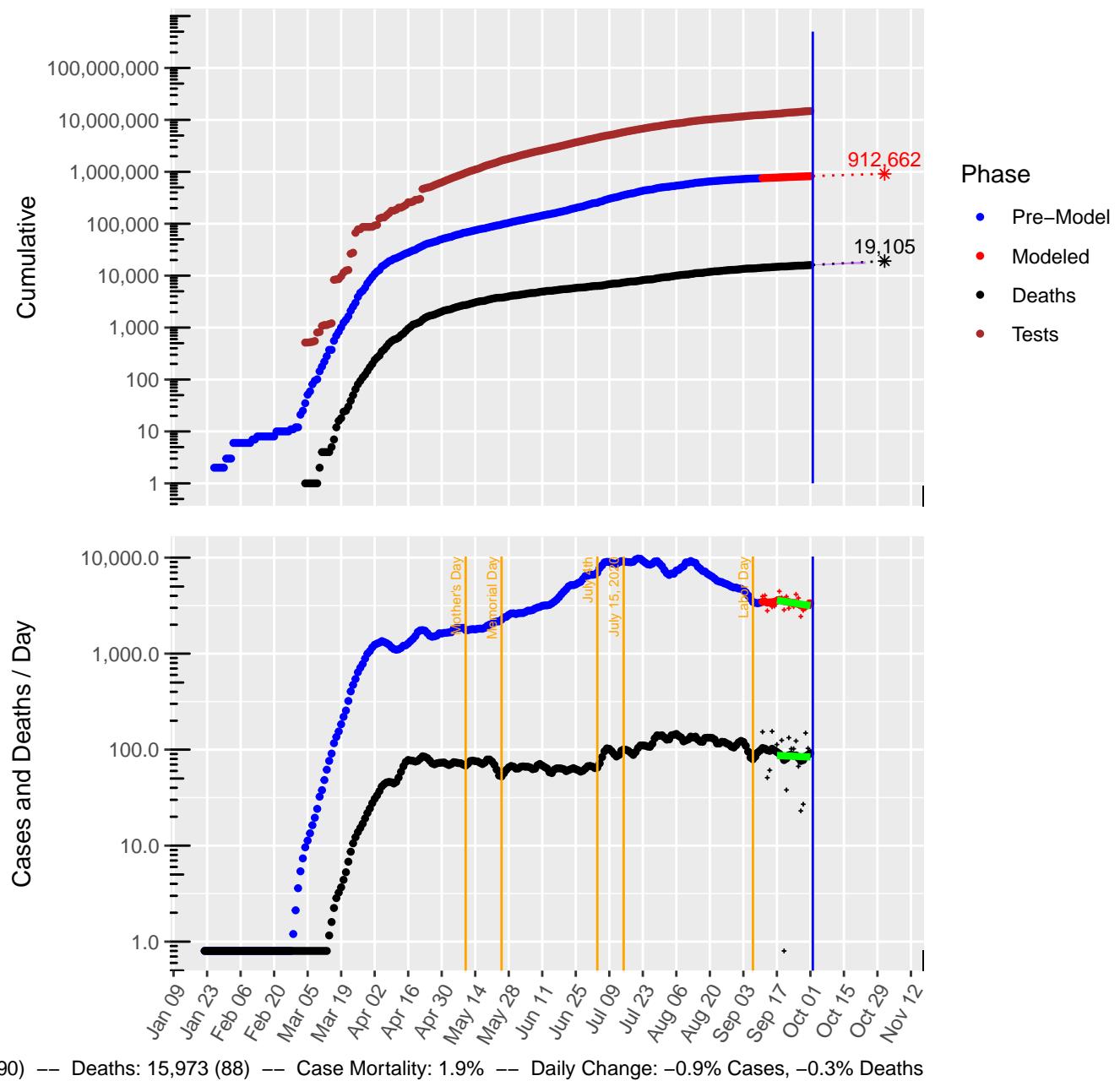
Arizona projection as of 2020-10-02



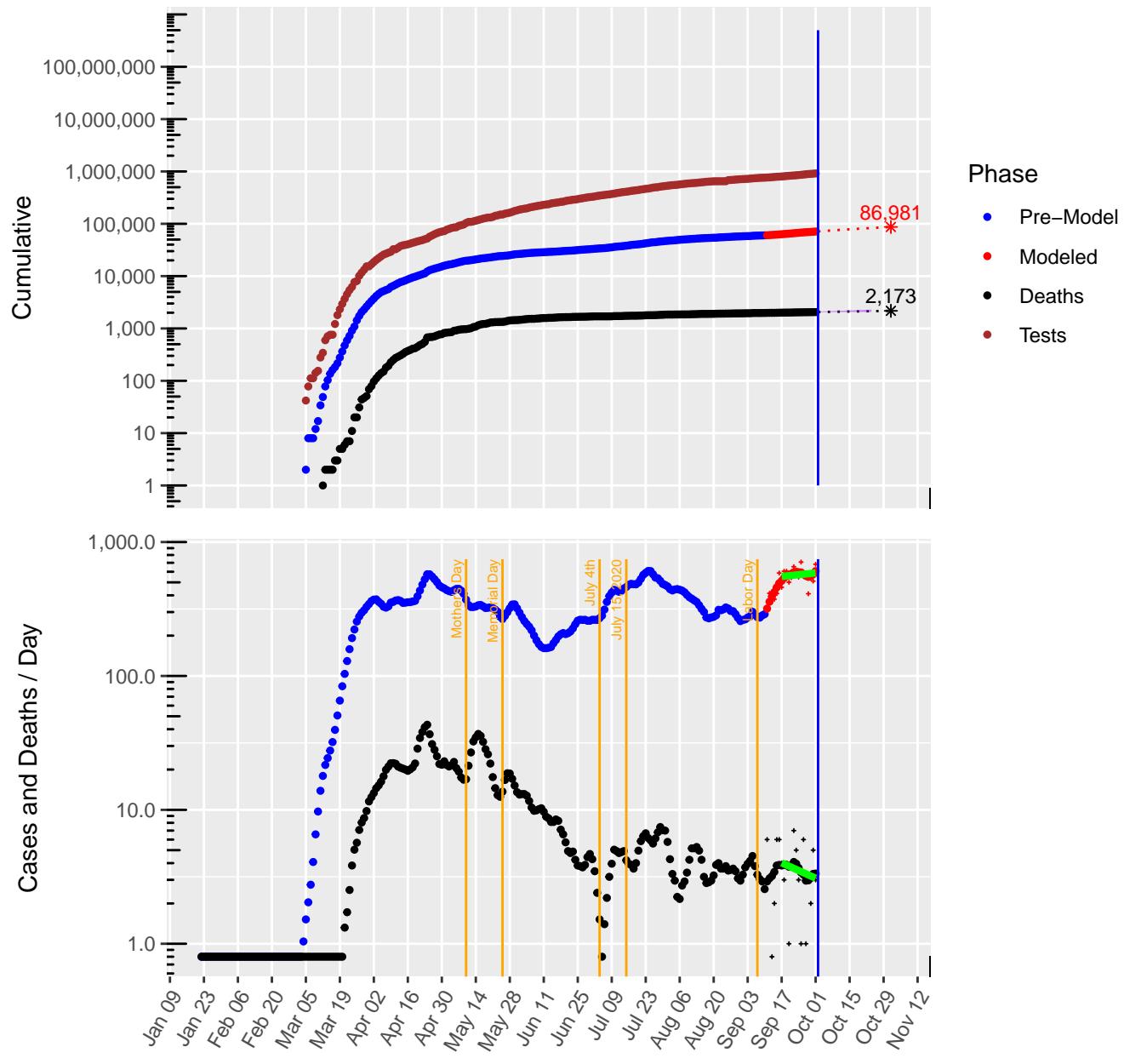
Arkansas projection as of 2020-10-02



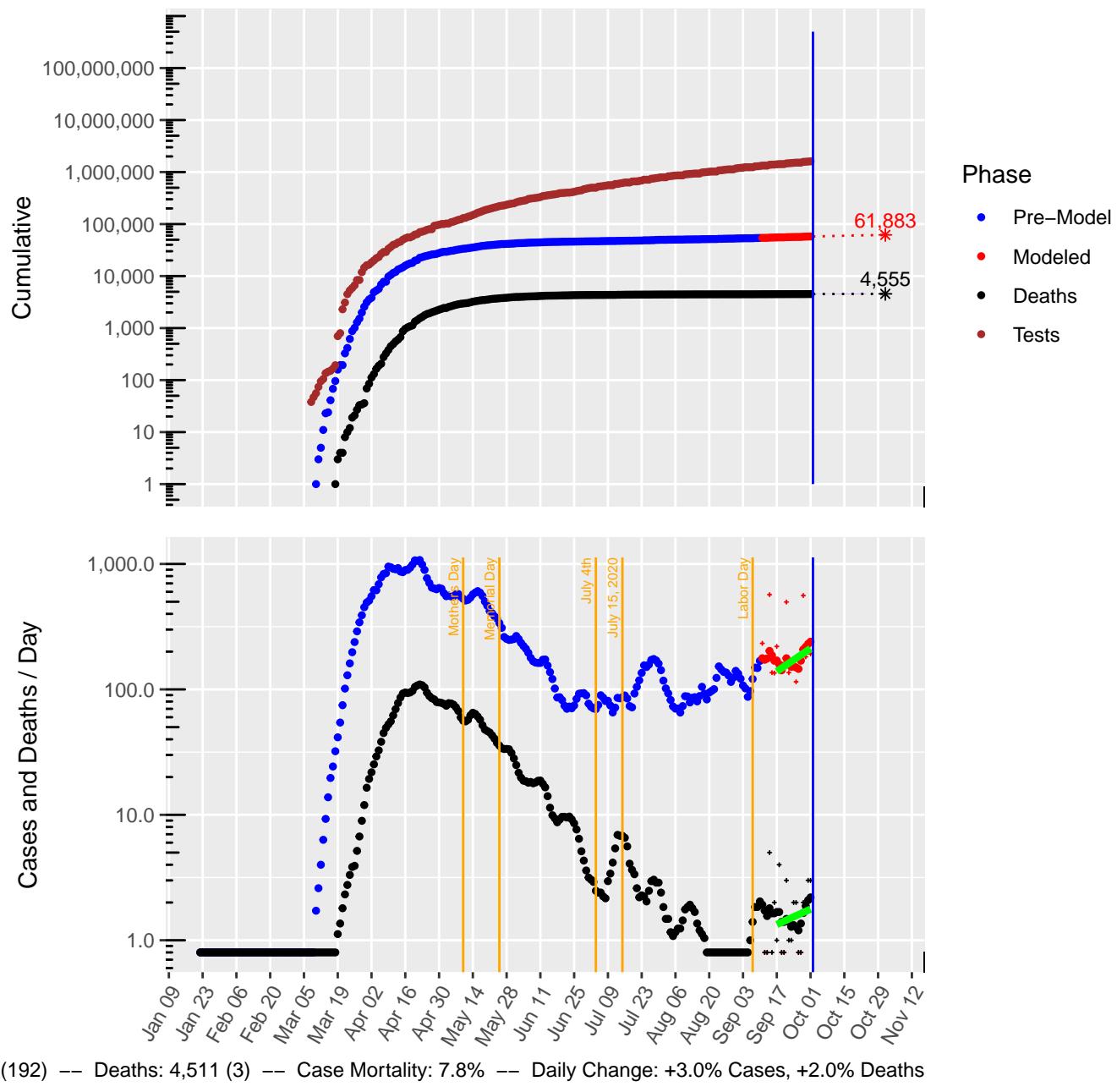
California projection as of 2020-10-02



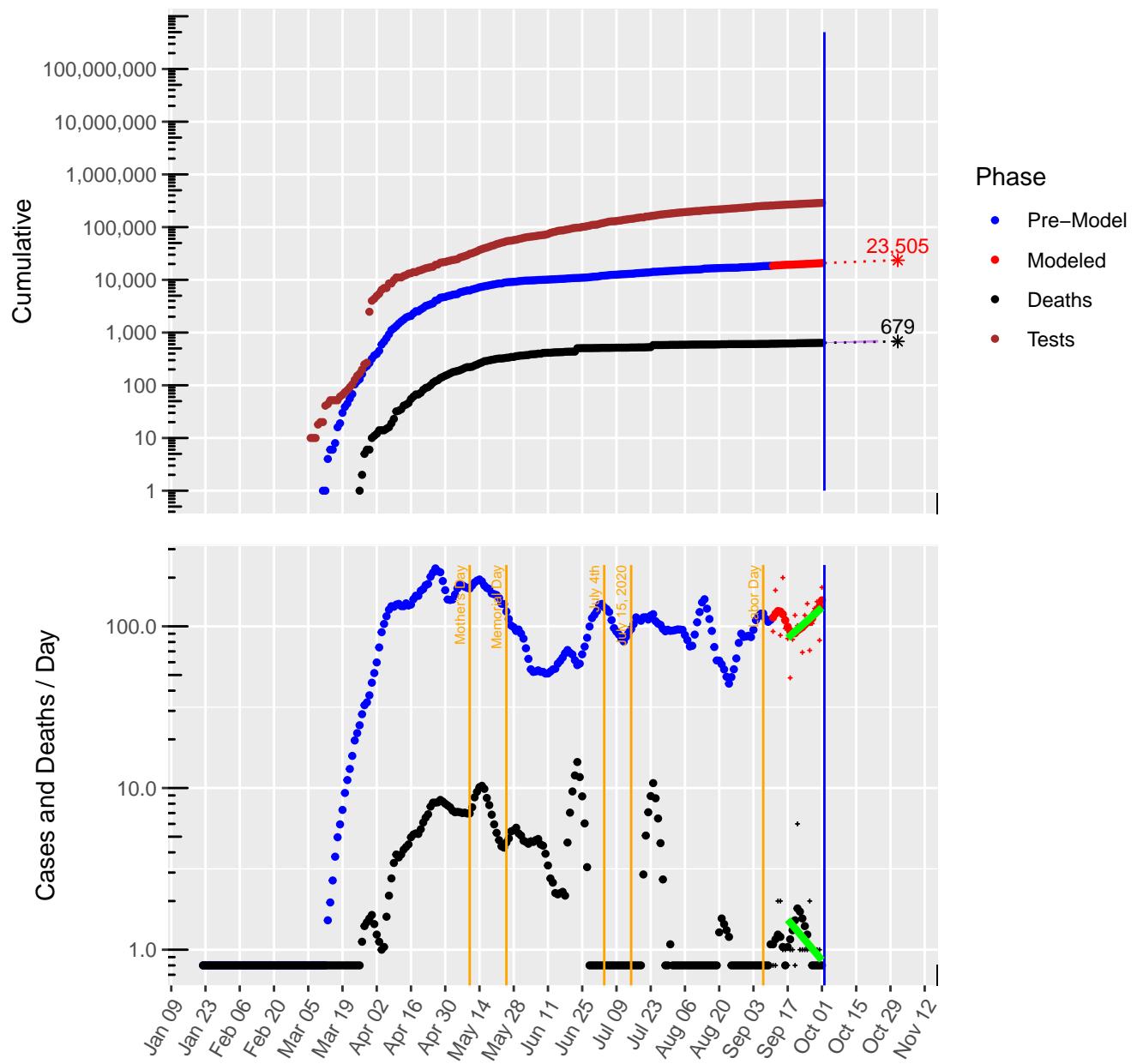
Colorado projection as of 2020-10-02



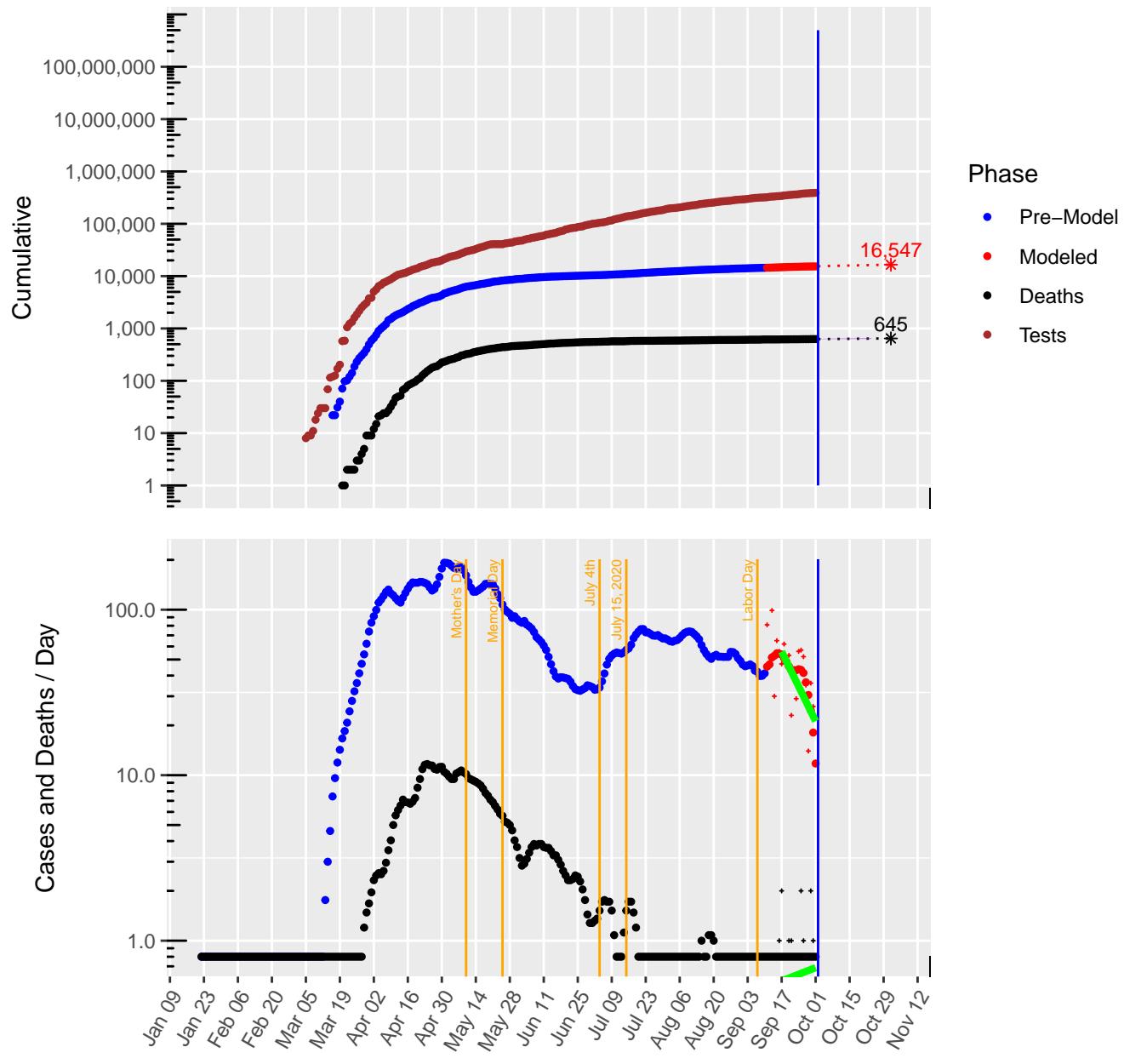
Connecticut projection as of 2020-10-02



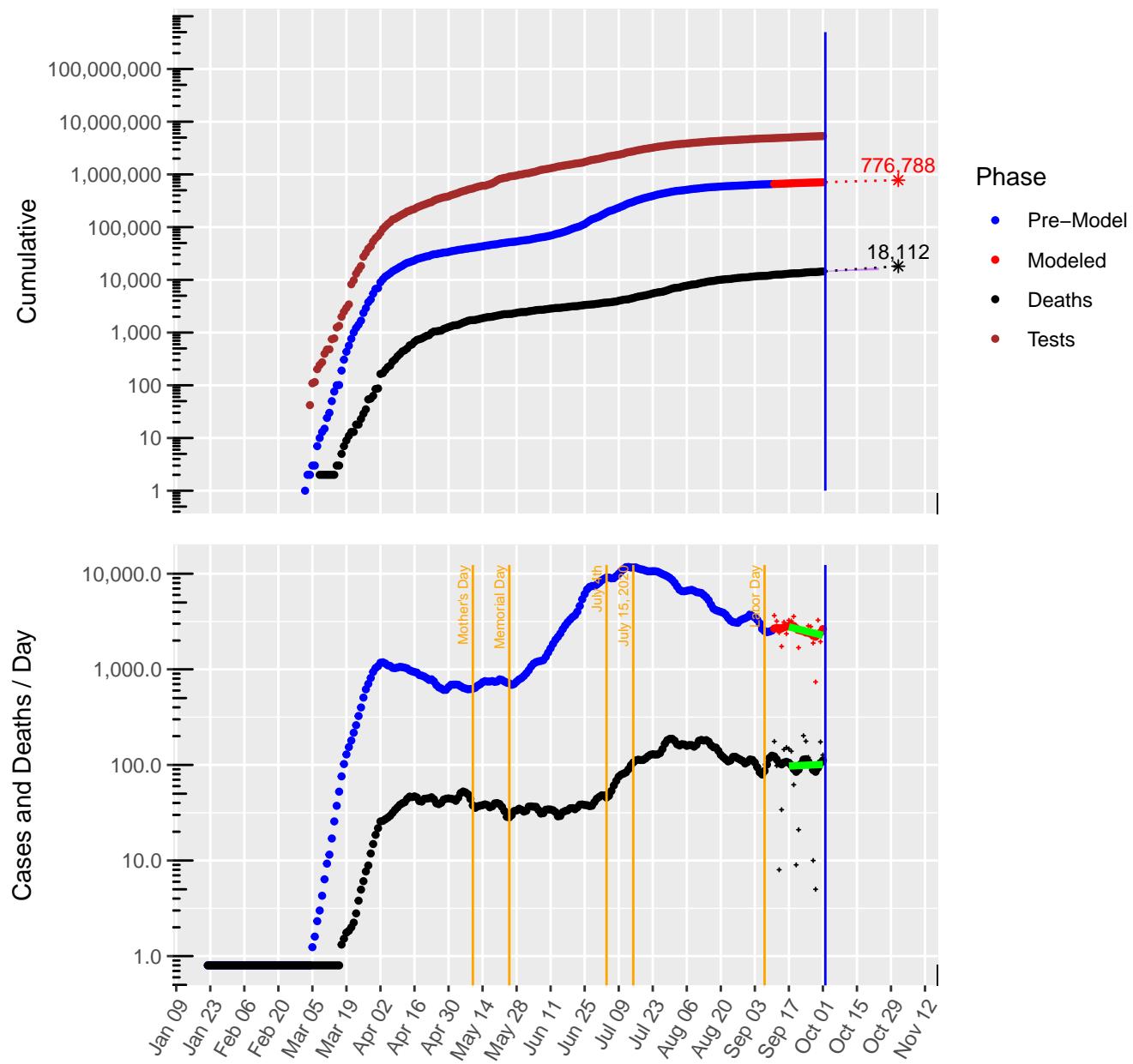
Delaware projection as of 2020-10-02



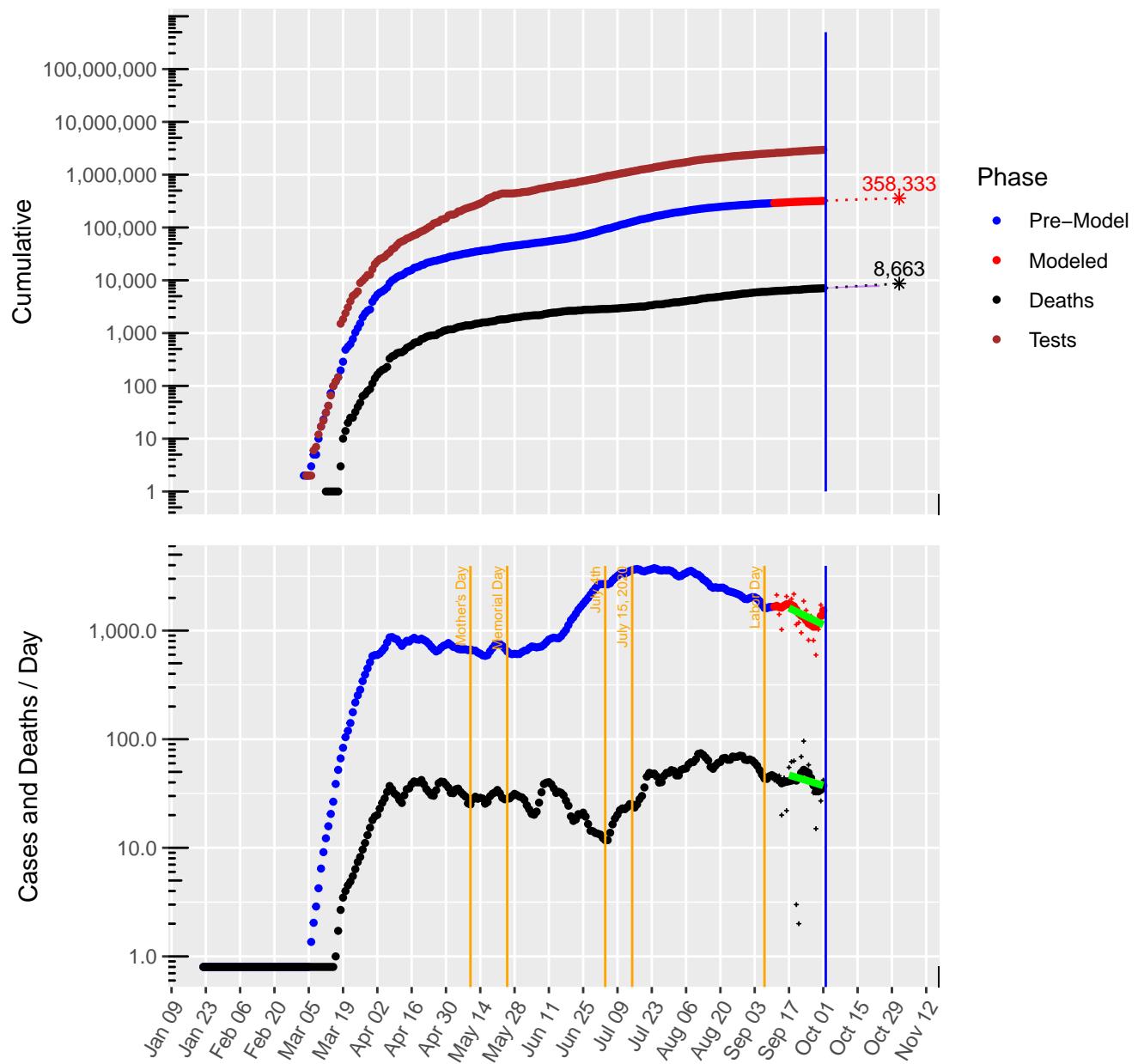
District of Columbia projection as of 2020-10-02



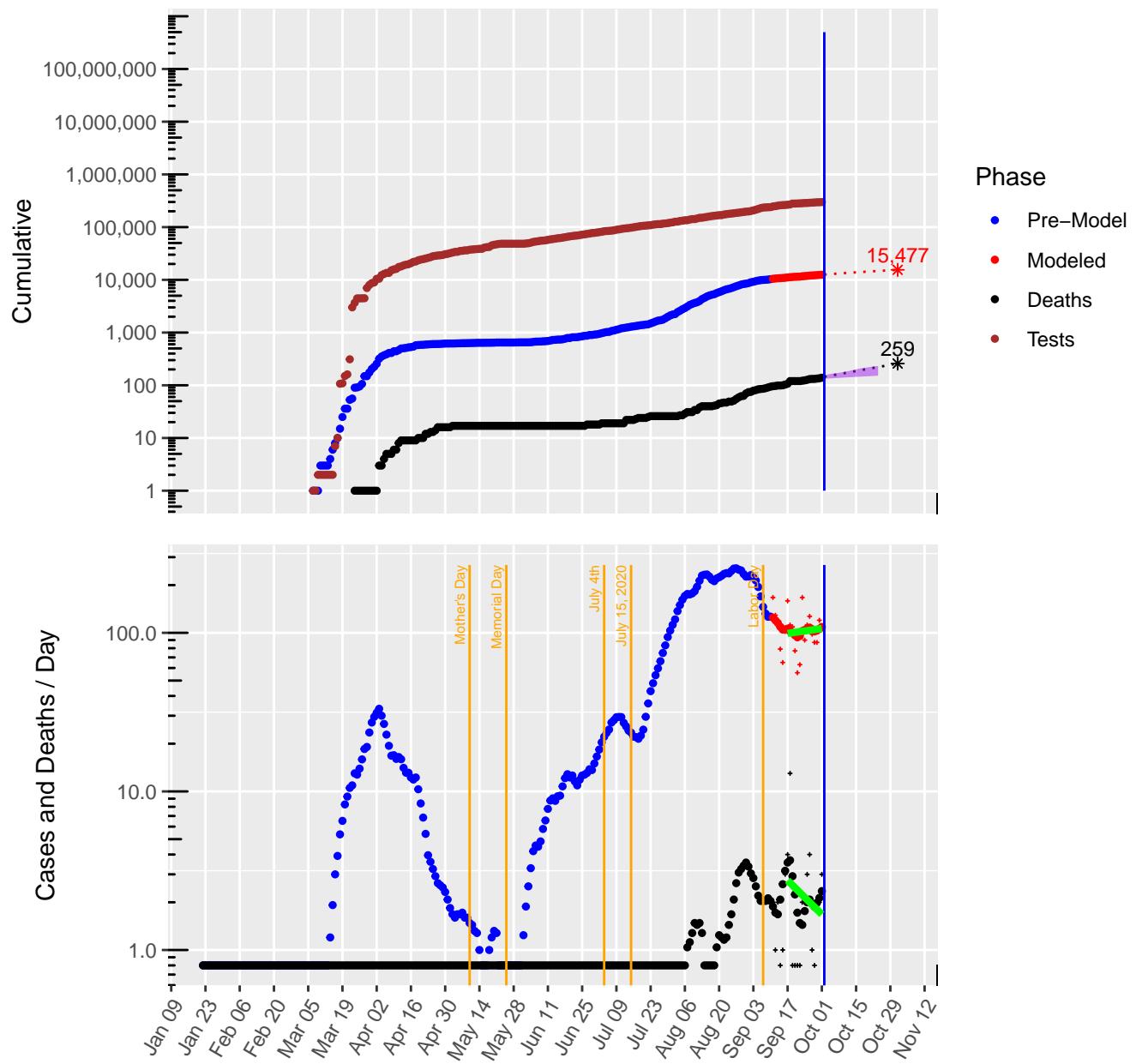
Florida projection as of 2020-10-02



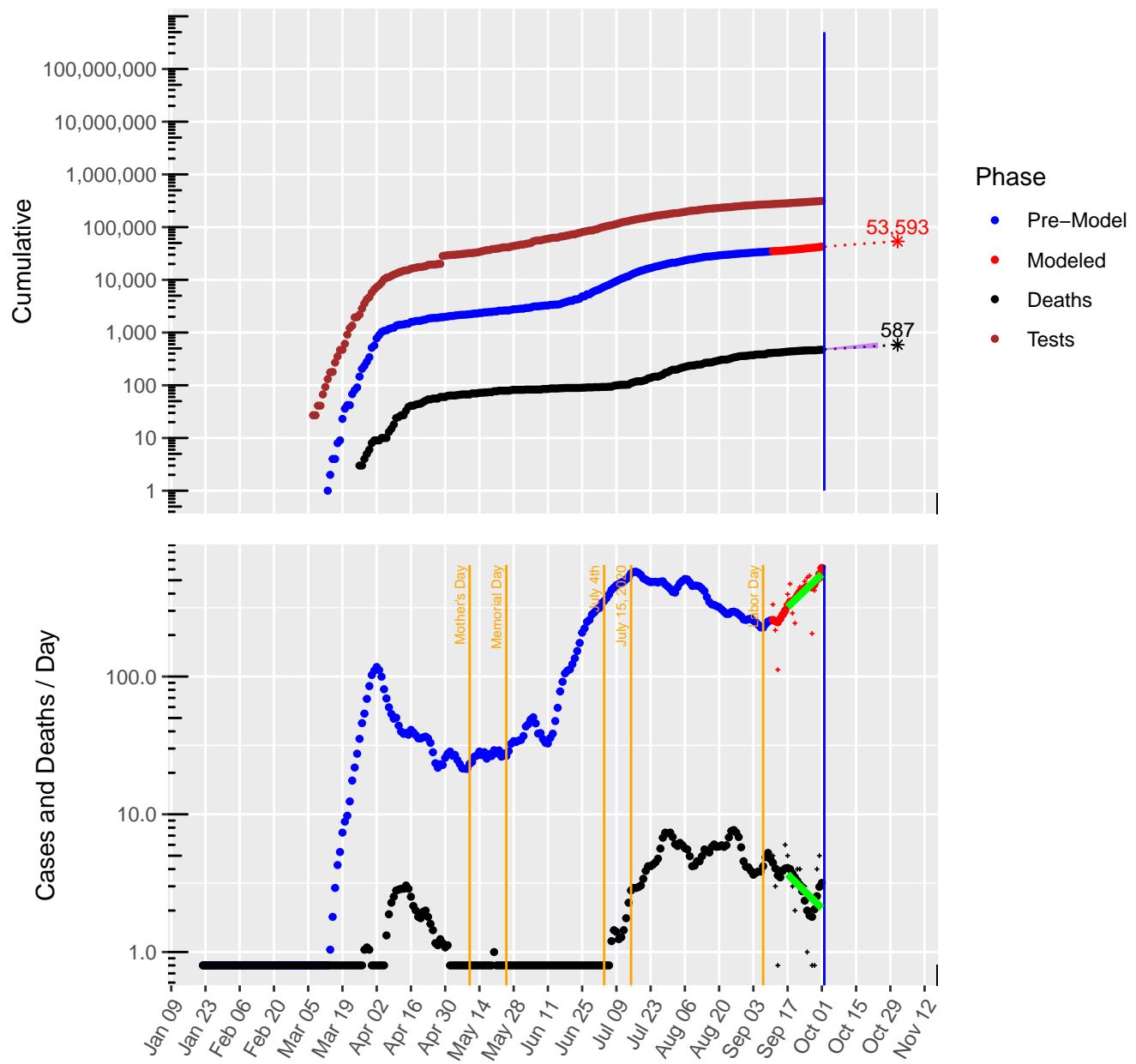
Georgia projection as of 2020-10-02



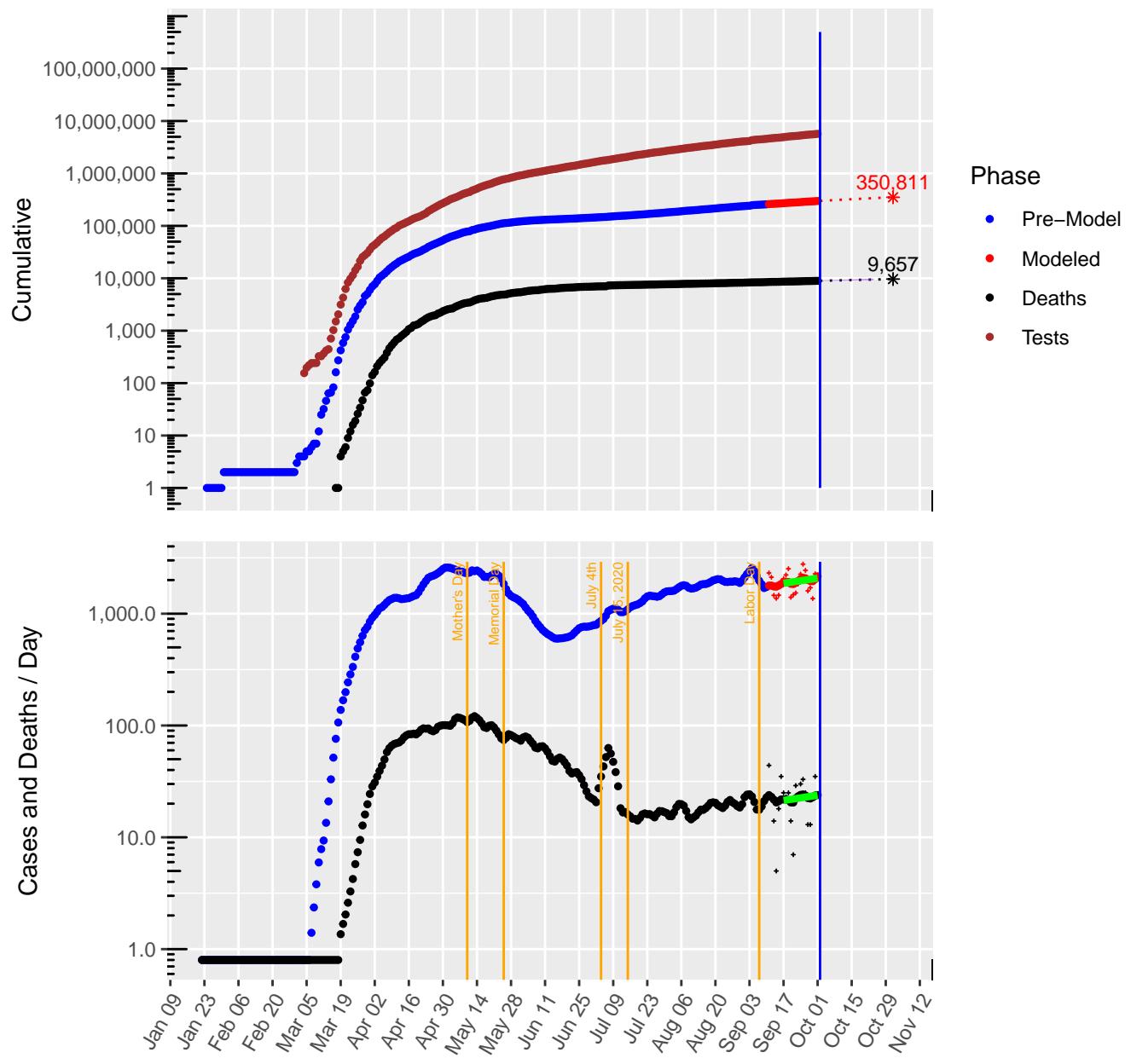
Hawaii projection as of 2020-10-02



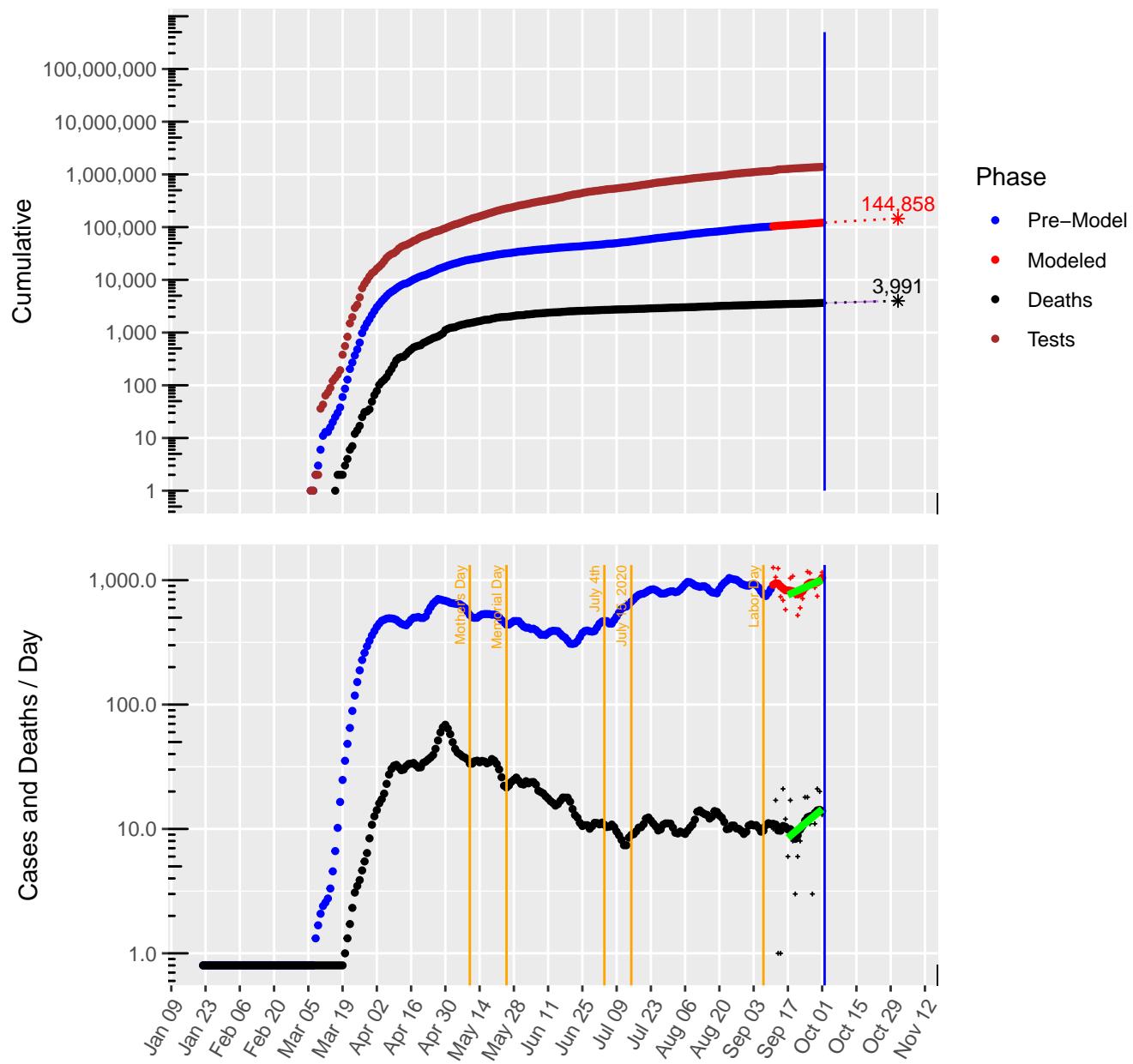
Idaho projection as of 2020-10-02



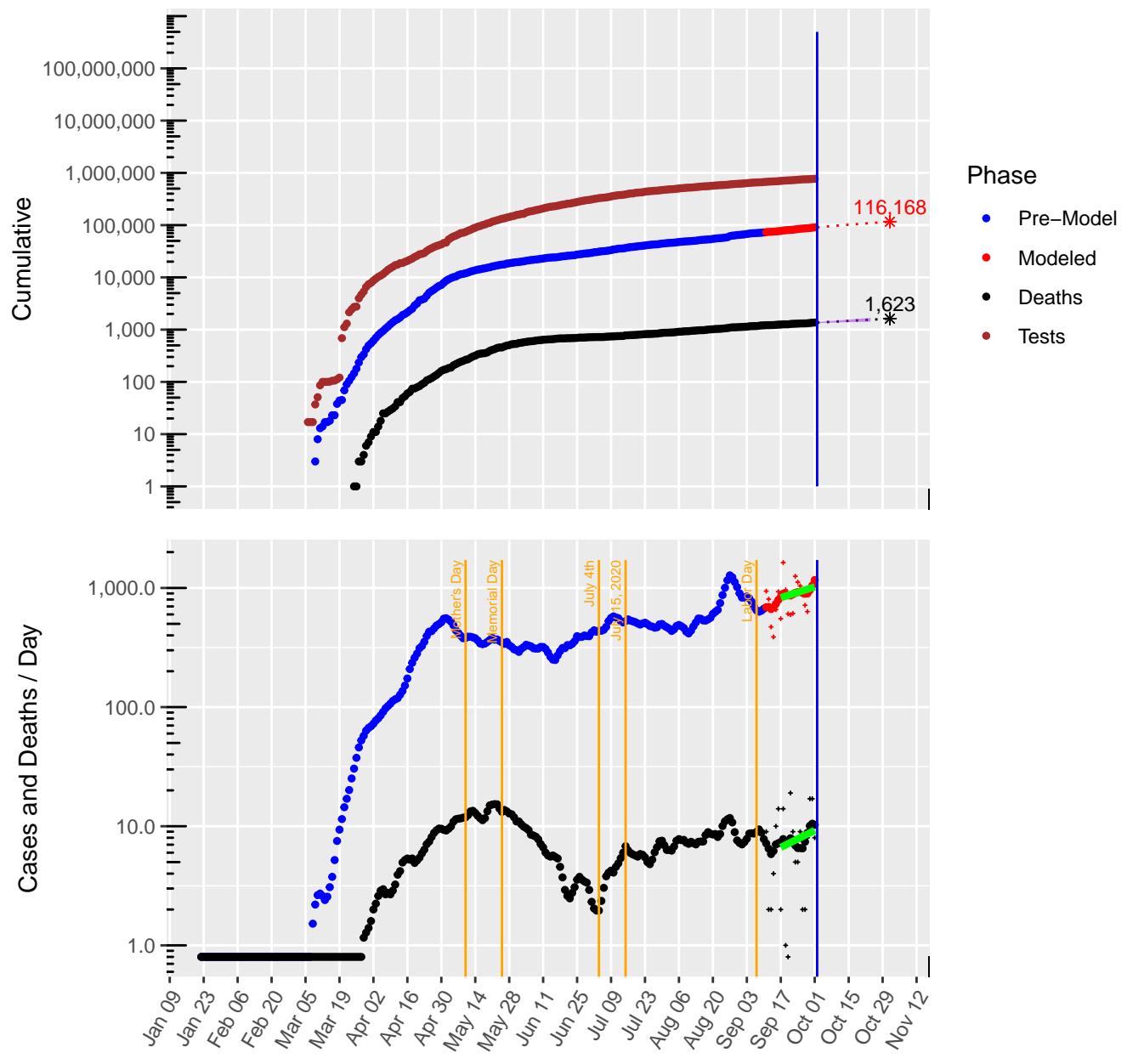
Illinois projection as of 2020-10-02



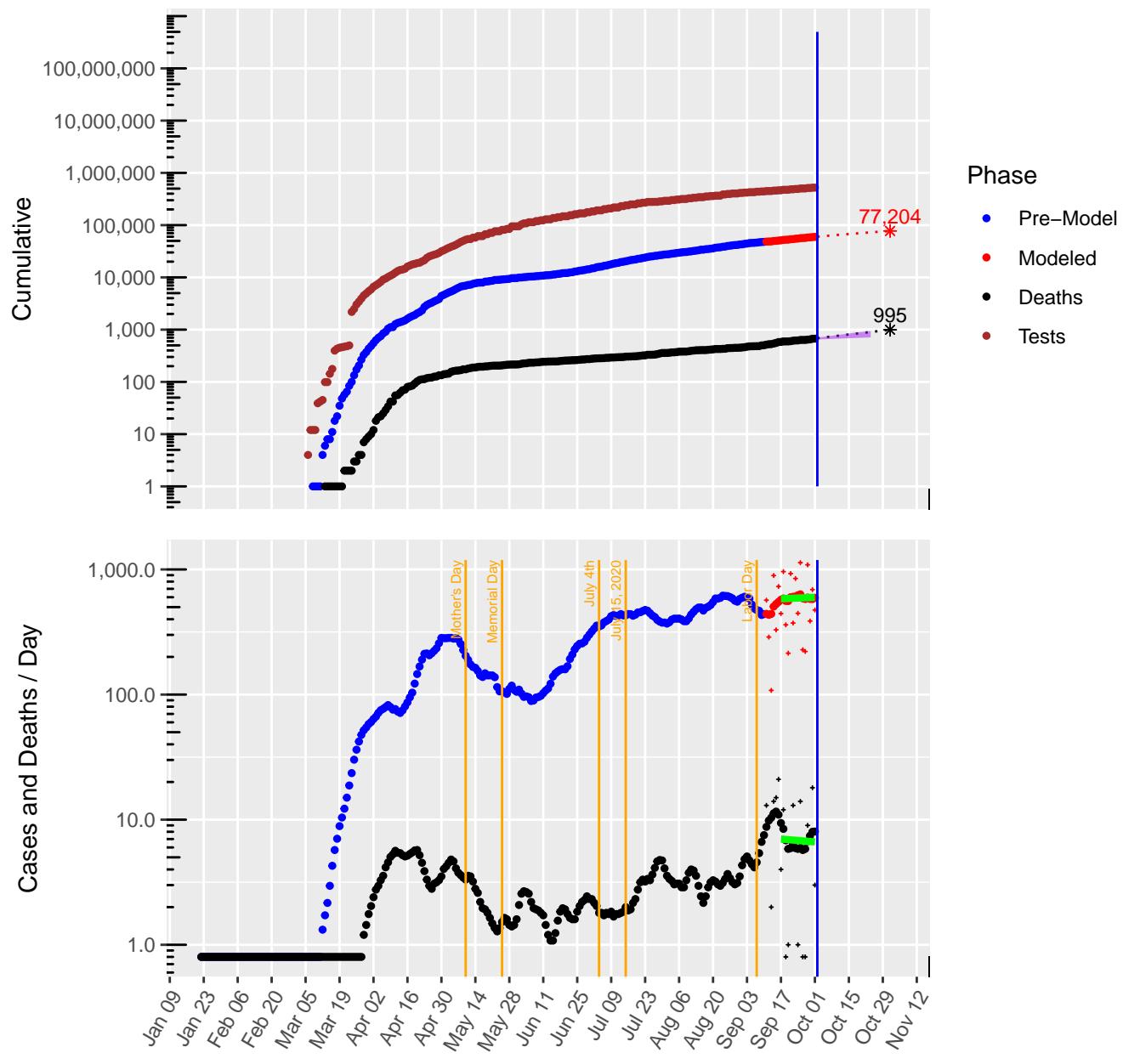
Indiana projection as of 2020-10-02



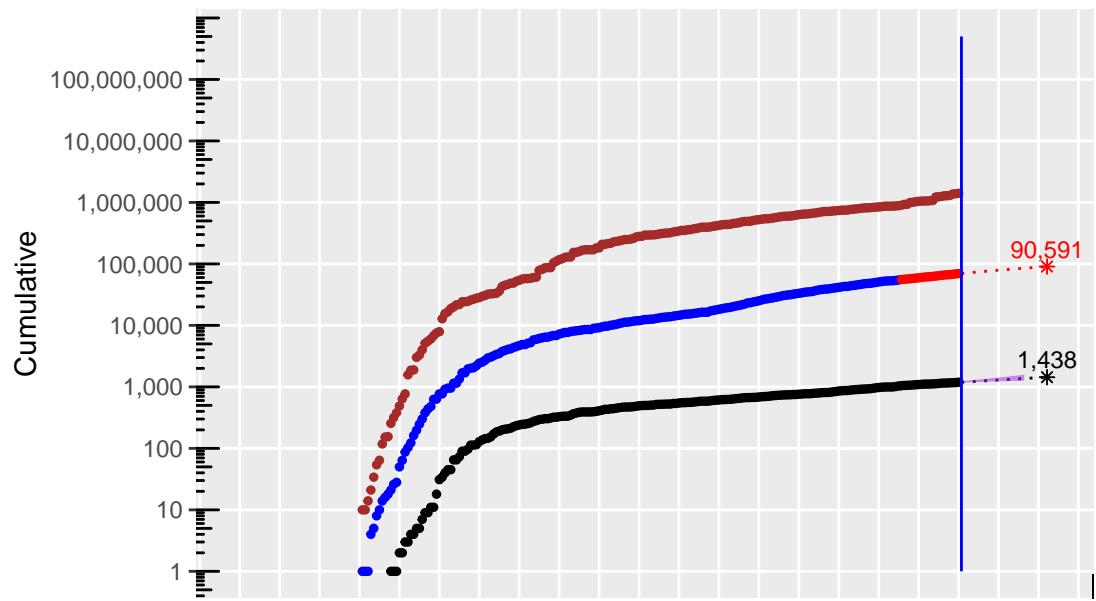
Iowa projection as of 2020-10-02



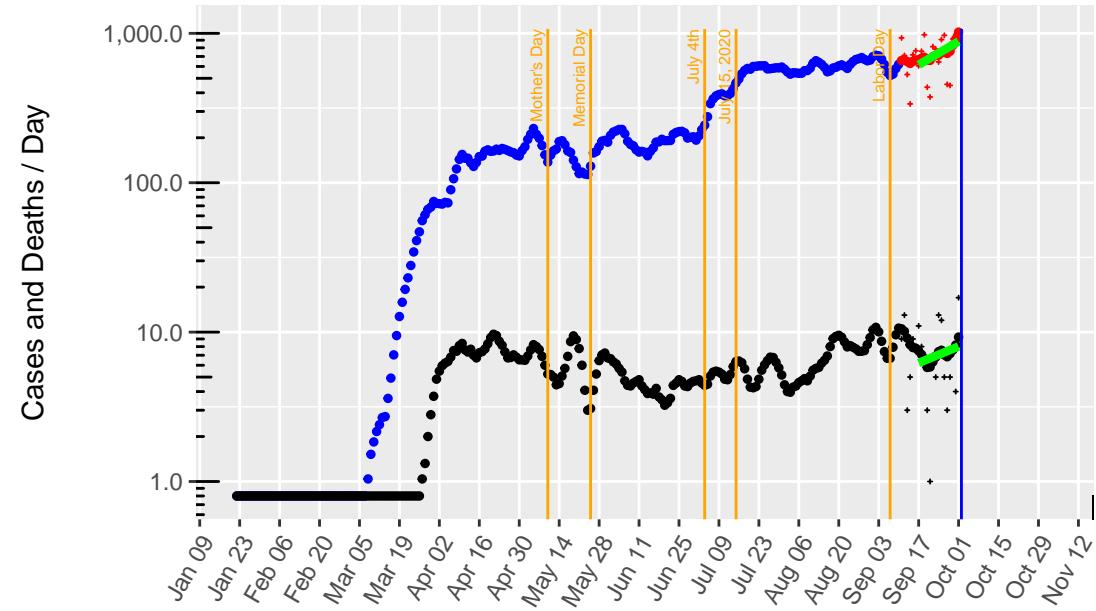
Kansas projection as of 2020-10-02



Kentucky projection as of 2020-10-02

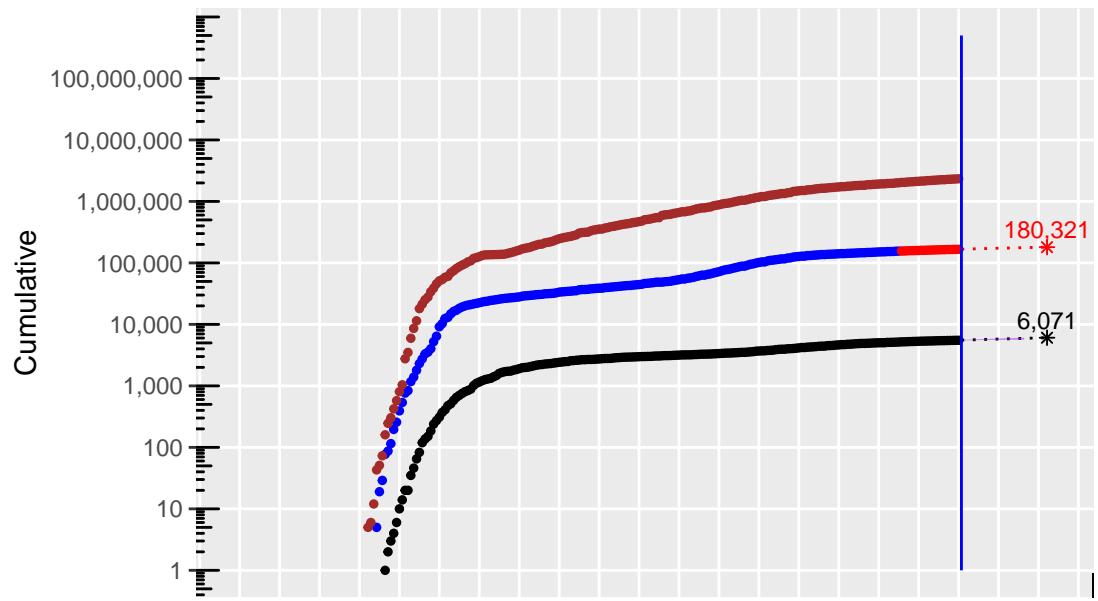


- Phase**
- Pre-Model
 - Modeled
 - Deaths
 - Tests

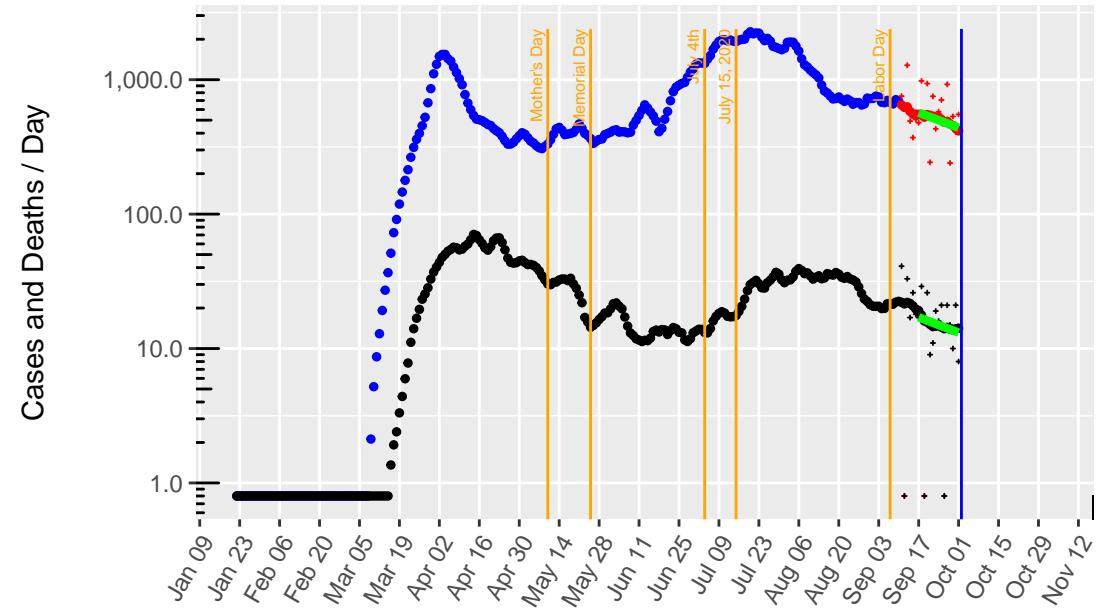


888) -- Deaths: 1,191 (17) -- Case Mortality: 1.7% -- Daily Change: +2.5% Cases, +1.8% Deaths

Louisiana projection as of 2020-10-02

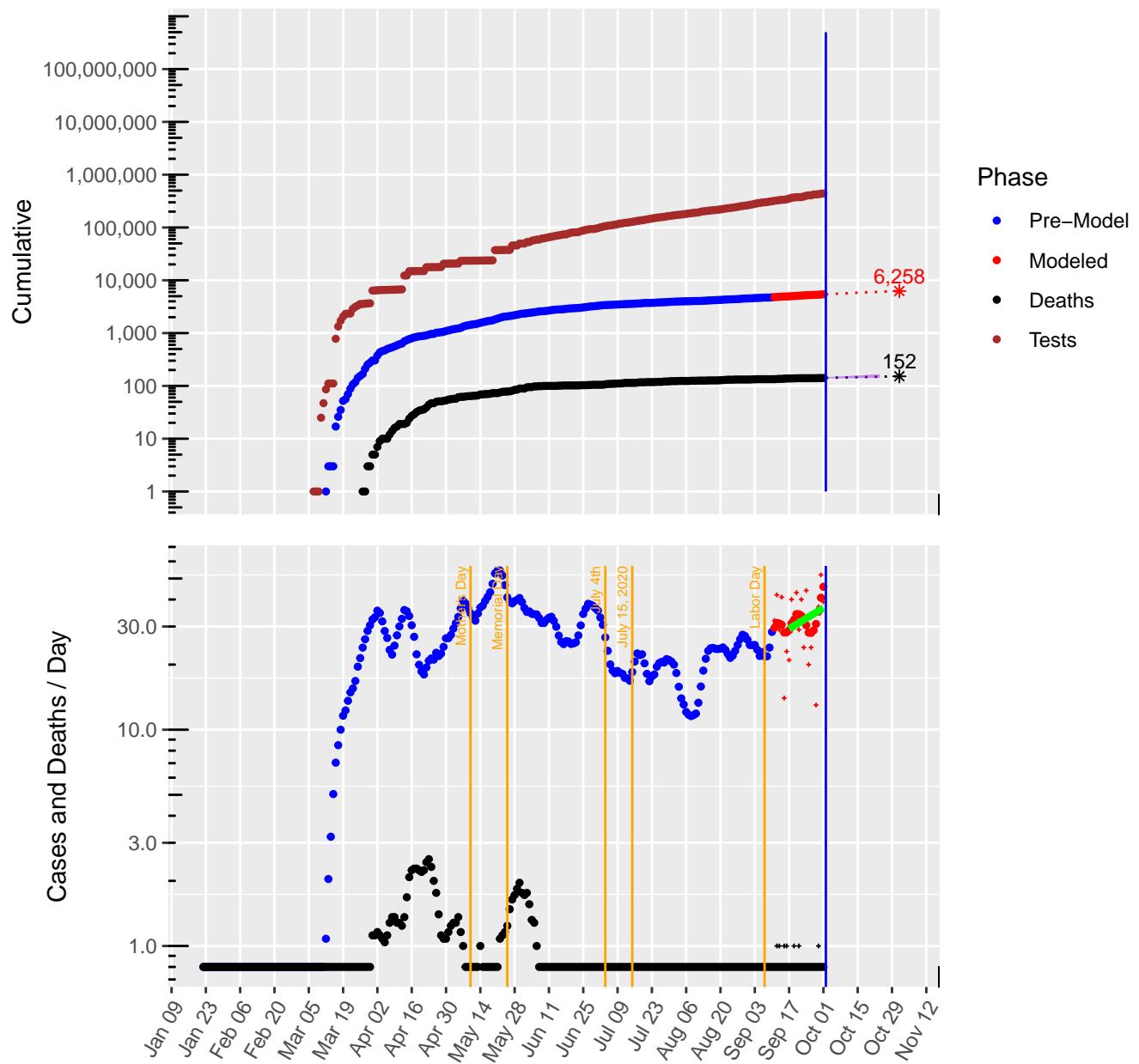


- Phase**
- Pre-Model
 - Modeled
 - Deaths
 - Tests

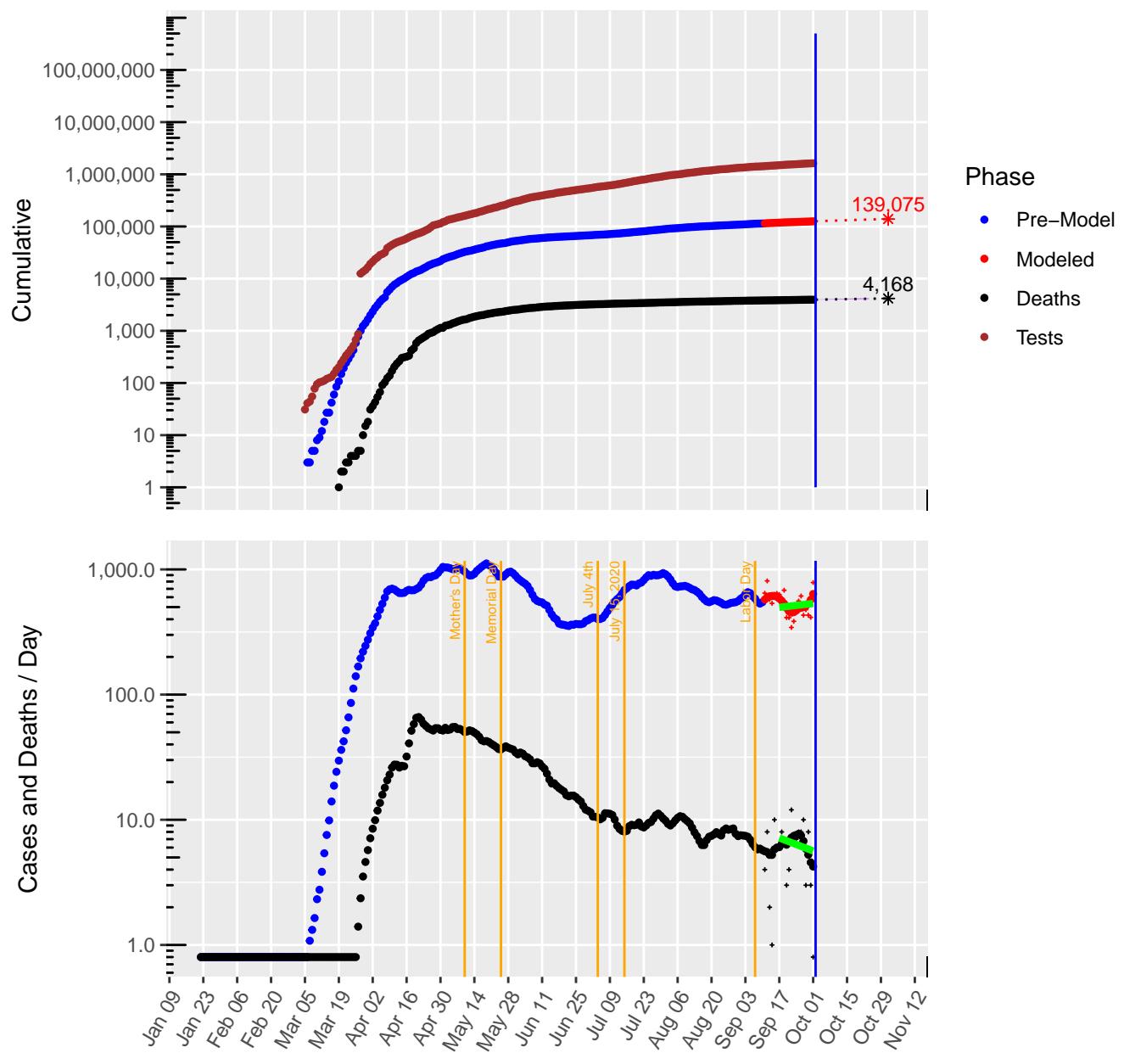


(551) -- Deaths: 5,519 (8) -- Case Mortality: 3.3% -- Daily Change: -1.8% Cases, -1.9% Deaths

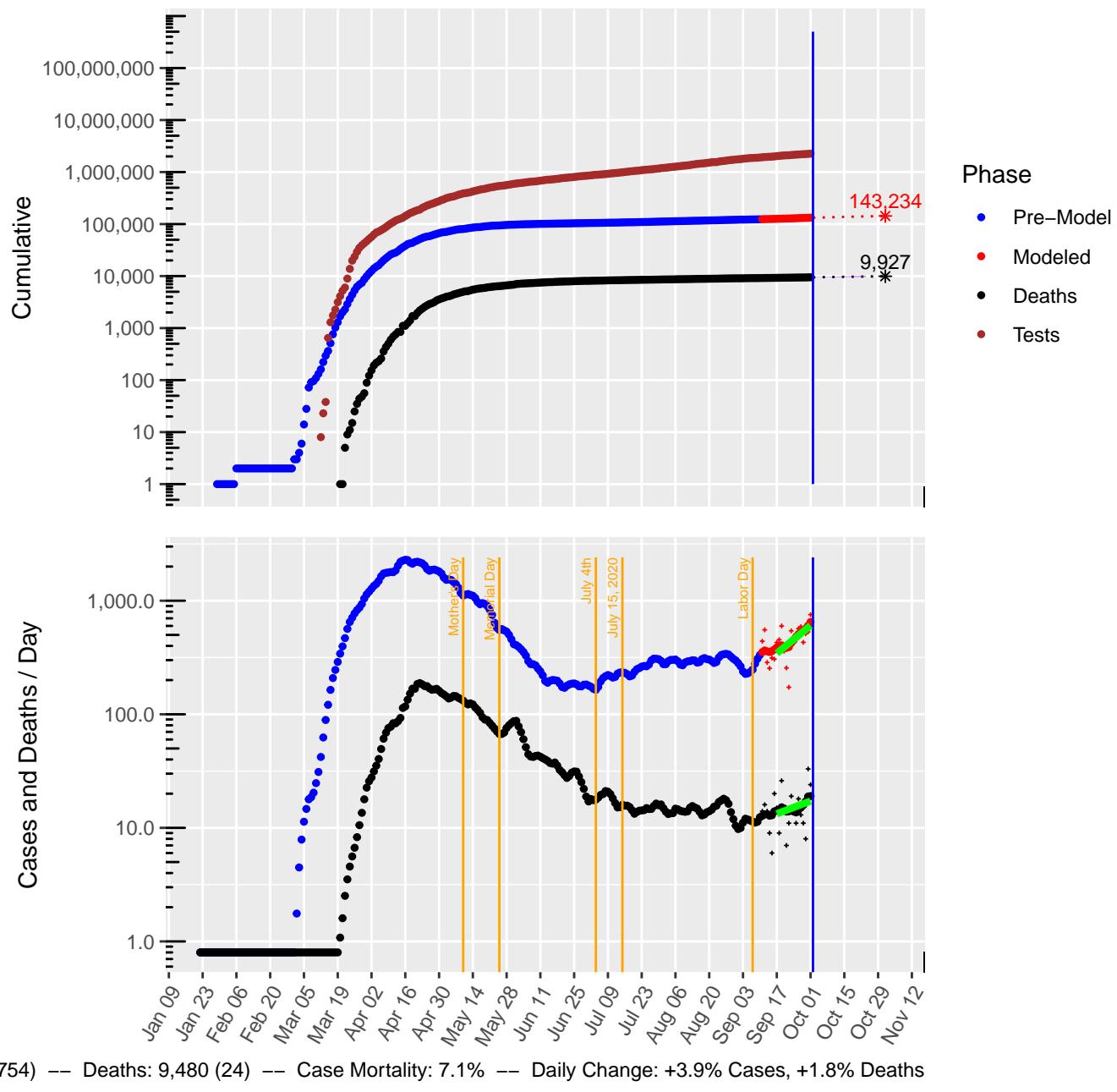
Maine projection as of 2020-10-02



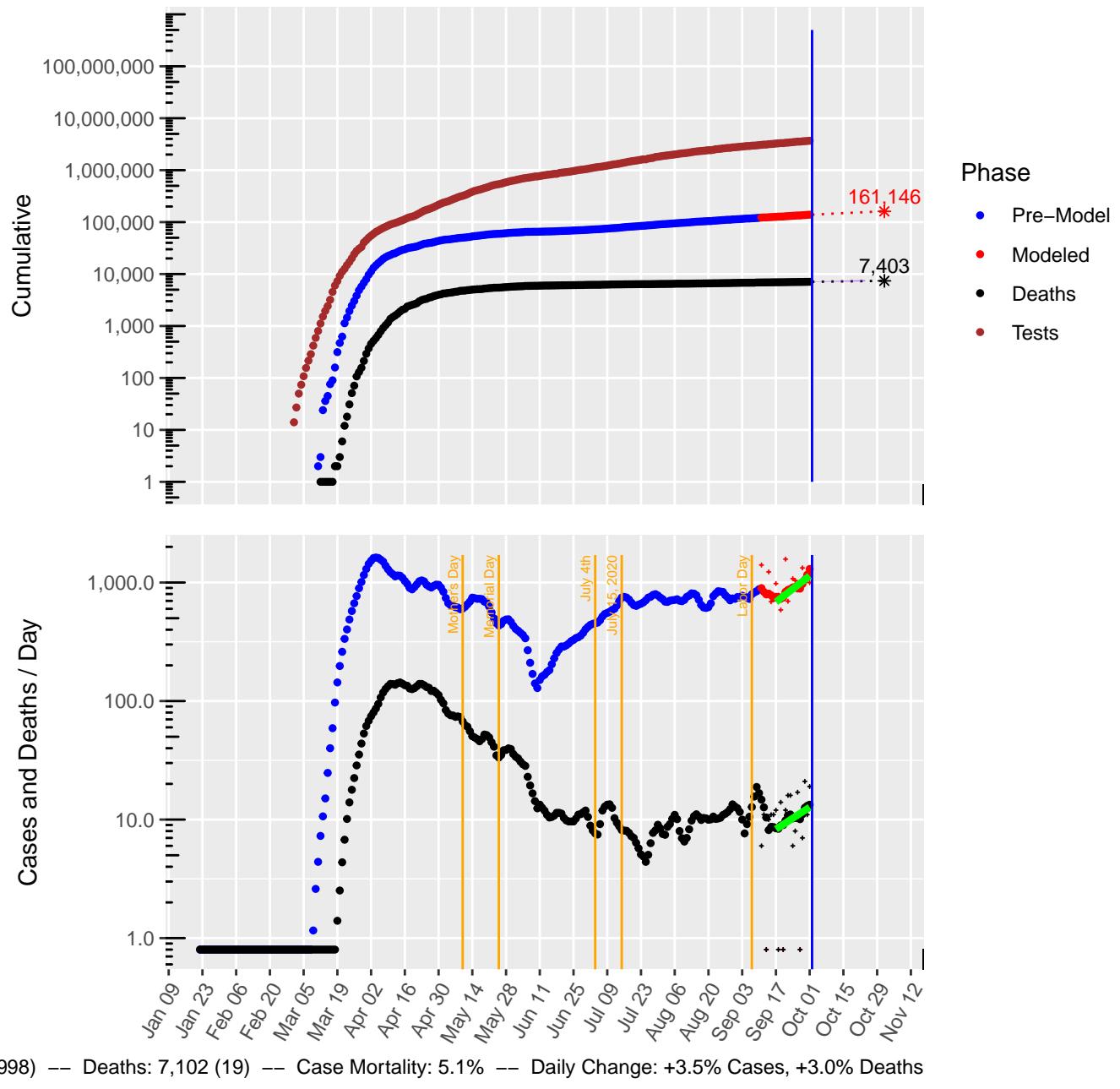
Maryland projection as of 2020-10-02



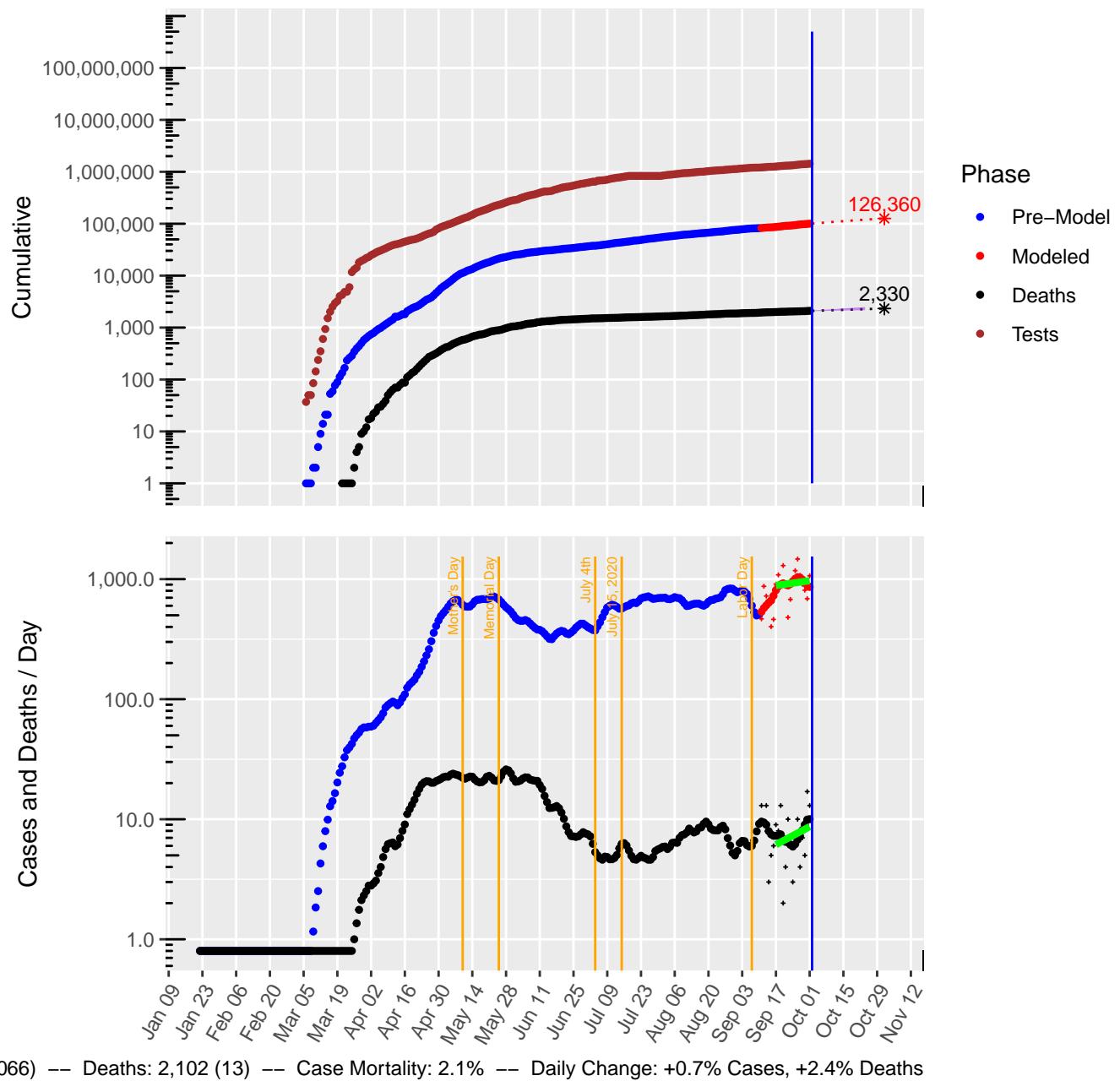
Massachusetts projection as of 2020-10-02



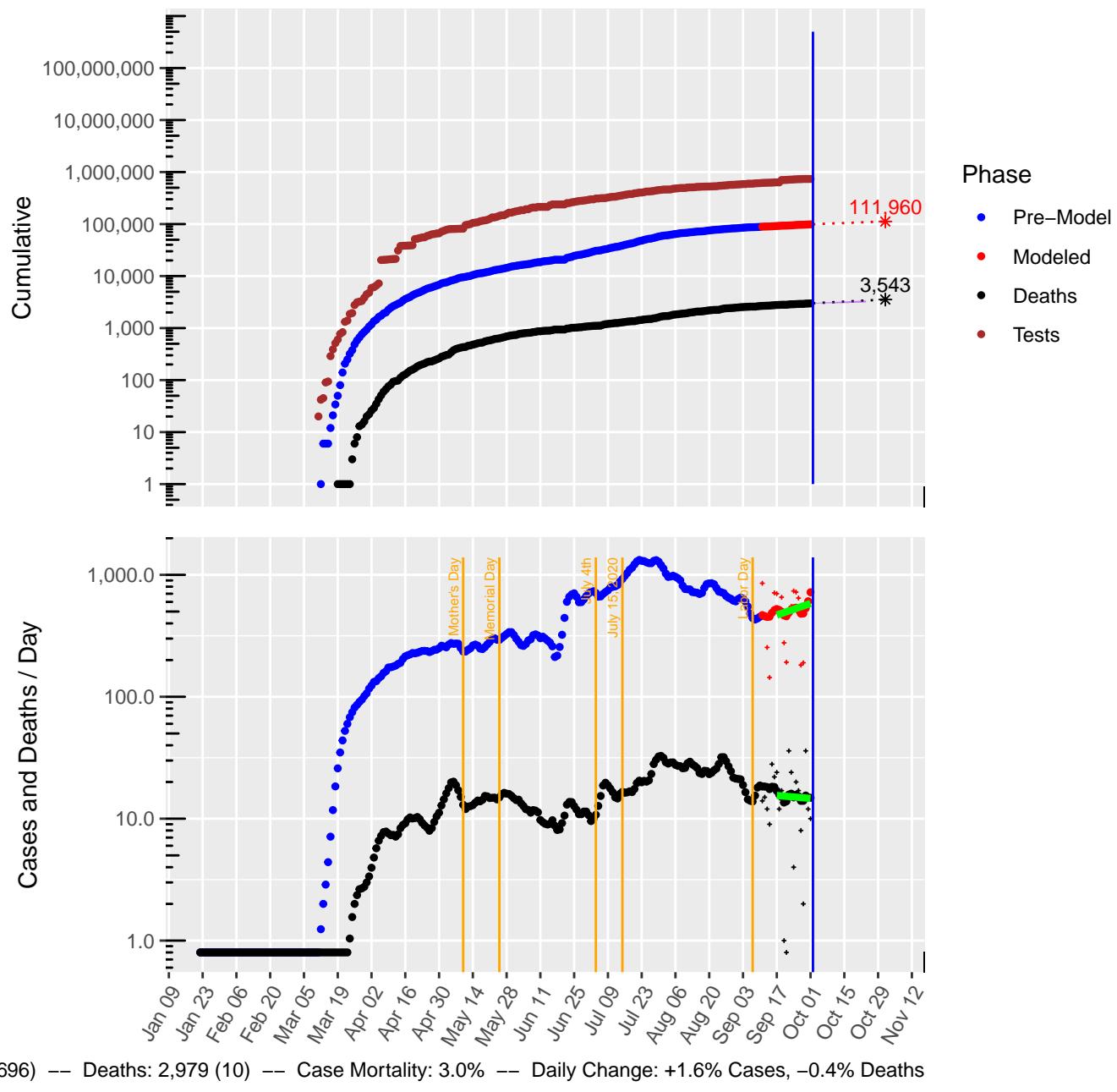
Michigan projection as of 2020-10-02



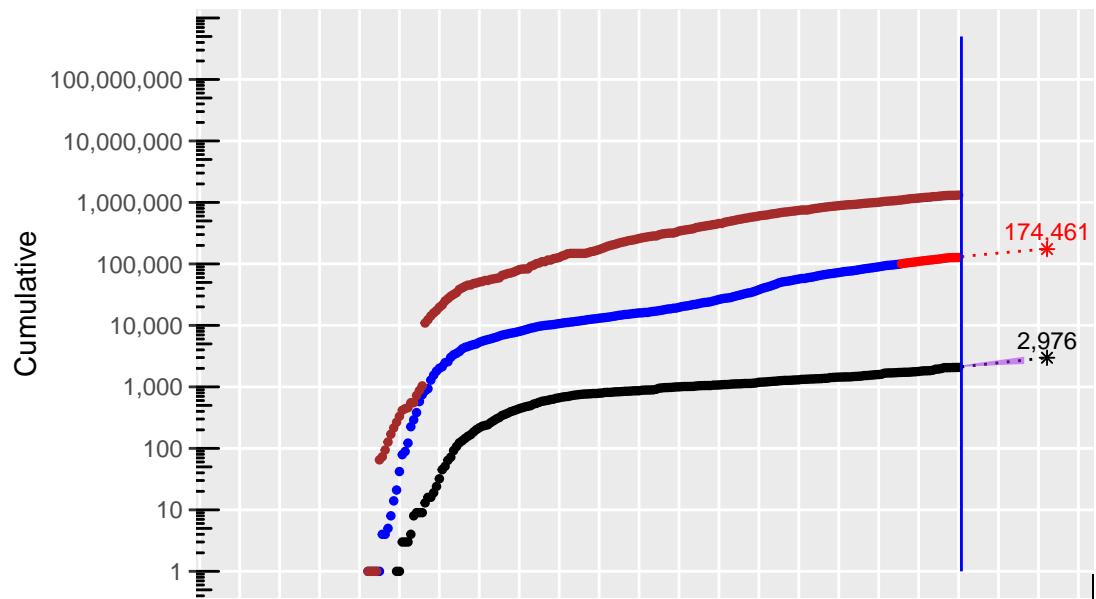
Minnesota projection as of 2020-10-02



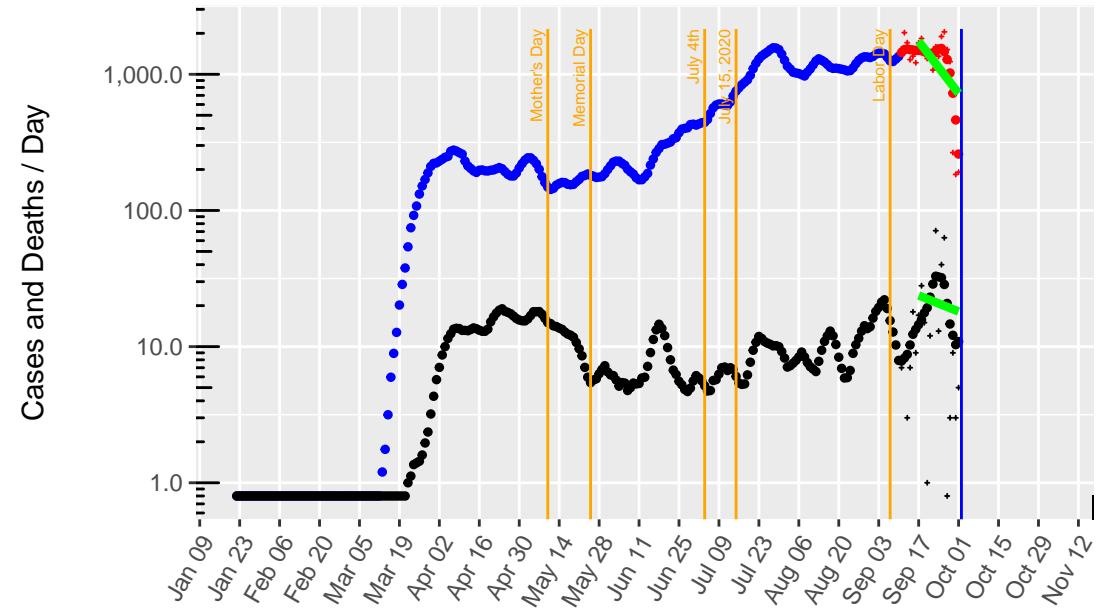
Mississippi projection as of 2020-10-02



Missouri projection as of 2020-10-02

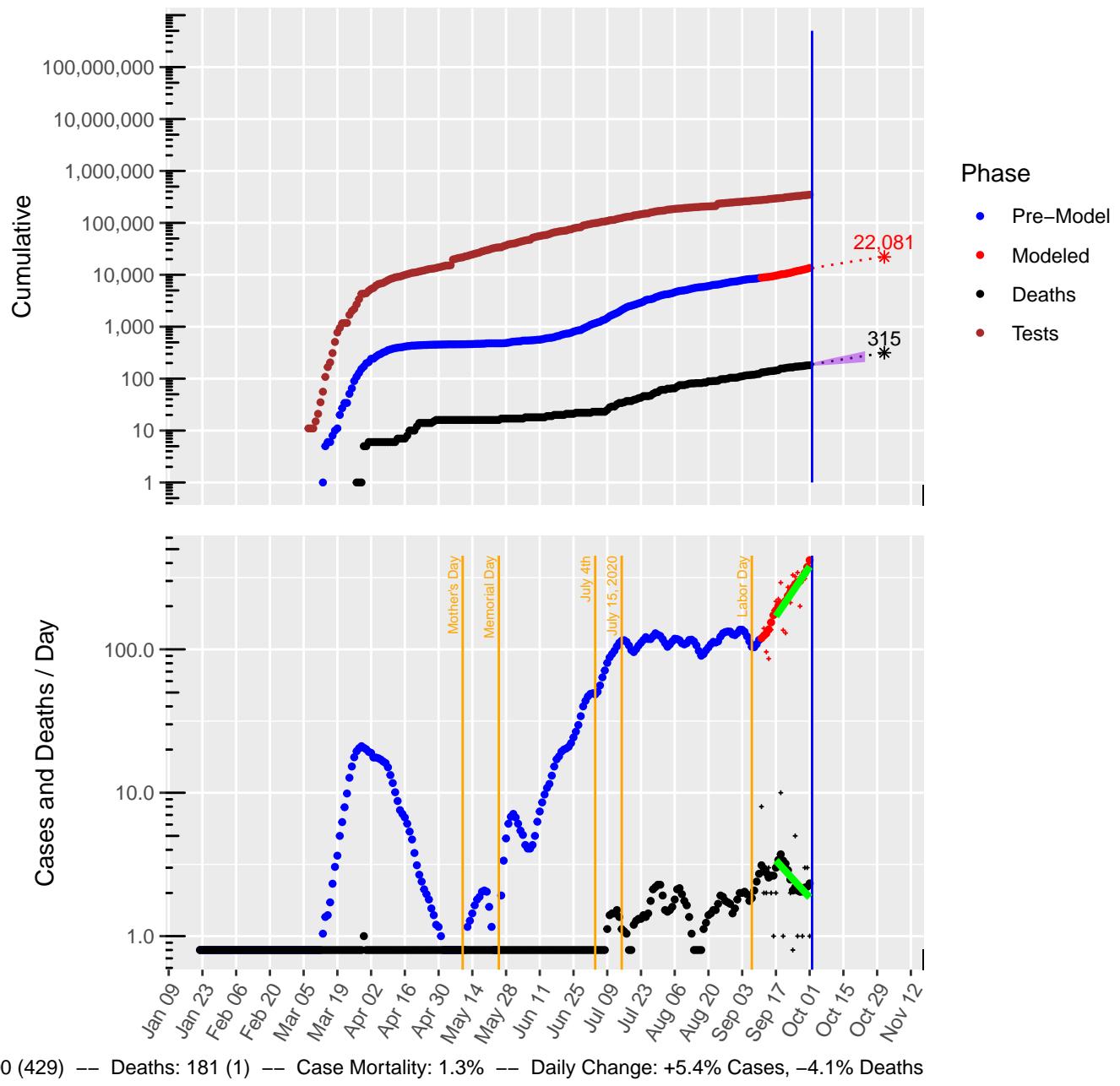


- Phase**
- Pre-Model
 - Modeled
 - Deaths
 - Tests

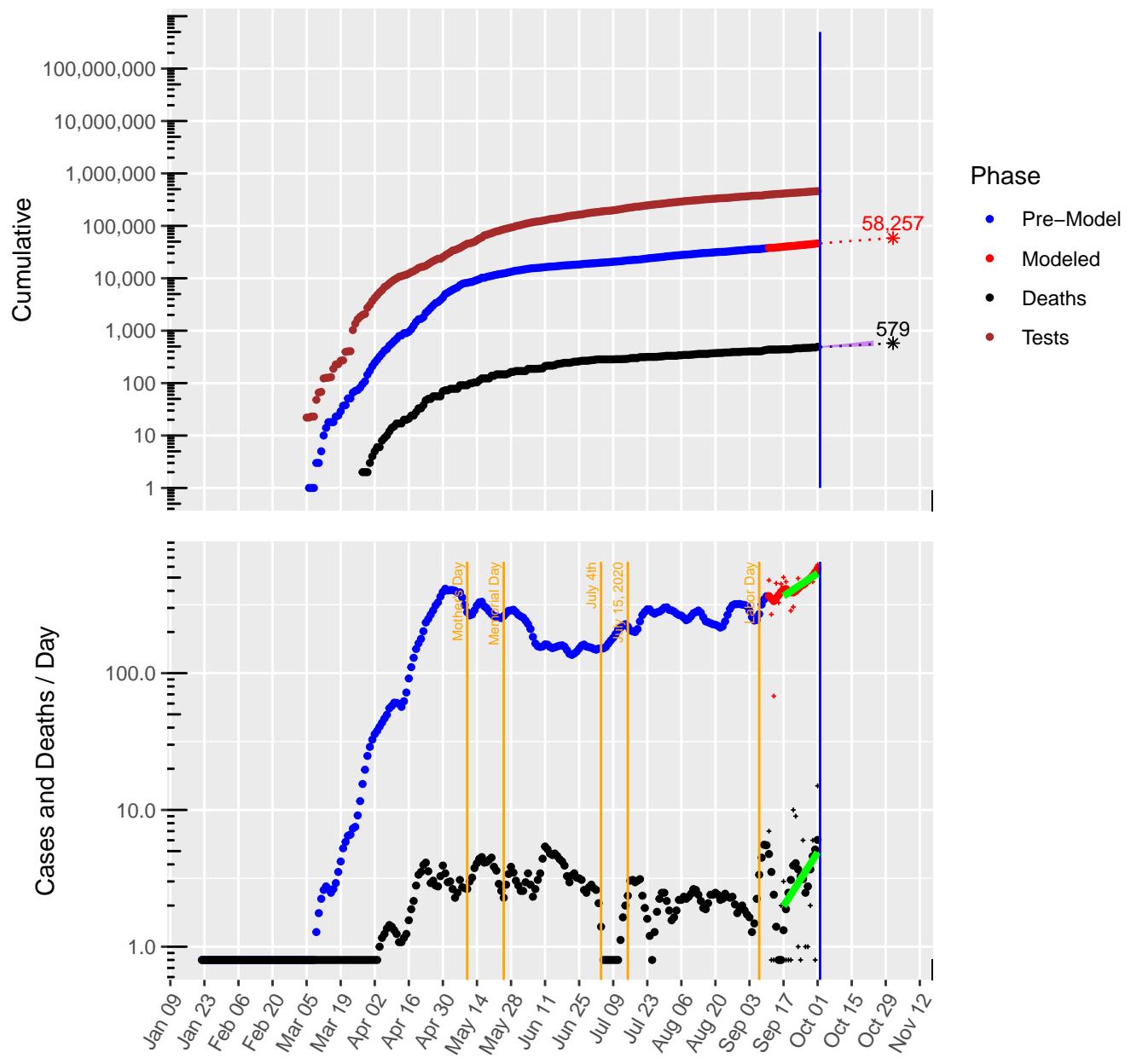


(191) -- Deaths: 2,074 (5) -- Case Mortality: 1.6% -- Daily Change: -5.9% Cases, -1.9% Deaths

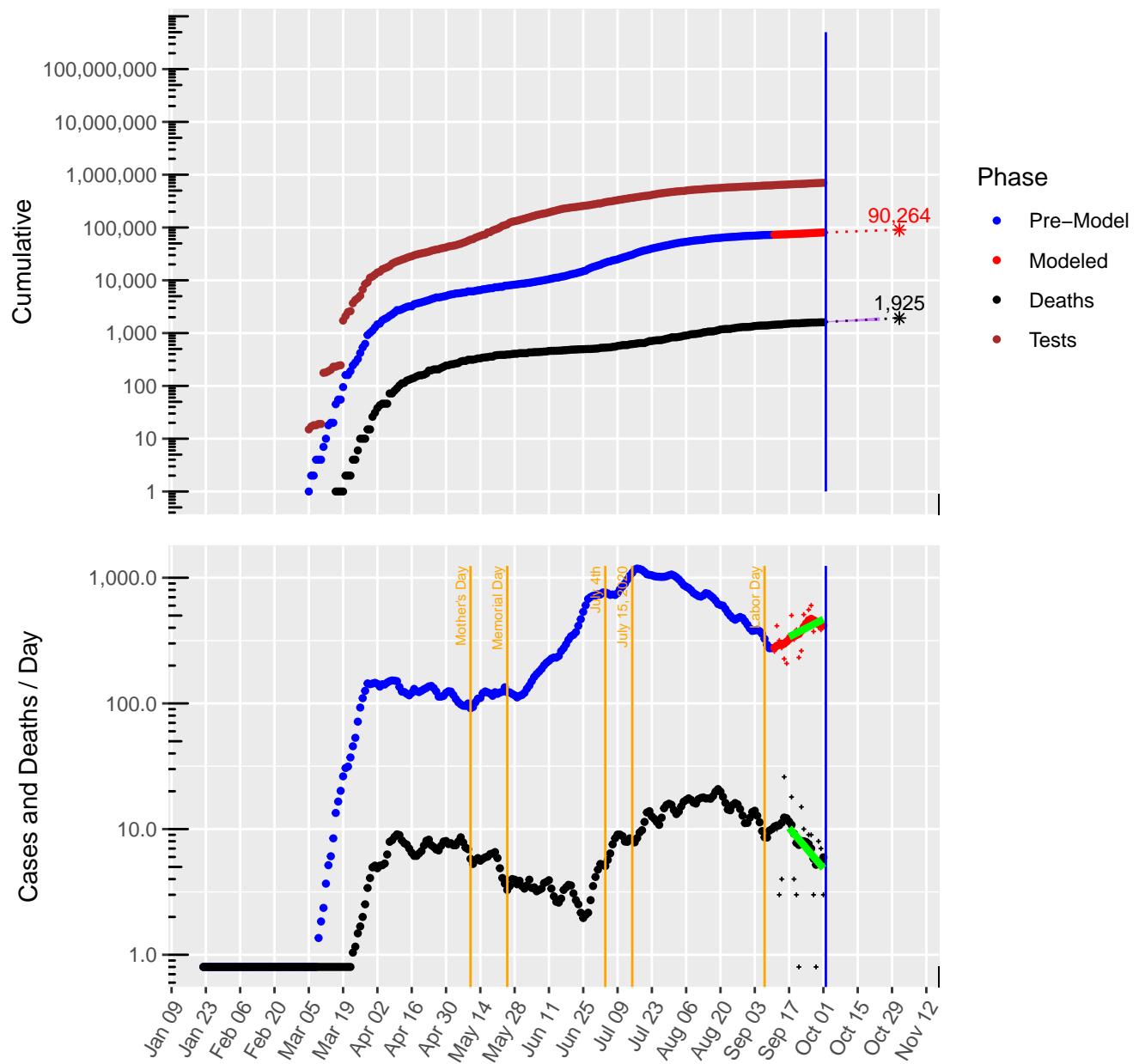
Montana projection as of 2020-10-02



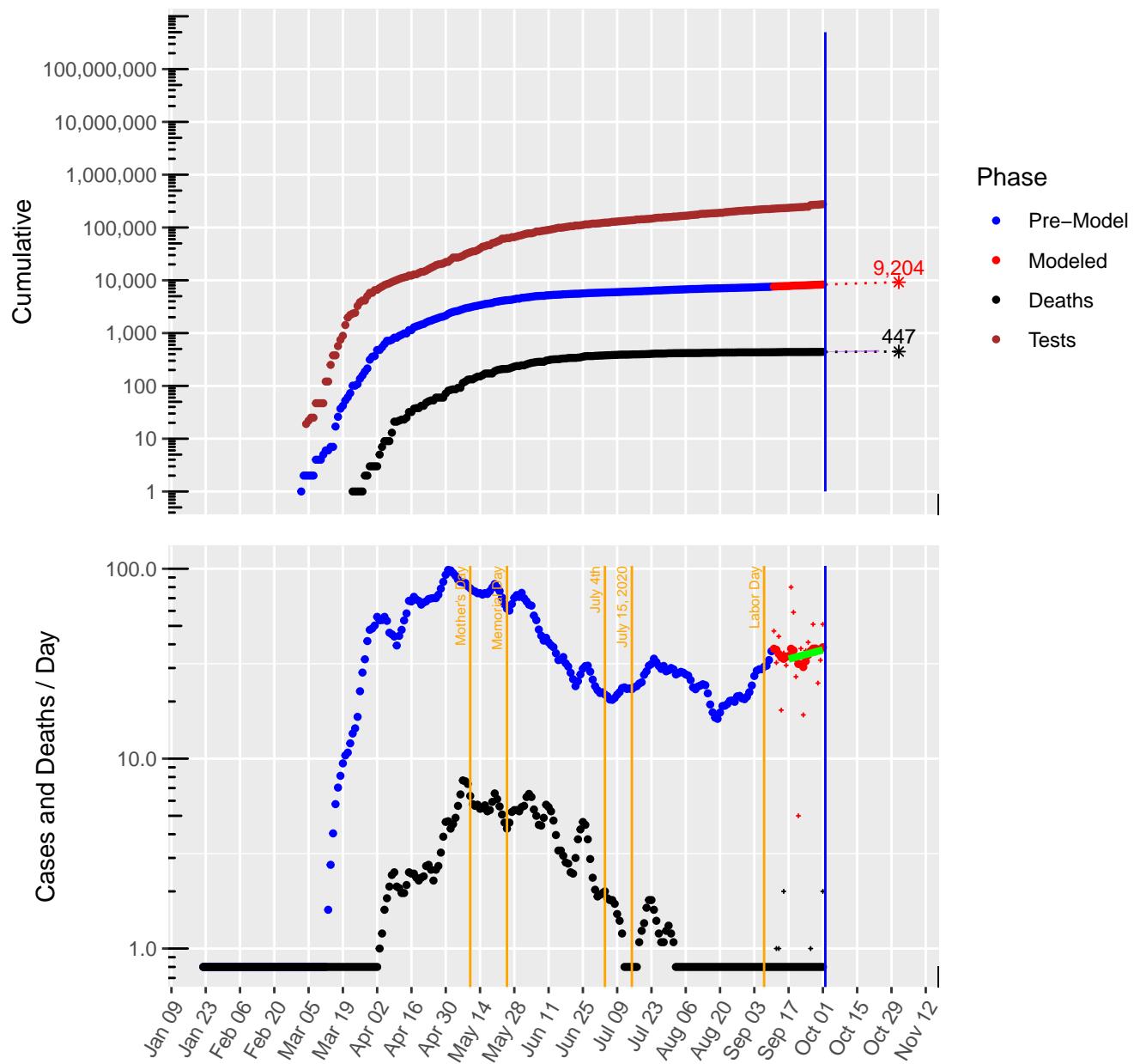
Nebraska projection as of 2020-10-02



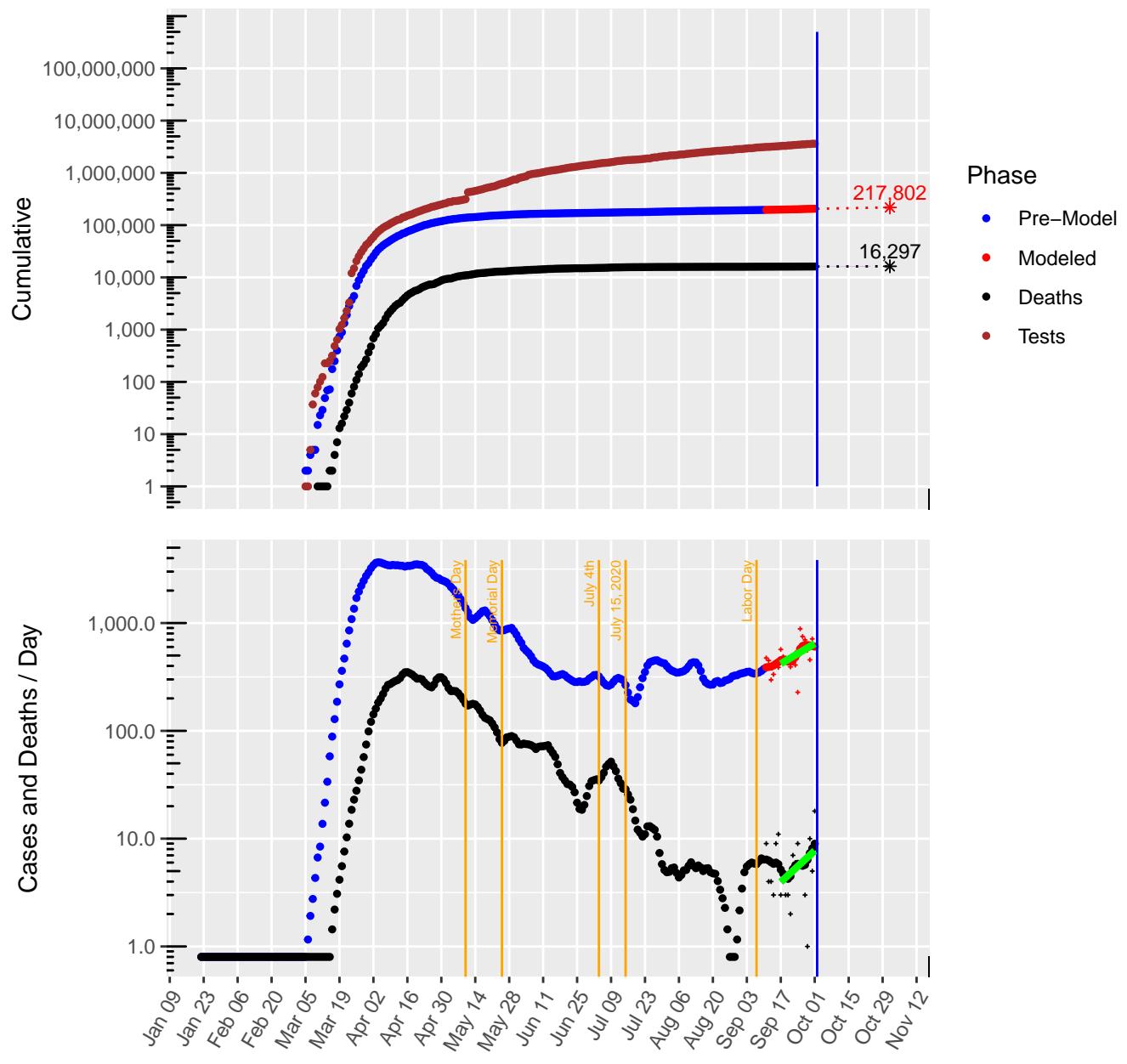
Nevada projection as of 2020-10-02



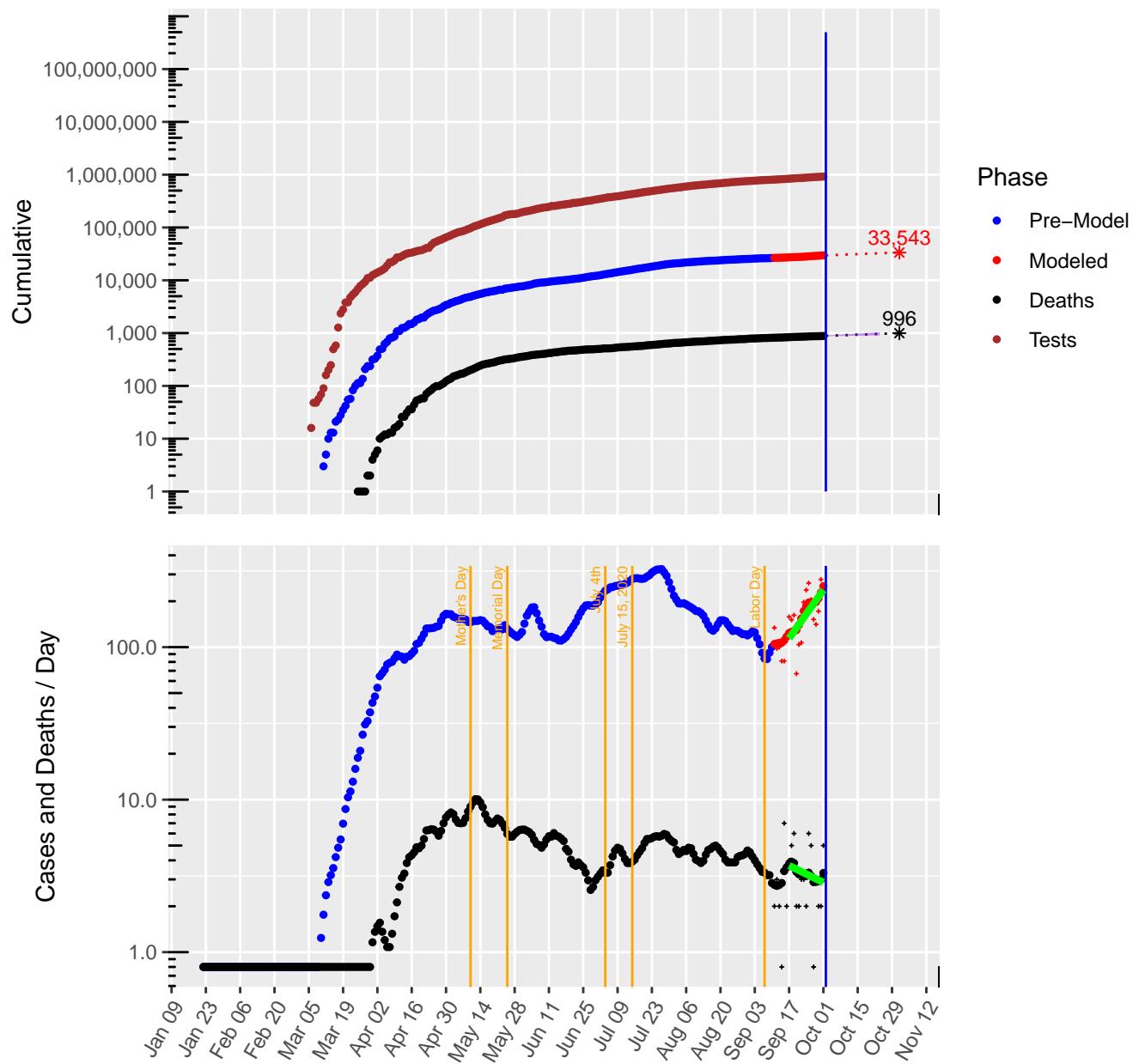
New Hampshire projection as of 2020-10-02



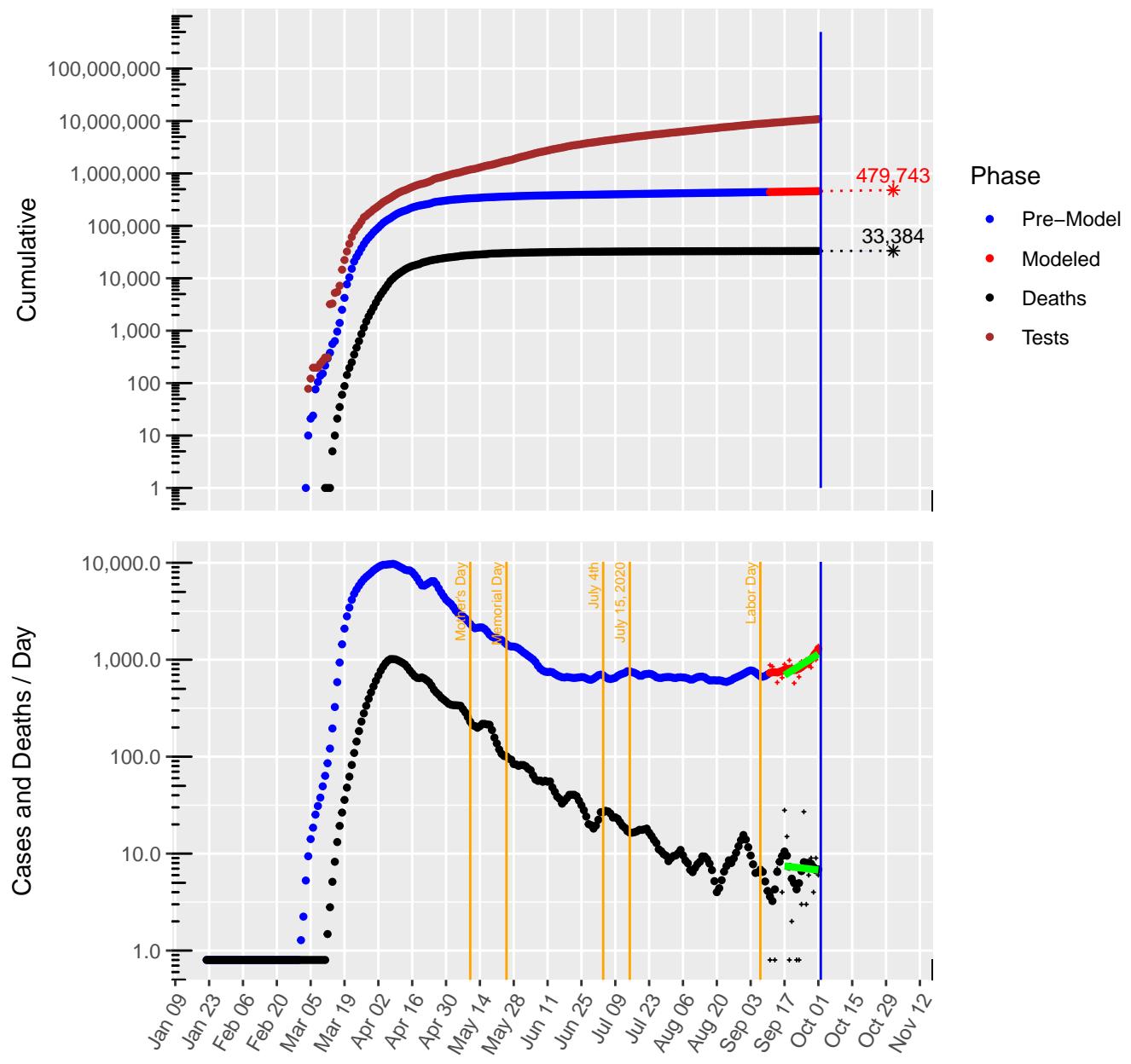
New Jersey projection as of 2020-10-02



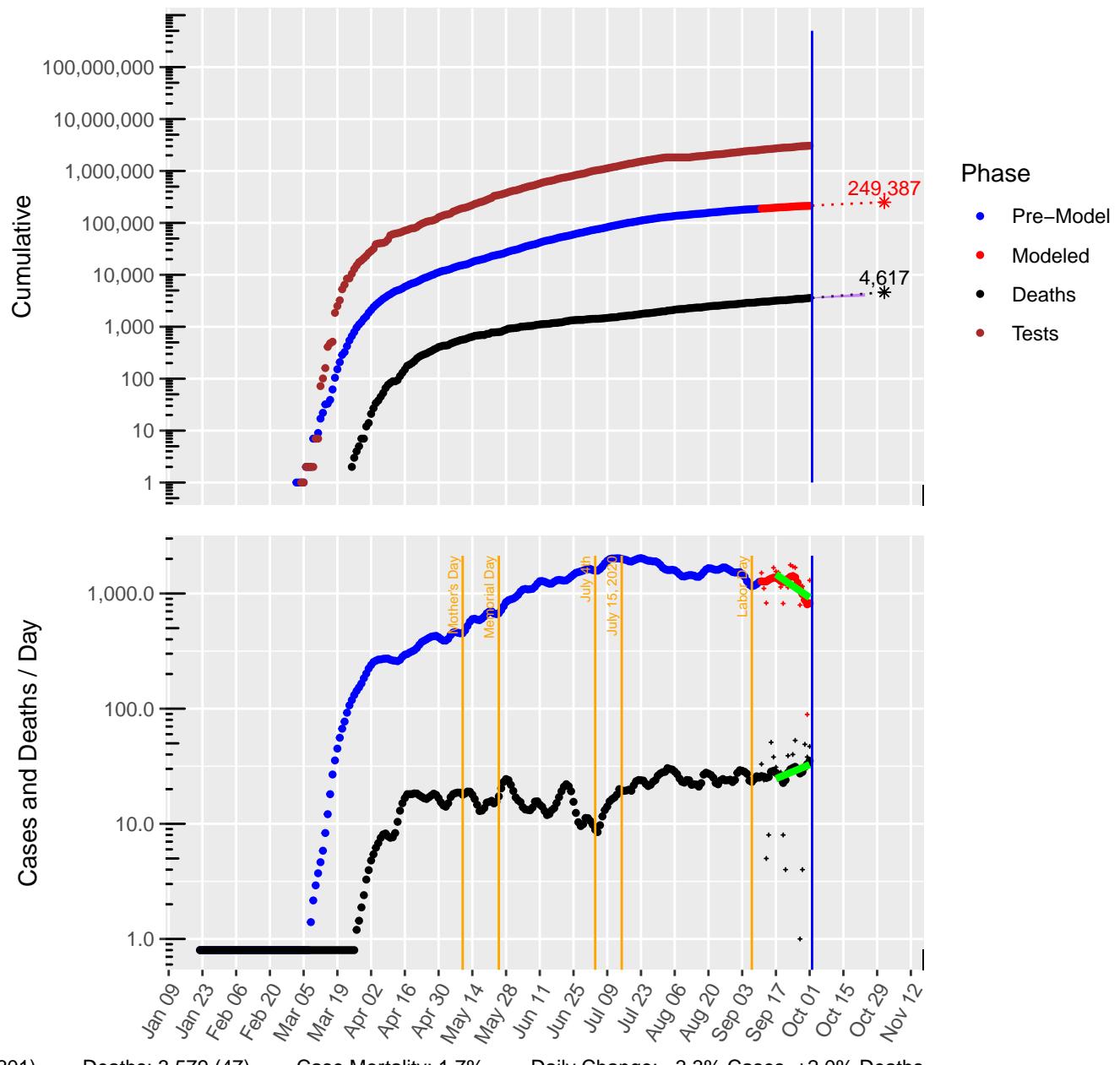
New Mexico projection as of 2020-10-02



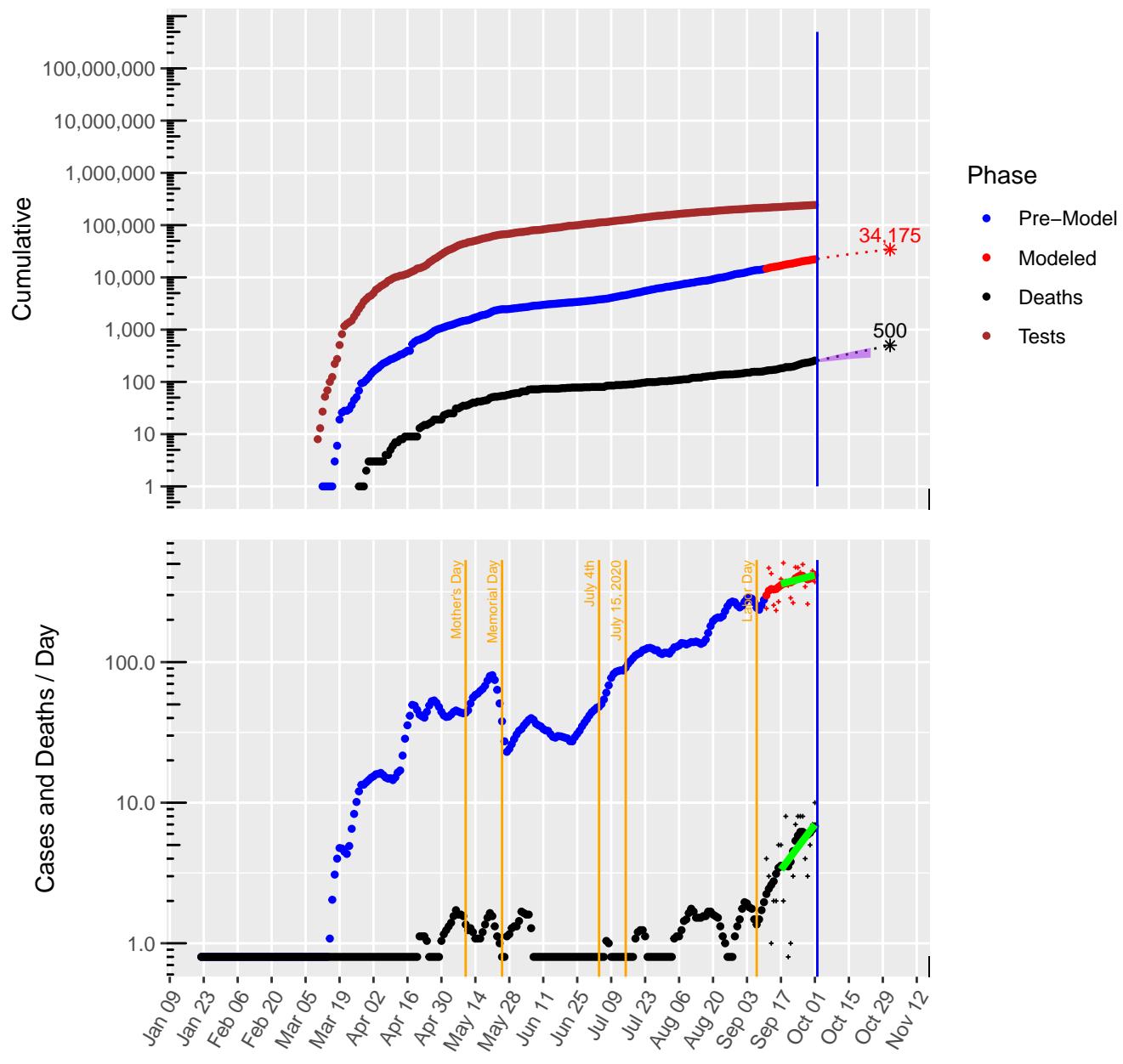
New York projection as of 2020-10-02



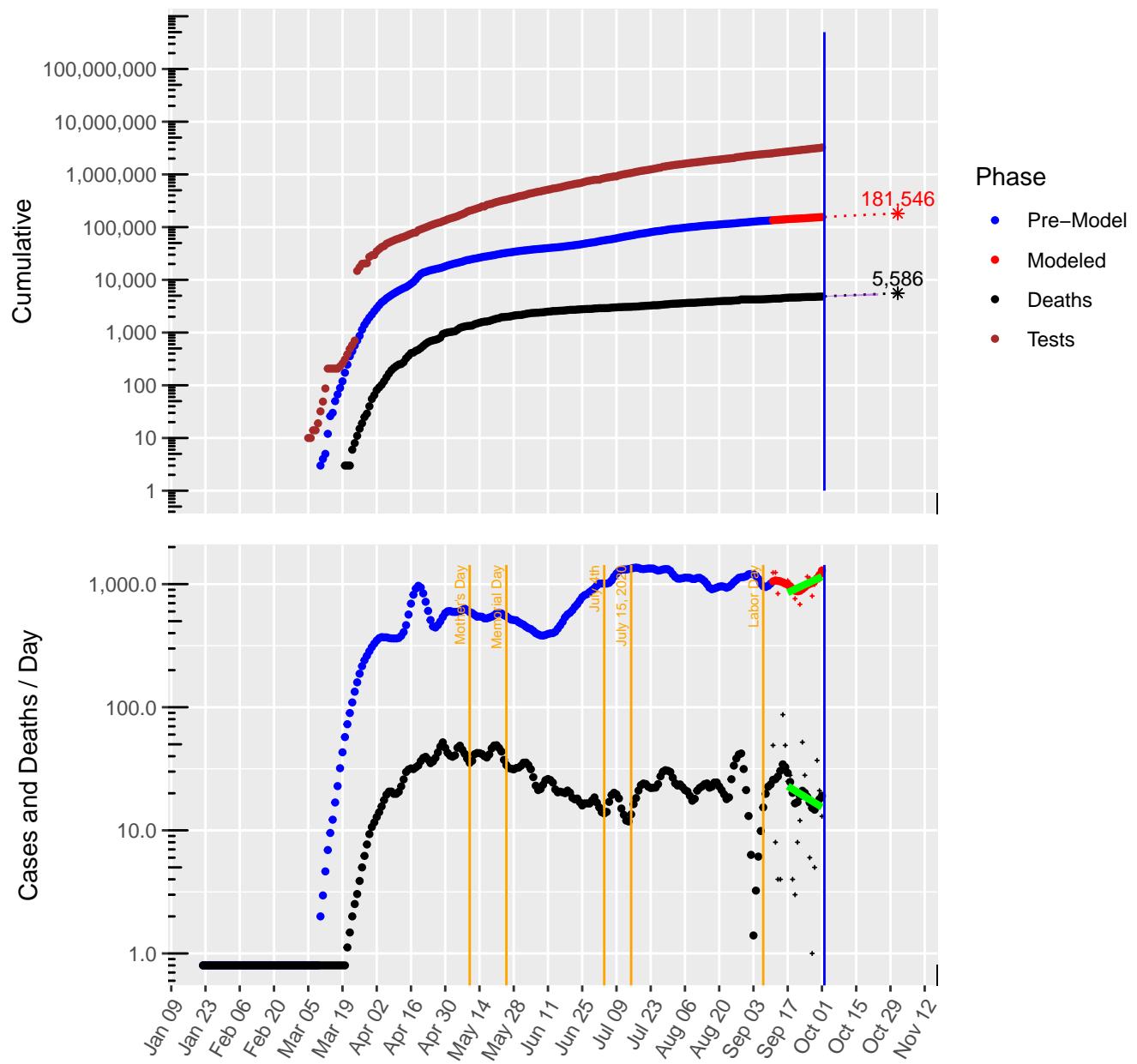
North Carolina projection as of 2020-10-02



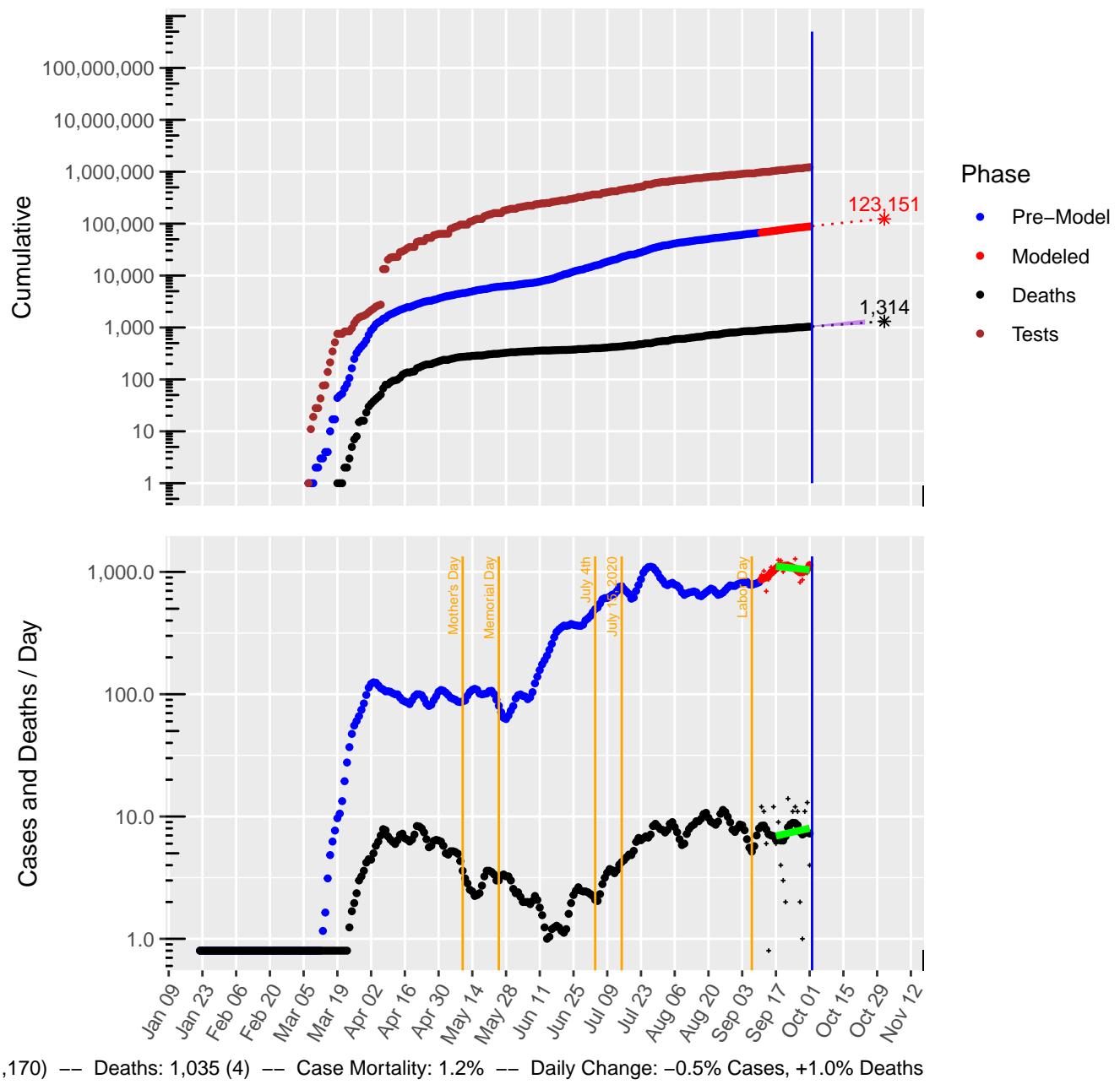
North Dakota projection as of 2020-10-02



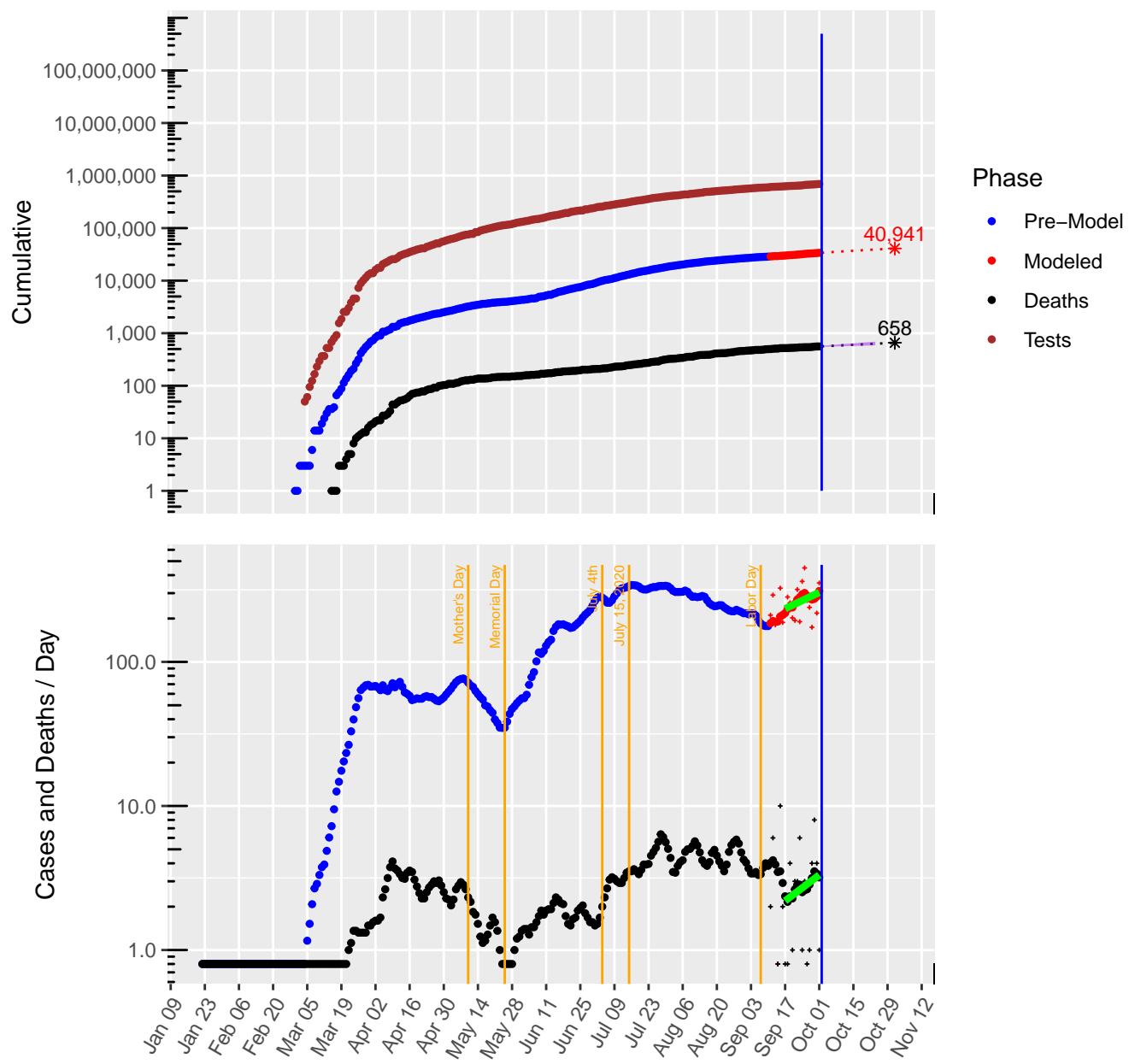
Ohio projection as of 2020-10-02



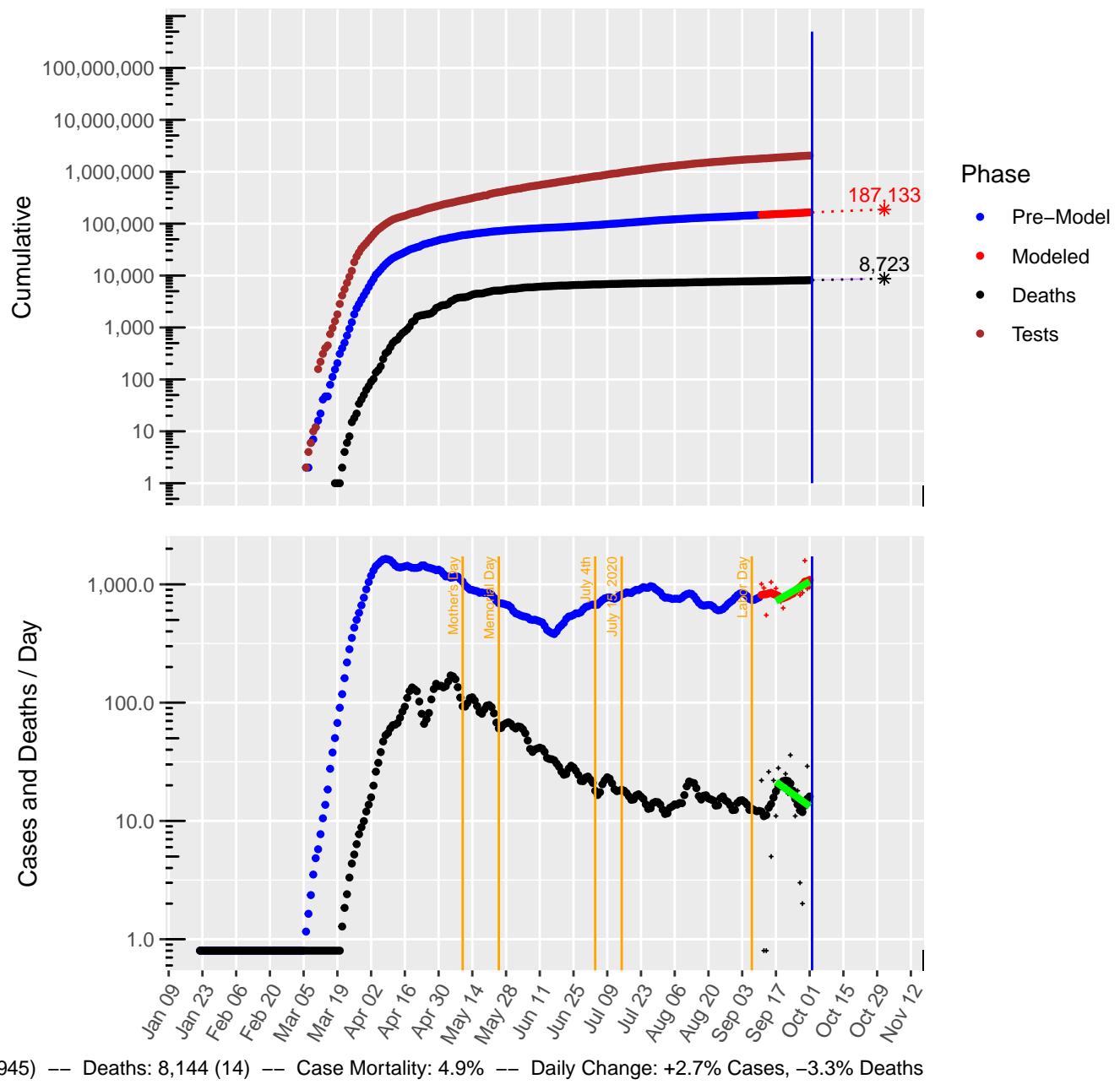
Oklahoma projection as of 2020-10-02



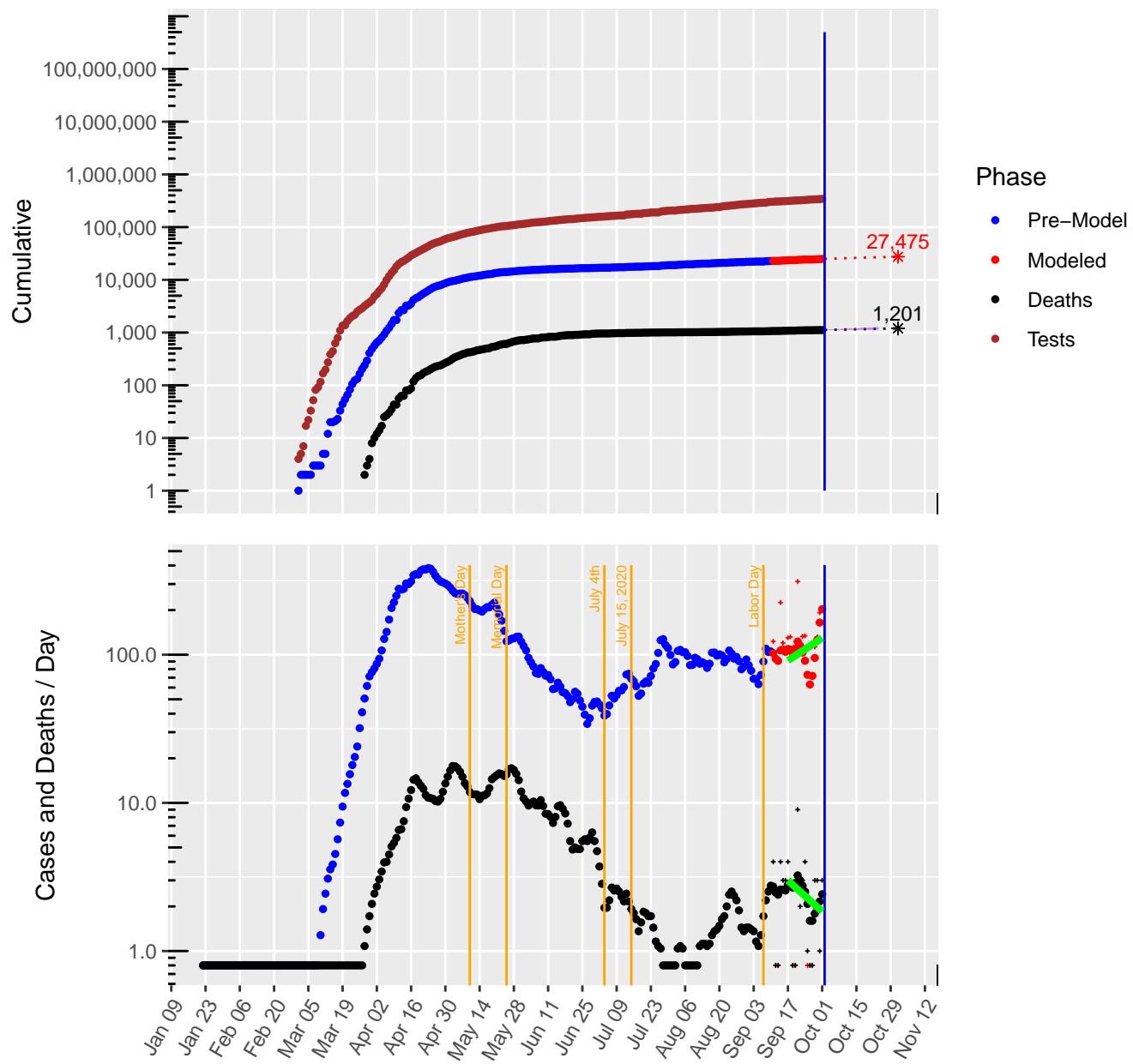
Oregon projection as of 2020-10-02



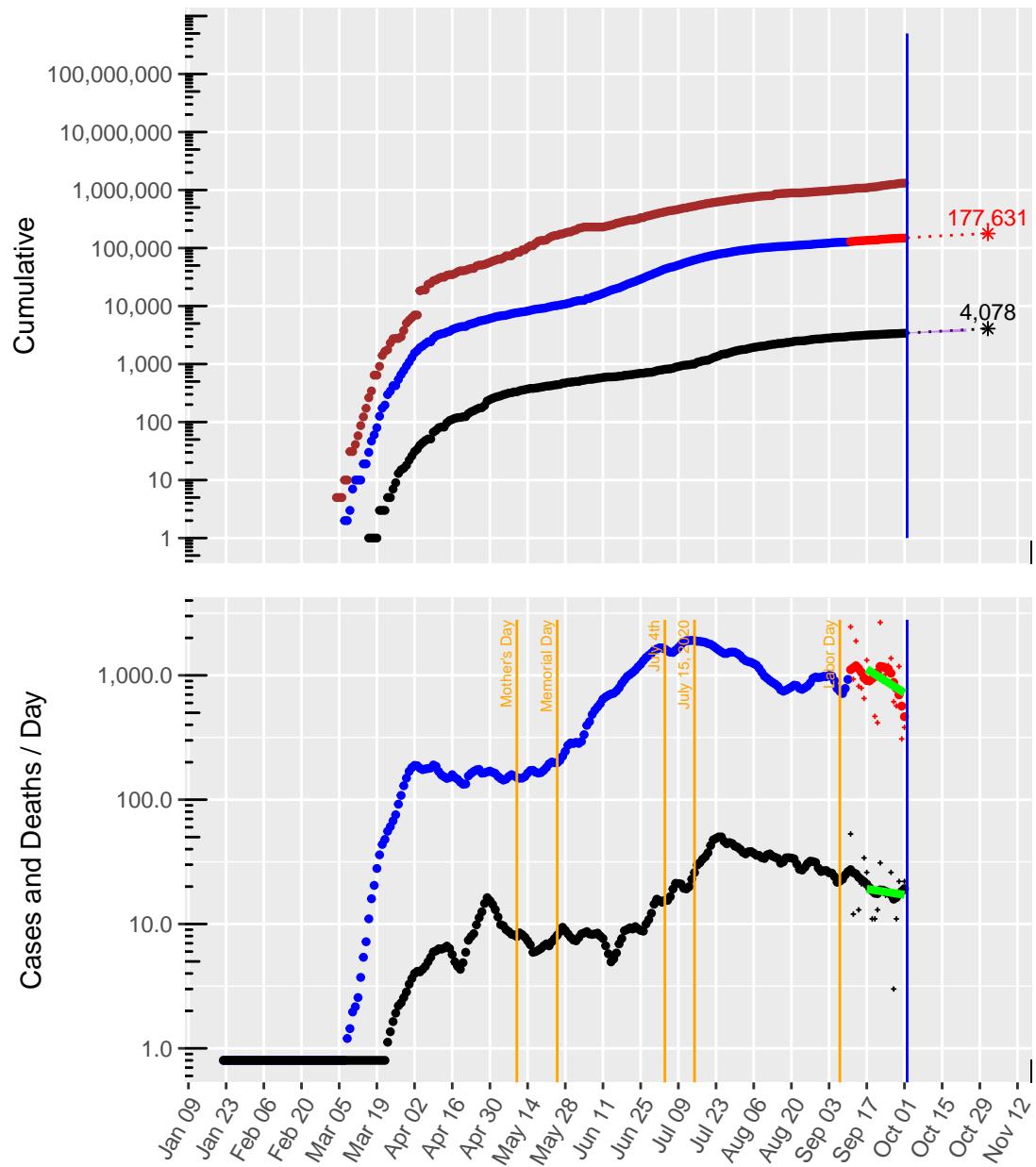
Pennsylvania projection as of 2020-10-02



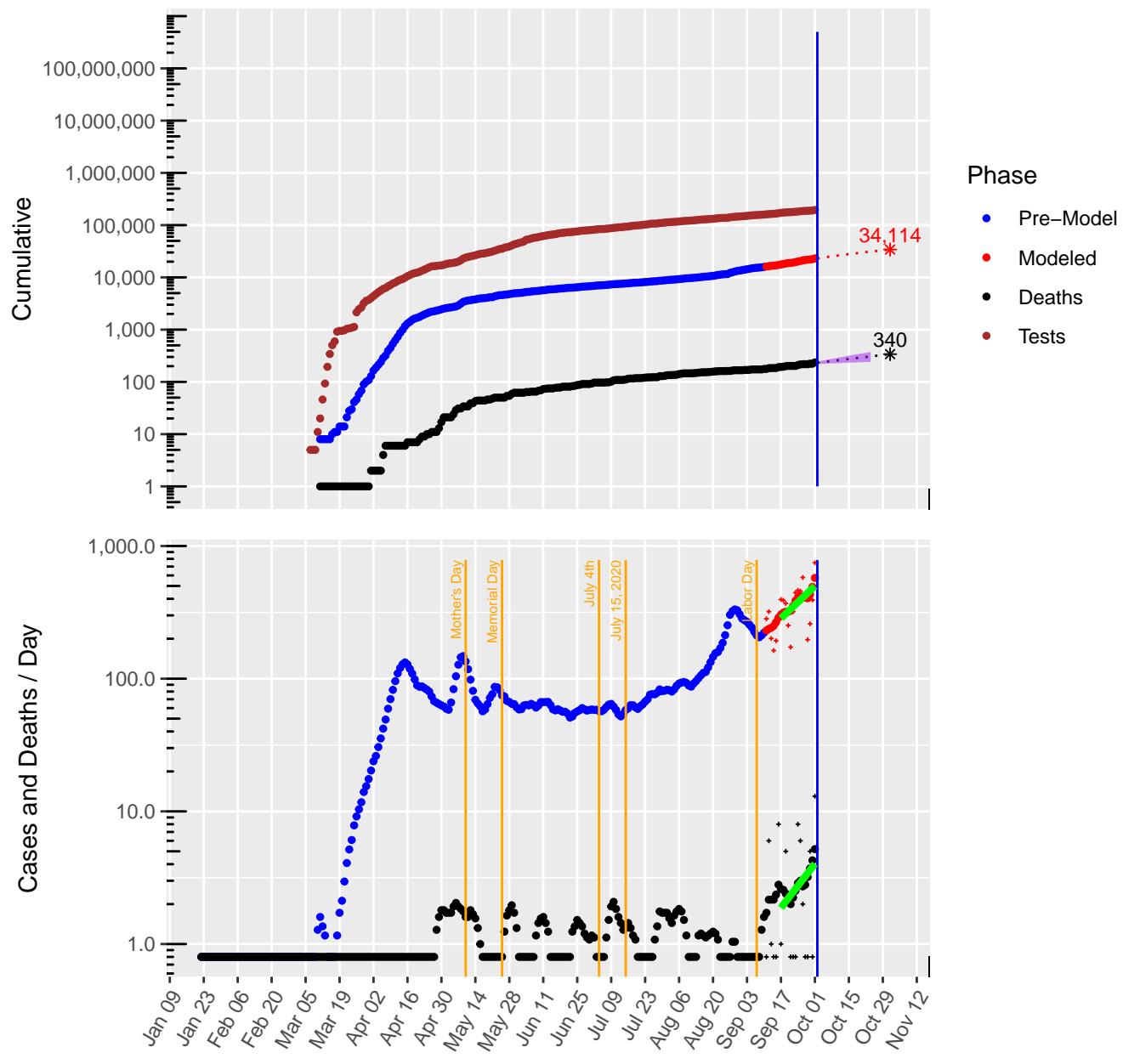
Rhode Island projection as of 2020-10-02



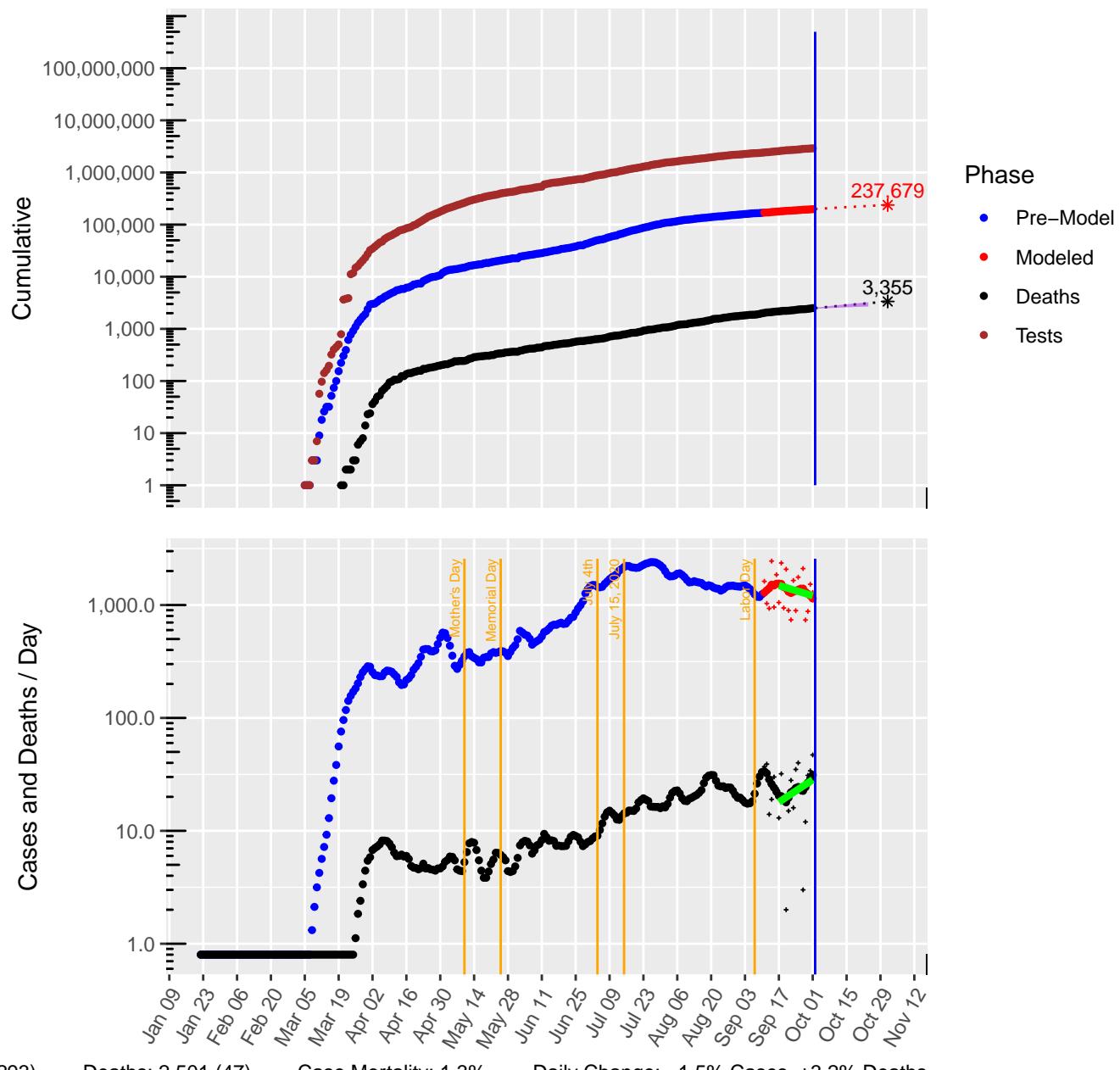
South Carolina projection as of 2020-10-02



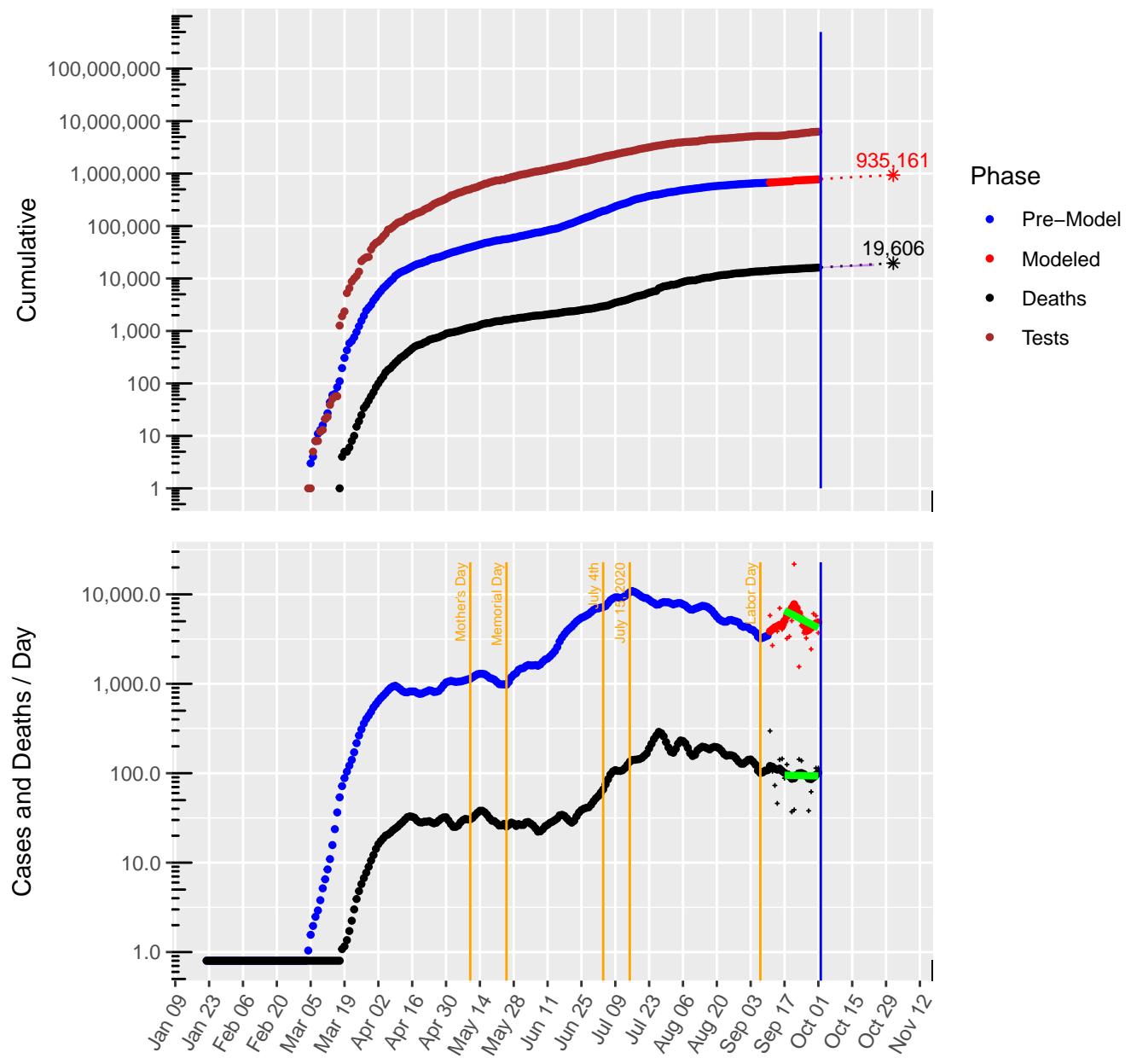
South Dakota projection as of 2020-10-02



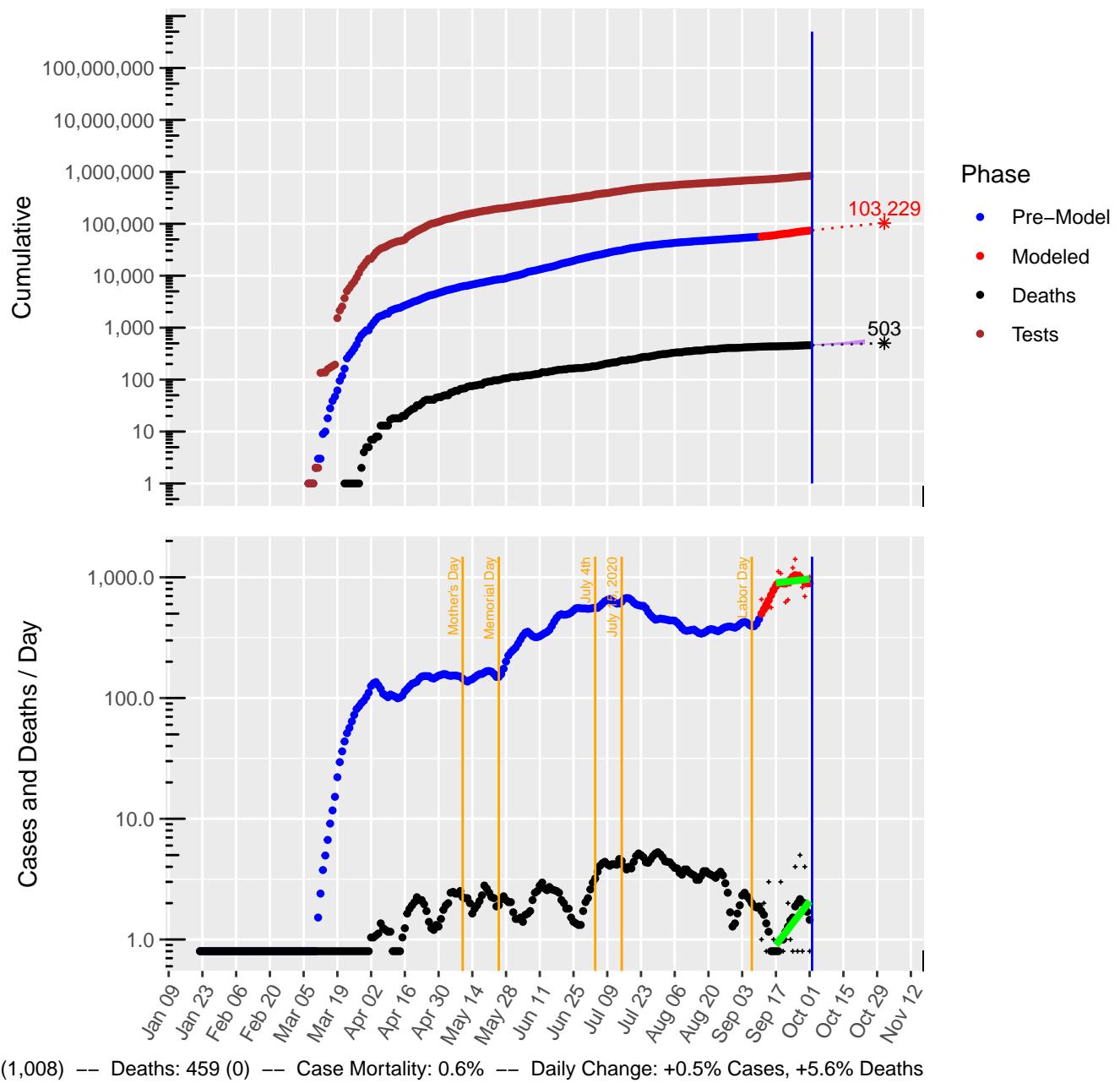
Tennessee projection as of 2020-10-02



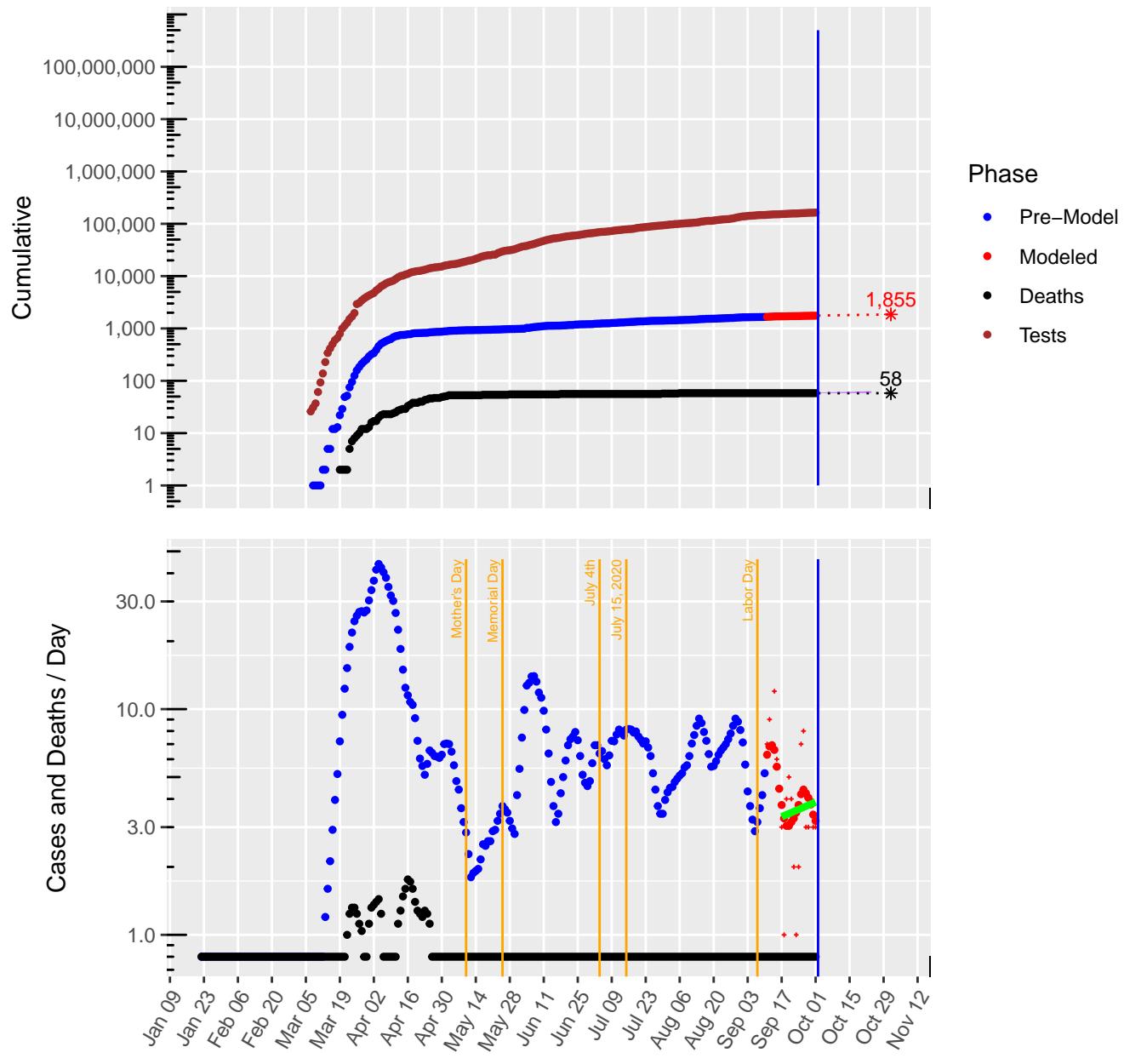
Texas projection as of 2020-10-02



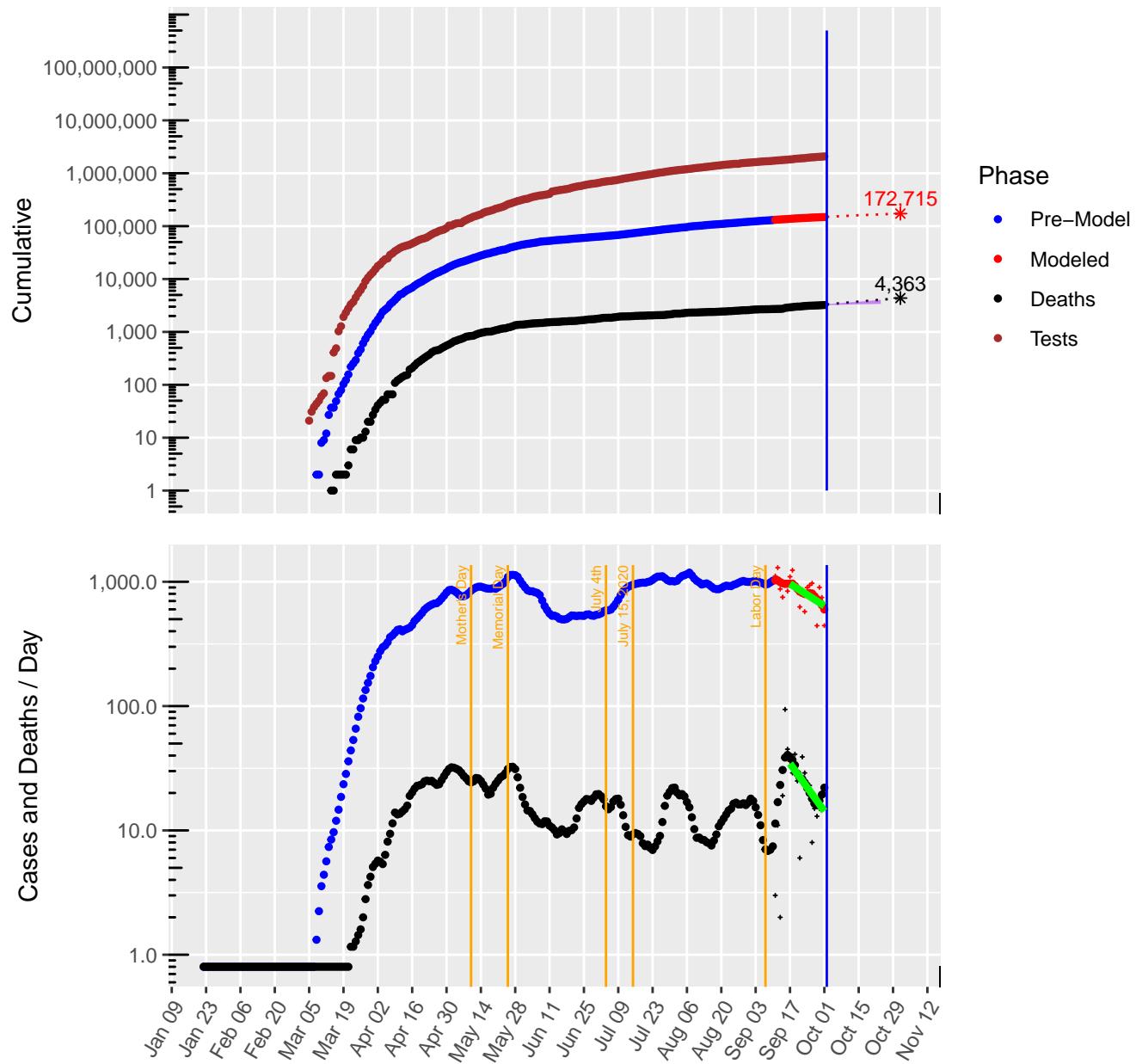
Utah projection as of 2020-10-02



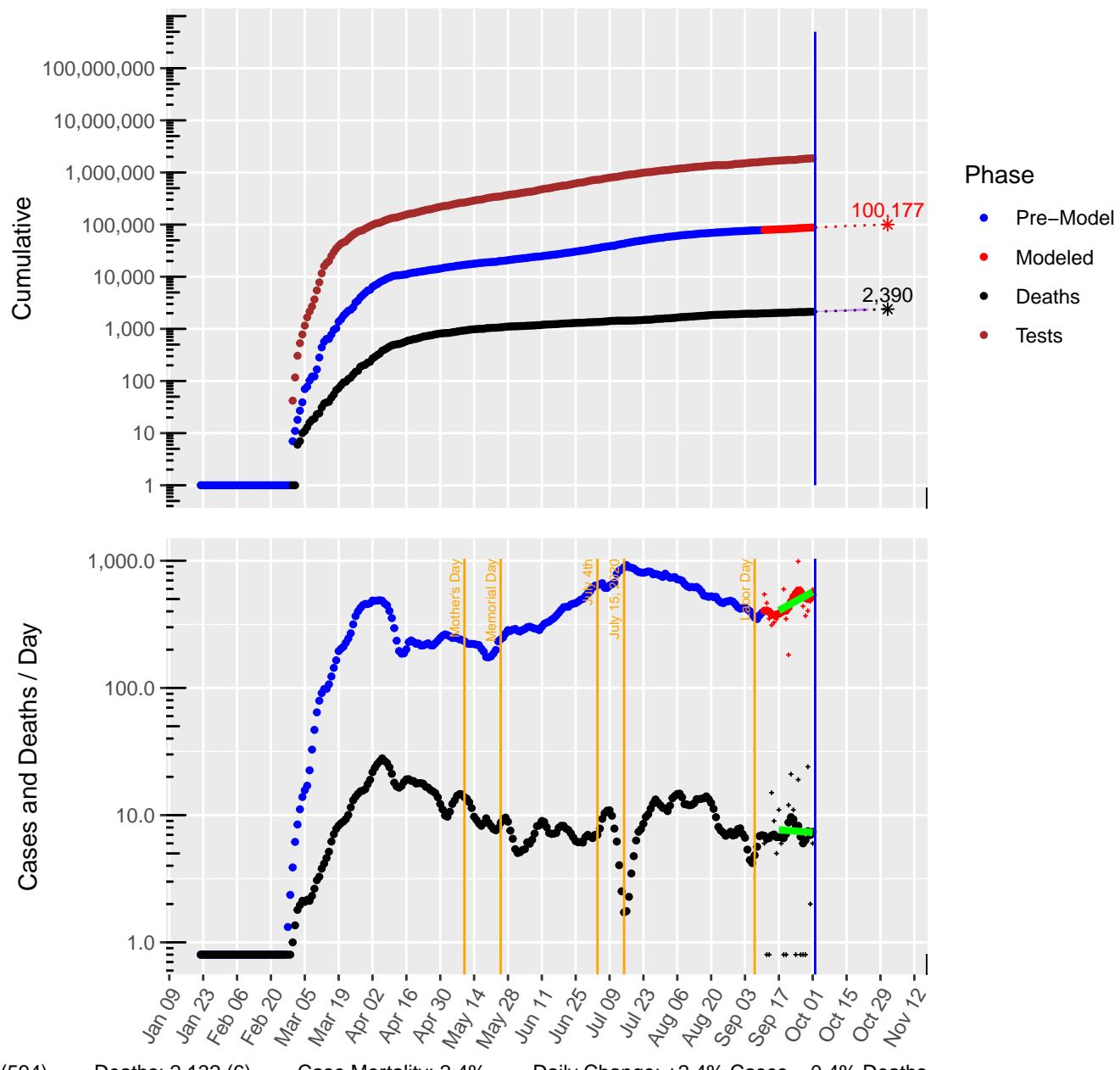
Vermont projection as of 2020-10-02



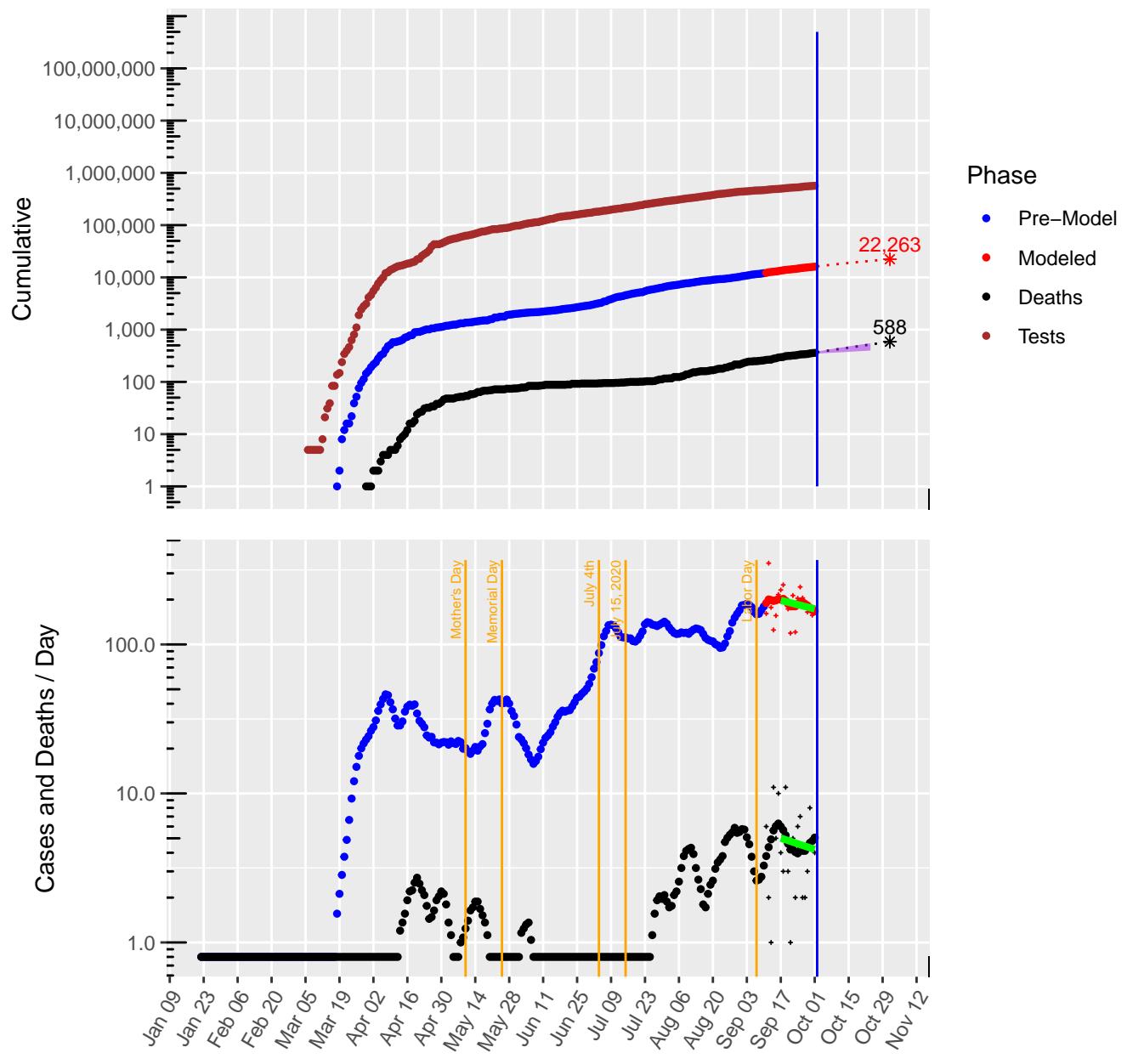
Virginia projection as of 2020-10-02



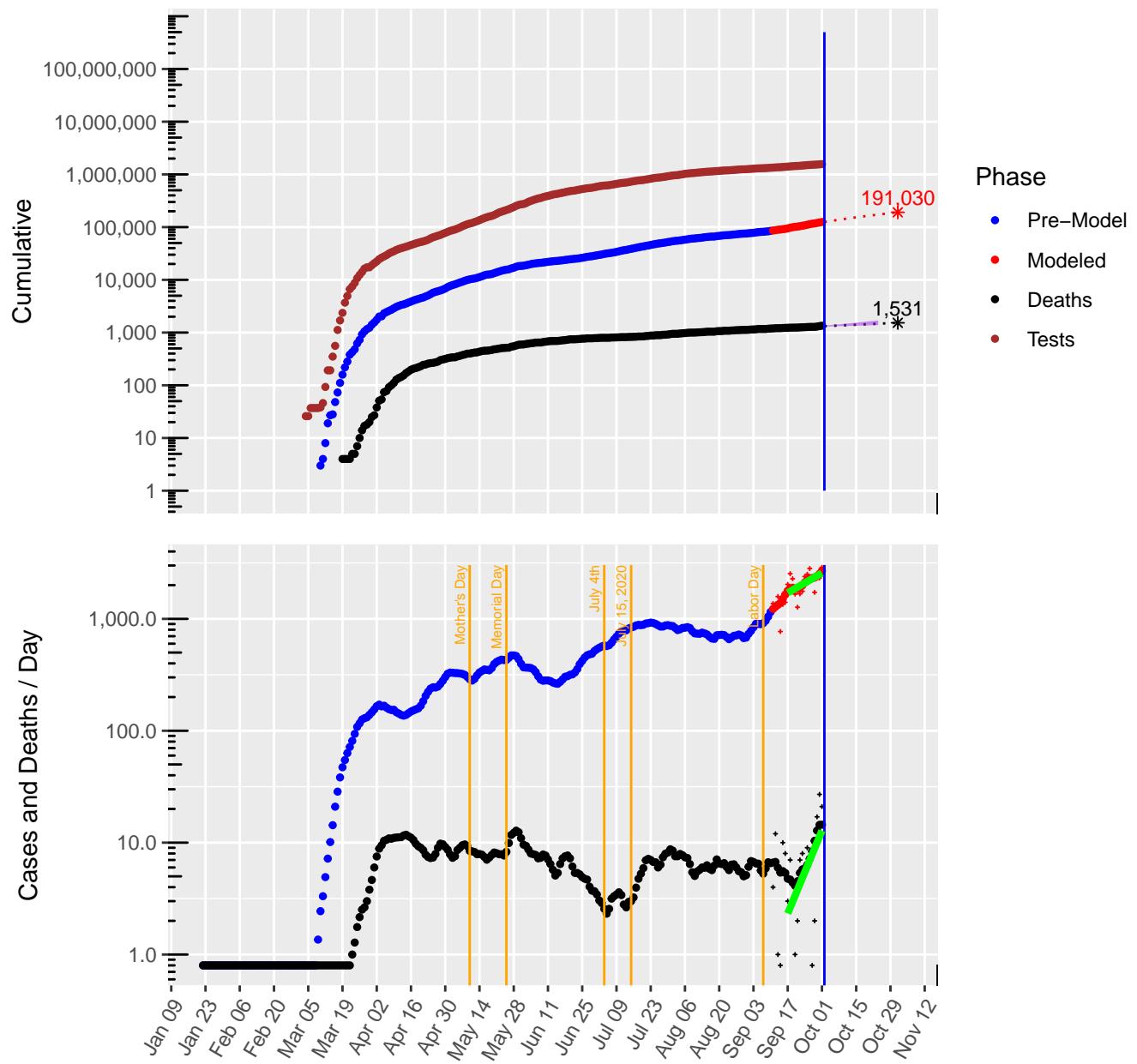
Washington projection as of 2020-10-02



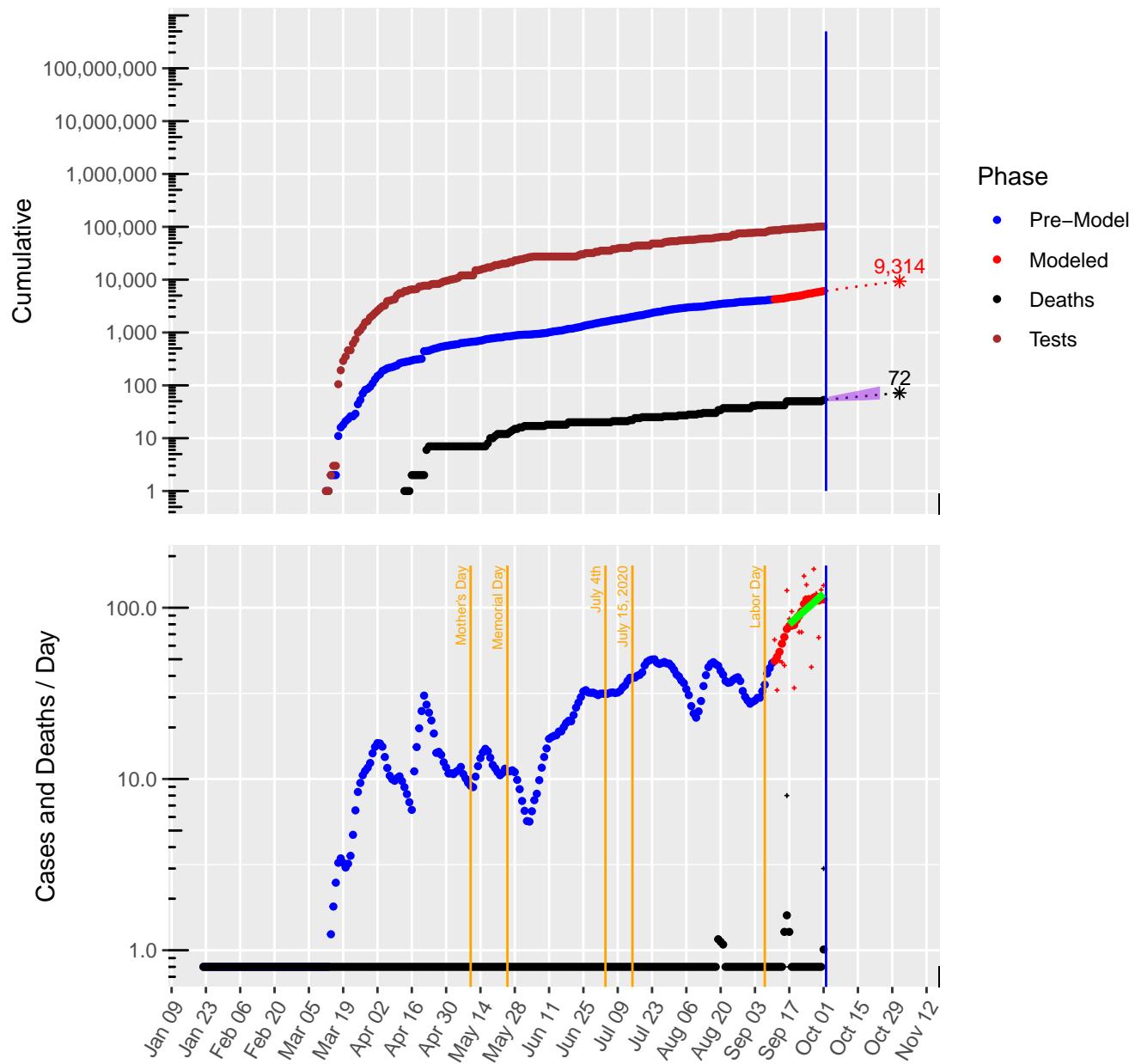
West Virginia projection as of 2020-10-02



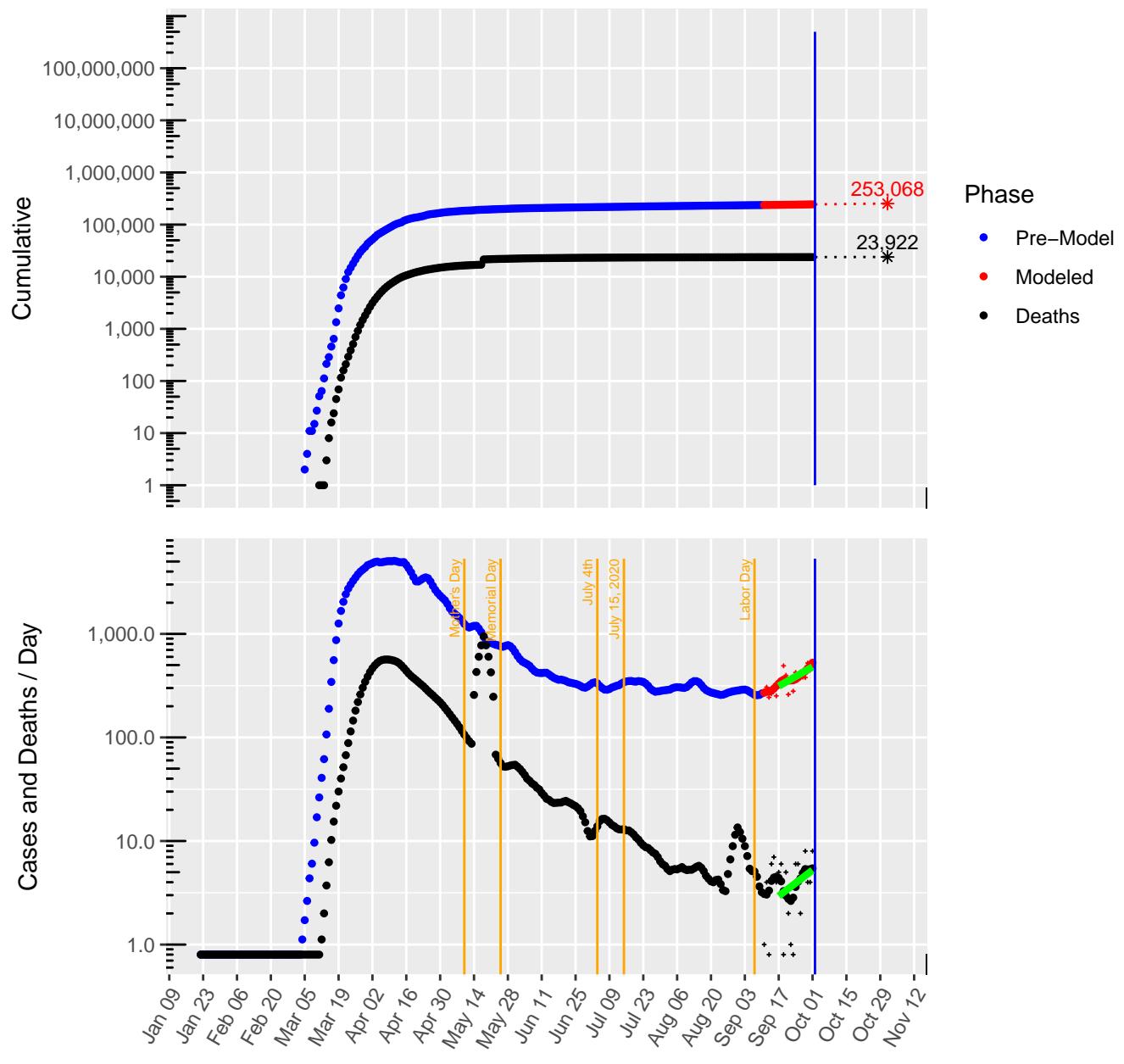
Wisconsin projection as of 2020-10-02



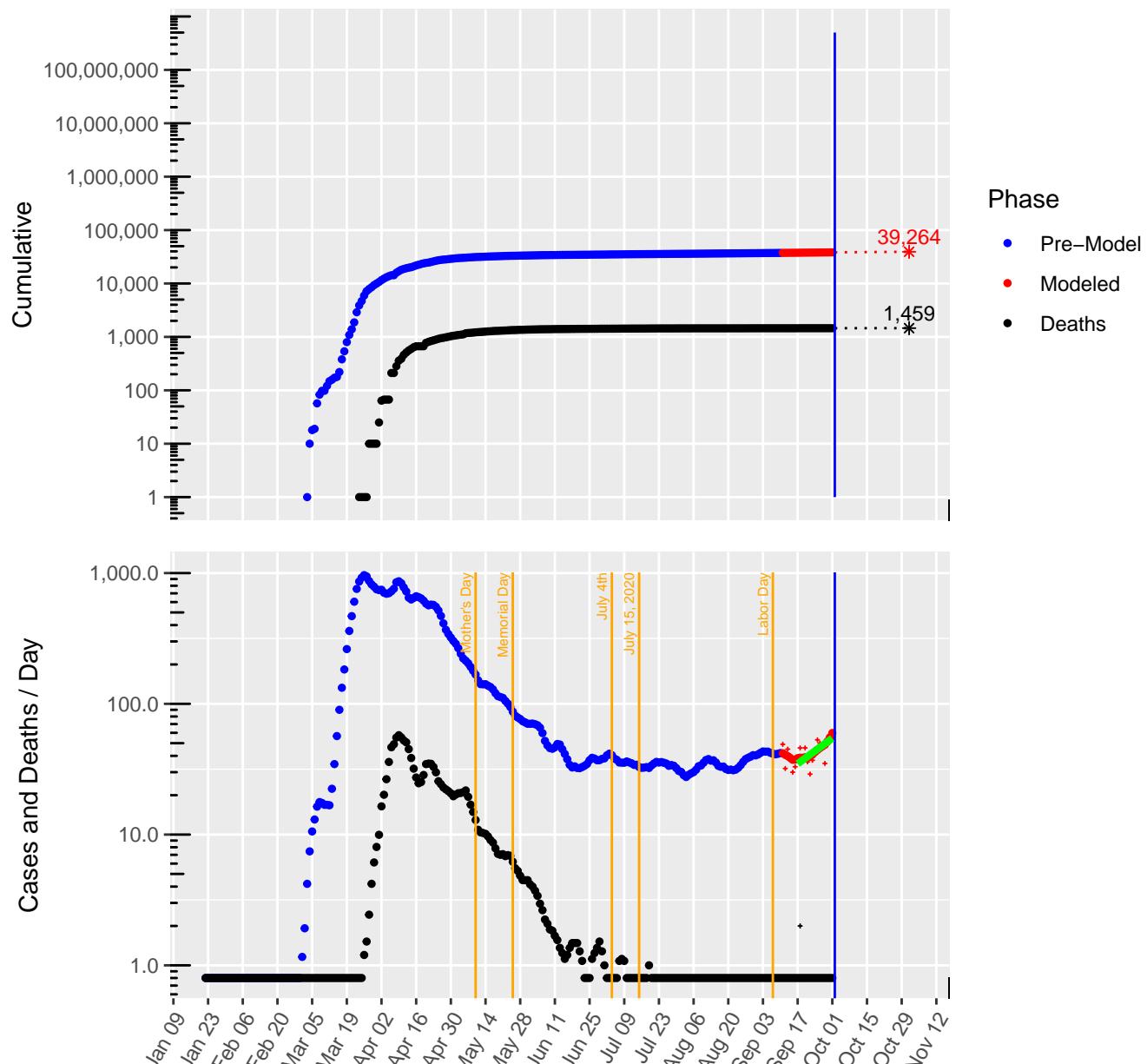
Wyoming projection as of 2020-10-02



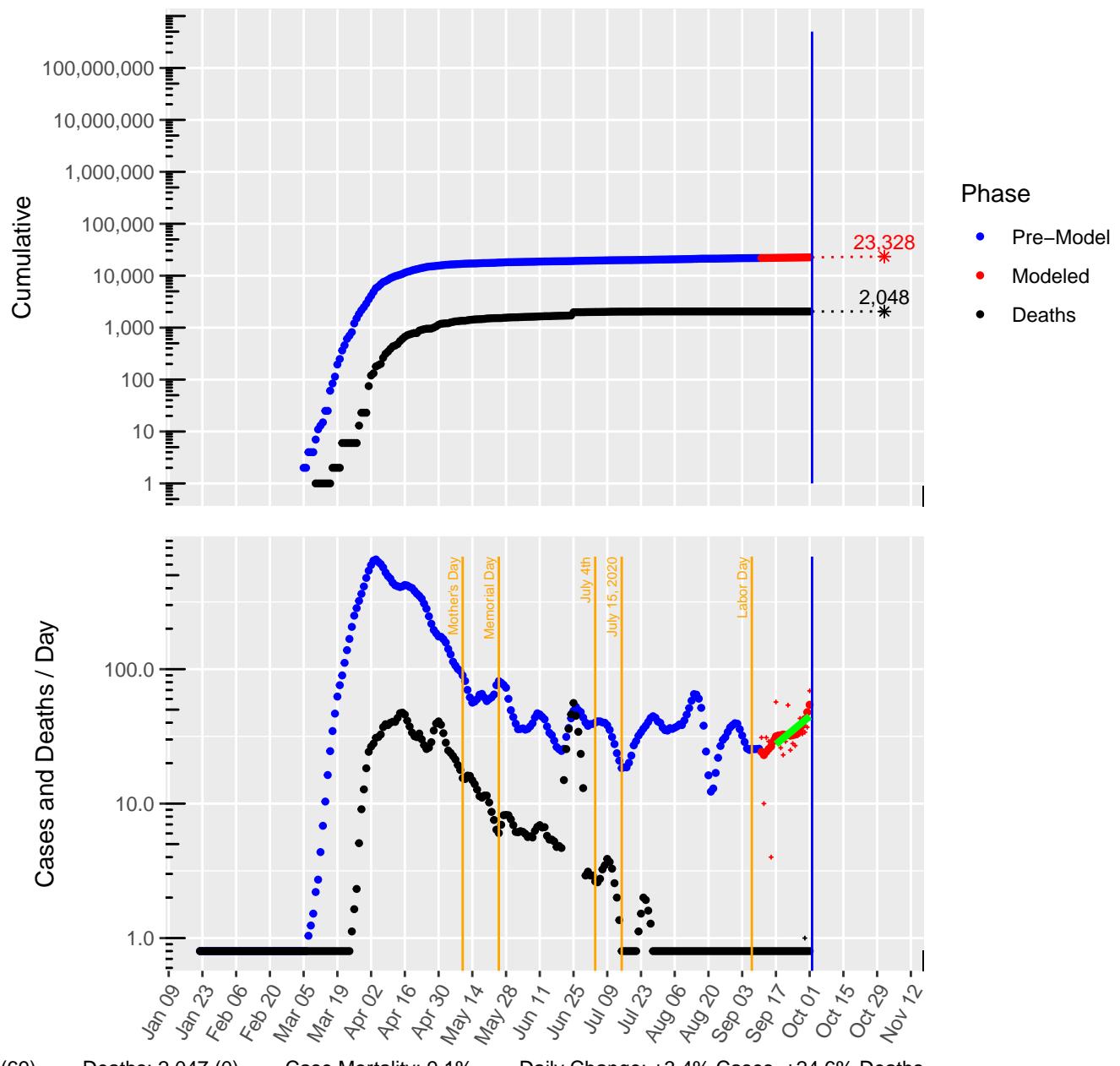
New York City projection as of 2020-10-02



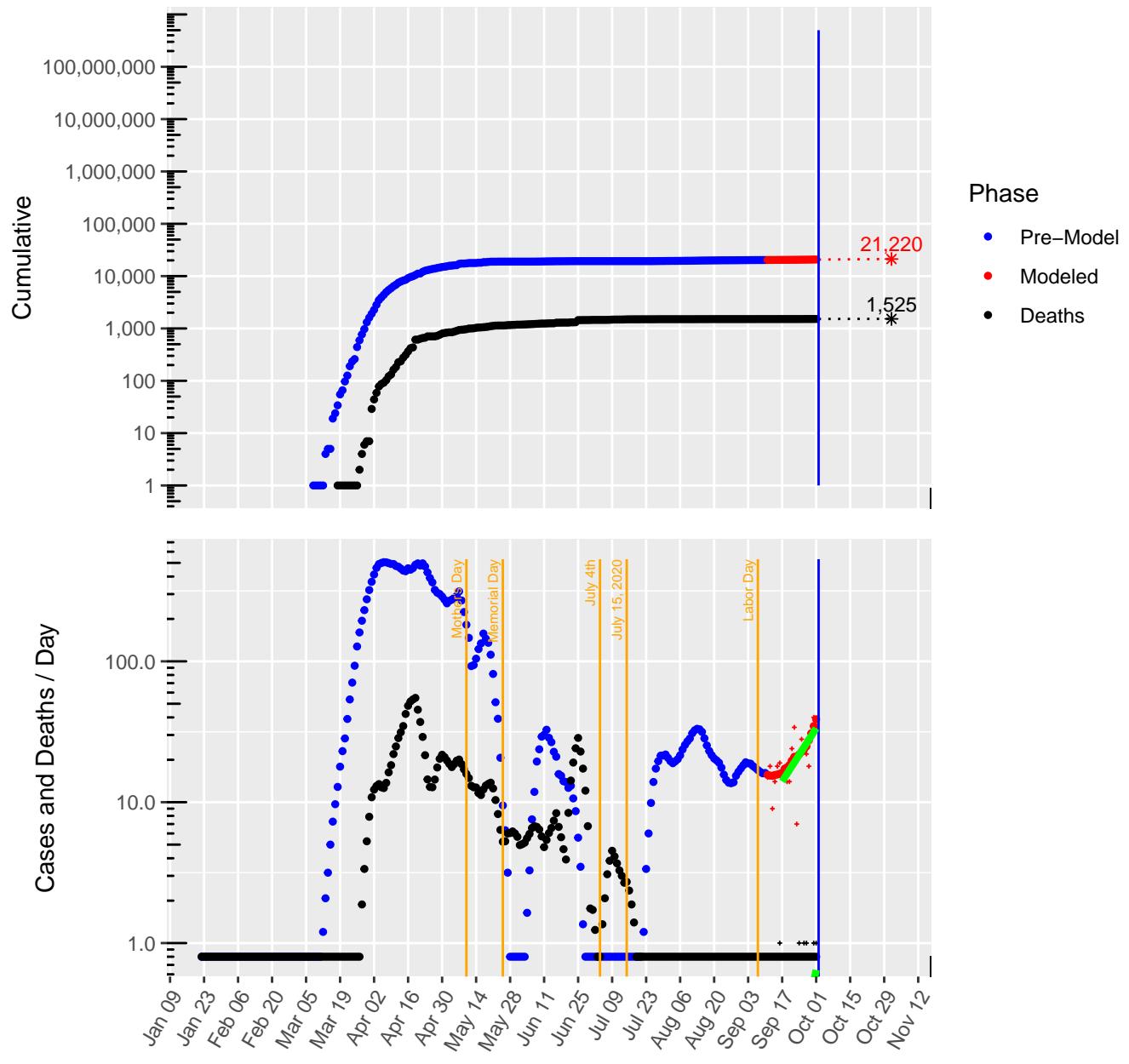
Westchester County, NY projection as of 2020-10-02



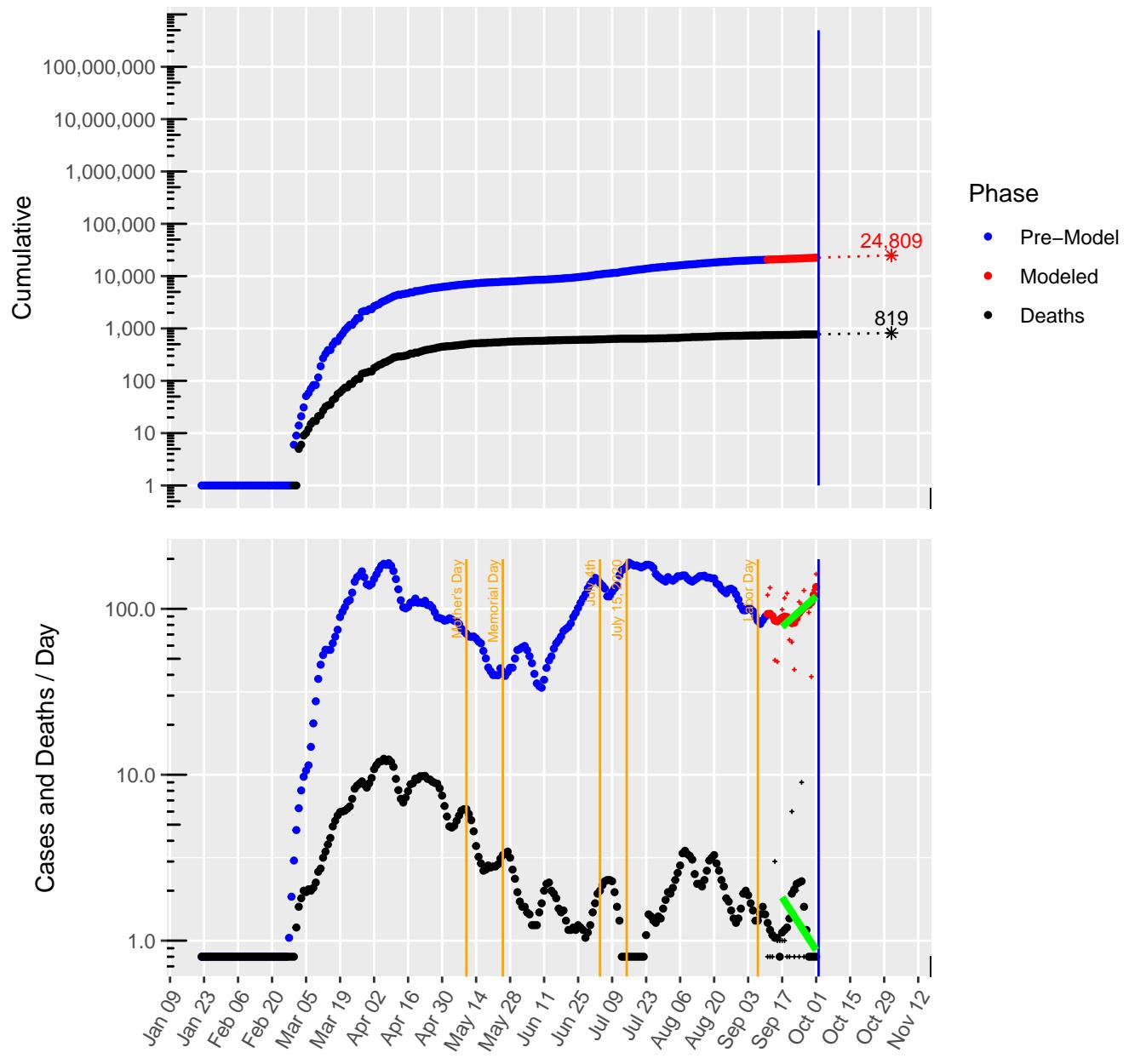
Bergen County, NJ projection as of 2020-10-02



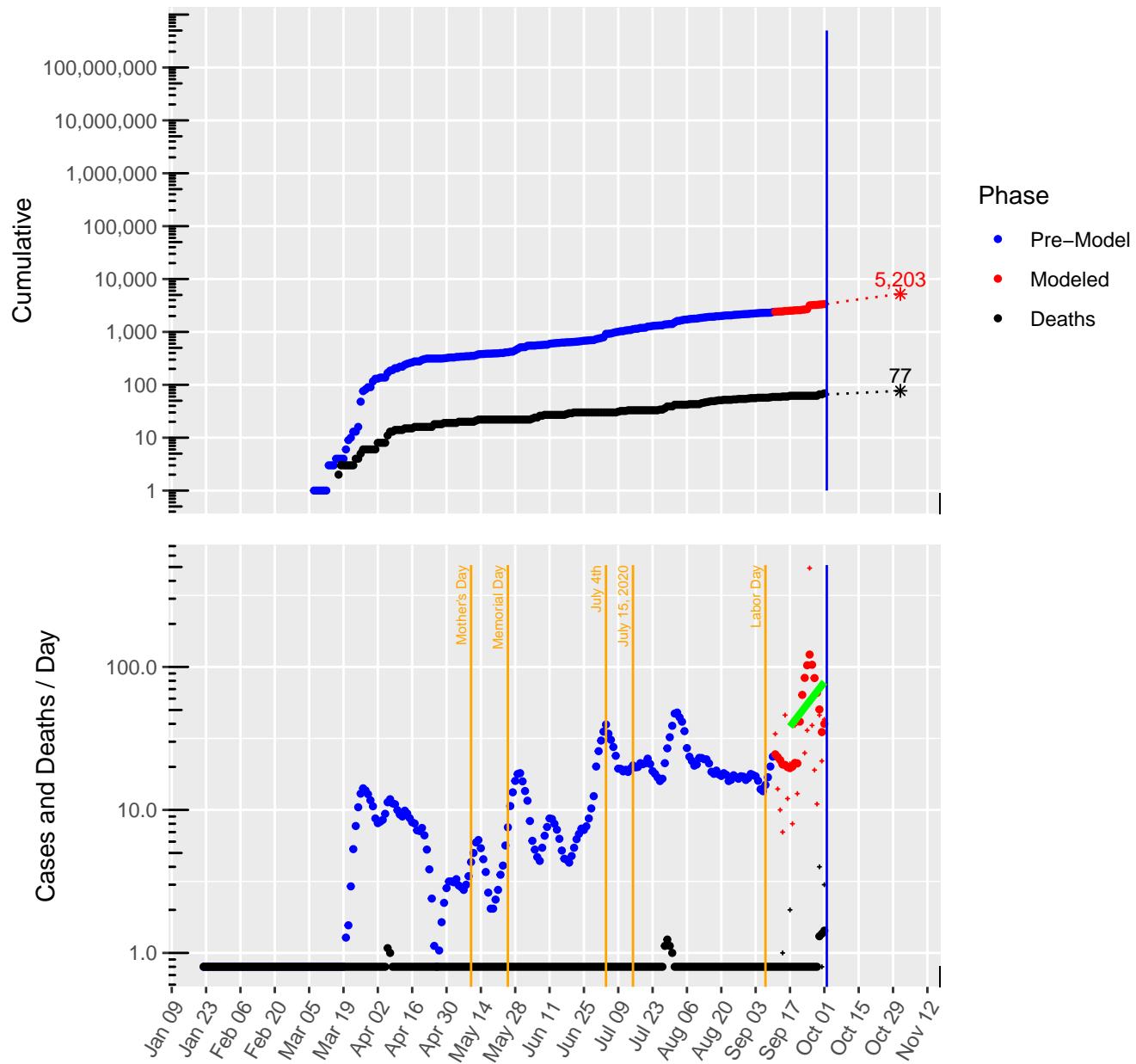
Hudson County, NJ projection as of 2020-10-02



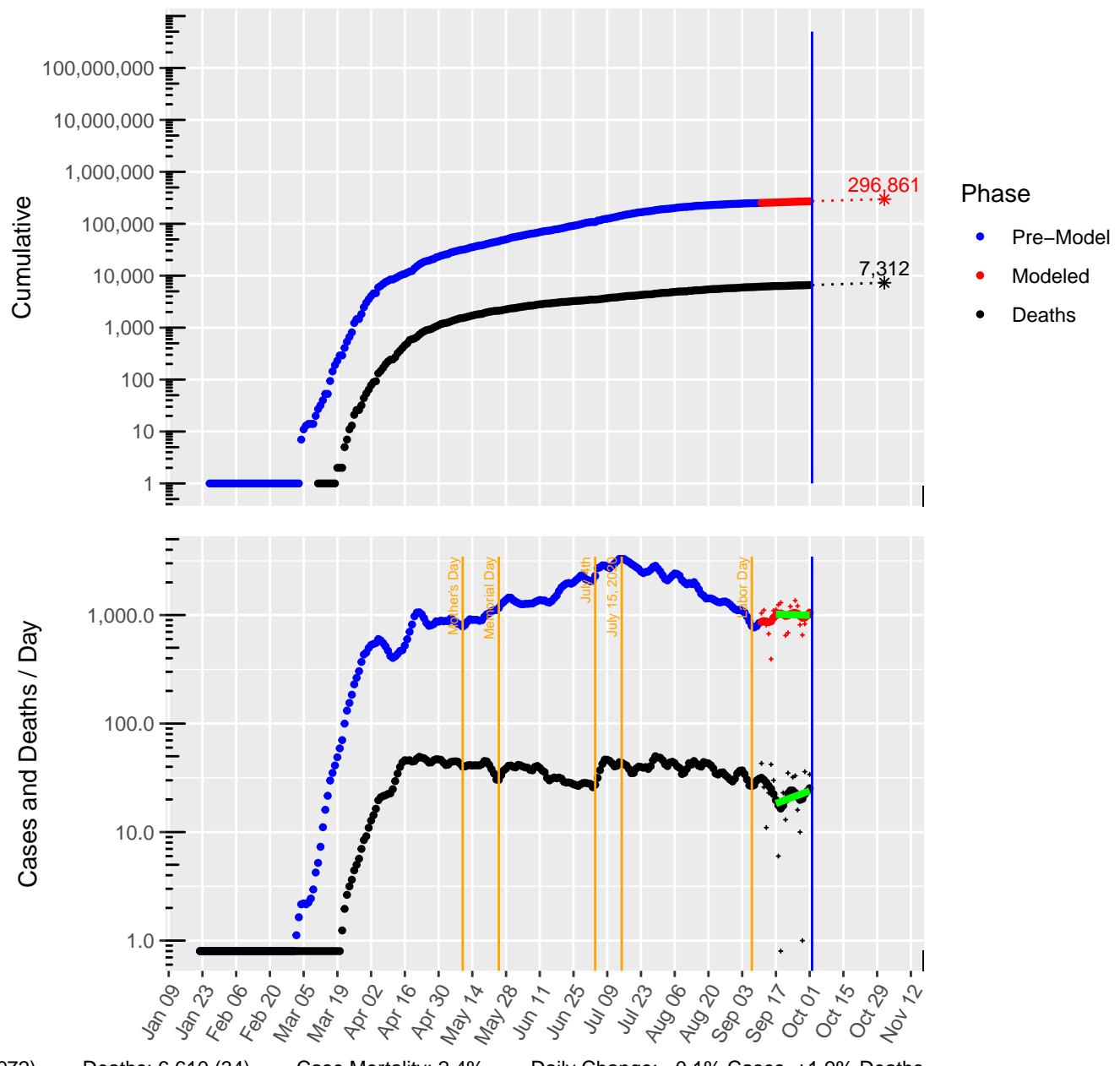
King County (Seattle) projection as of 2020-10-02



Clark County, Washington projection as of 2020-10-02

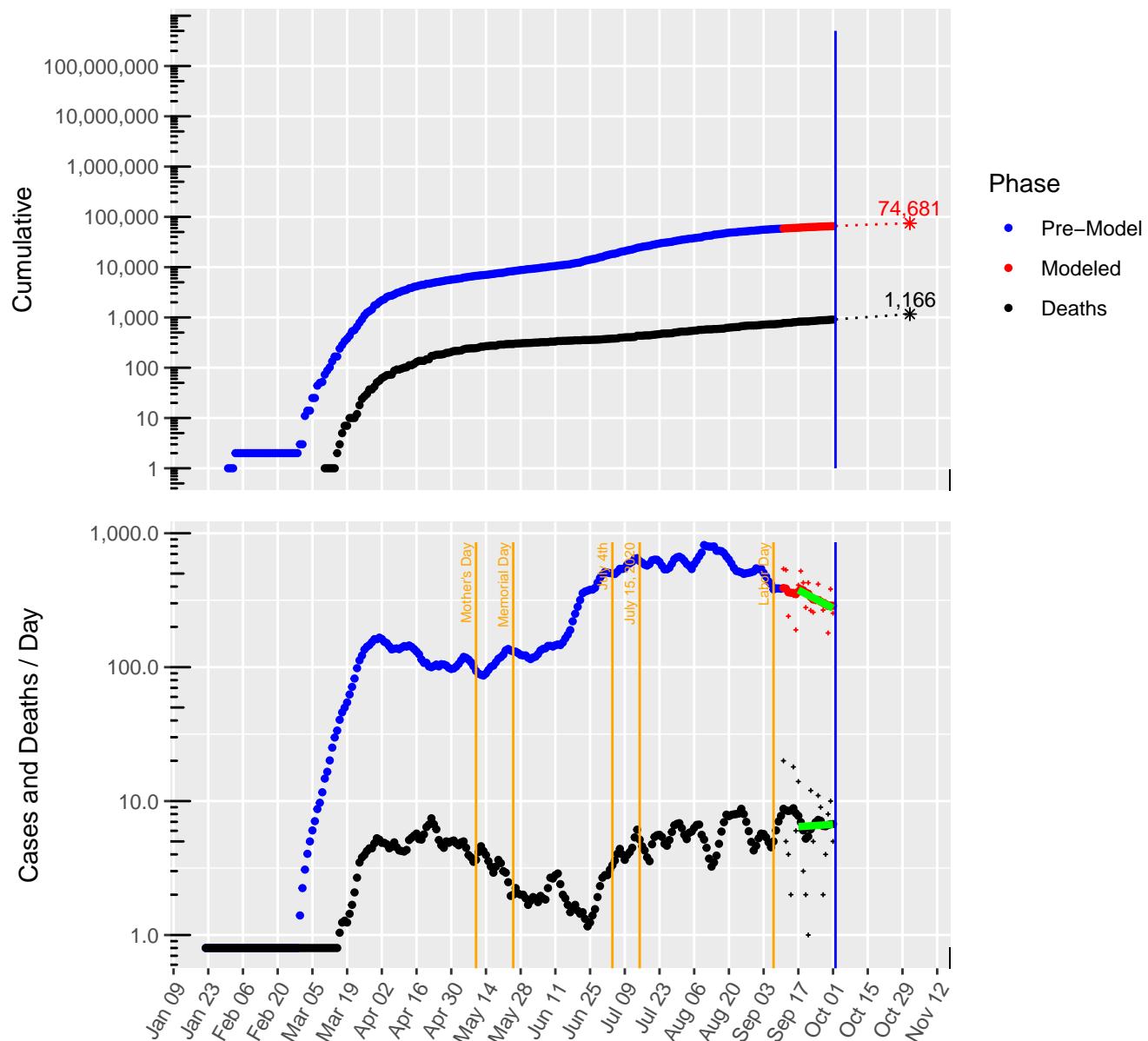


Los Angeles projection as of 2020-10-02

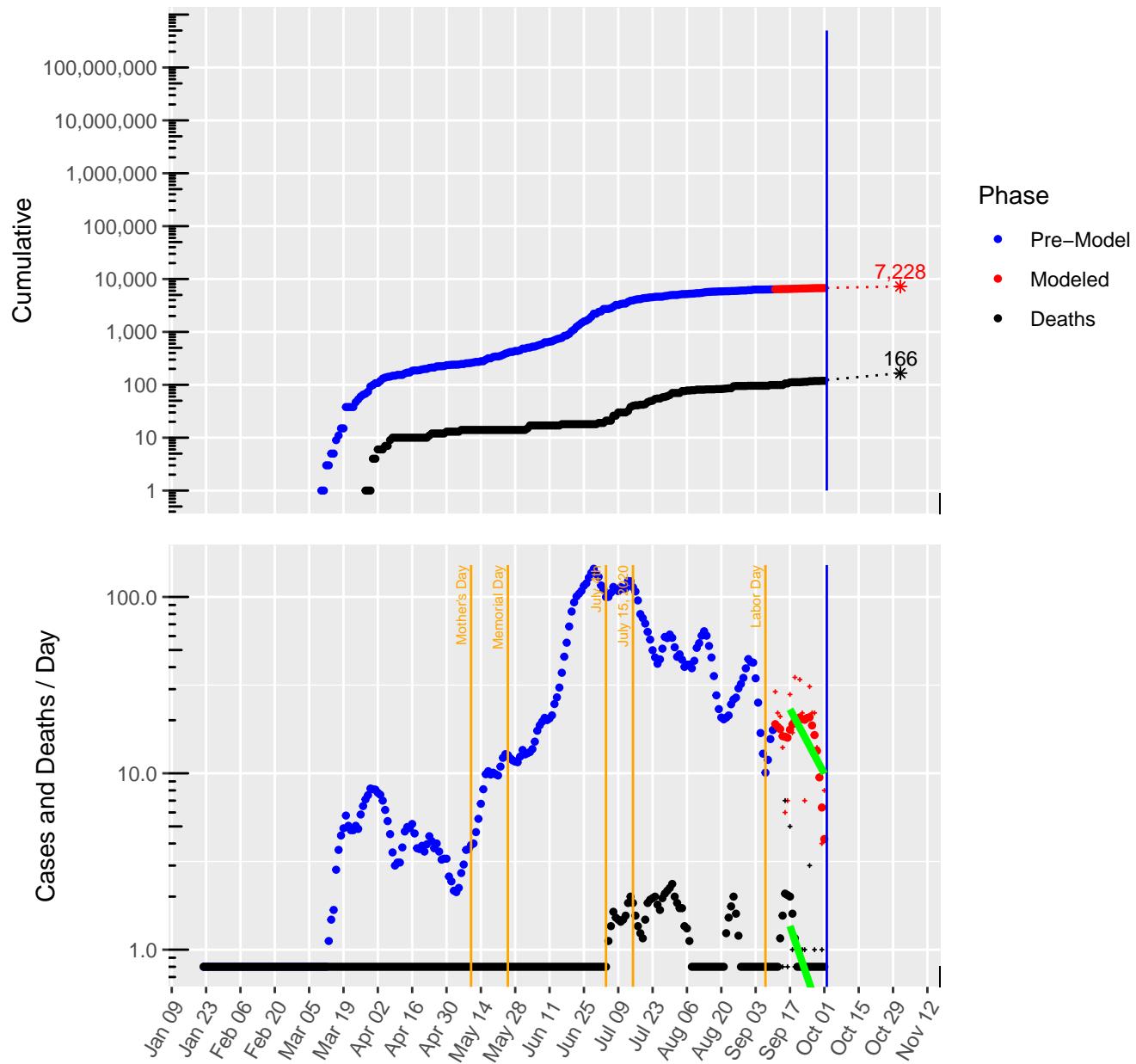


Bay Area projection as of 2020-10-02

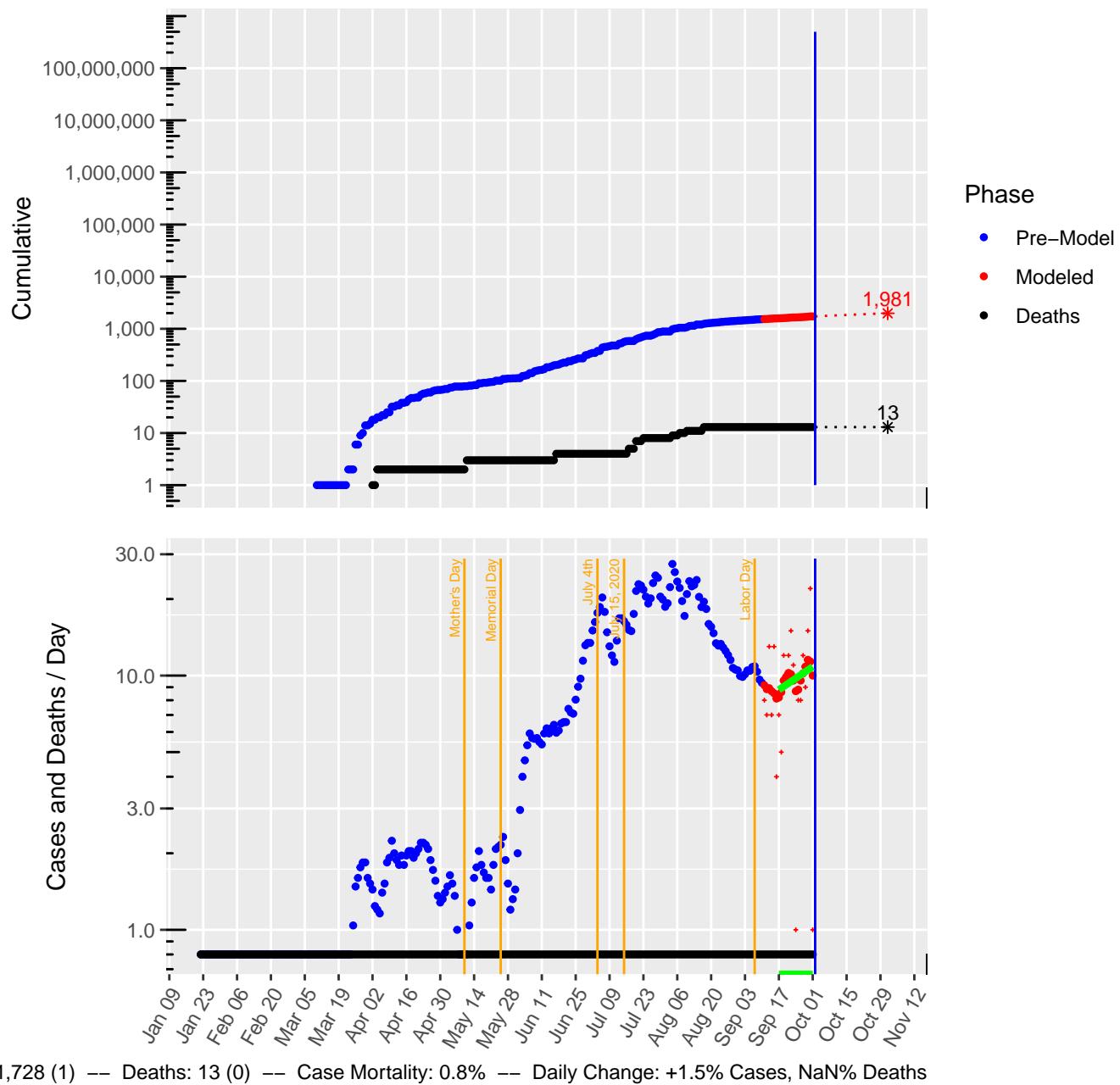
Marin, Napa, San Mateo, San Francisco, Santa Clara, Solano, and Sonoma Counties



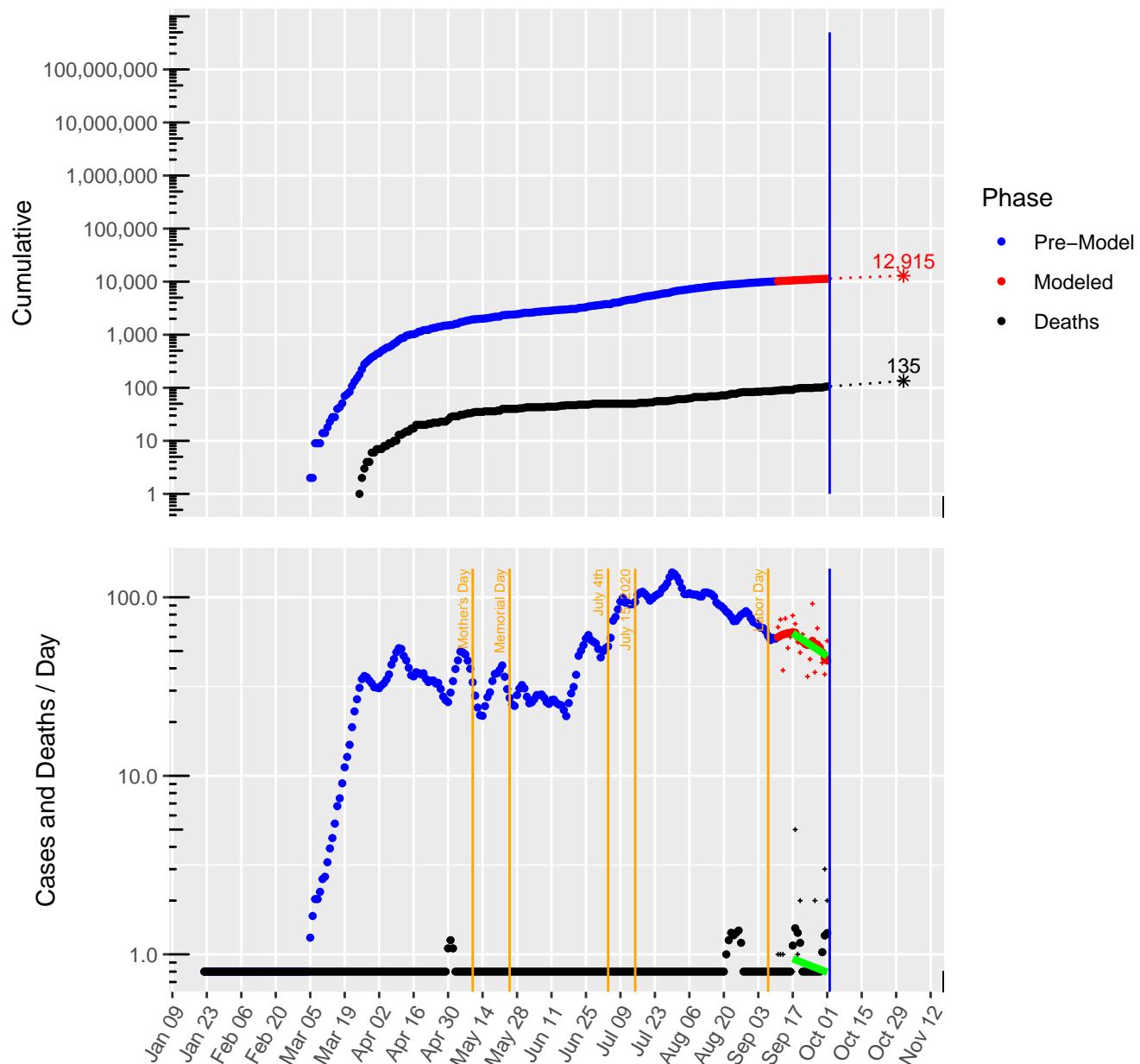
Marin County, California projection as of 2020-10-02



Napa County, California projection as of 2020-10-02

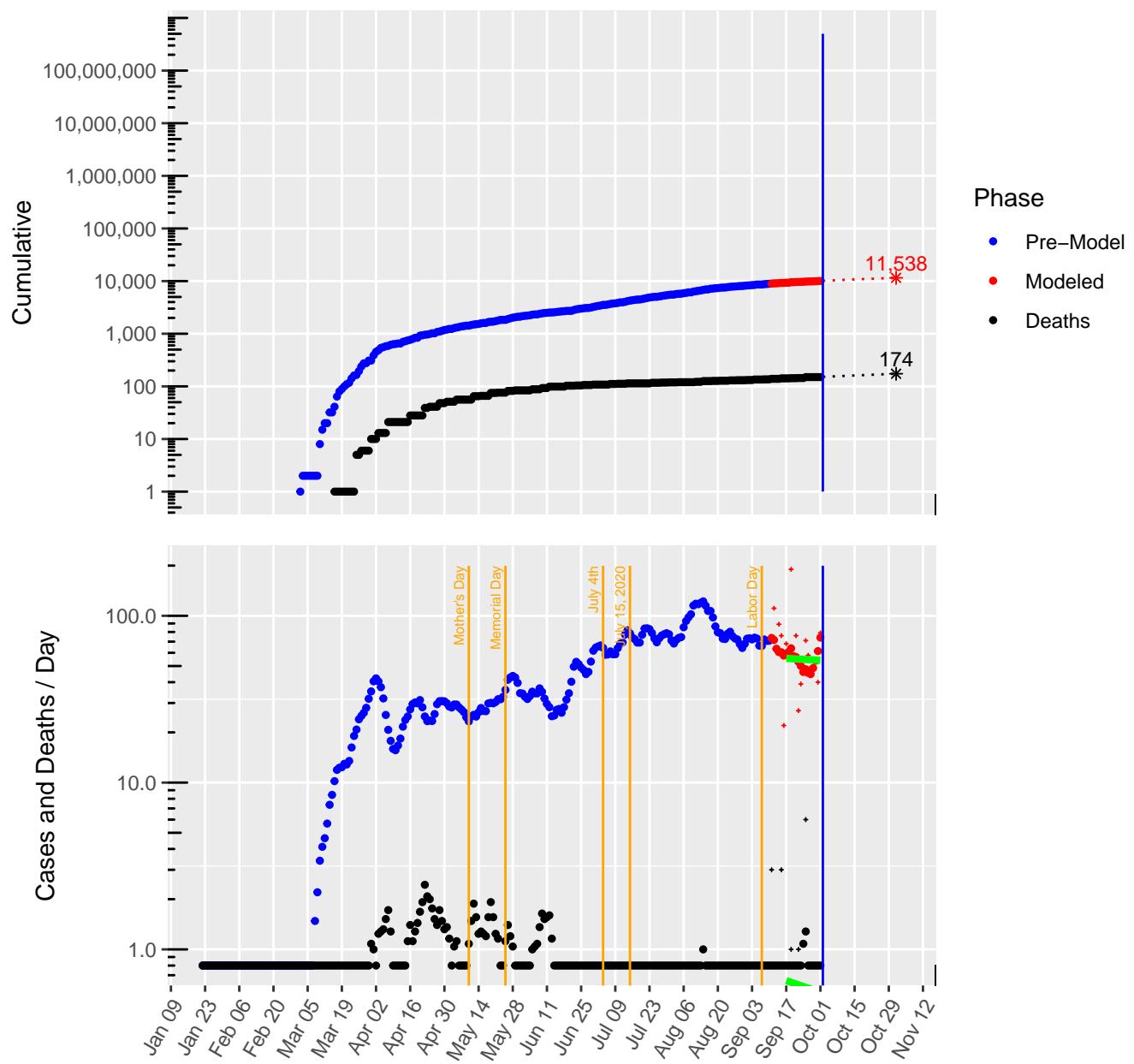


San Francisco projection as of 2020-10-02

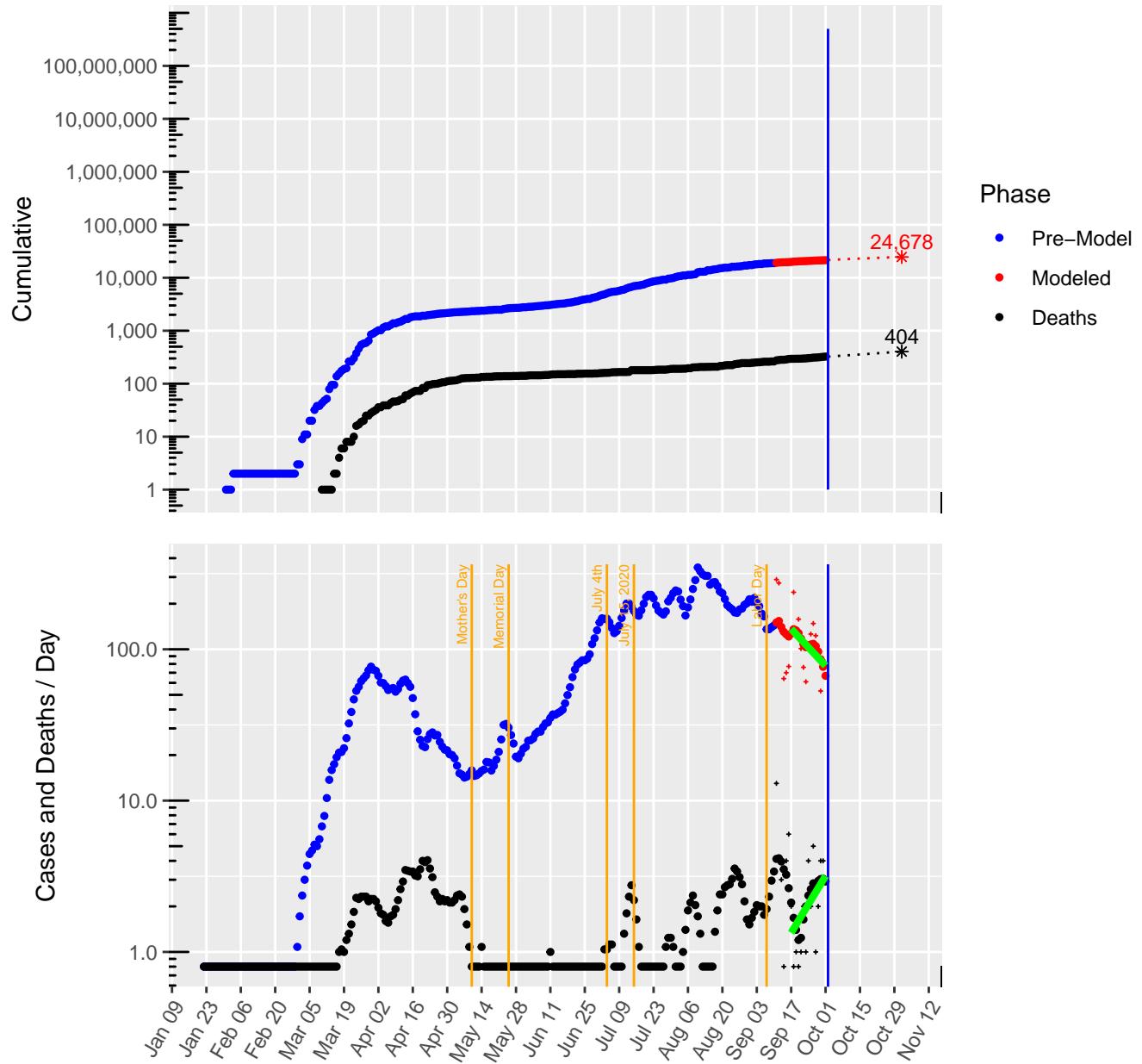


32 (57) --- Deaths: 106 (2) --- Case Mortality: 0.9% --- Daily Change: -2.1% Cases, -1.2% Deaths

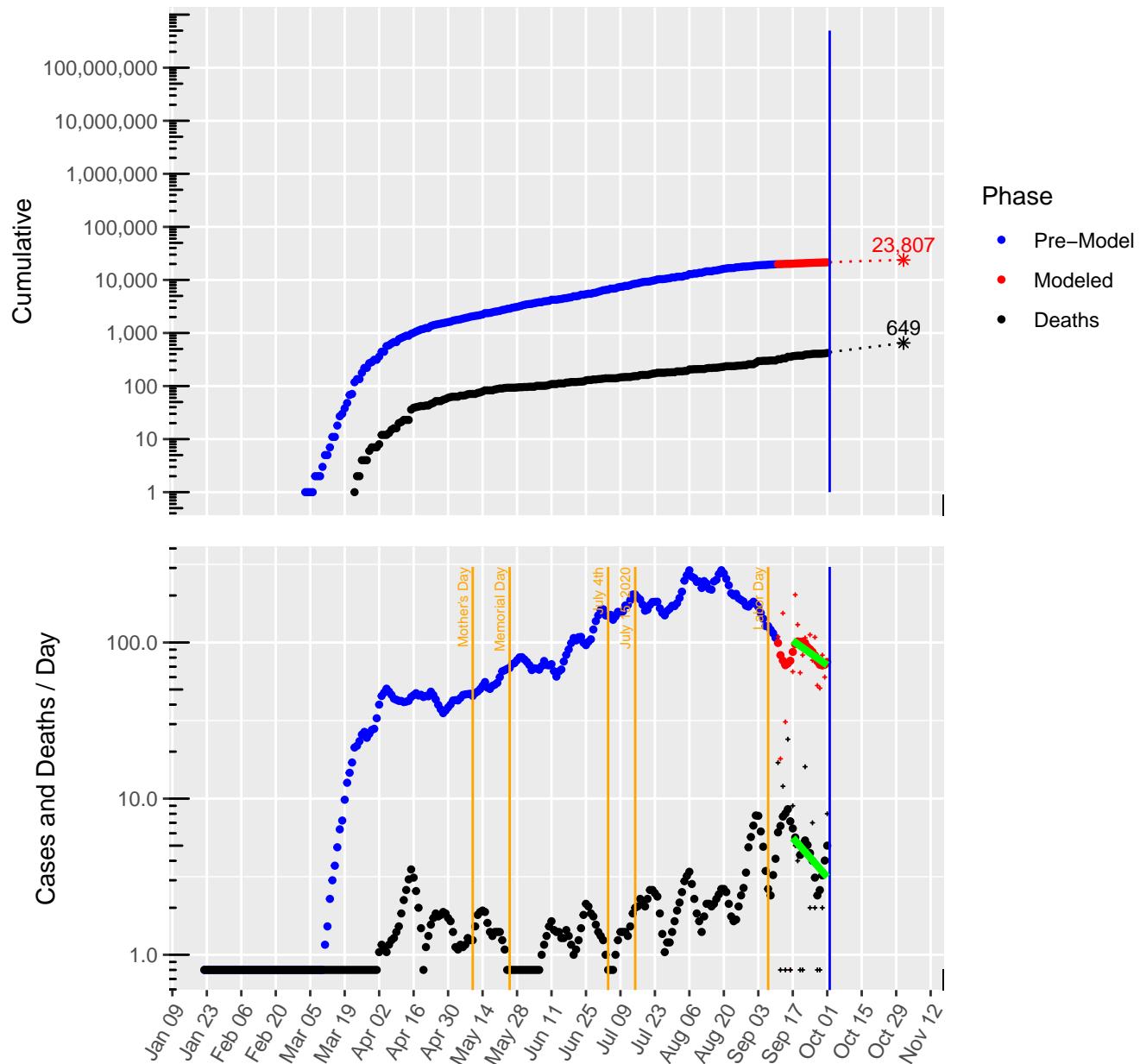
San Mateo County, California projection as of 2020-10-02



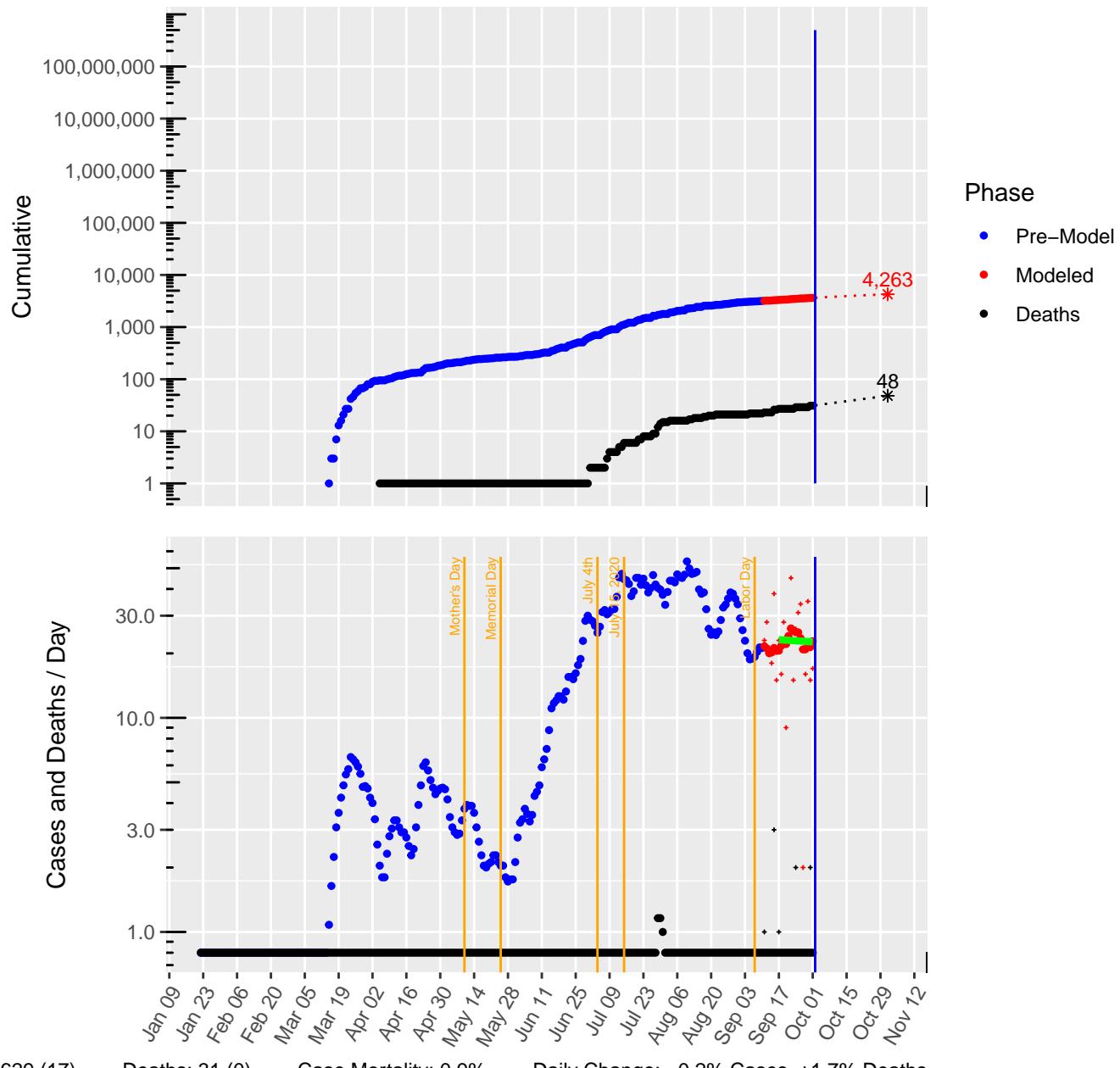
Santa Clara County, California projection as of 2020-10-02



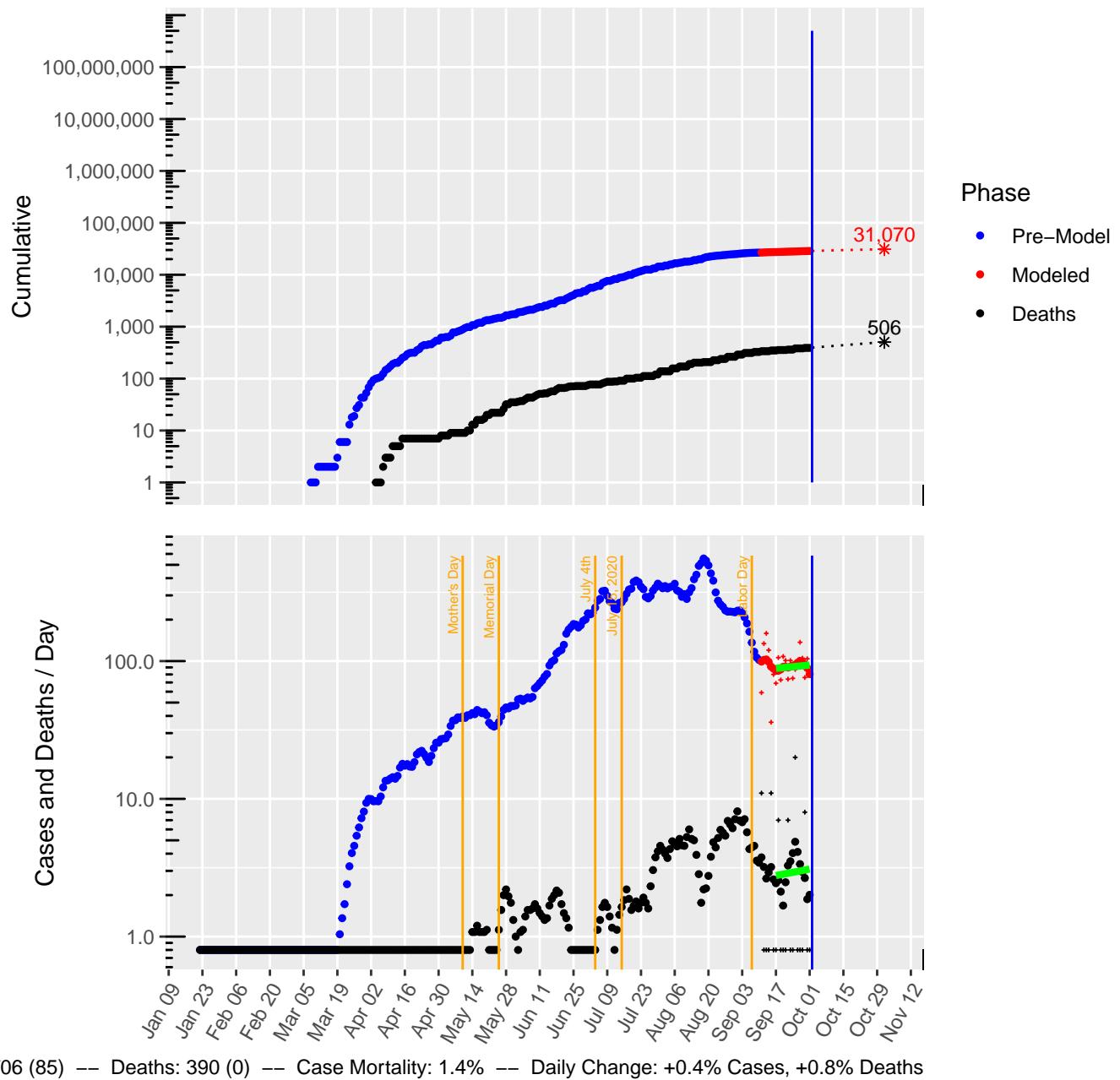
Alameda County, California projection as of 2020-10-02



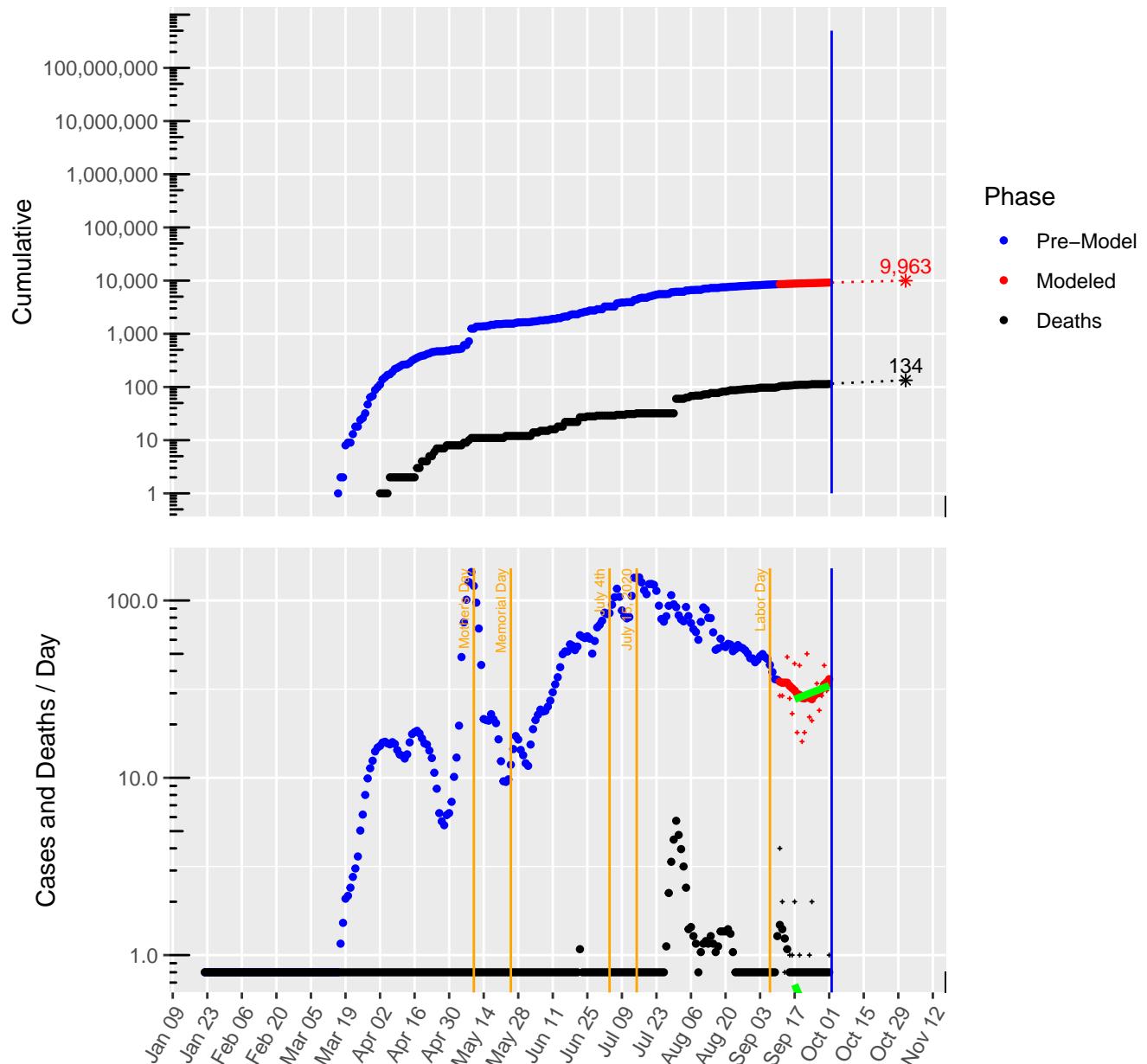
San Luis Obispo, California projection as of 2020-10-02



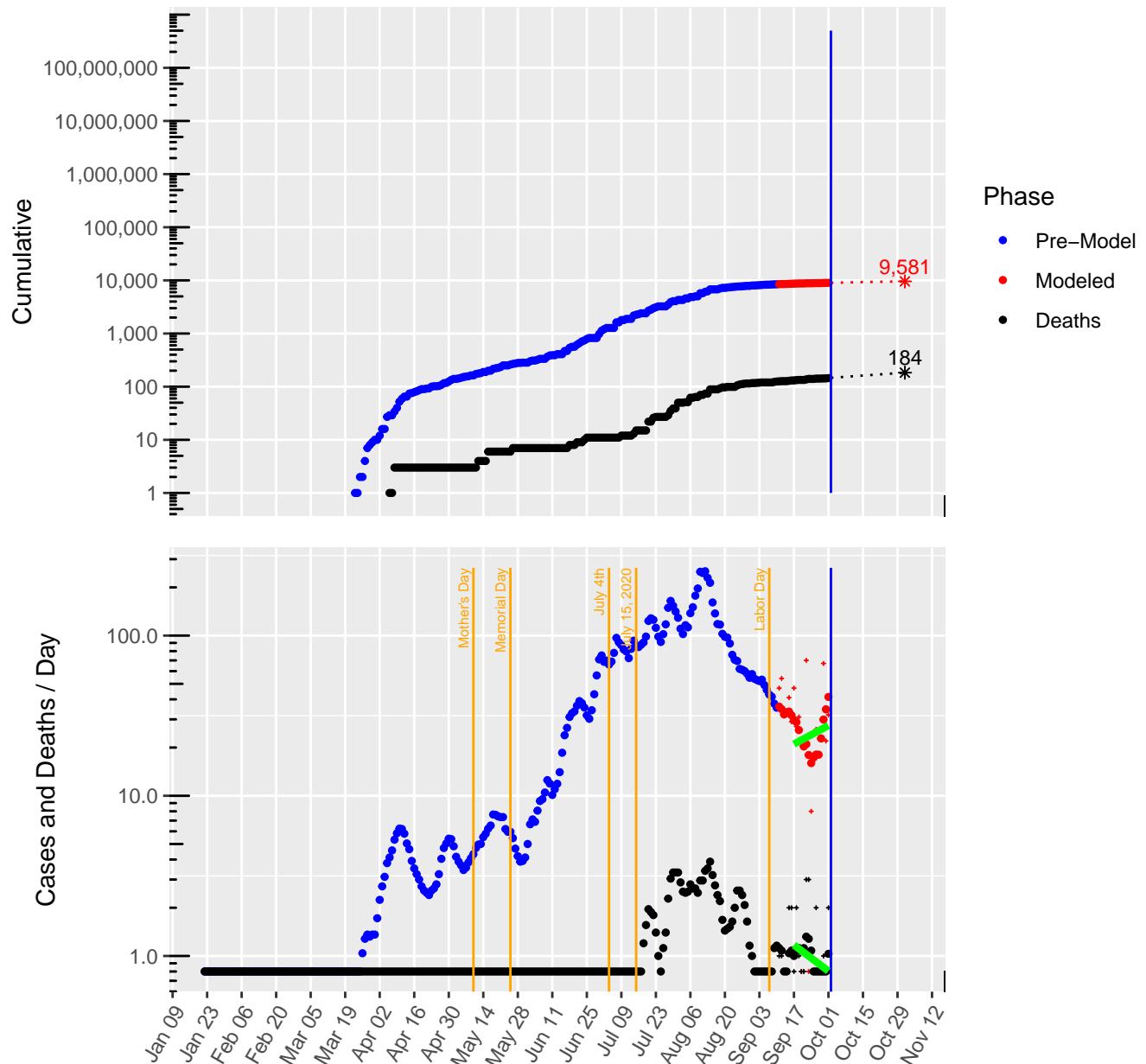
Fresno, California projection as of 2020-10-02



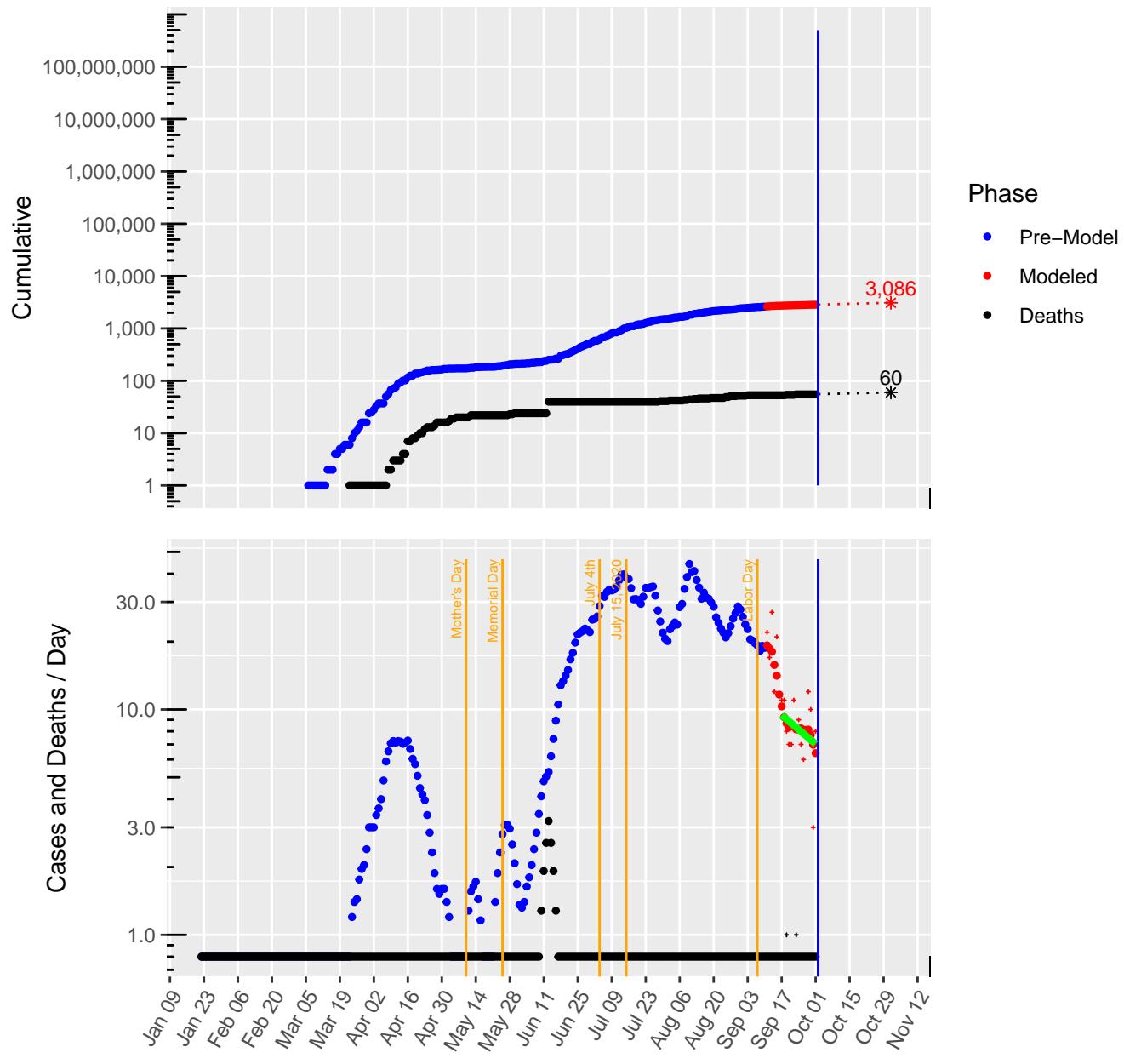
Santa Barbara County, California projection as of 2020-10-02



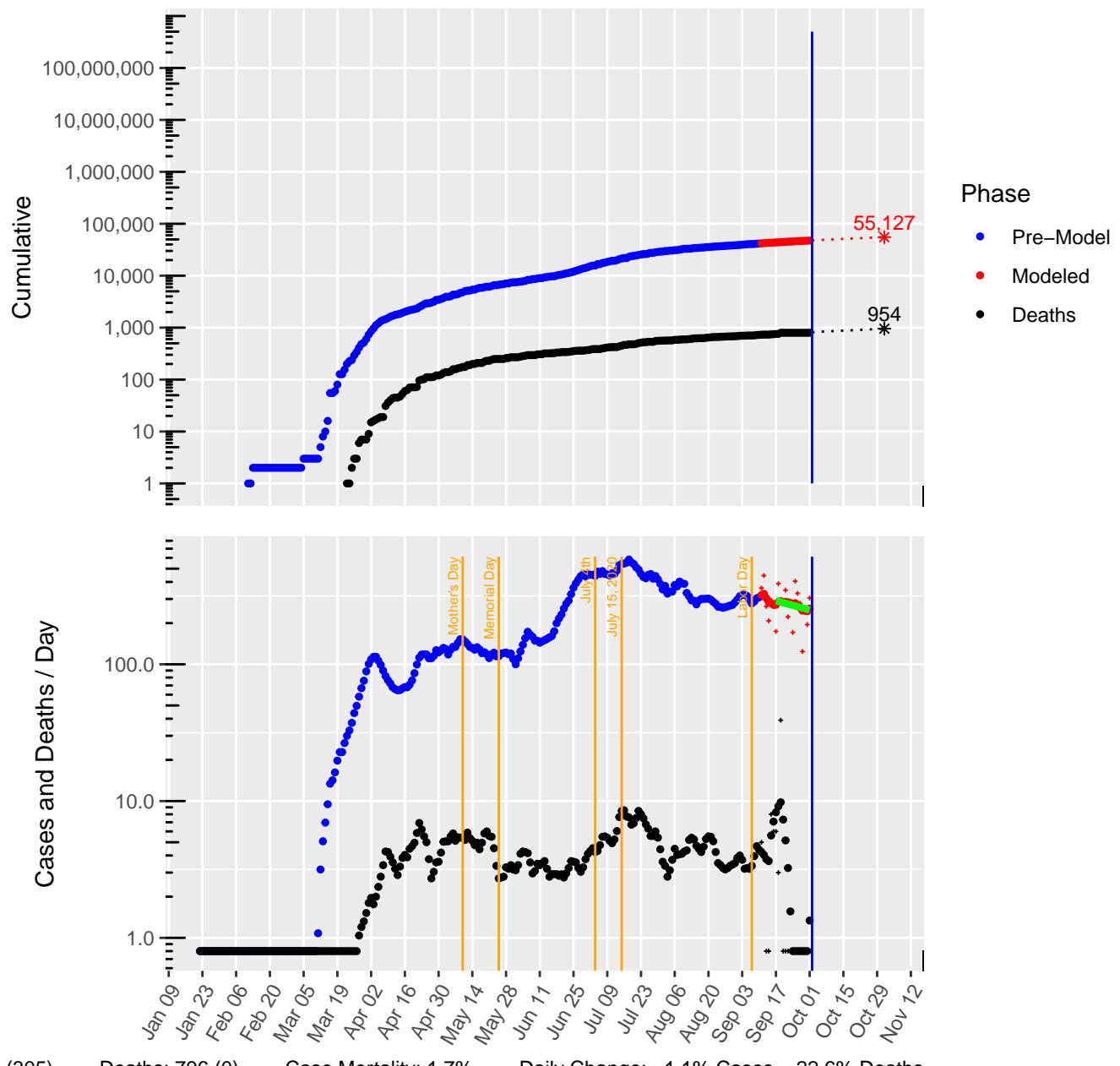
Merced County, California projection as of 2020-10-02



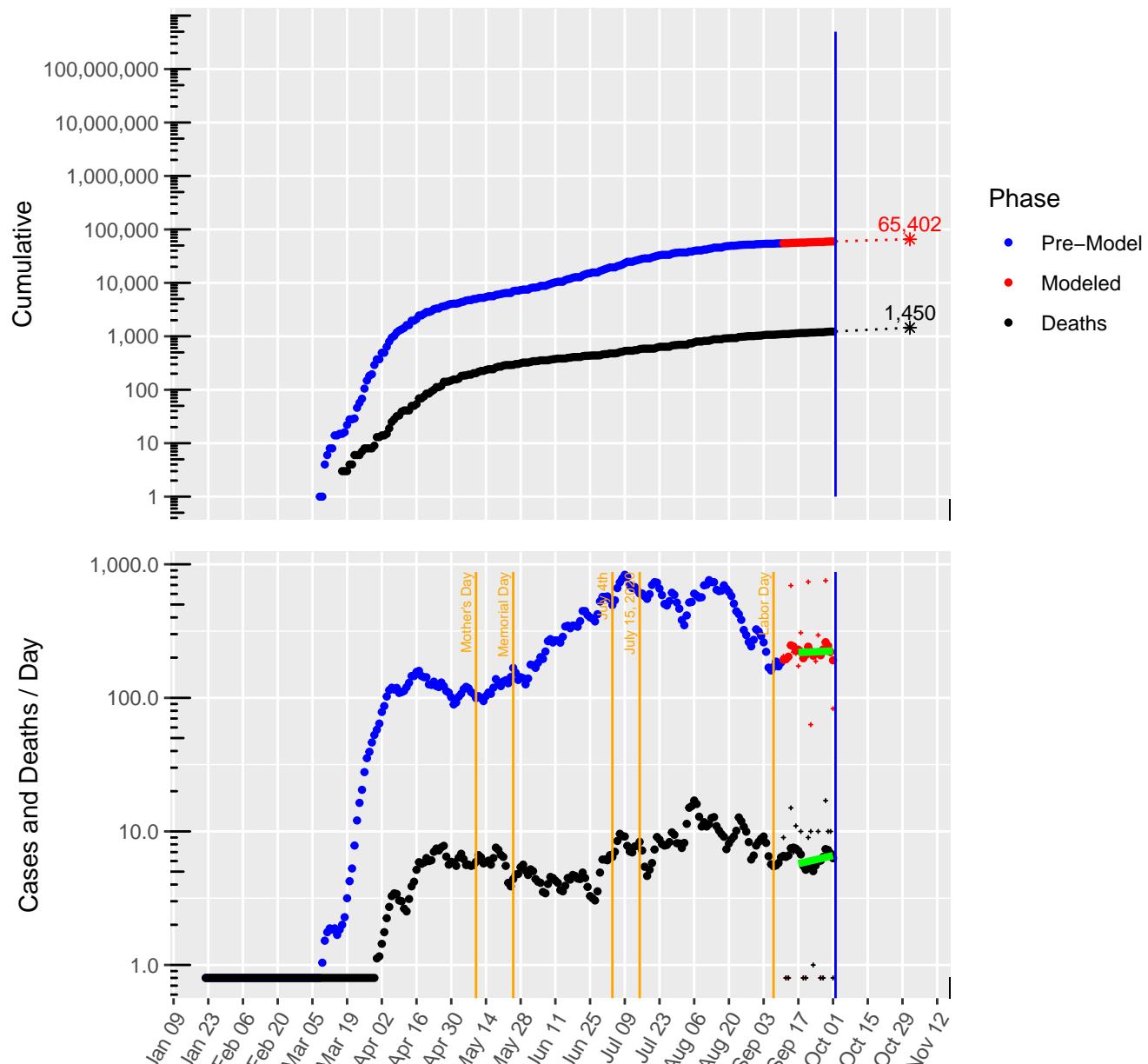
Yolo County, California projection as of 2020-10-02



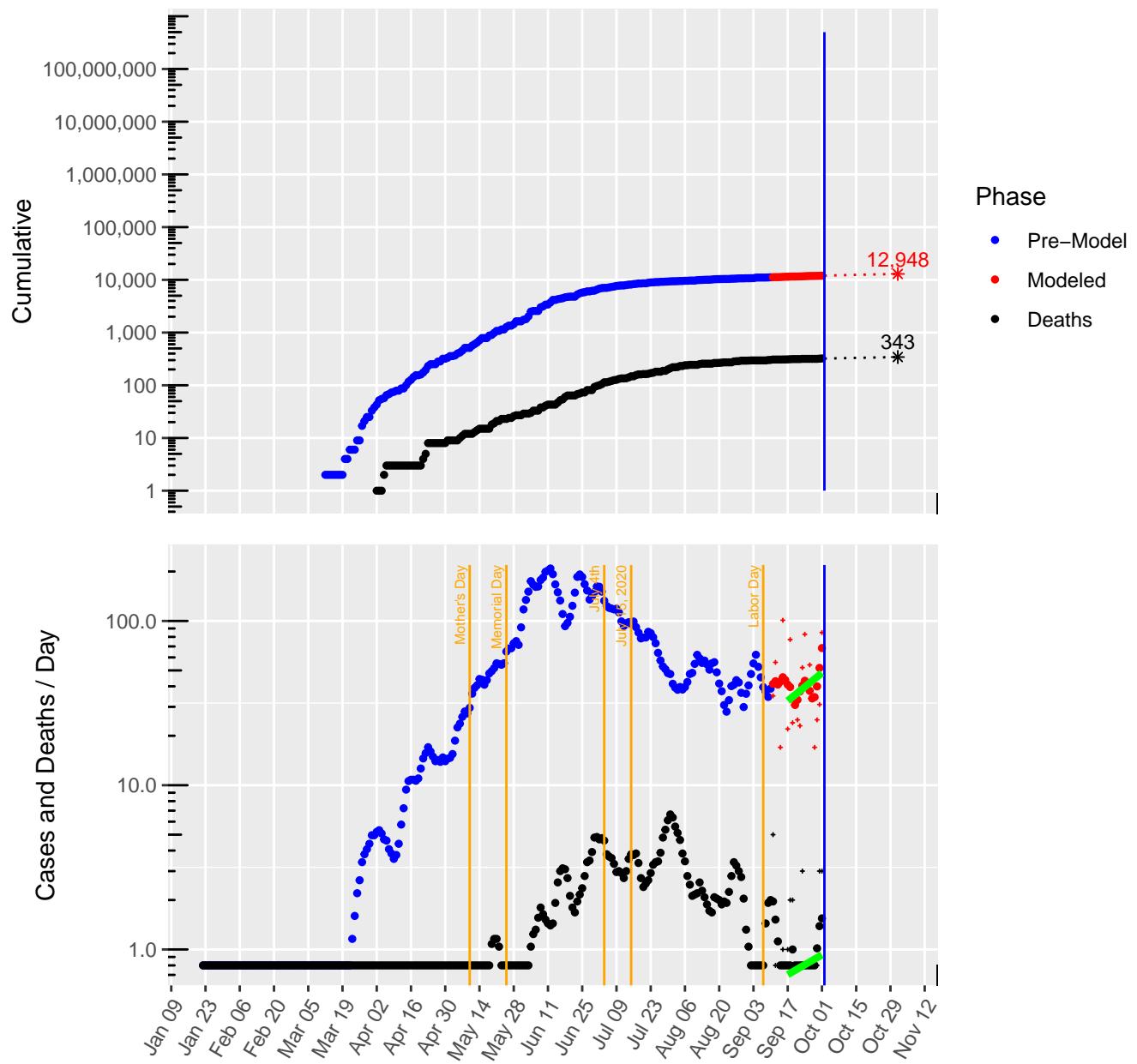
San Diego County projection as of 2020-10-02



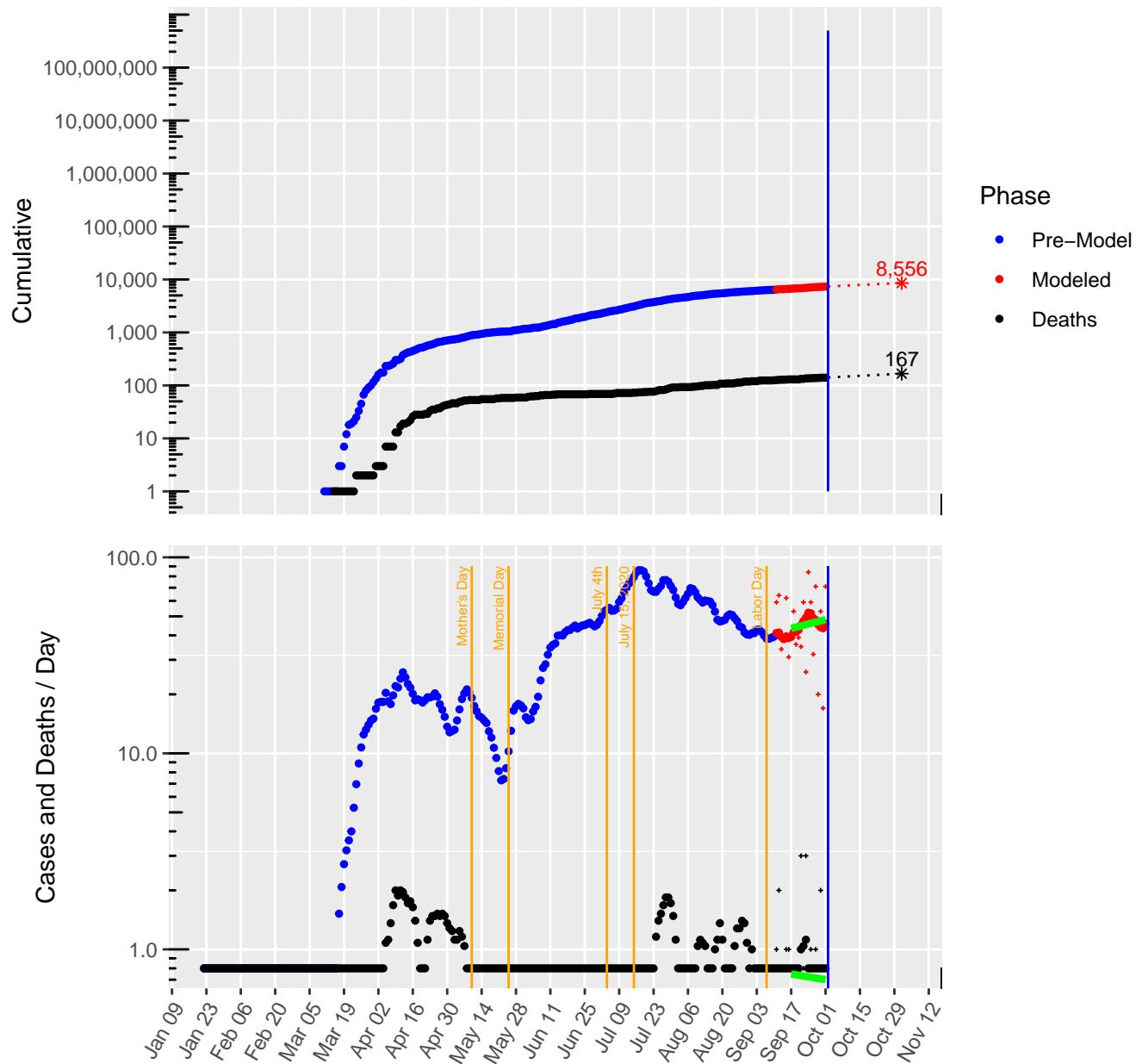
Riverside County projection as of 2020-10-02



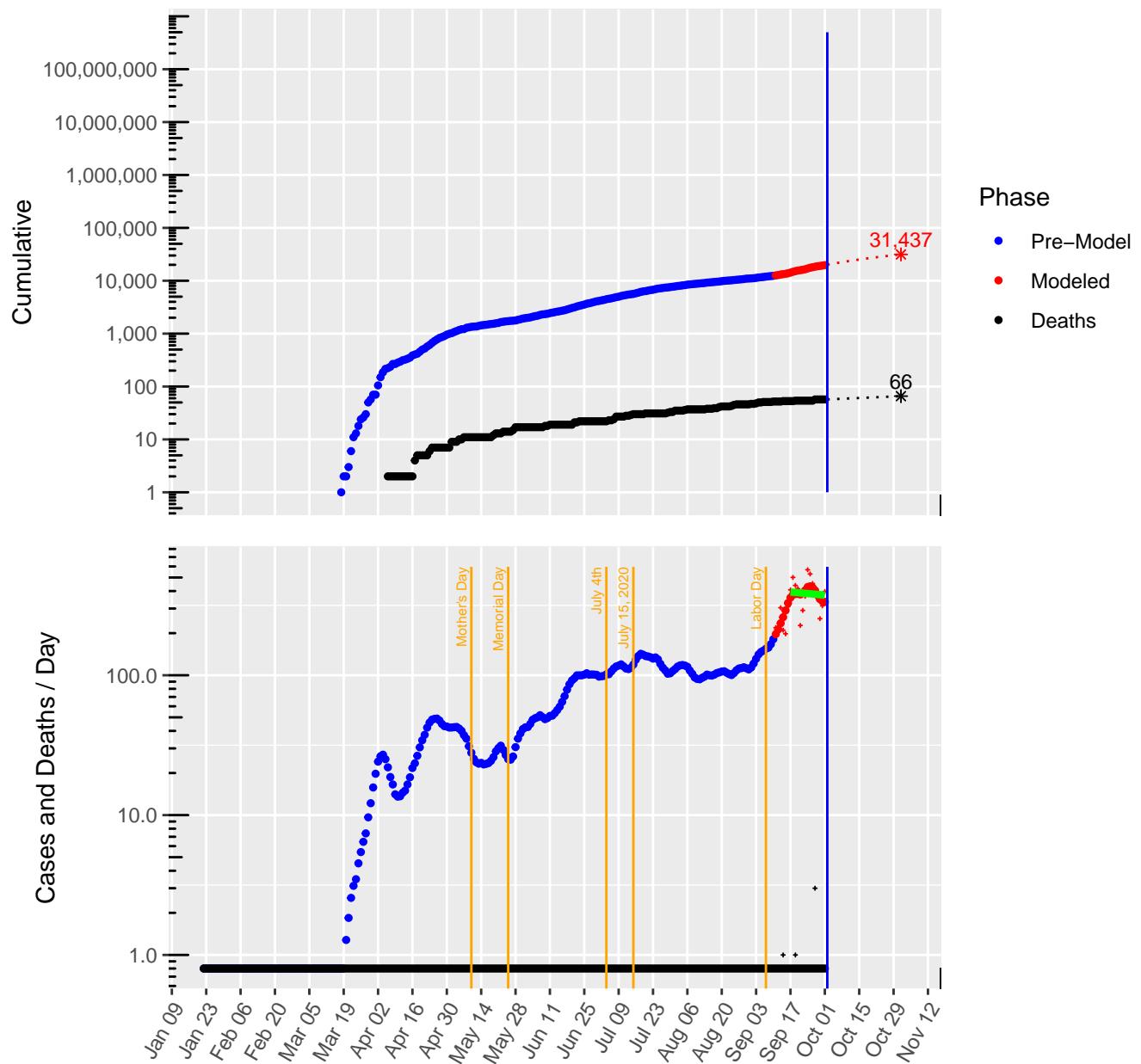
Imperial County projection as of 2020-10-02



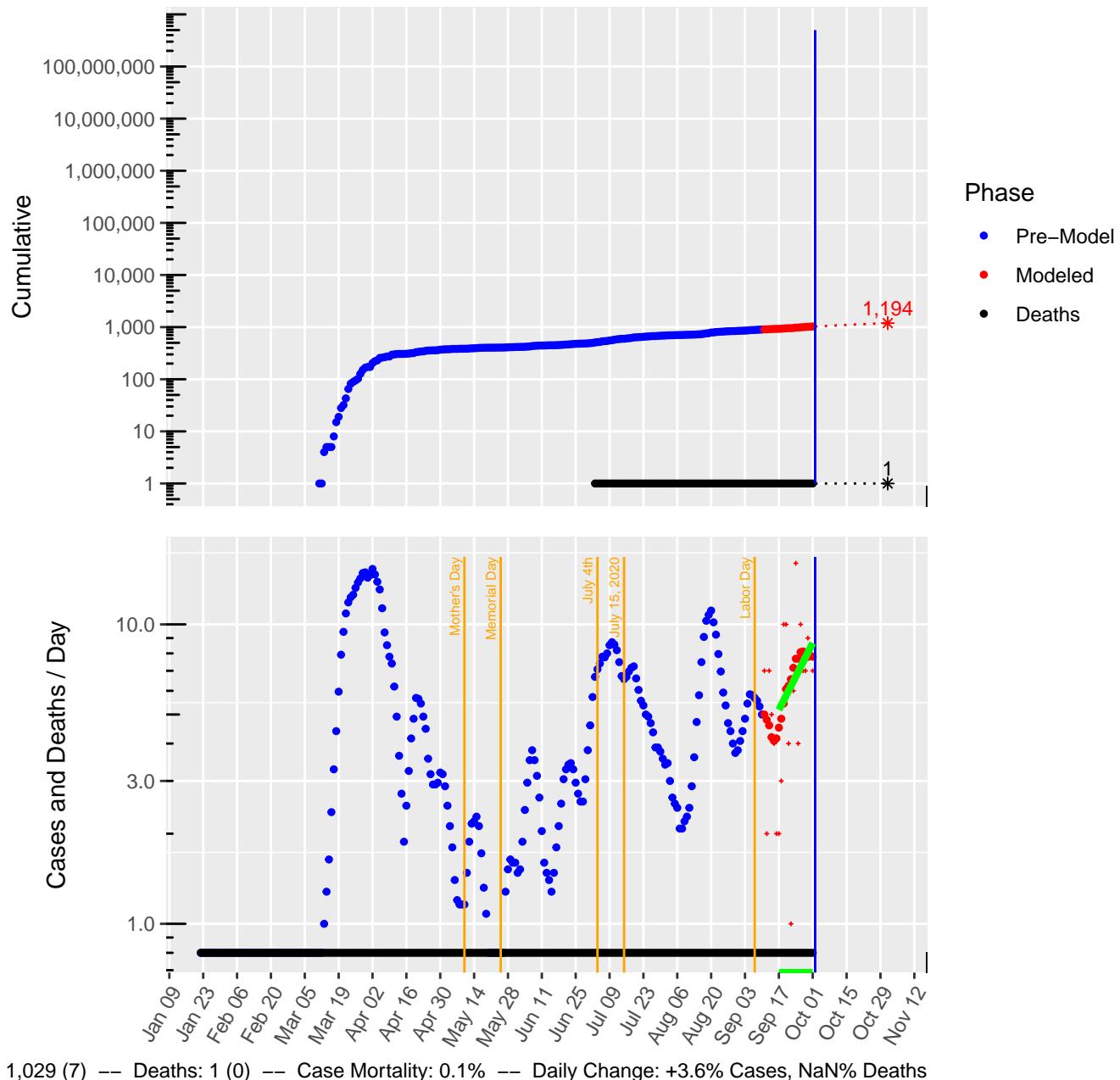
Multnomah County (Portland) projection as of 2020-10-02



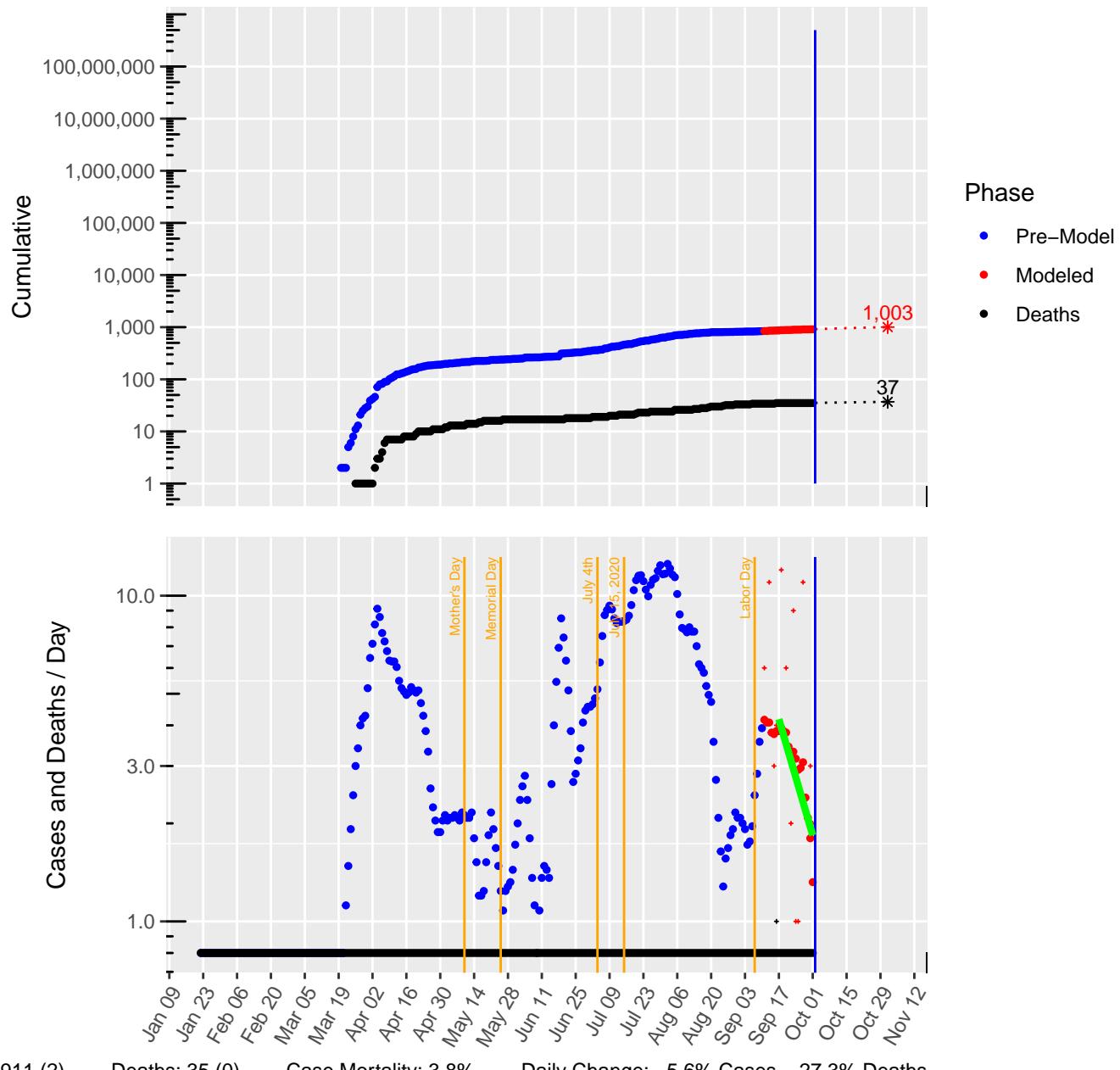
Utah County projection as of 2020-10-02



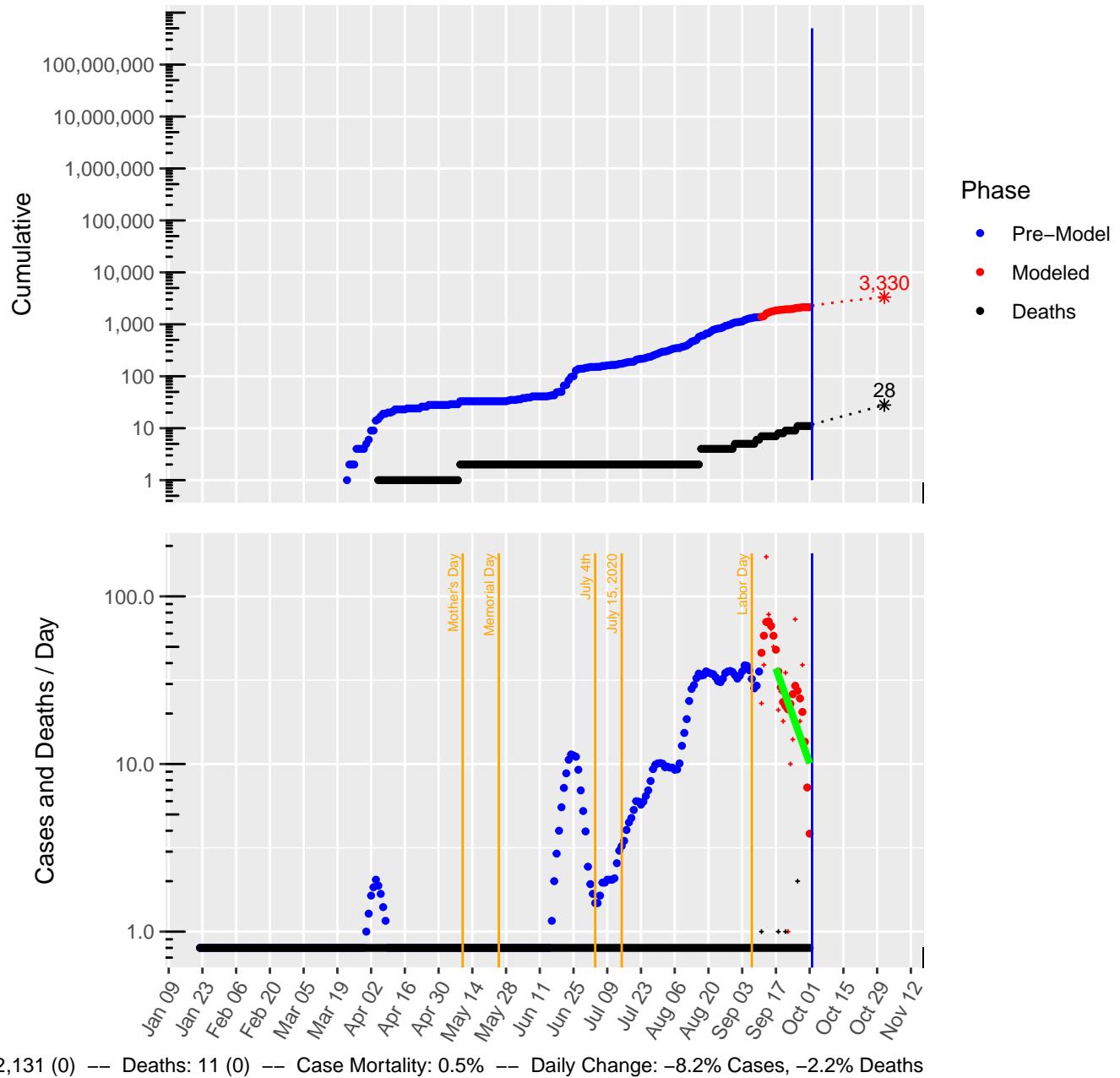
Summit County, Utah projection as of 2020-10-02



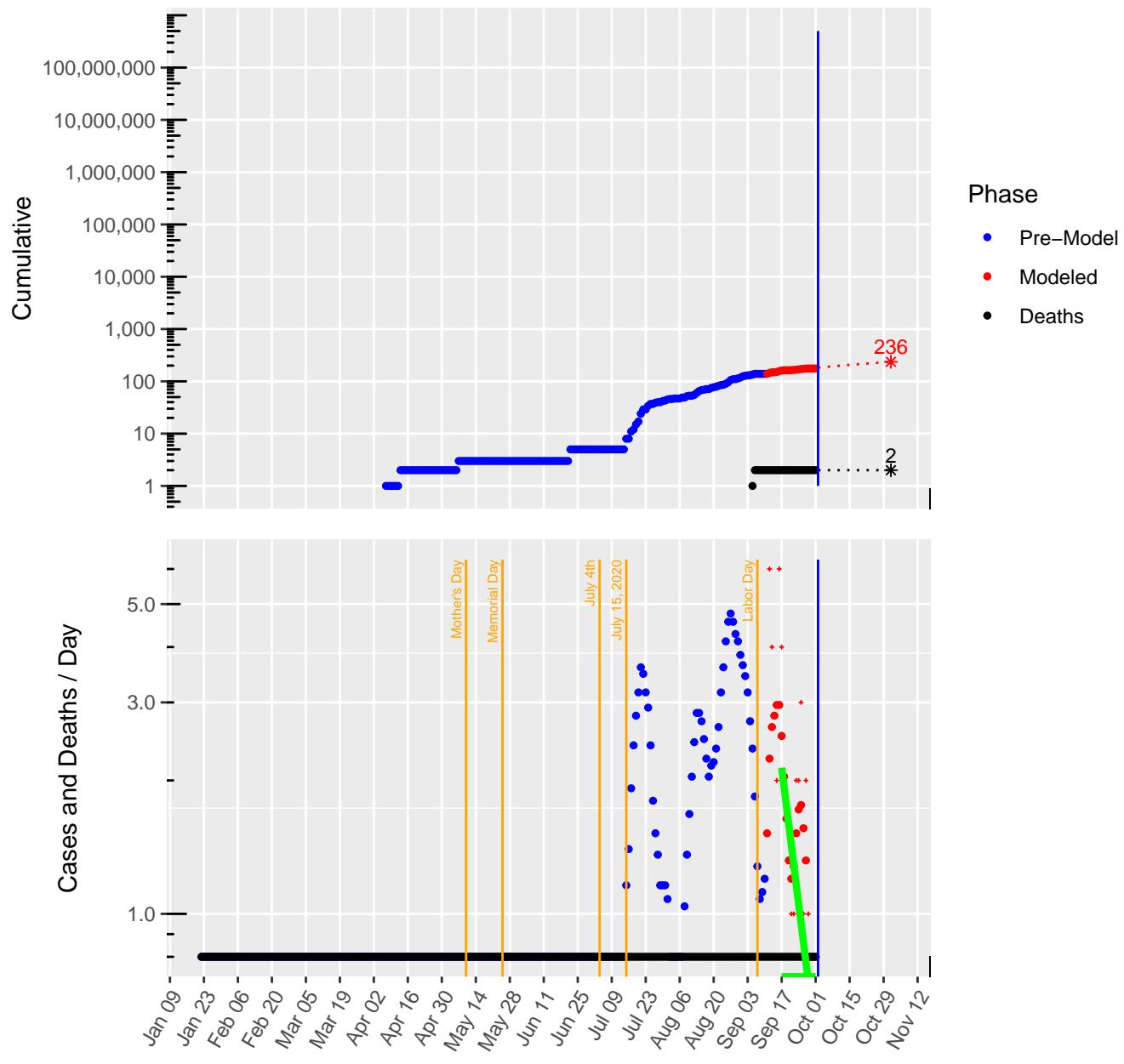
De Soto Parish, Louisiana projection as of 2020-10-02



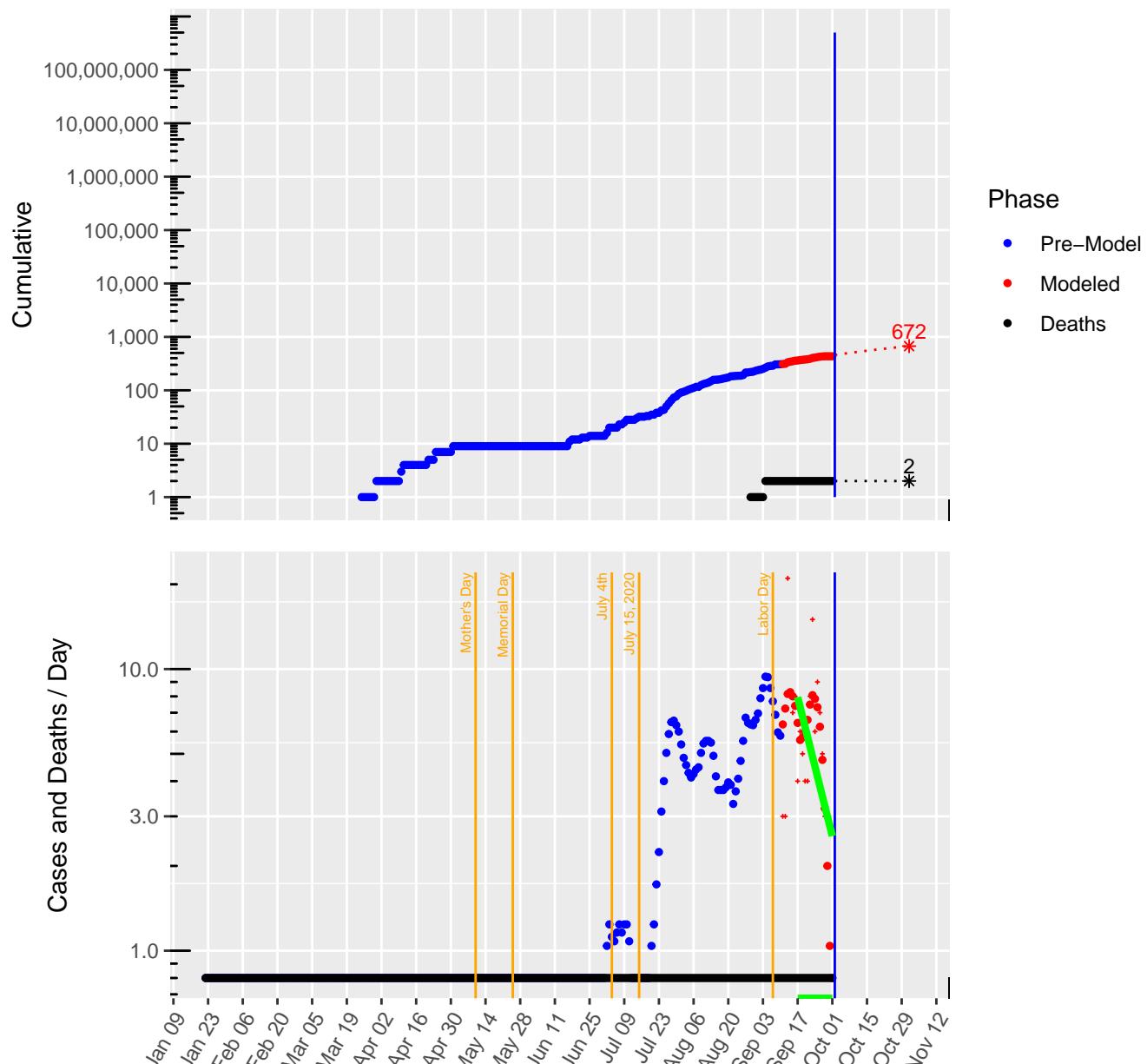
St. Francois County, Missouri projection as of 2020-10-02



Howard County, Missouri projection as of 2020-10-02

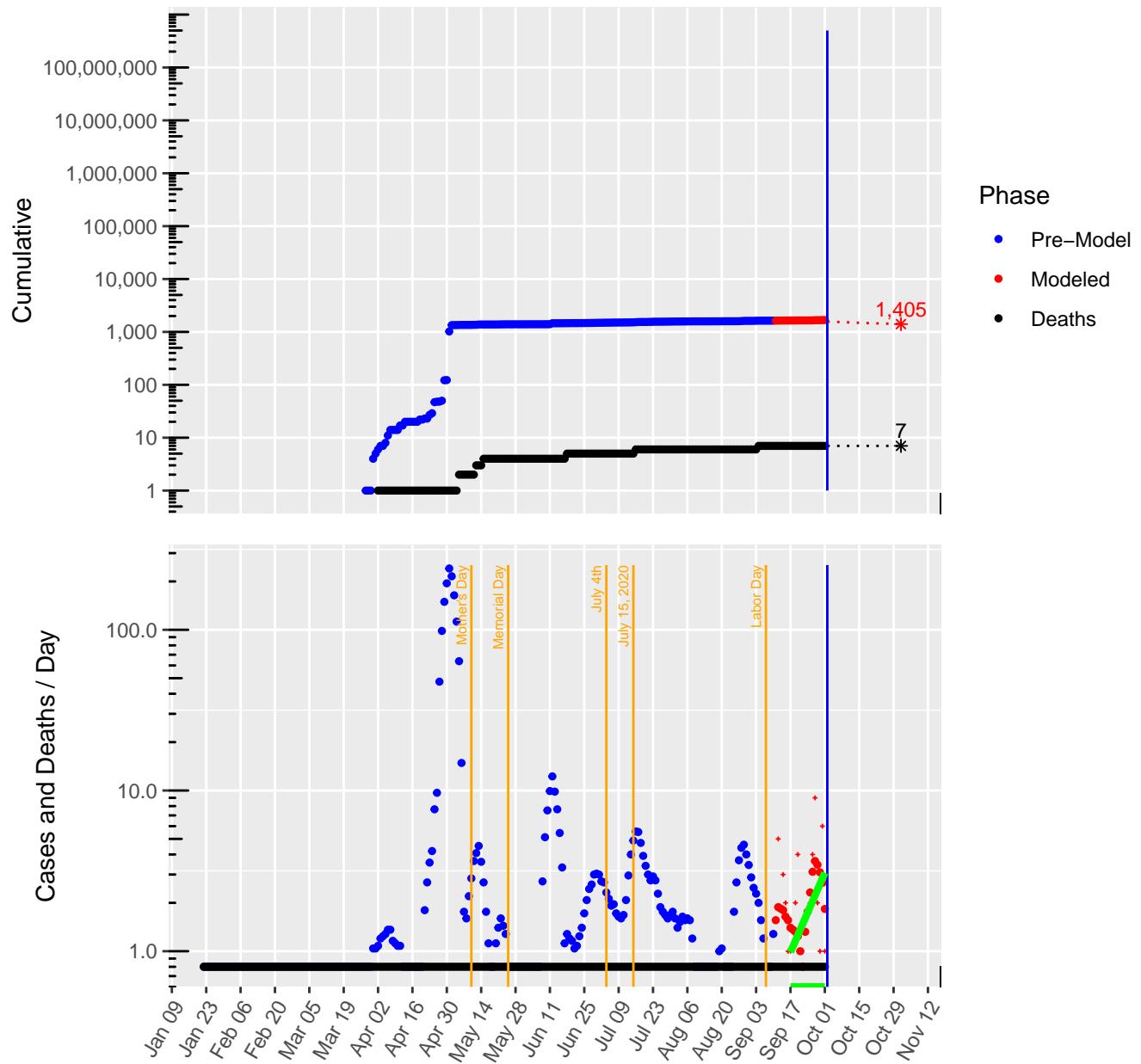


Cooper County, Missouri projection as of 2020-10-02

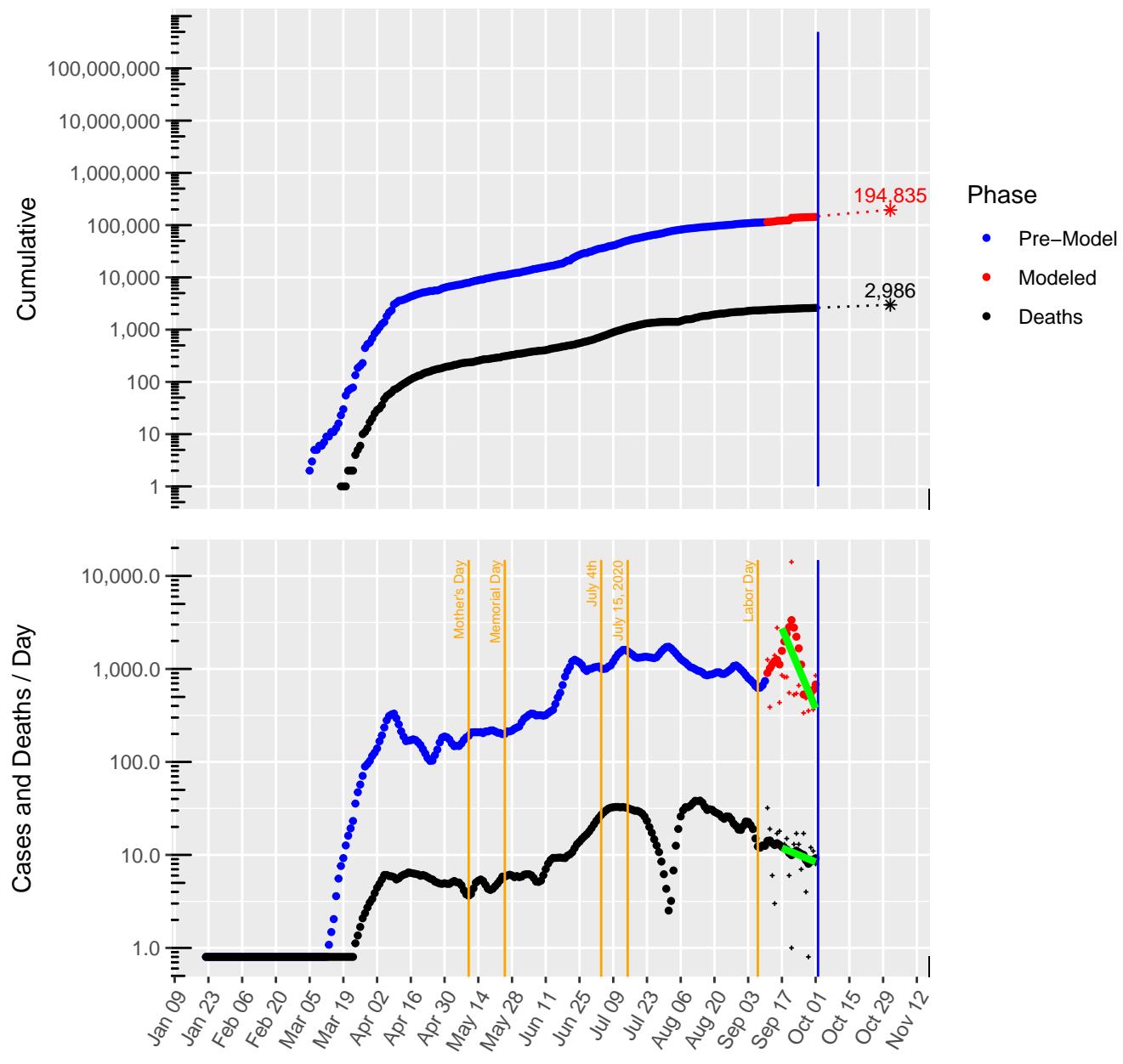


s: 434 (0) --- Deaths: 2 (0) --- Case Mortality: 0.5% --- Daily Change: -7.3% Cases, NaN% Deaths

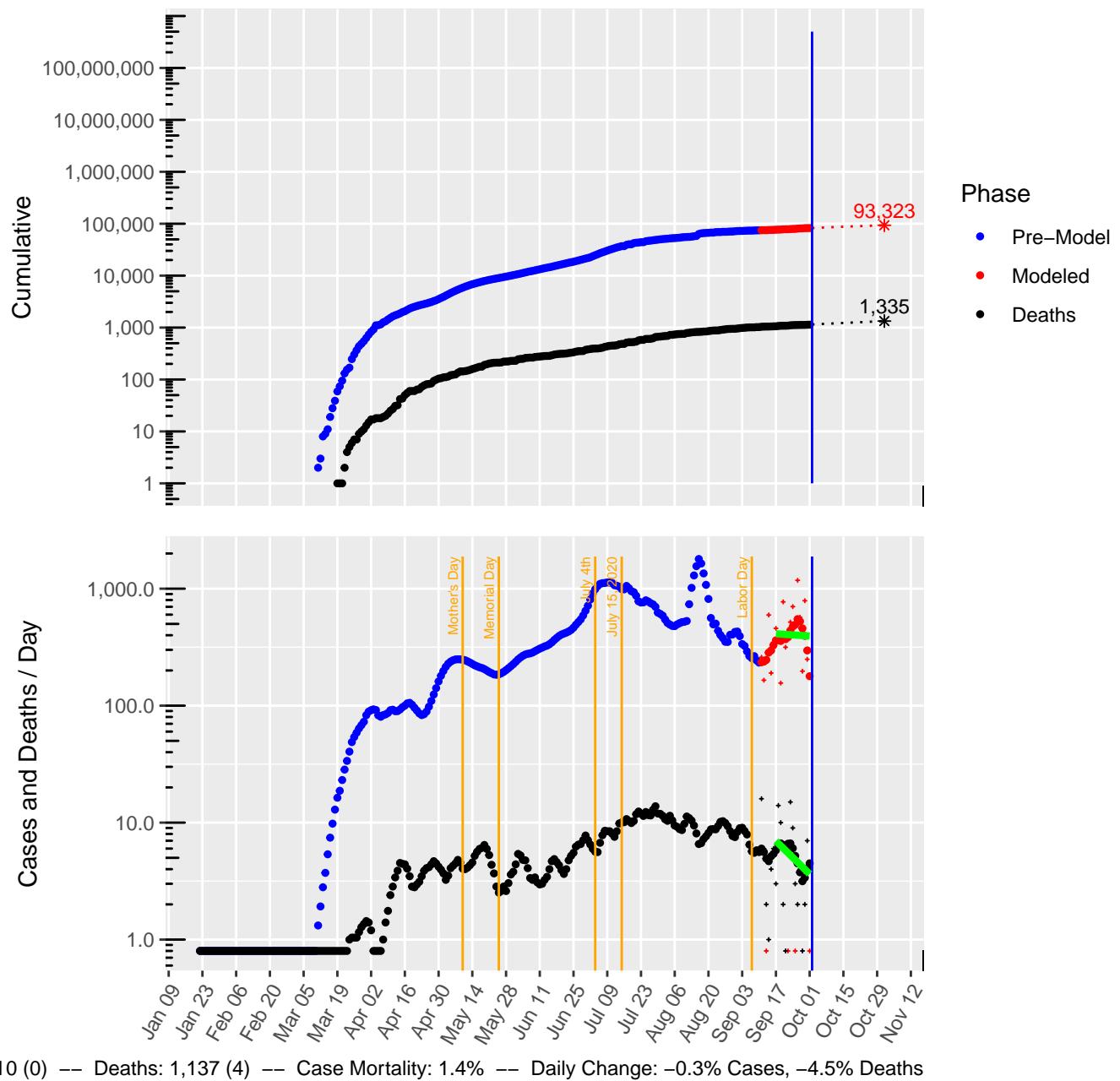
Trousdale County, Tennessee projection as of 2020-10-02



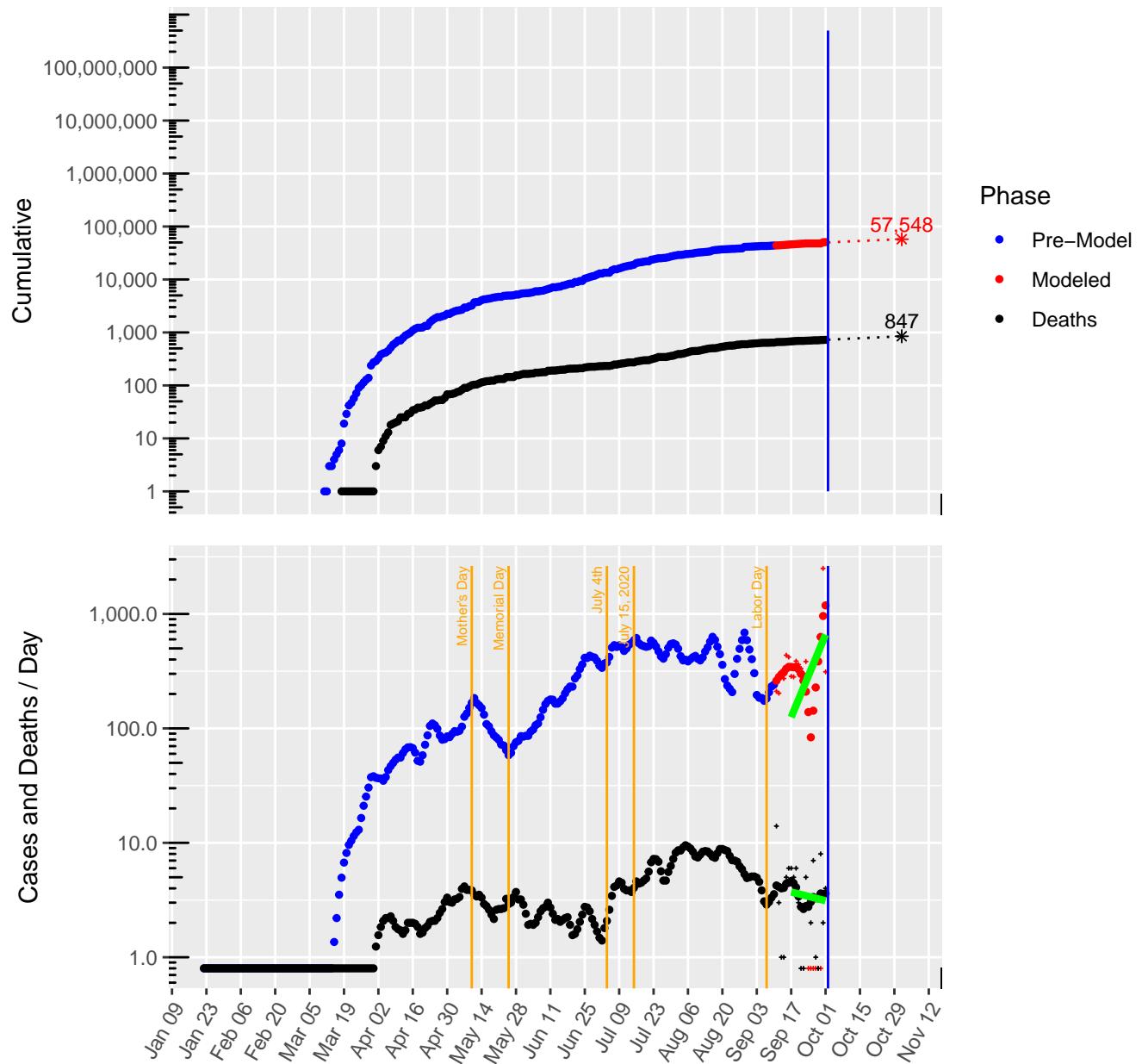
Harris County (Houston) projection as of 2020-10-02



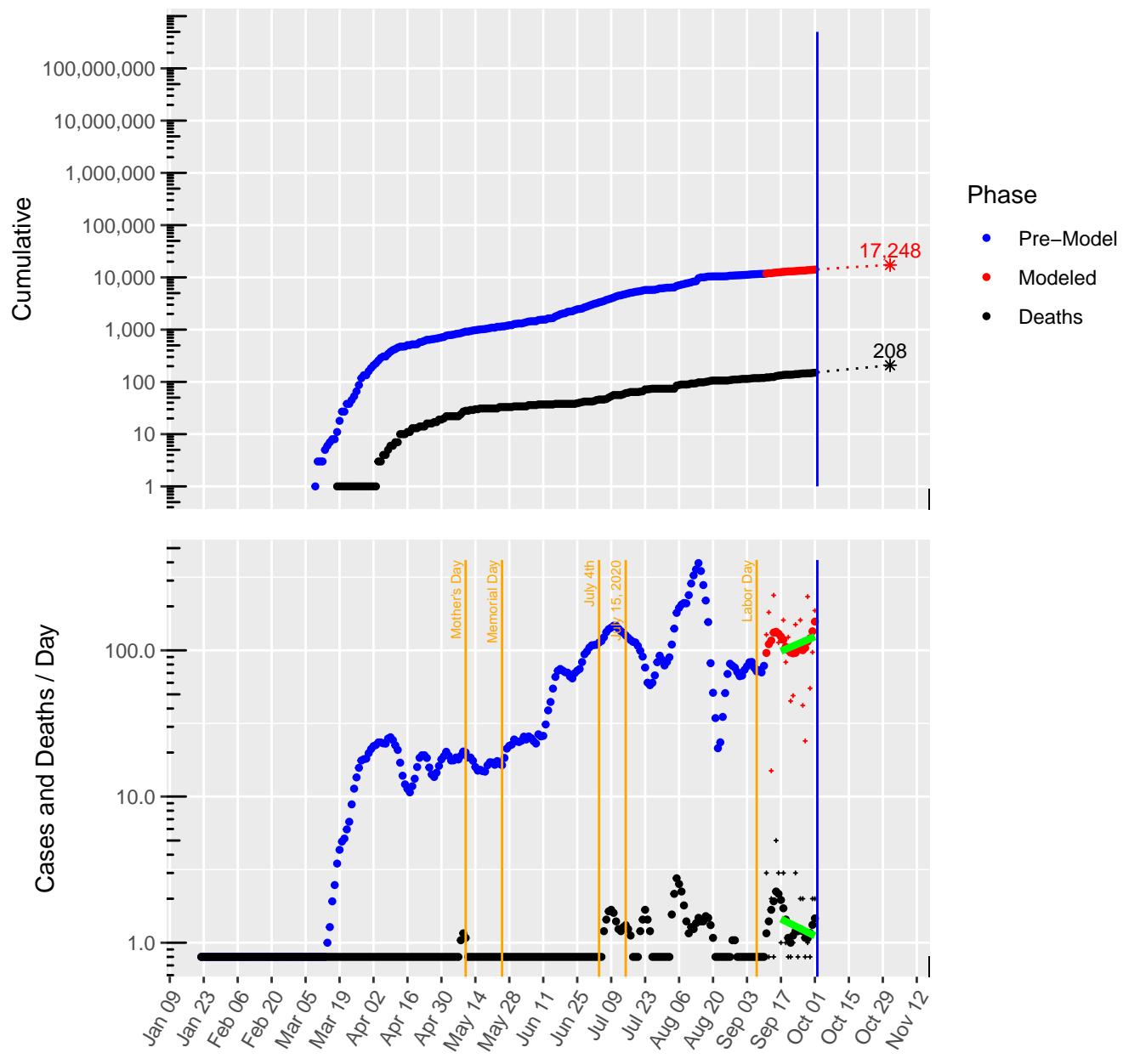
Dallas, Texas projection as of 2020-10-02



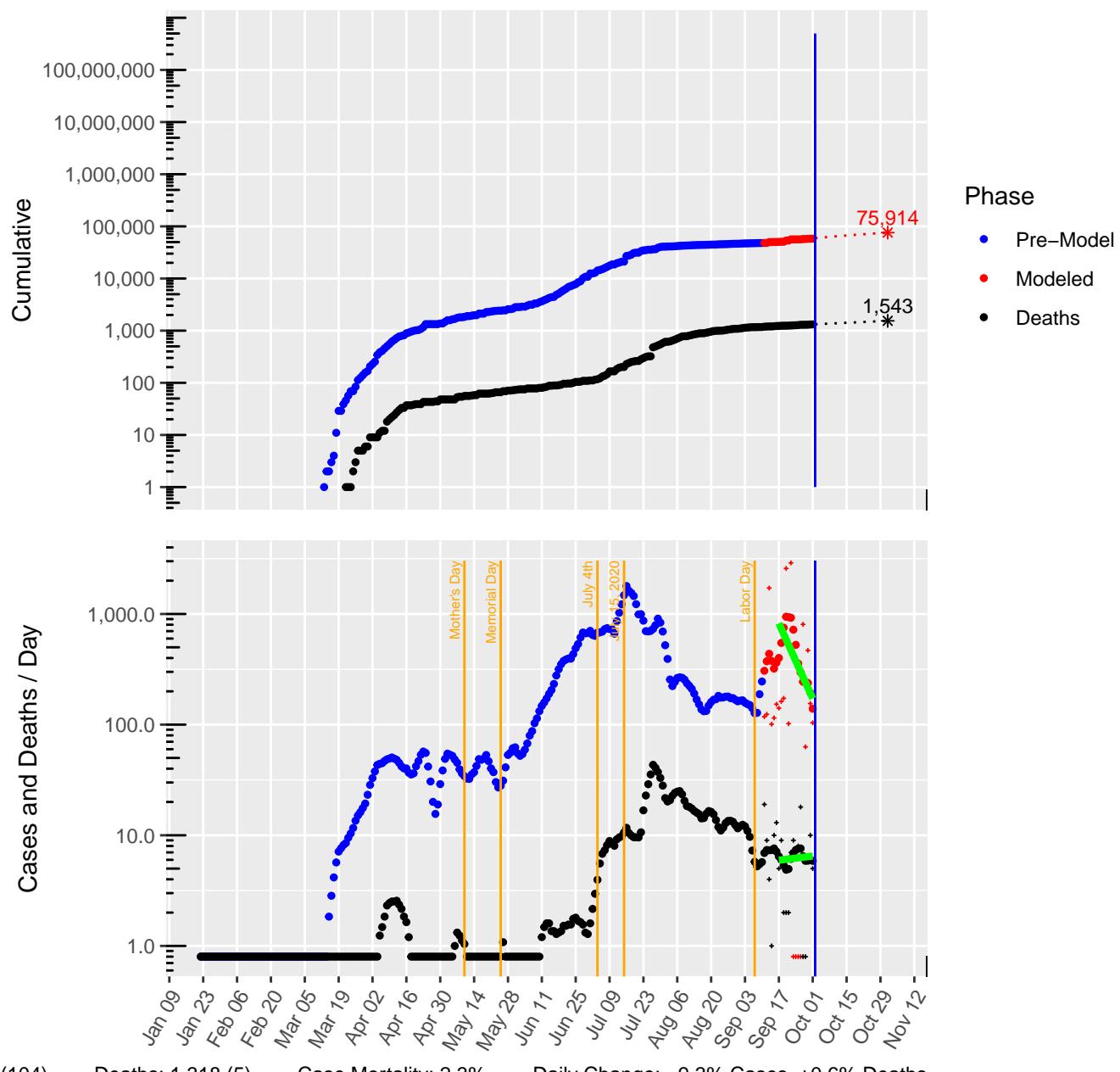
Tarrant County (Fort Worth) projection as of 2020-10-02



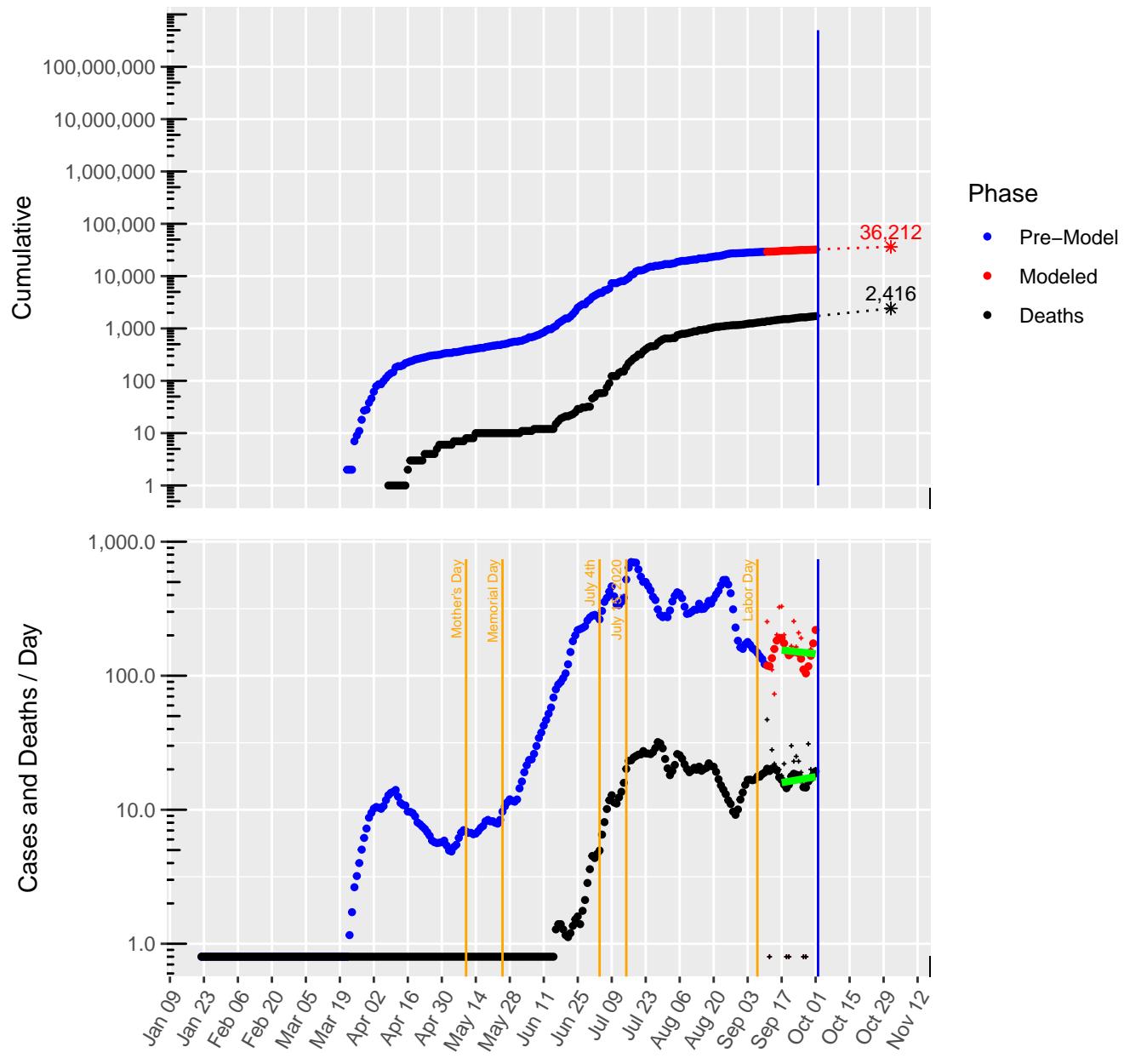
Collin County, Texas projection as of 2020-10-02



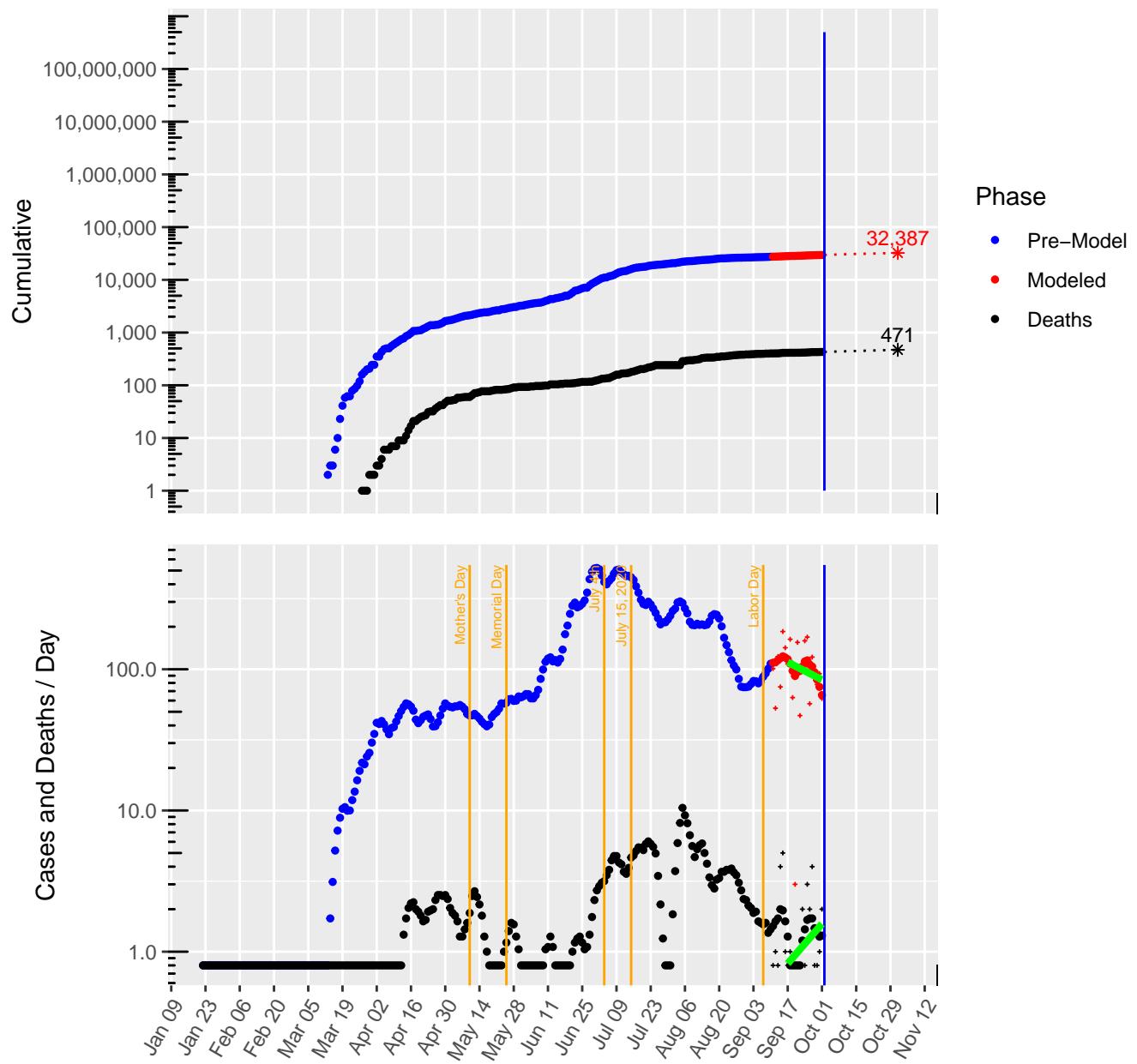
Bexar County (San Antonio) projection as of 2020-10-02



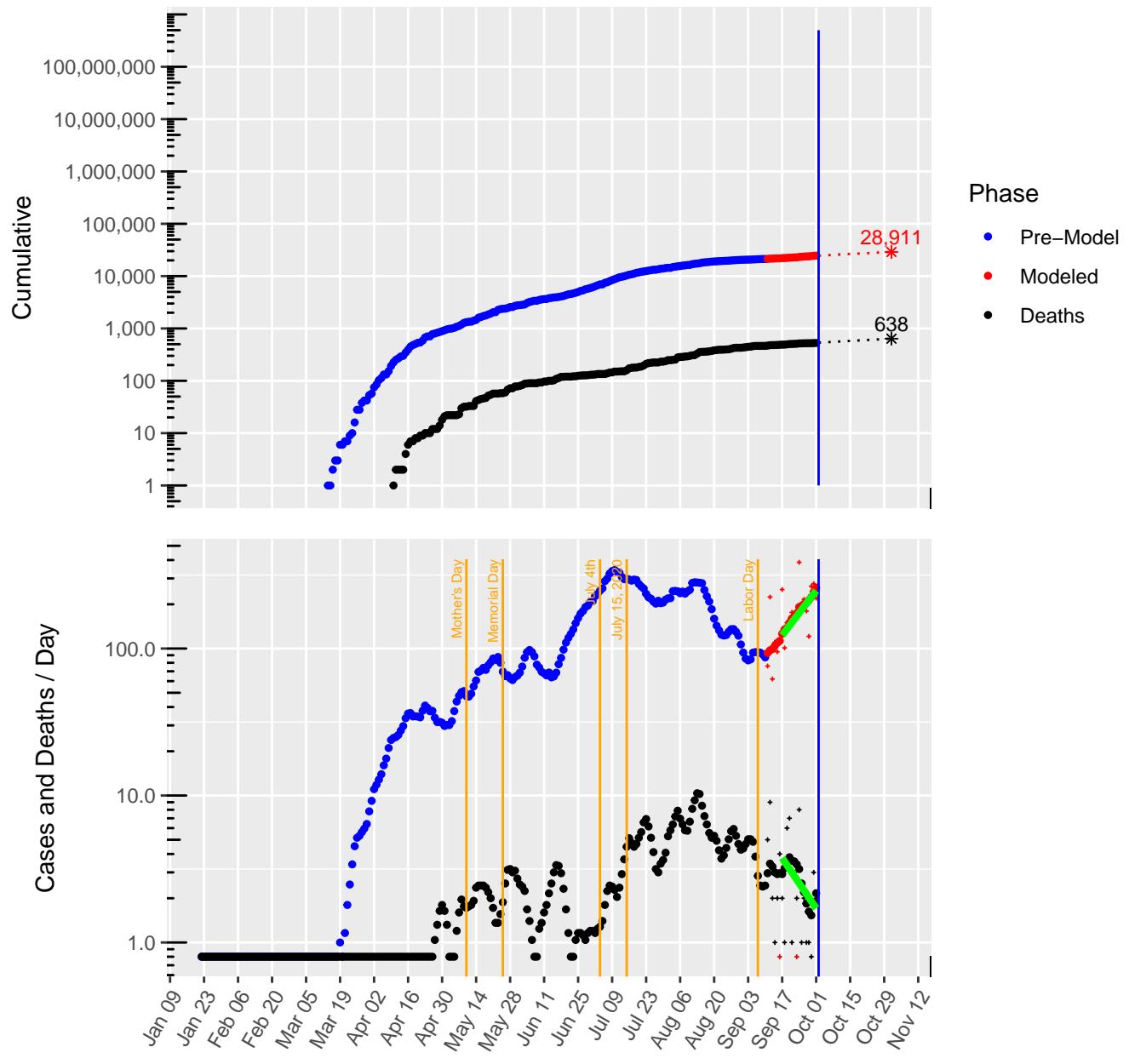
Hidalgo County, Texas projection as of 2020-10-02



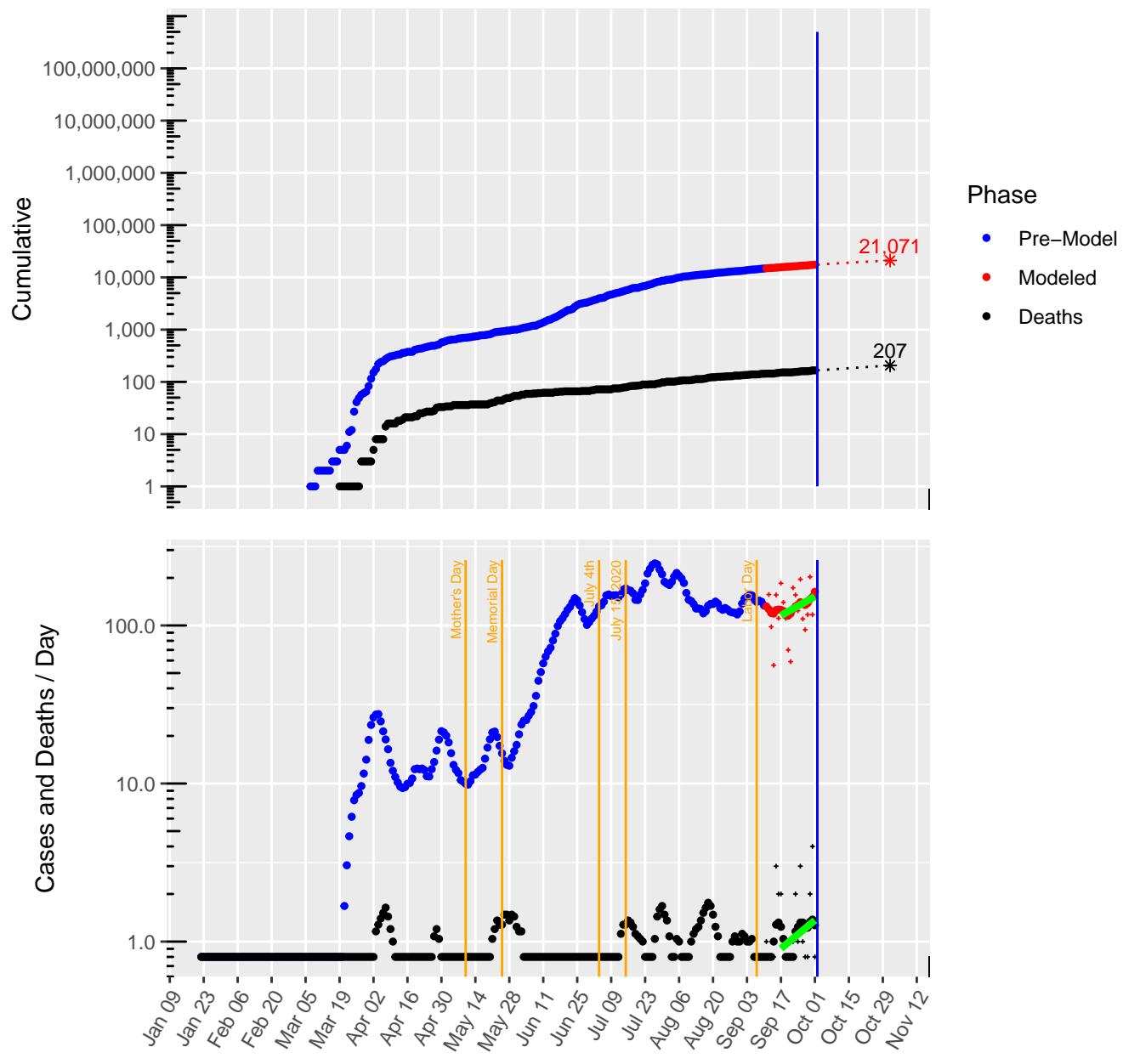
Travis County (Austin) projection as of 2020-10-02



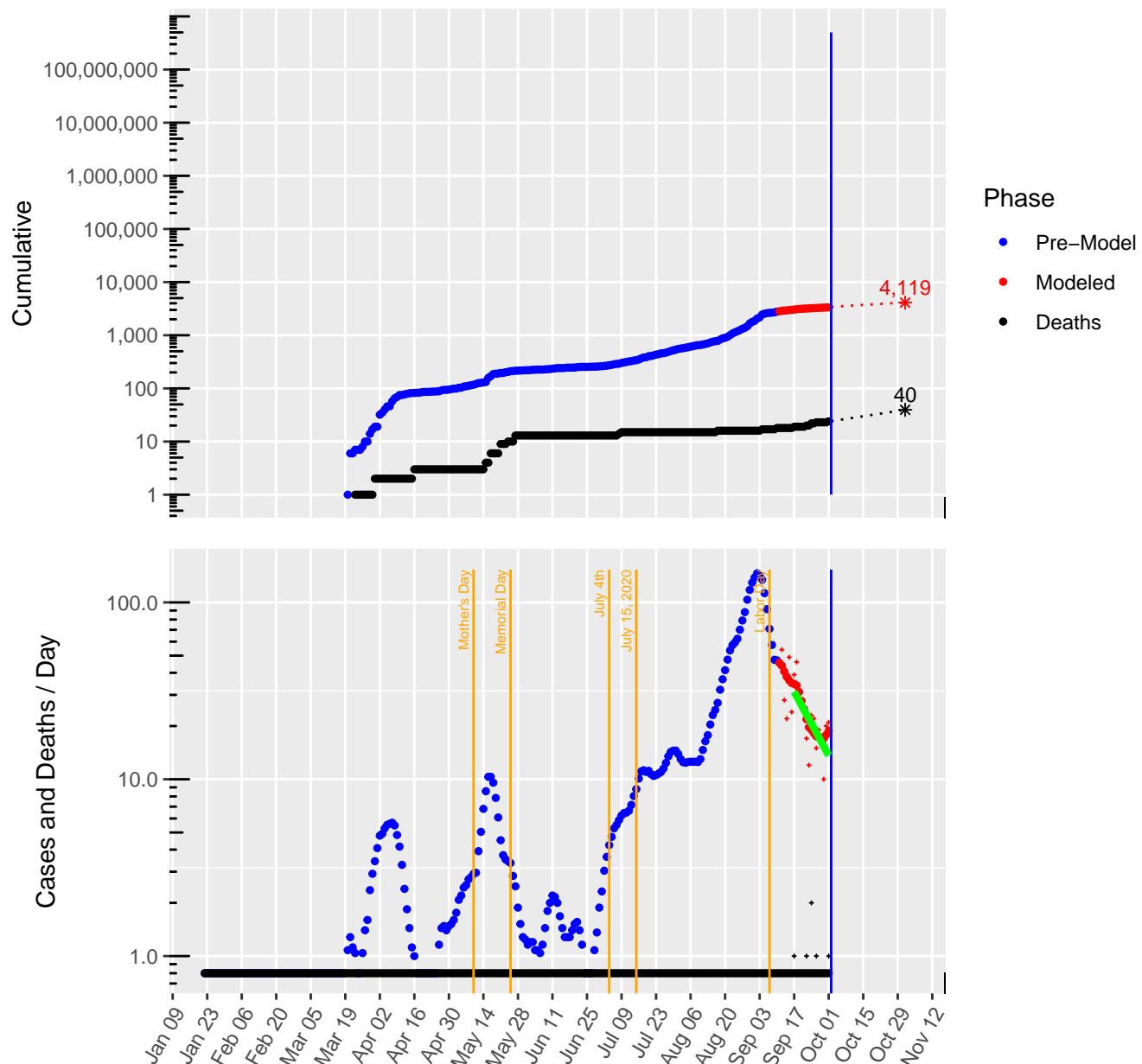
El Paso County, Texas projection as of 2020-10-02



Tulsa County, Oklahoma projection as of 2020-10-02

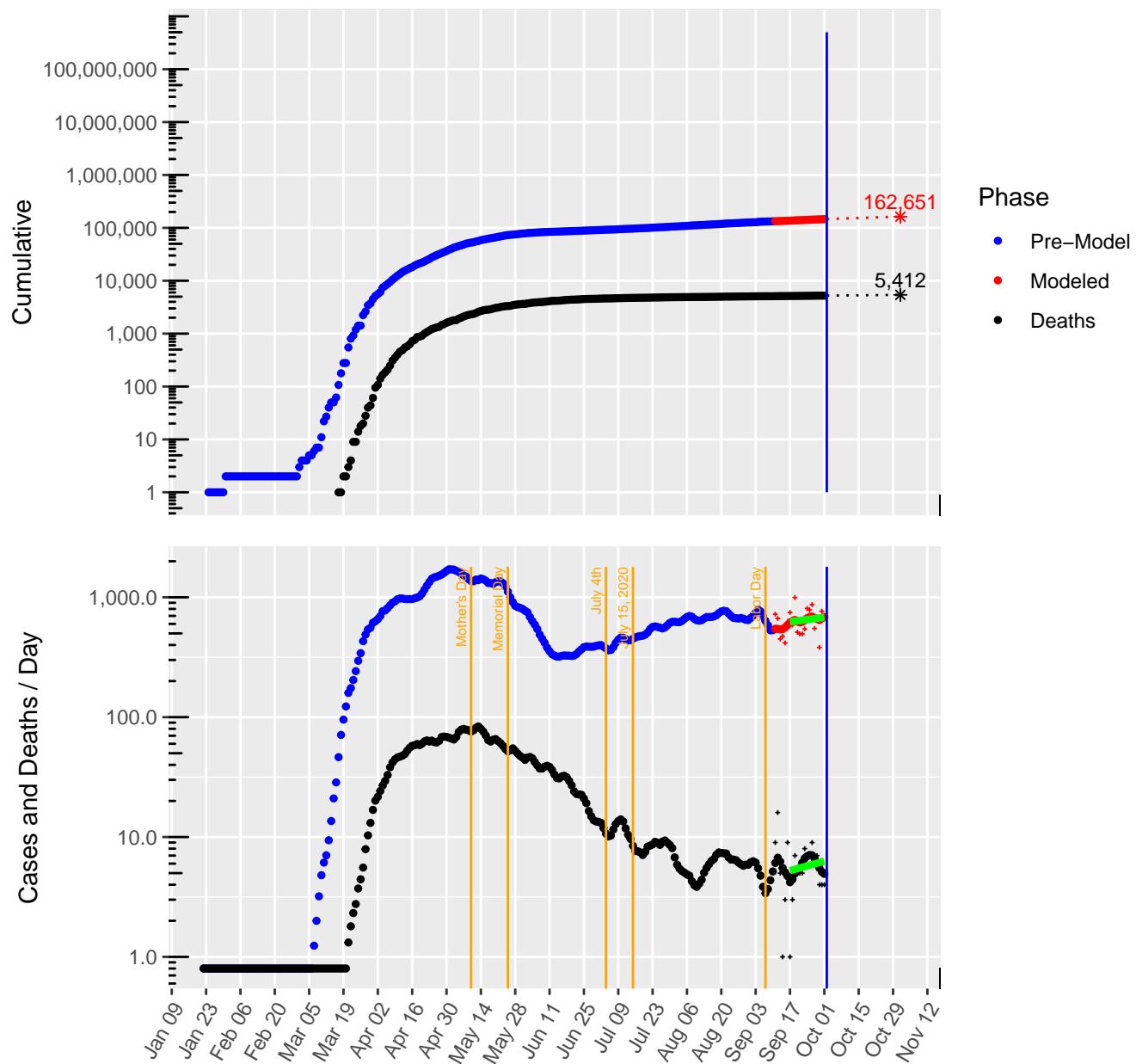


McLean County, Illinois projection as of 2020-10-02

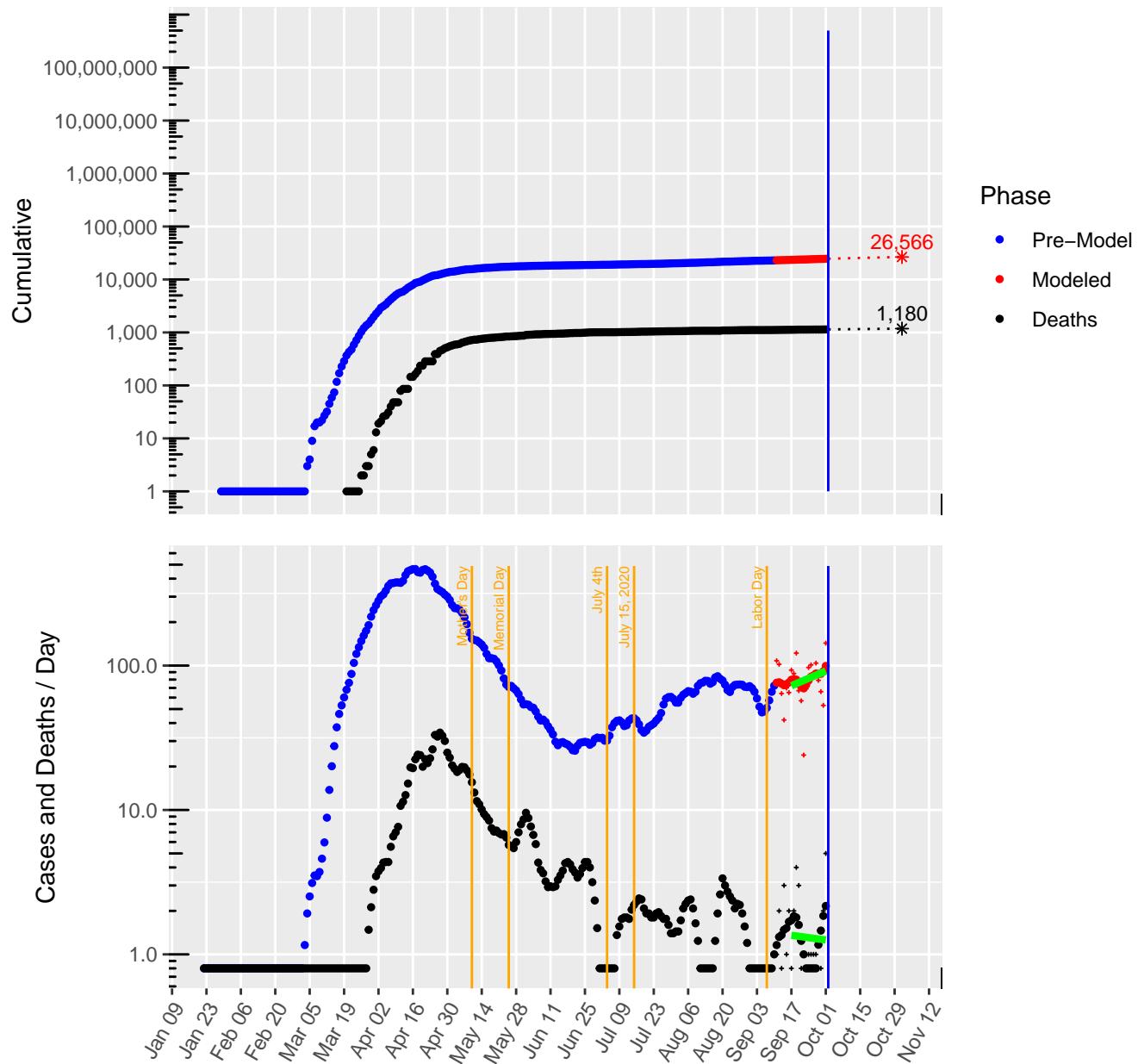


346 (21) --- Deaths: 24 (1) --- Case Mortality: 0.7% --- Daily Change: -5.6% Cases, +2.6% Deaths

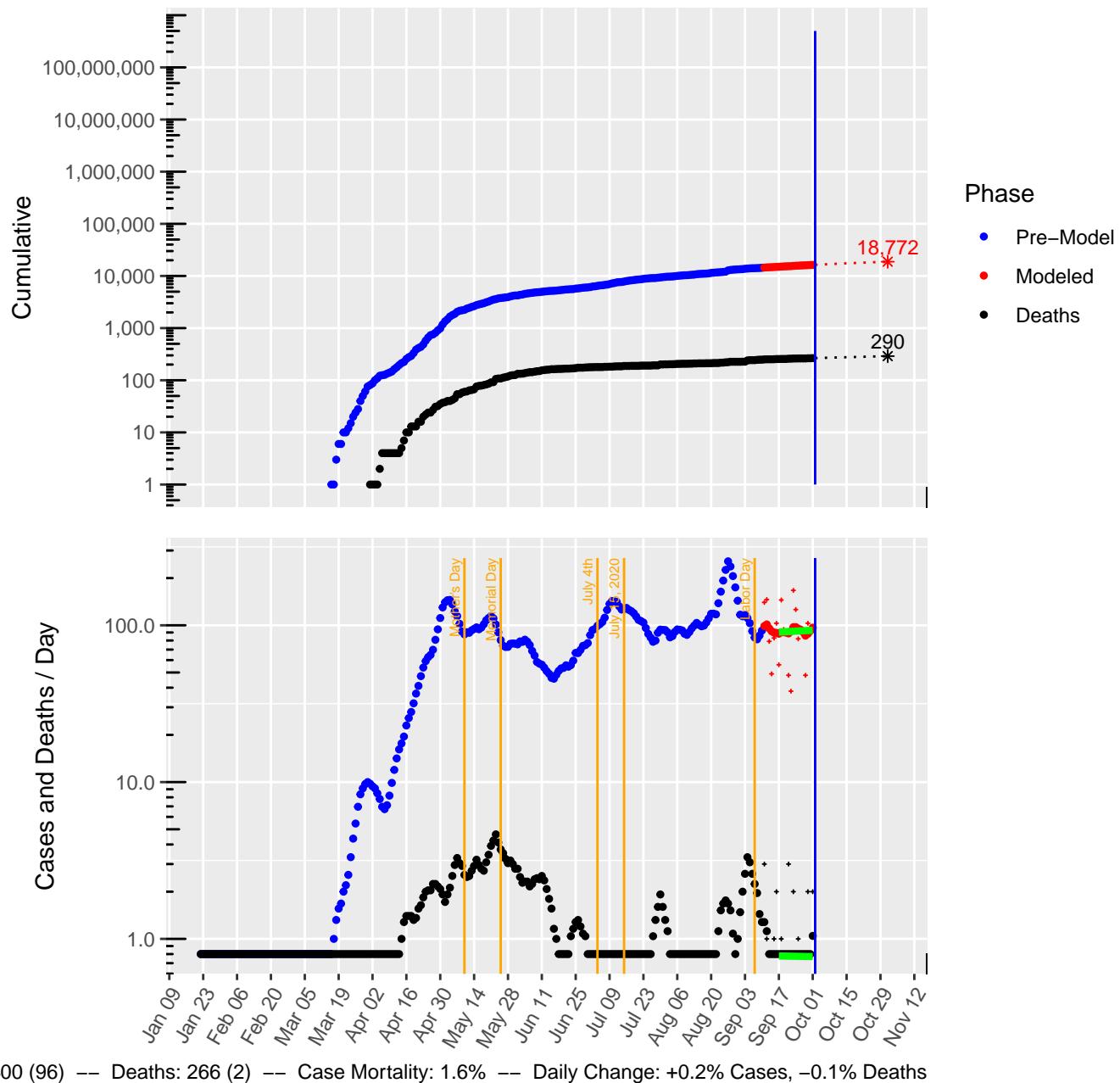
Cook County, Illinois projection as of 2020-10-02



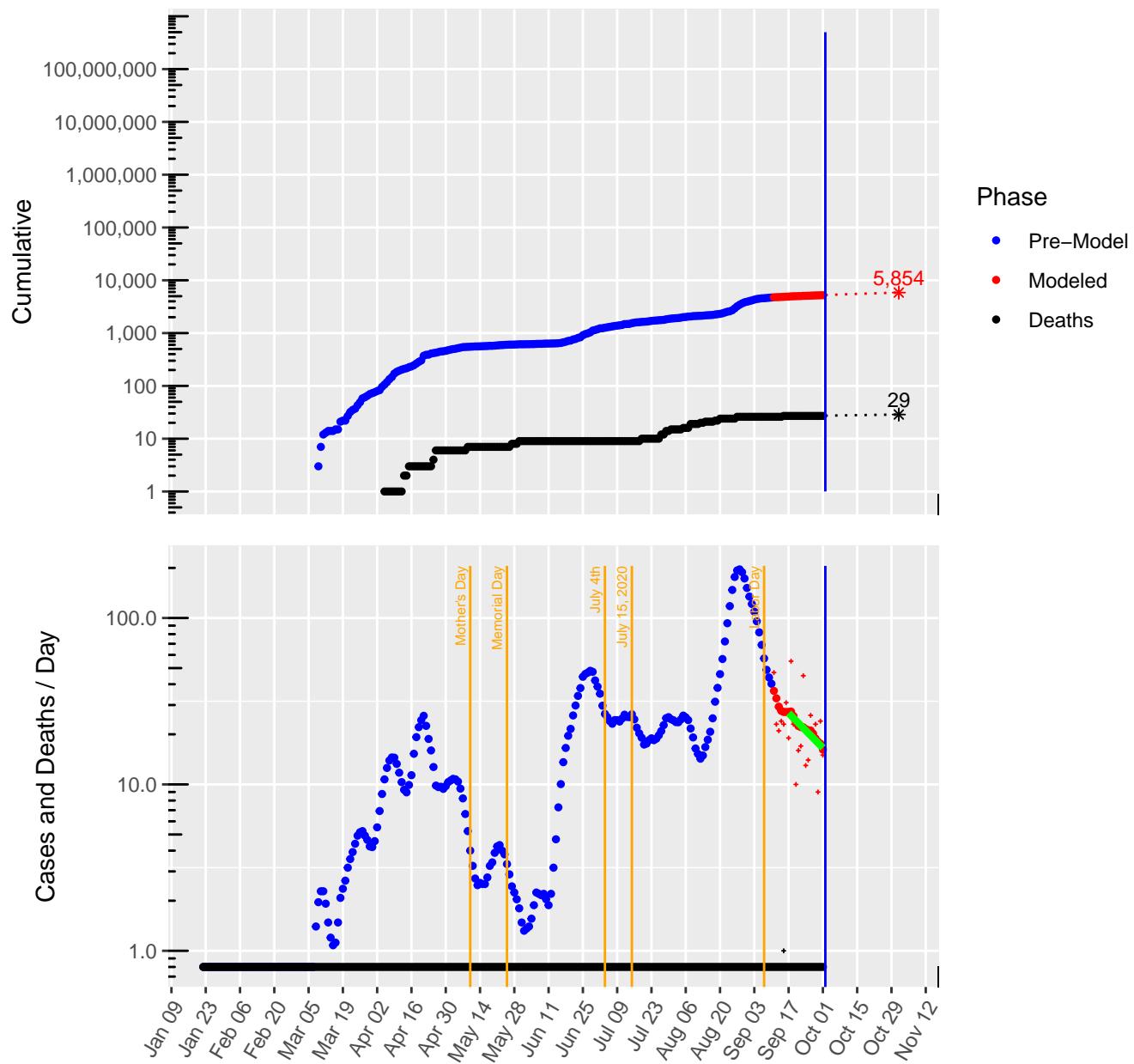
Suffolk County (Boston) projection as of 2020-10-02



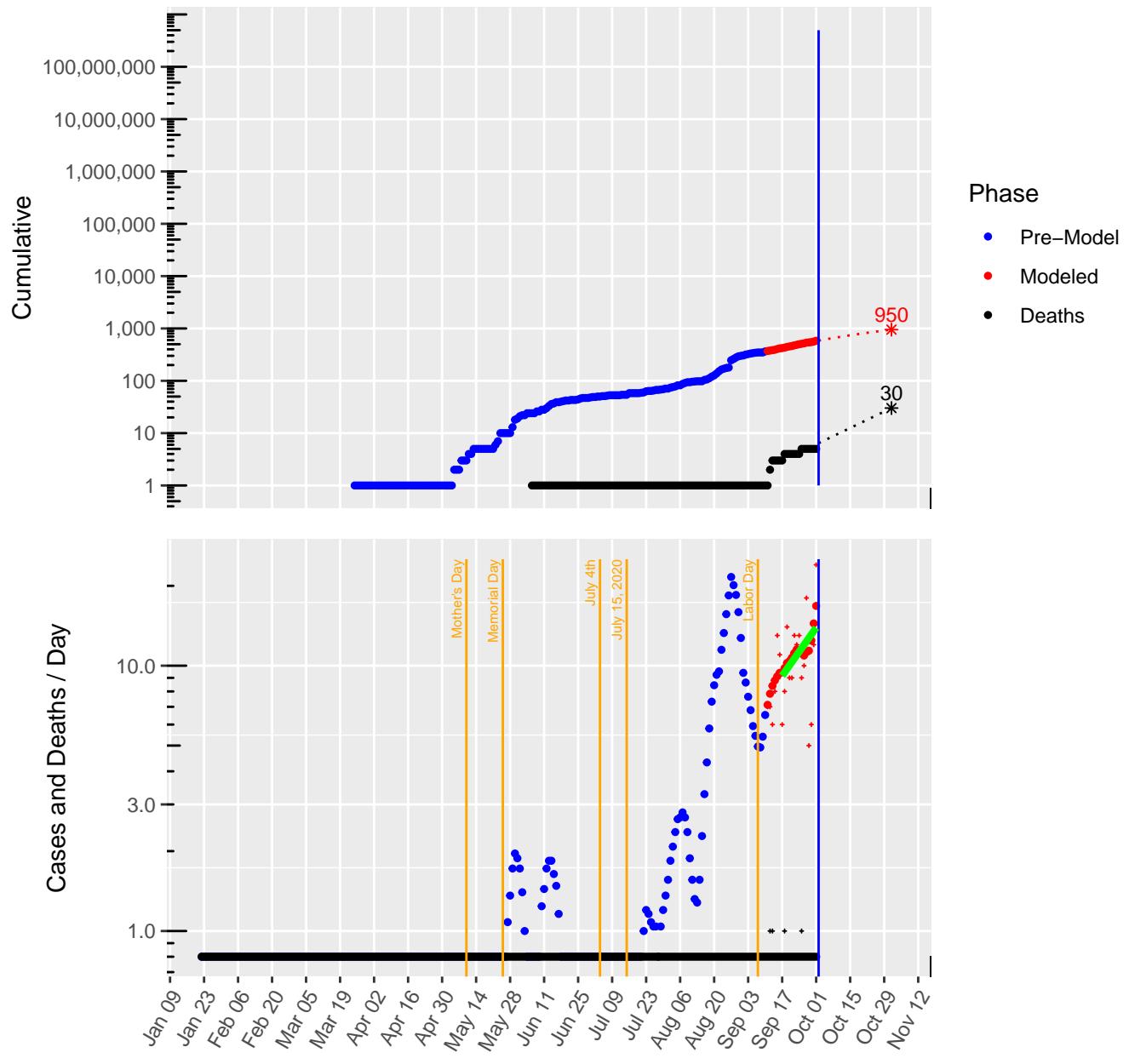
Polk County, Iowa projection as of 2020-10-02



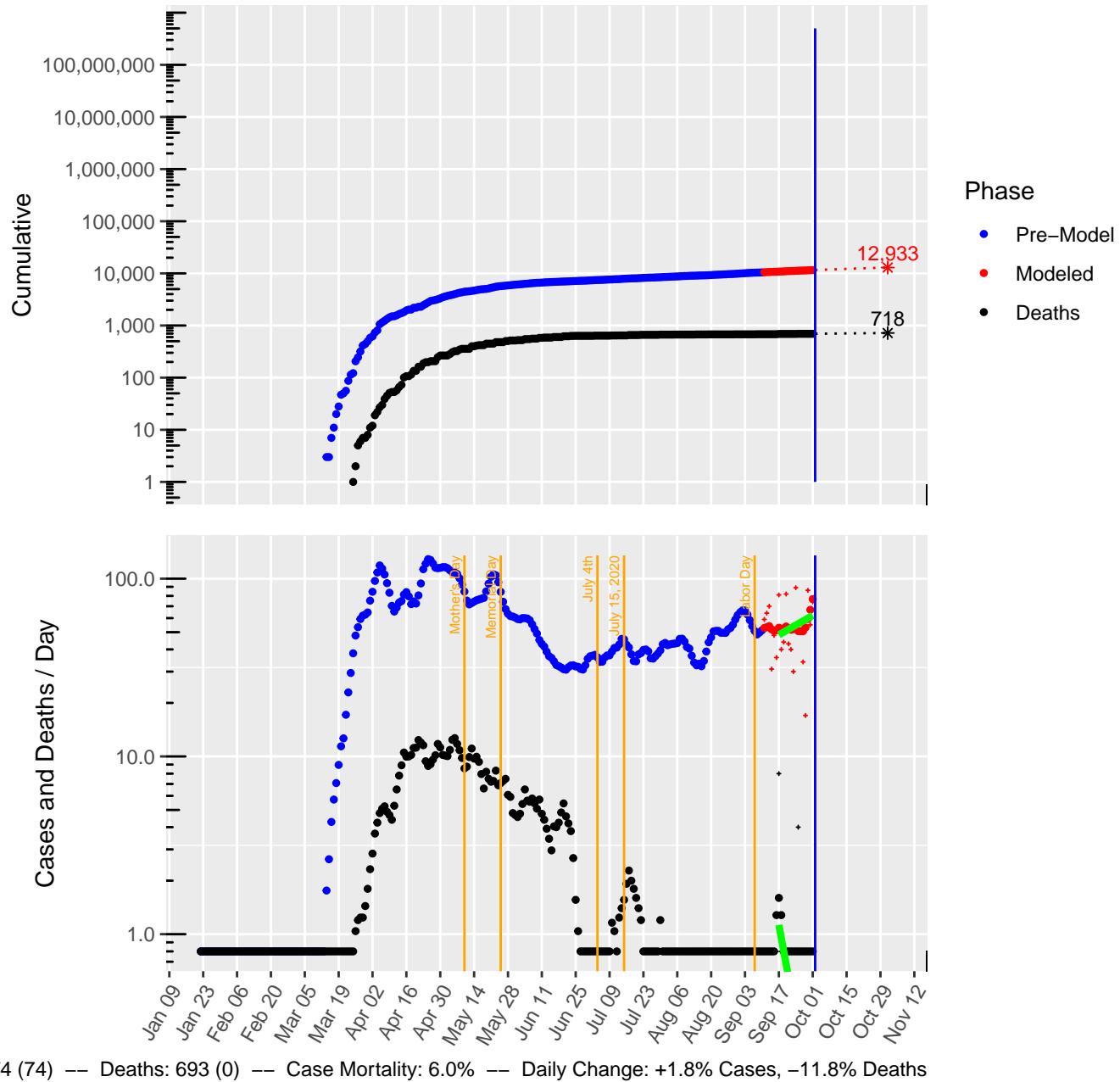
Johnson County, Iowa projection as of 2020-10-02



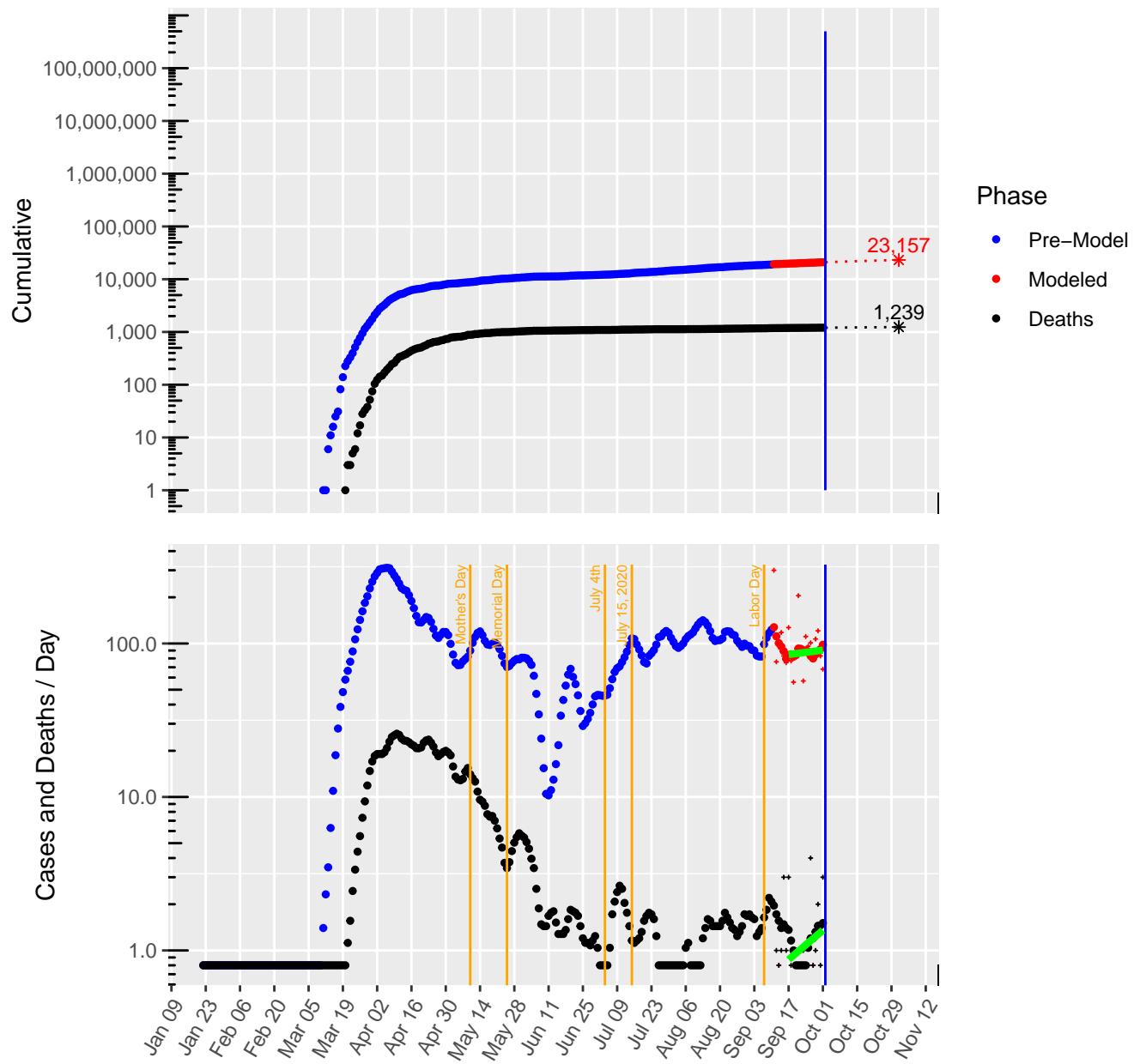
Meade County, South Dakota (Sturgis) projection as of 2020-10-02



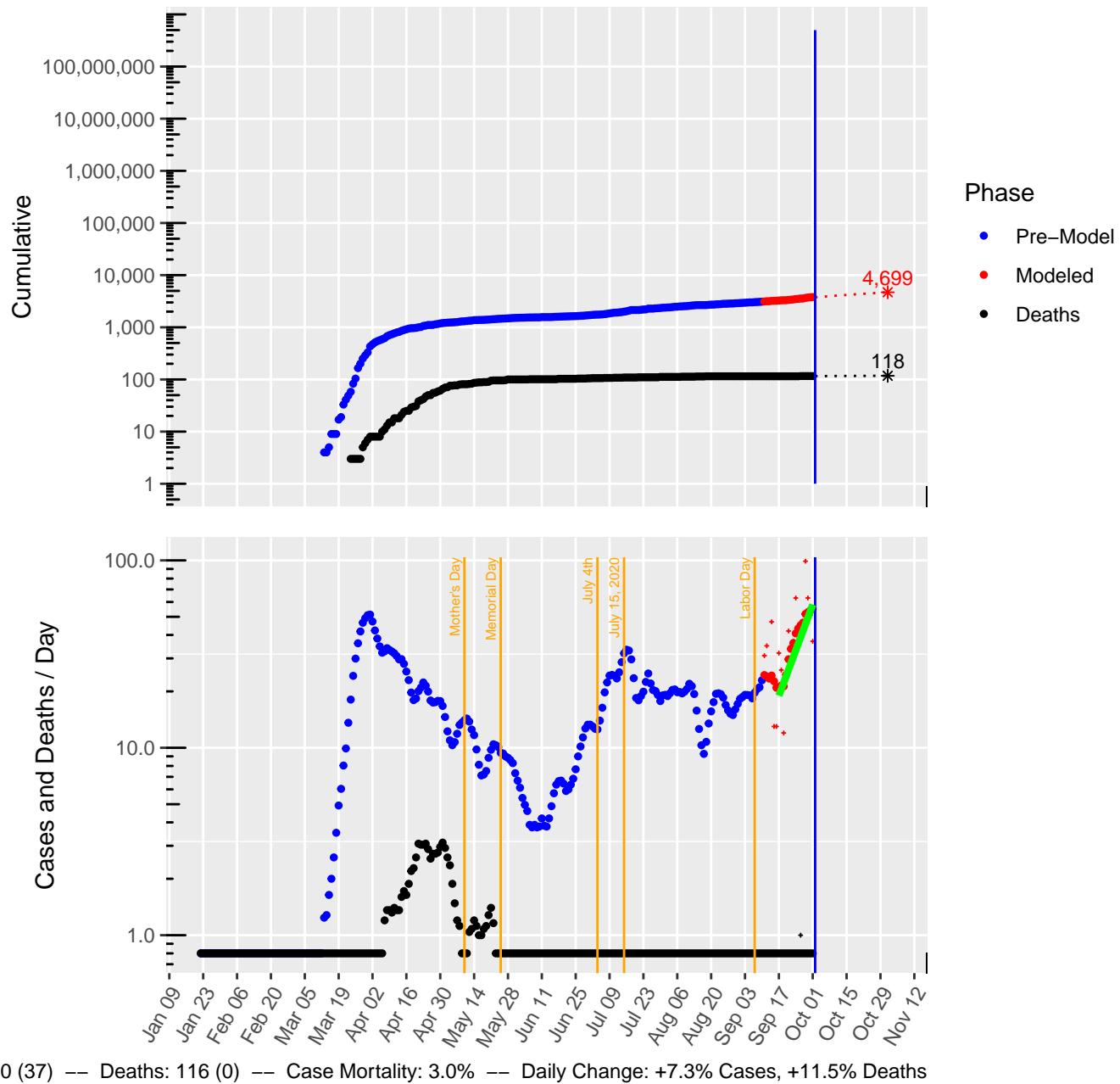
Erie County, New York projection as of 2020-10-02



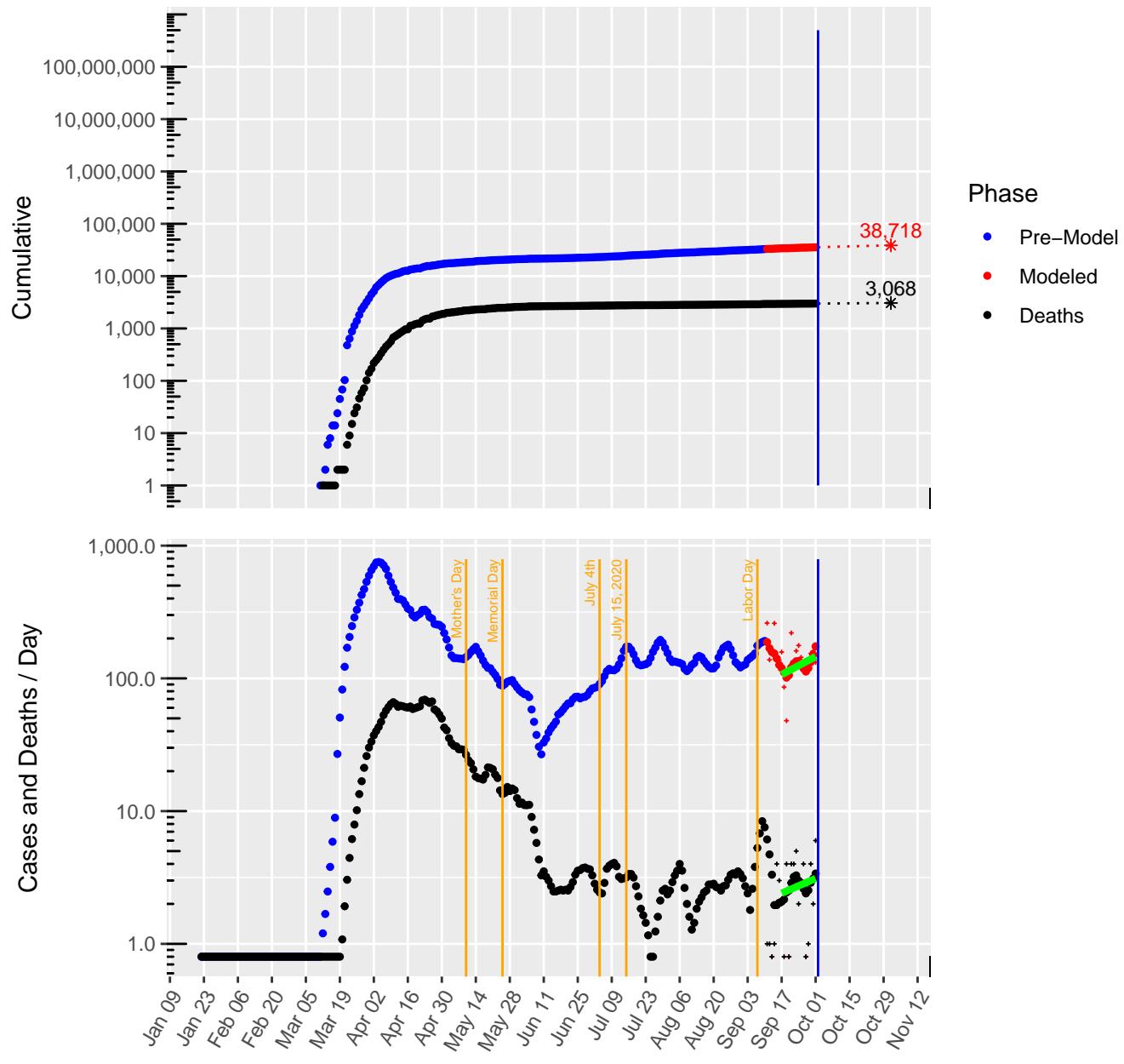
Oakland County, Michigan projection as of 2020-10-02



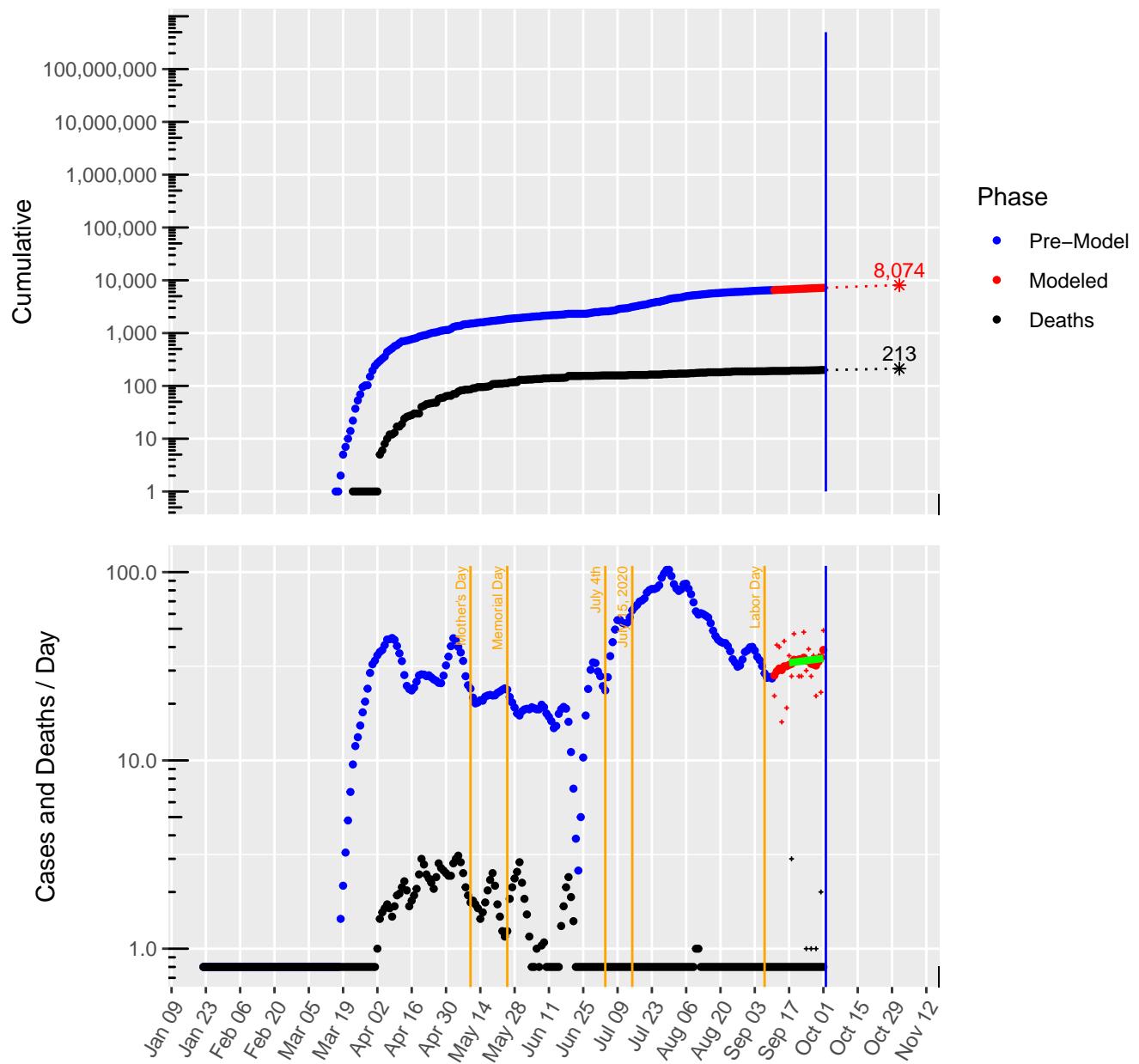
Washtenaw County, Michigan (Ann Arbor) projection as of 2020-10-02



Wayne County (Detroit) projection as of 2020-10-02

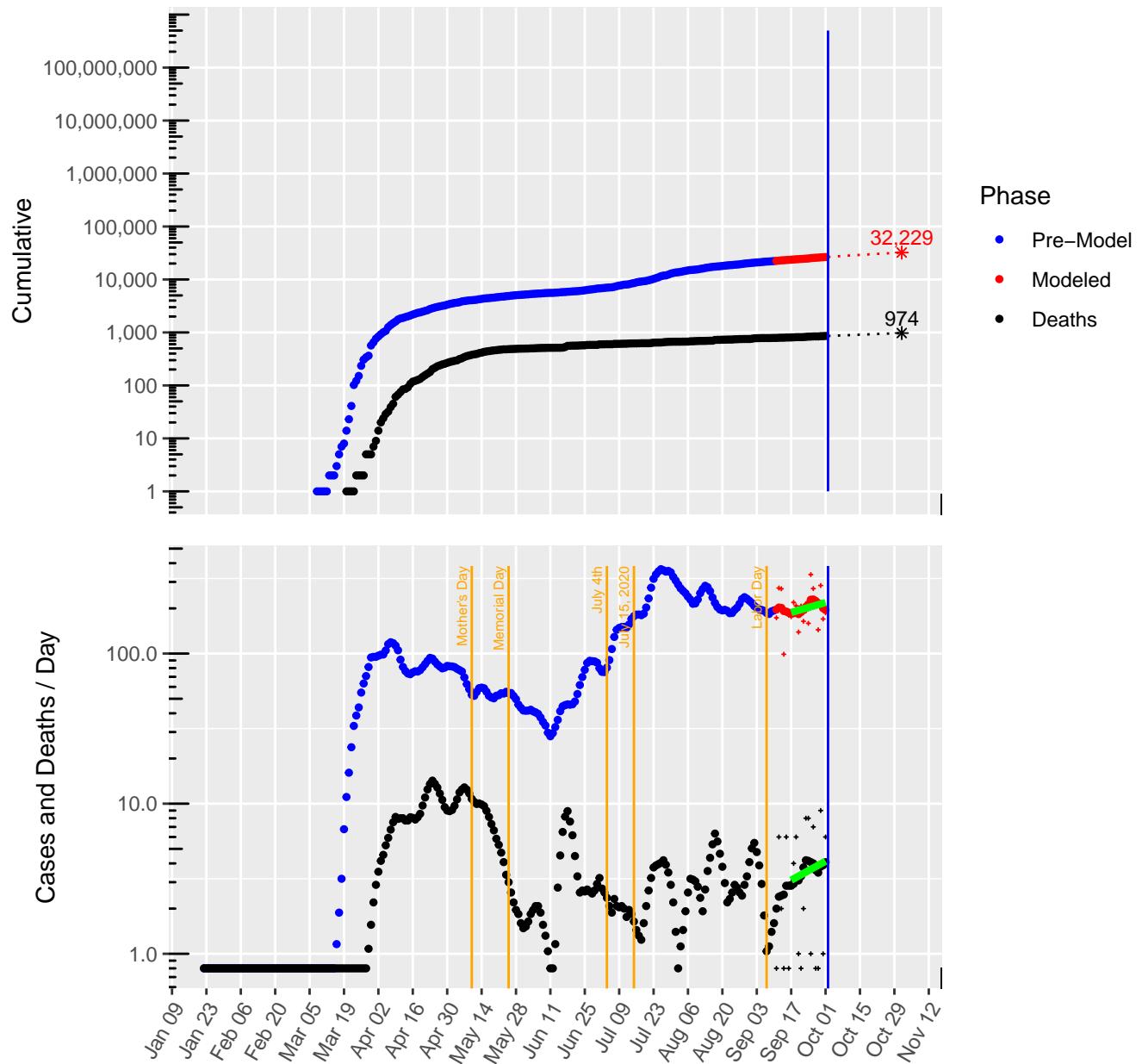


St. Louis (City) projection as of 2020-10-02

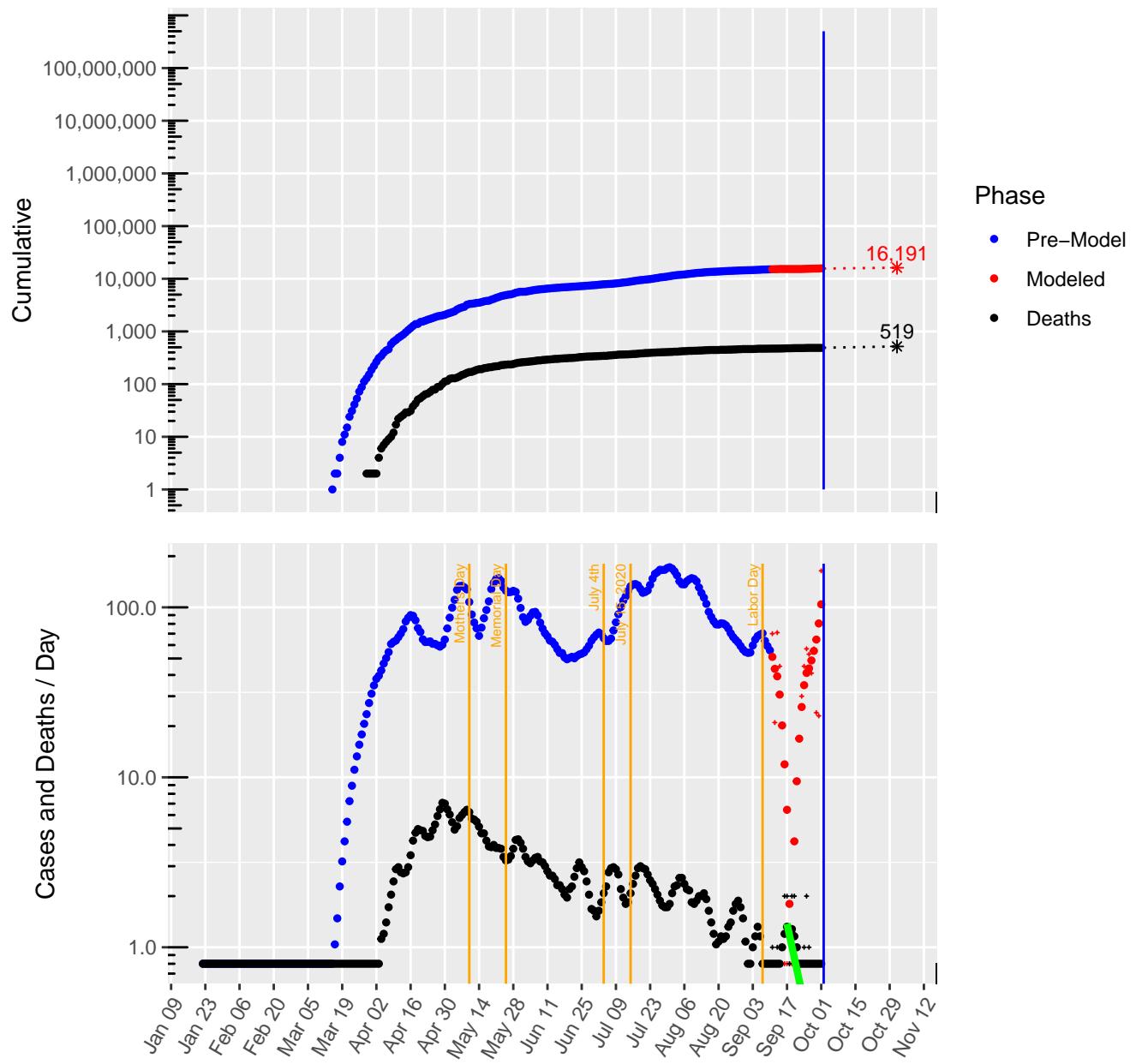


97 (49) --- Deaths: 200 (0) --- Case Mortality: 2.8% --- Daily Change: +0.4% Cases, +2.6% Deaths

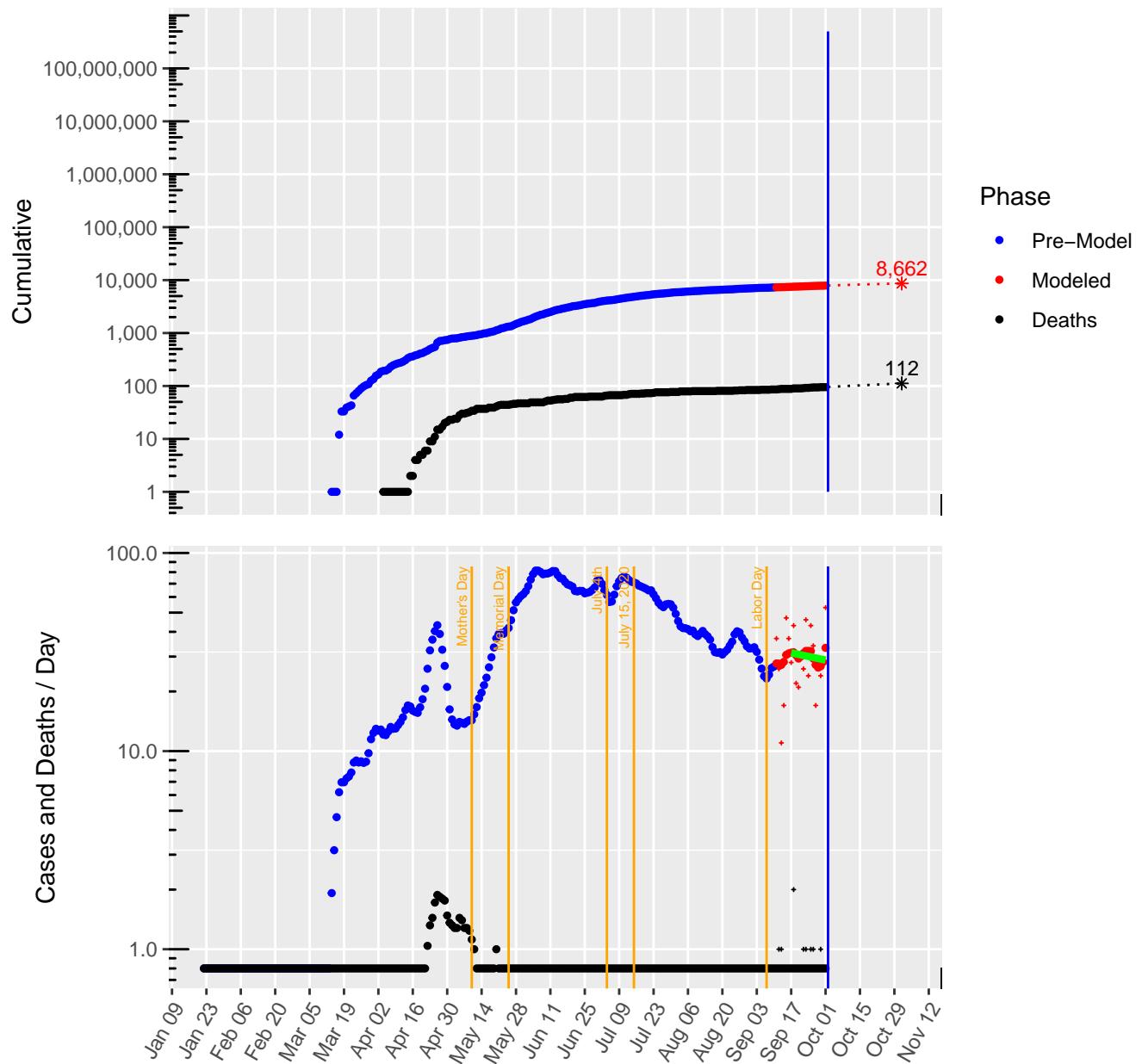
St. Louis (County) projection as of 2020-10-02



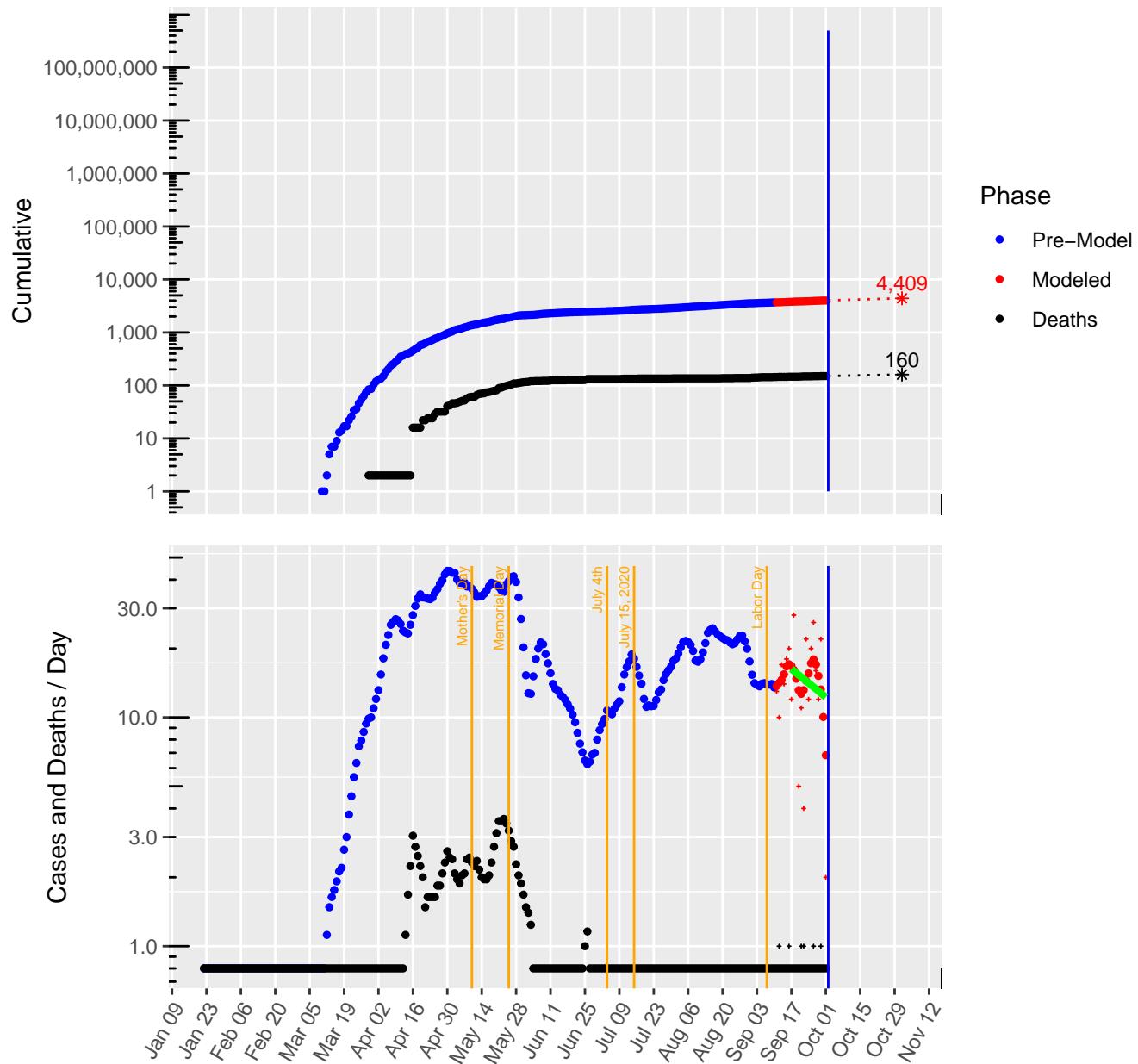
Baltimore (City) projection as of 2020-10-02



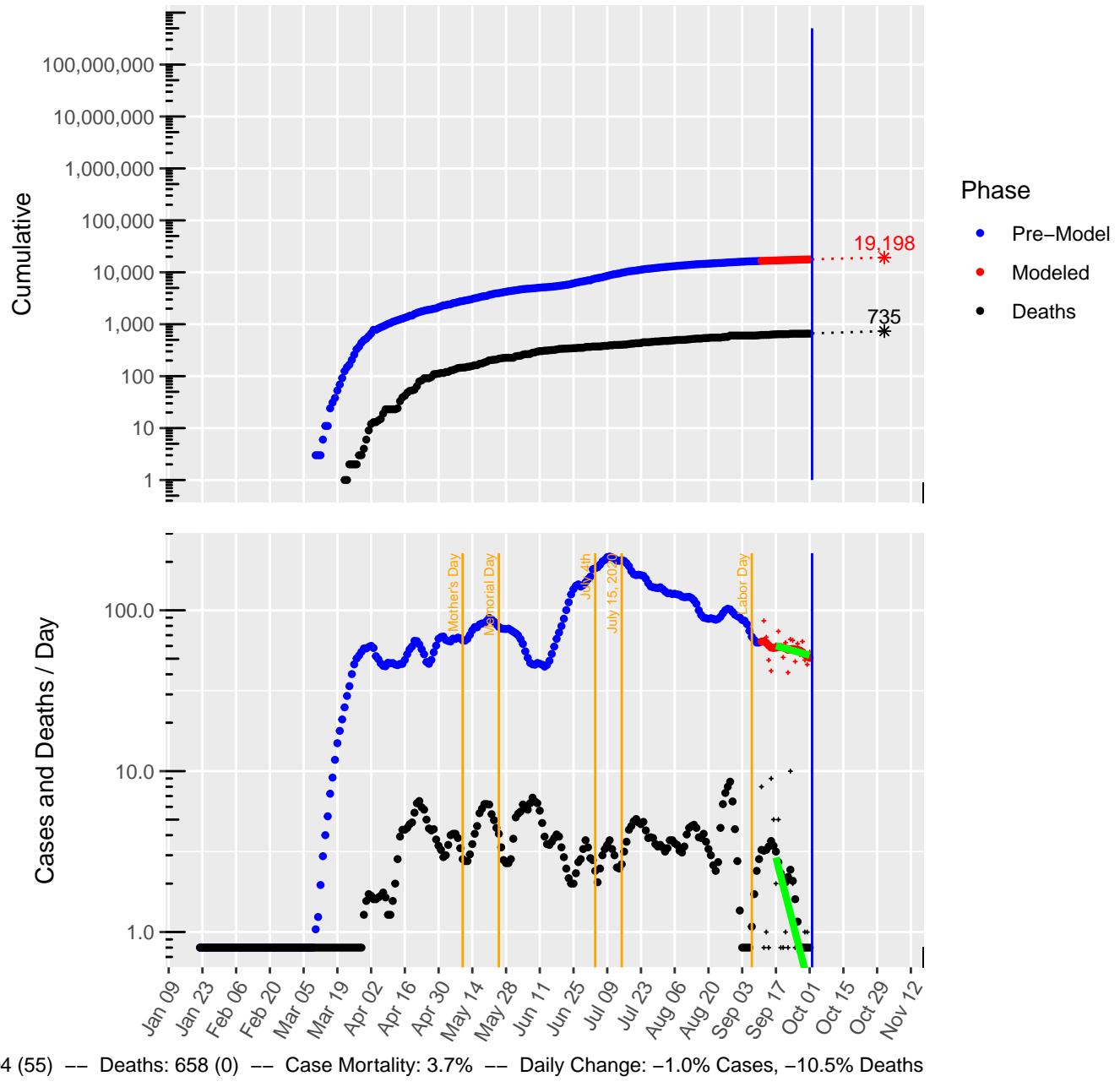
Durham County, North Carolina projection as of 2020-10-02



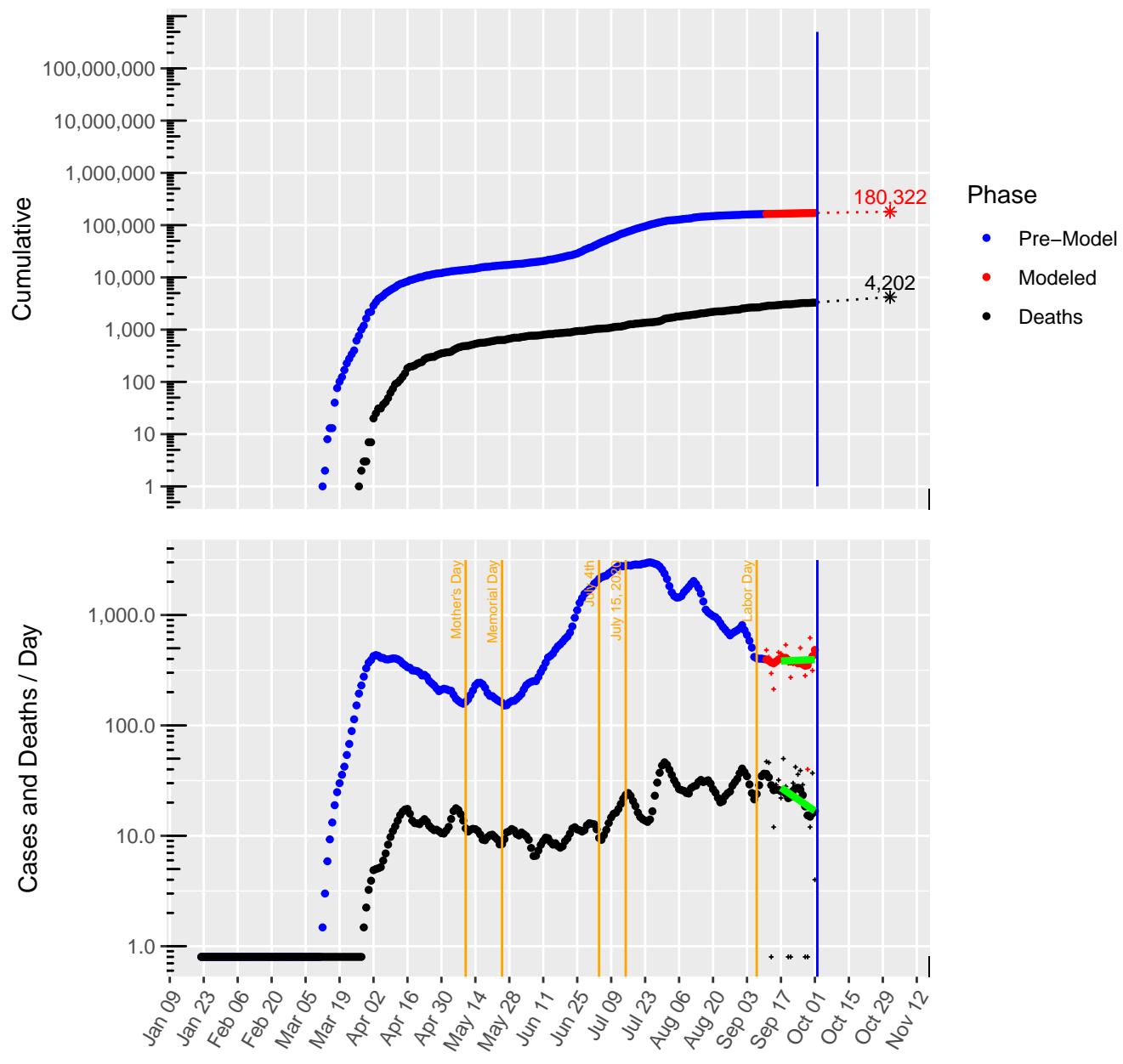
Arlington County, Virginia projection as of 2020-10-02



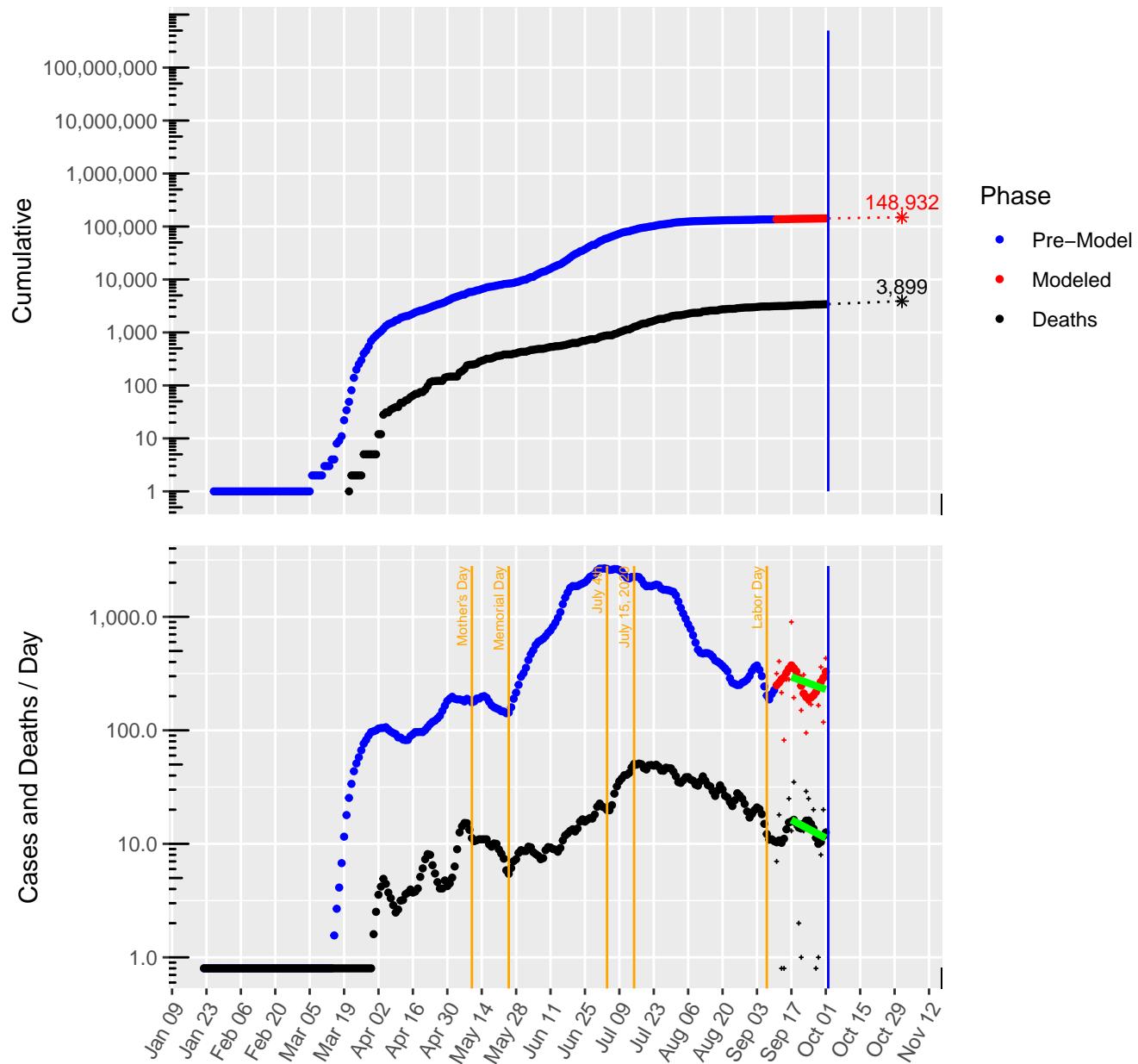
Cuyahoga County (Cleveland) projection as of 2020-10-02



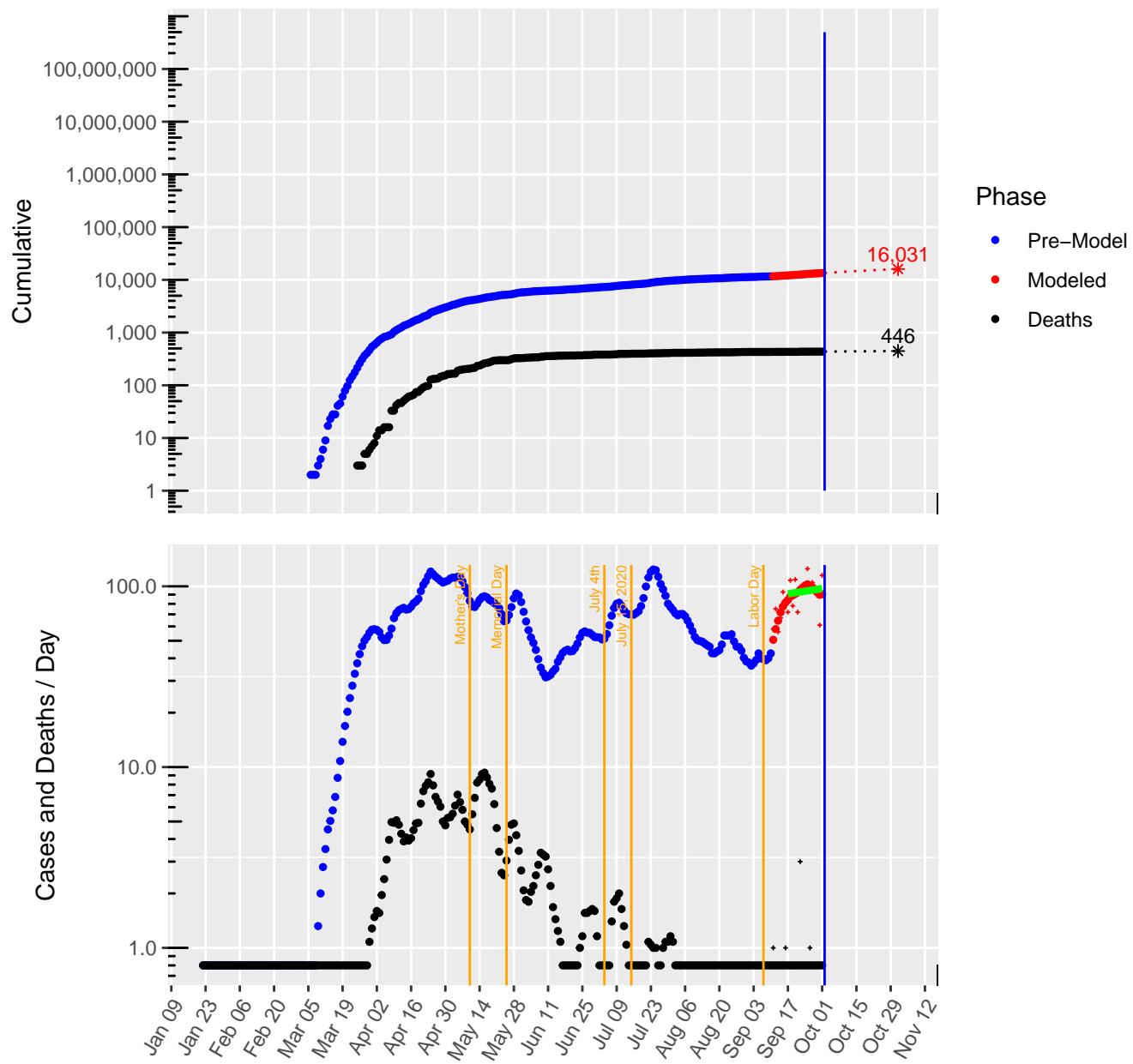
Miami-Dade projection as of 2020-10-02



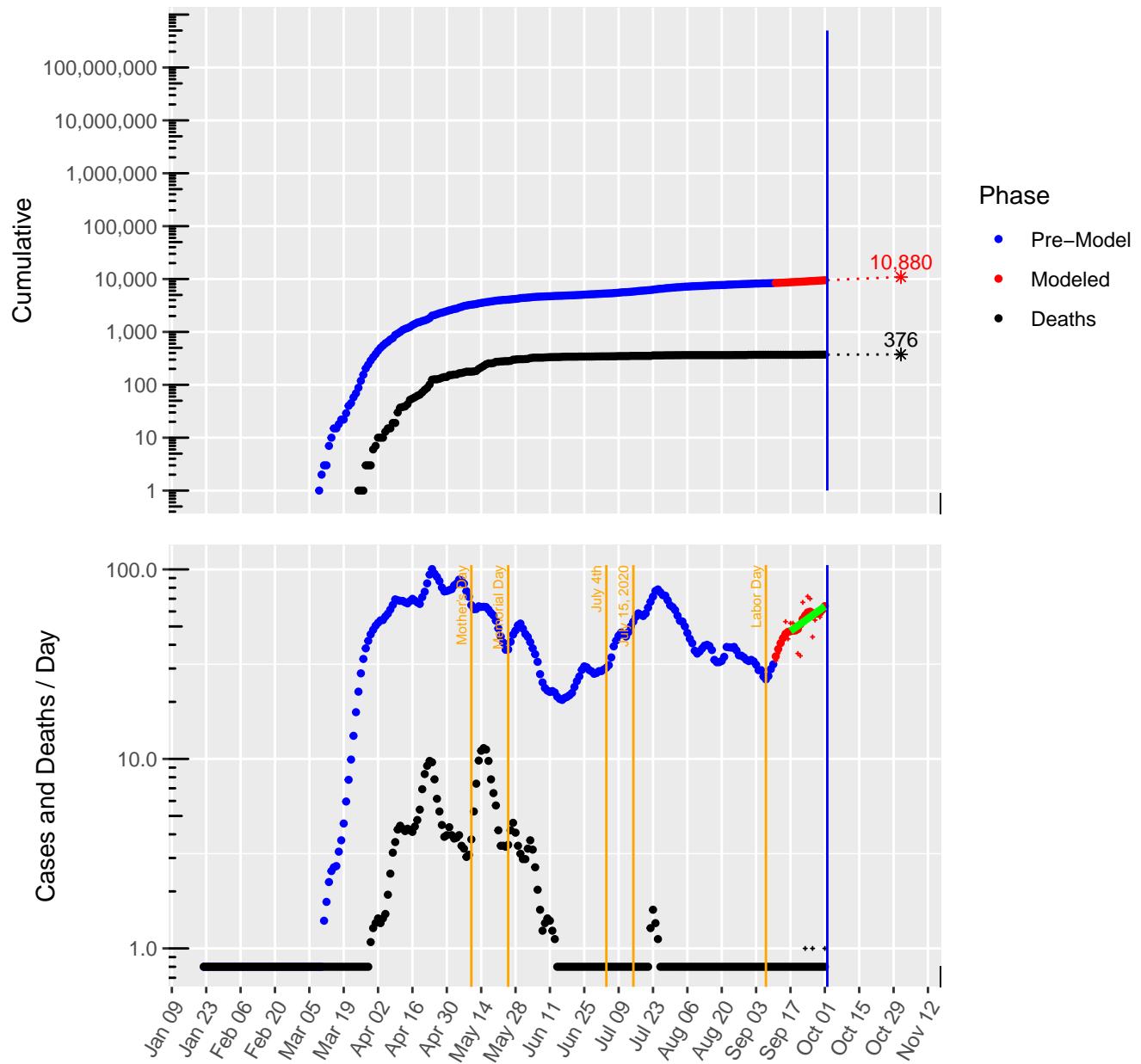
Maricopa County, Arizona projection as of 2020-10-02



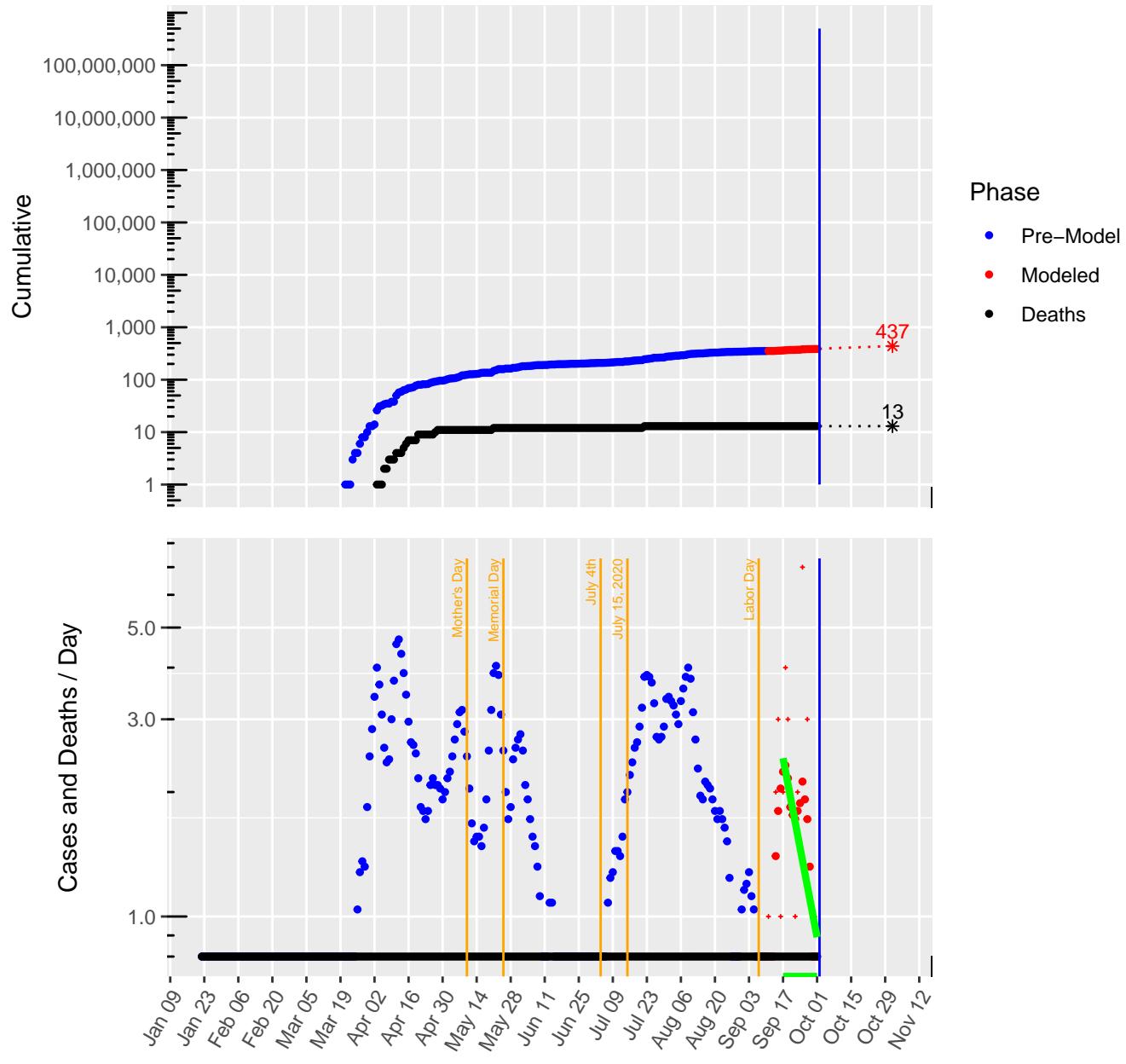
Denver County projection as of 2020-10-02



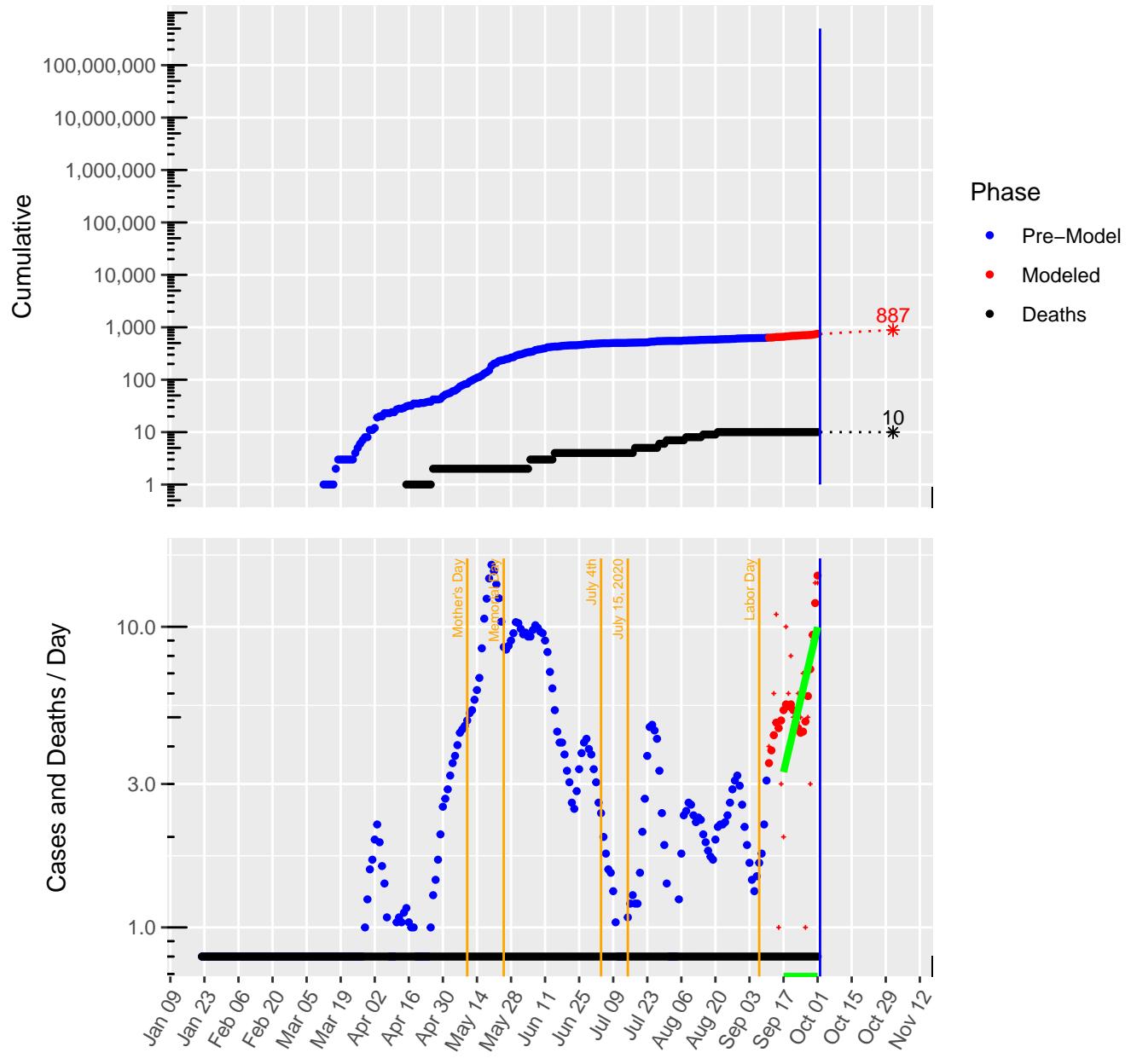
Arapahoe County, Colorado projection as of 2020-10-02



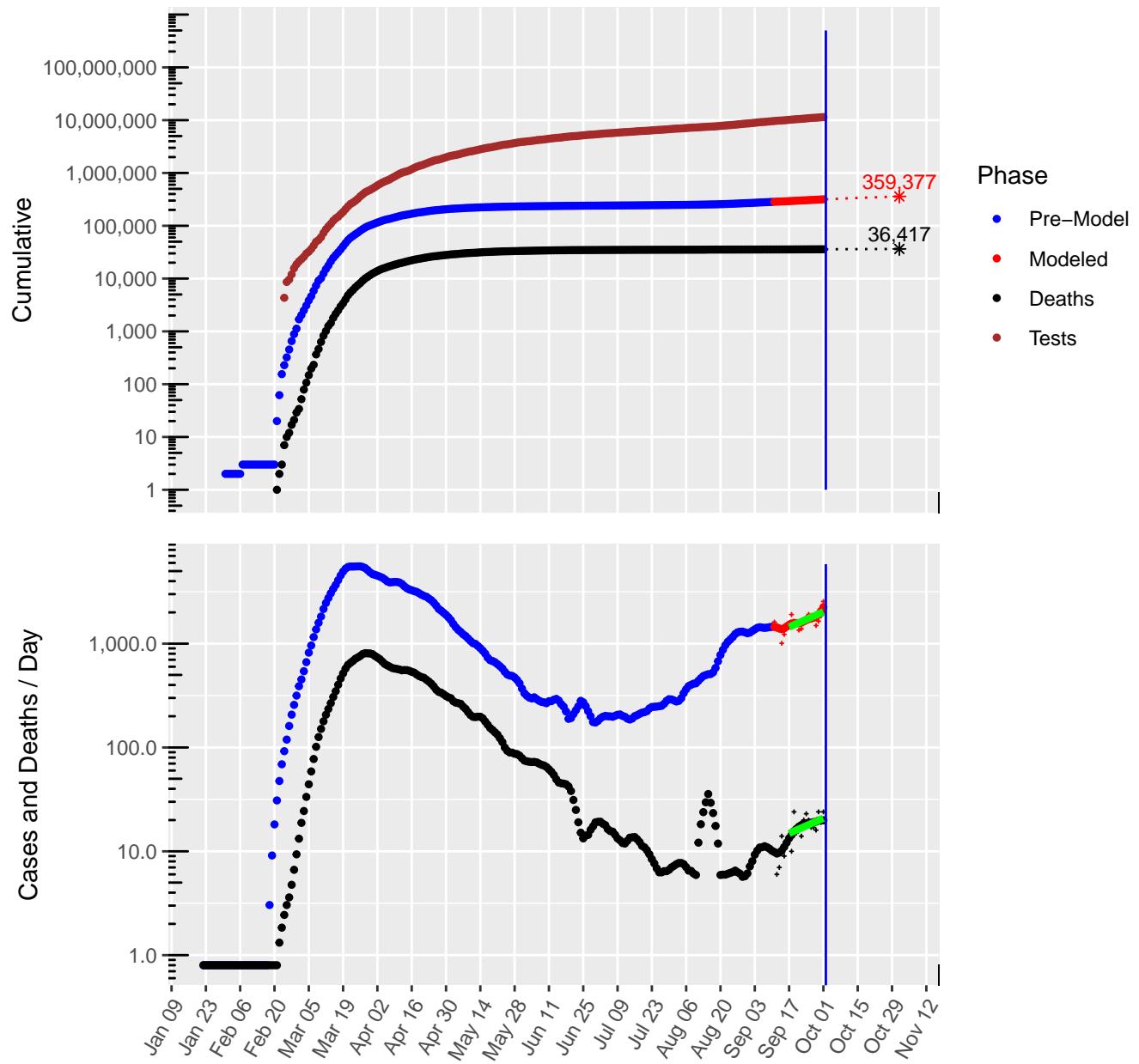
Montrose County, Colorado projection as of 2020-10-02



Androscoggin County, Maine projection as of 2020-10-02

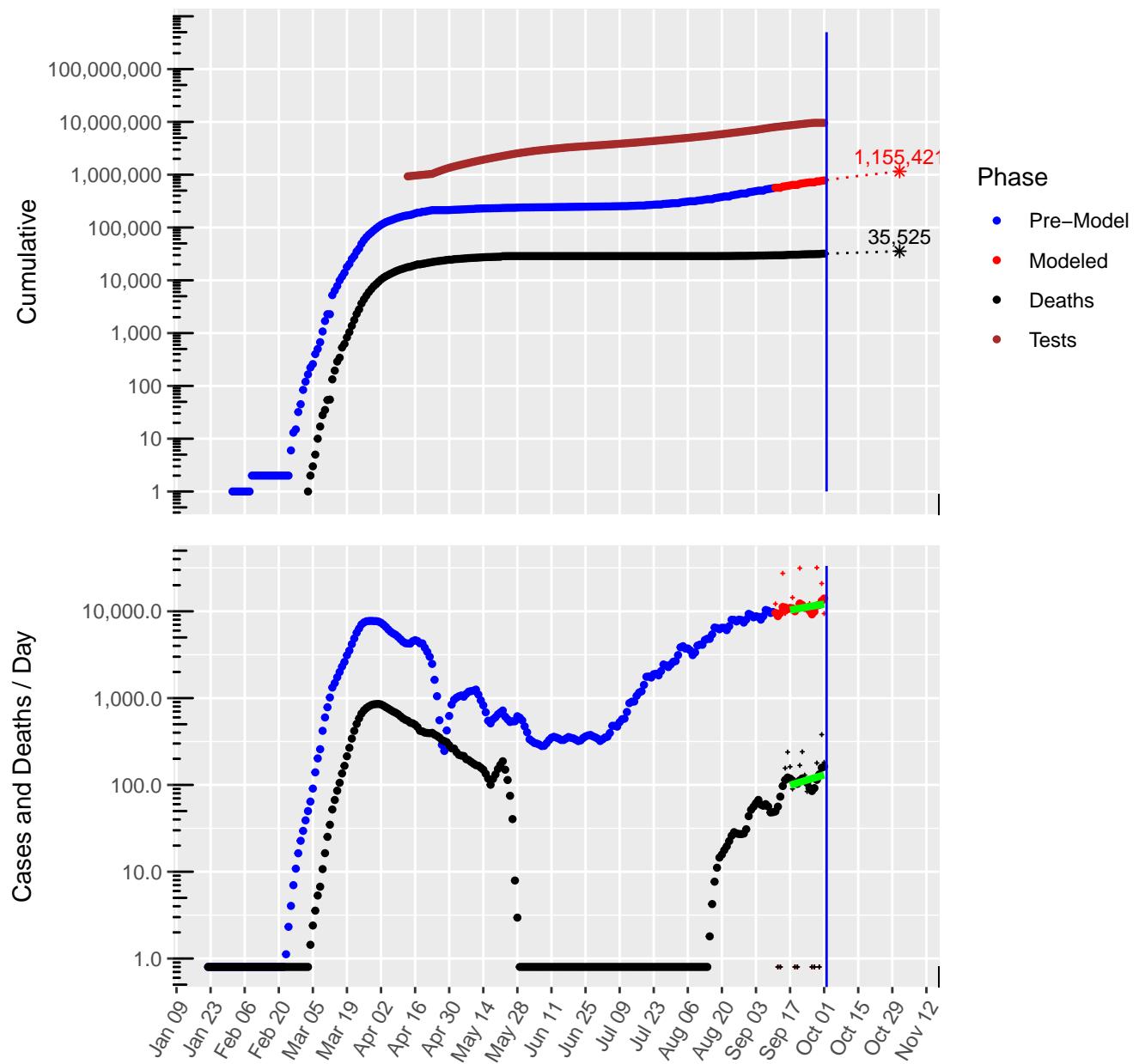


Italy projection as of 2020-10-02

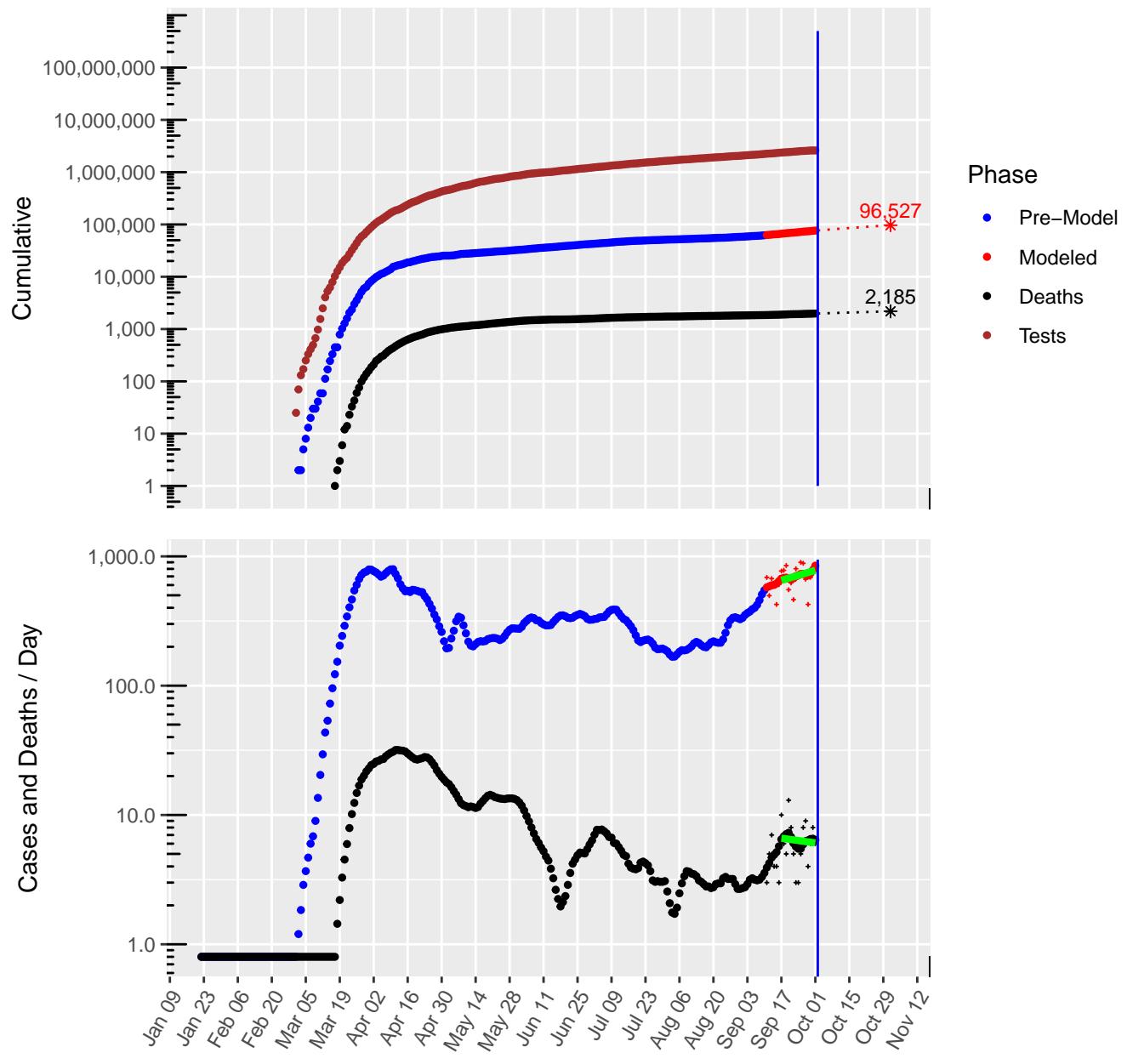


(8) --- Deaths: 35,918 (24) --- Case Mortality: 11.3% --- Daily Change: +2.4% Cases, +2.4% Deaths

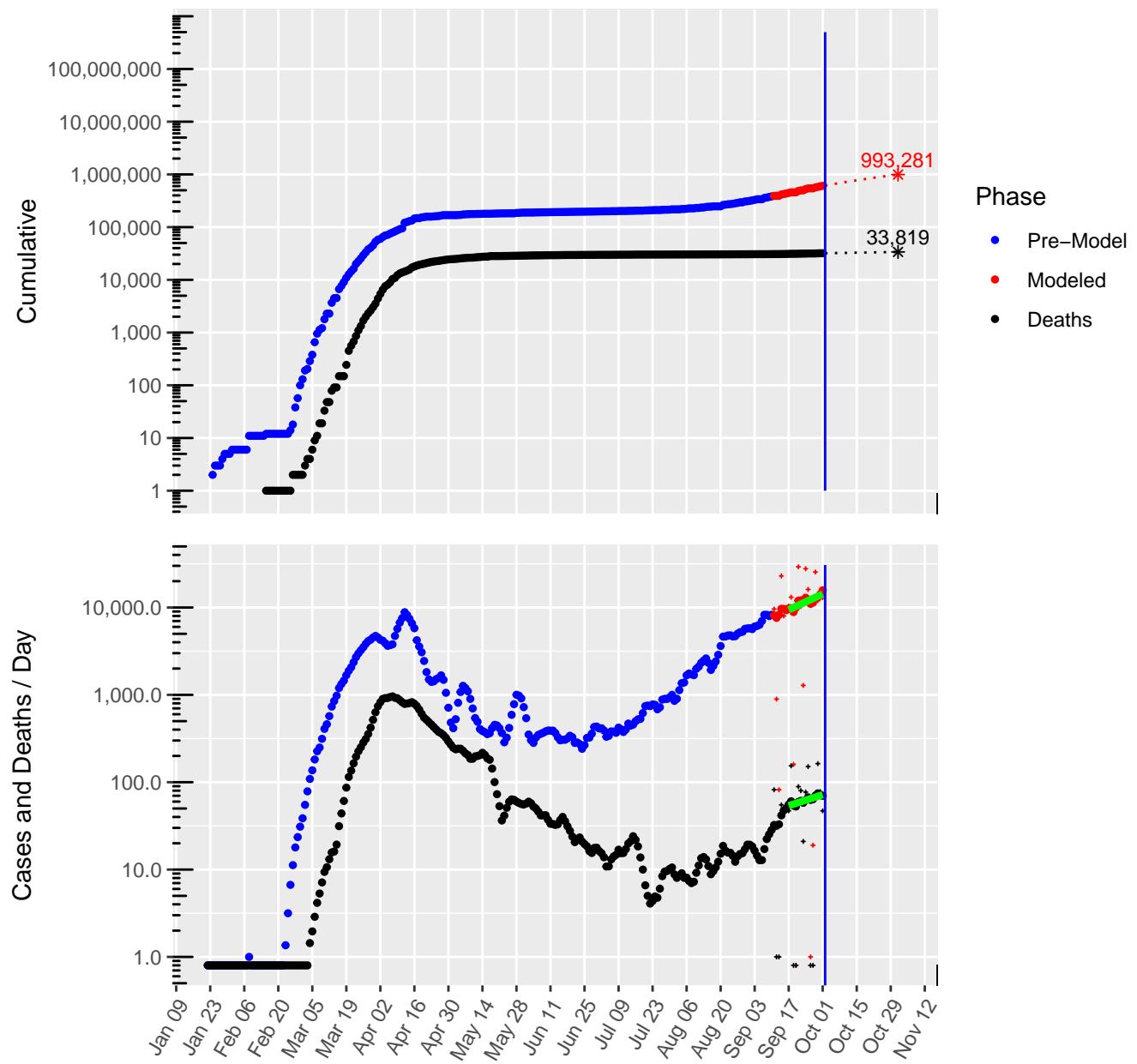
Spain projection as of 2020-10-02



Portugal projection as of 2020-10-02

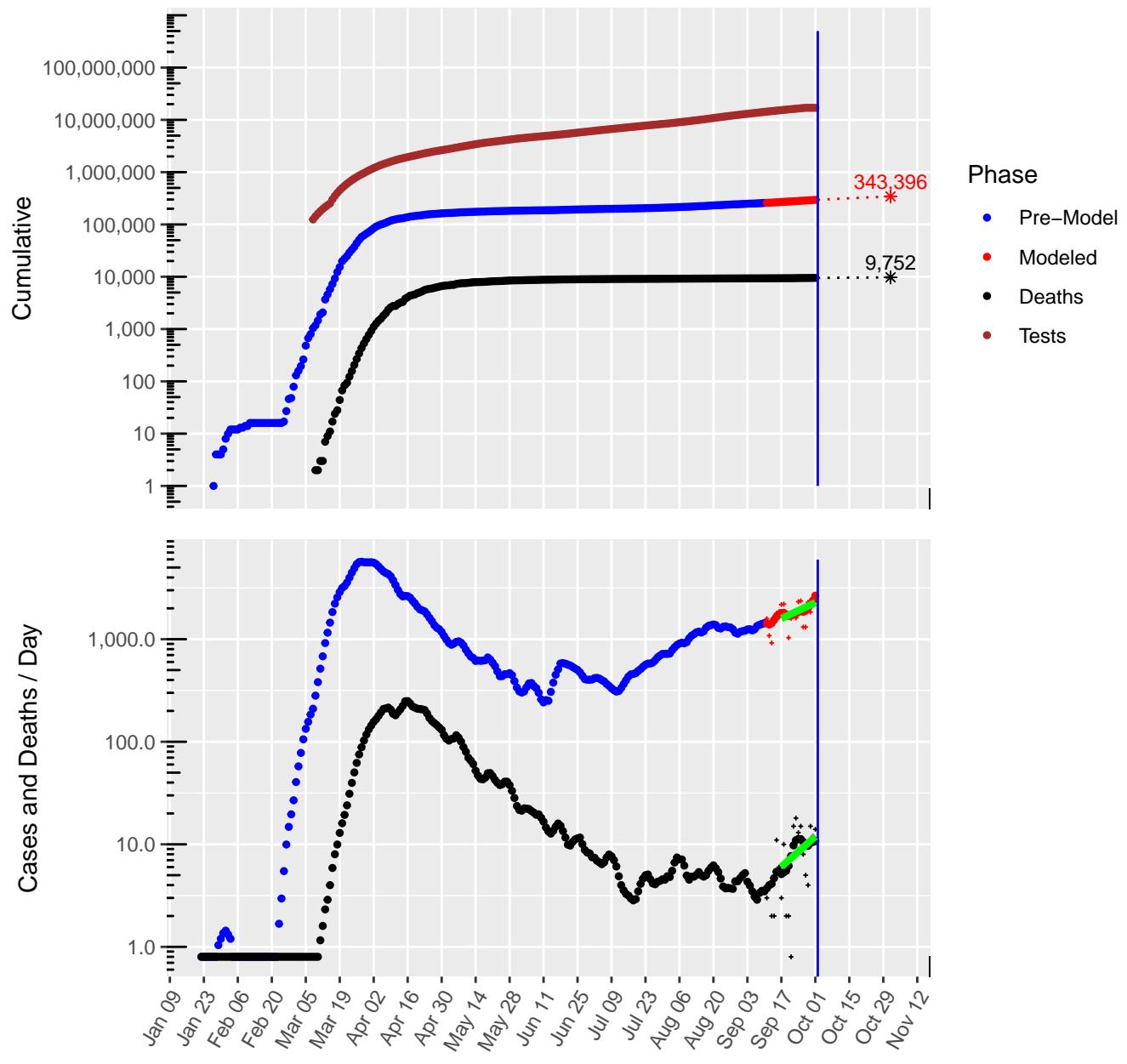


France projection as of 2020-10-02

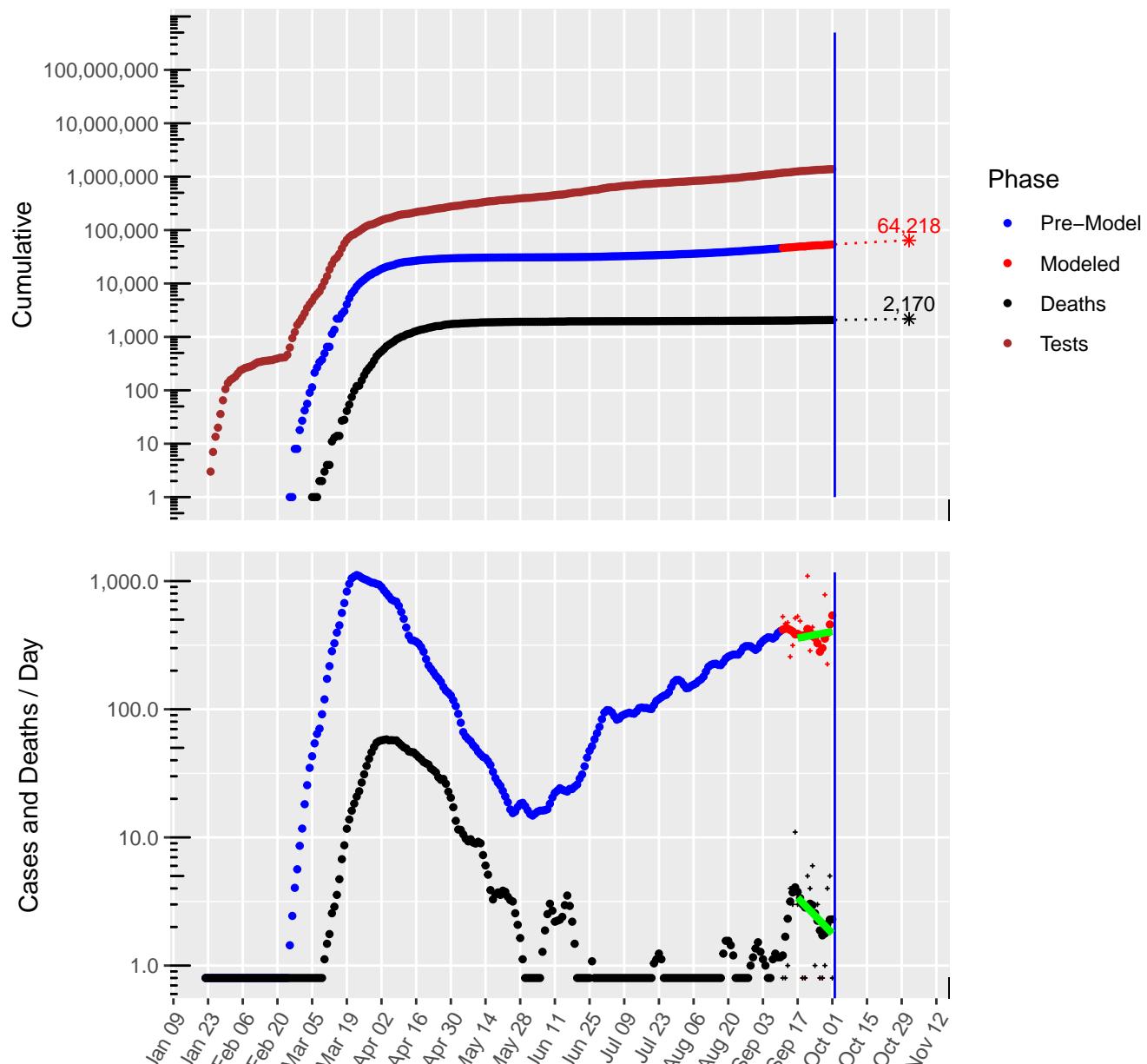


44) --- Deaths: 31,967 (47) --- Case Mortality: 5.3% --- Daily Change: +2.9% Cases, +2.1% Deaths

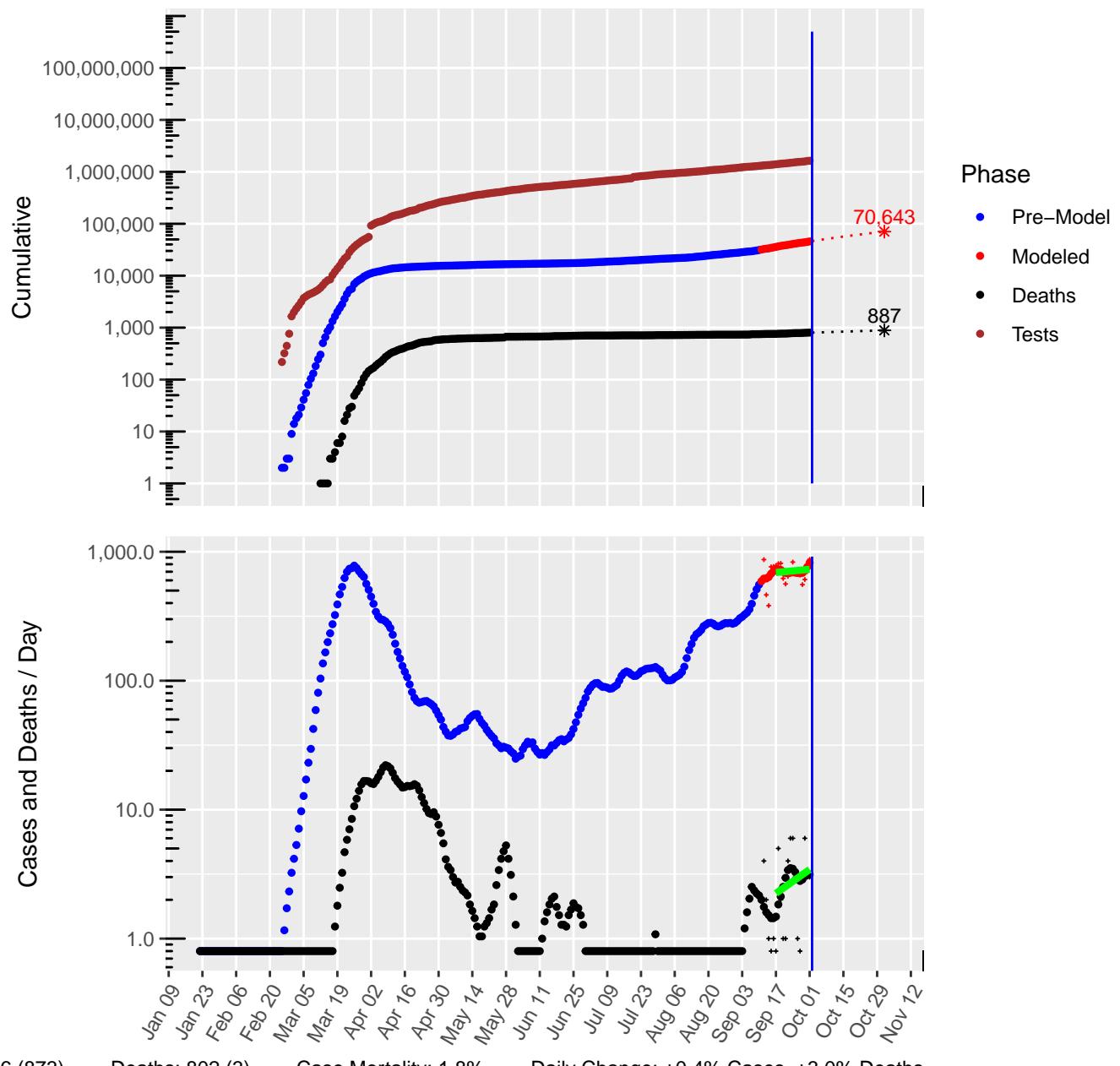
Germany projection as of 2020-10-02



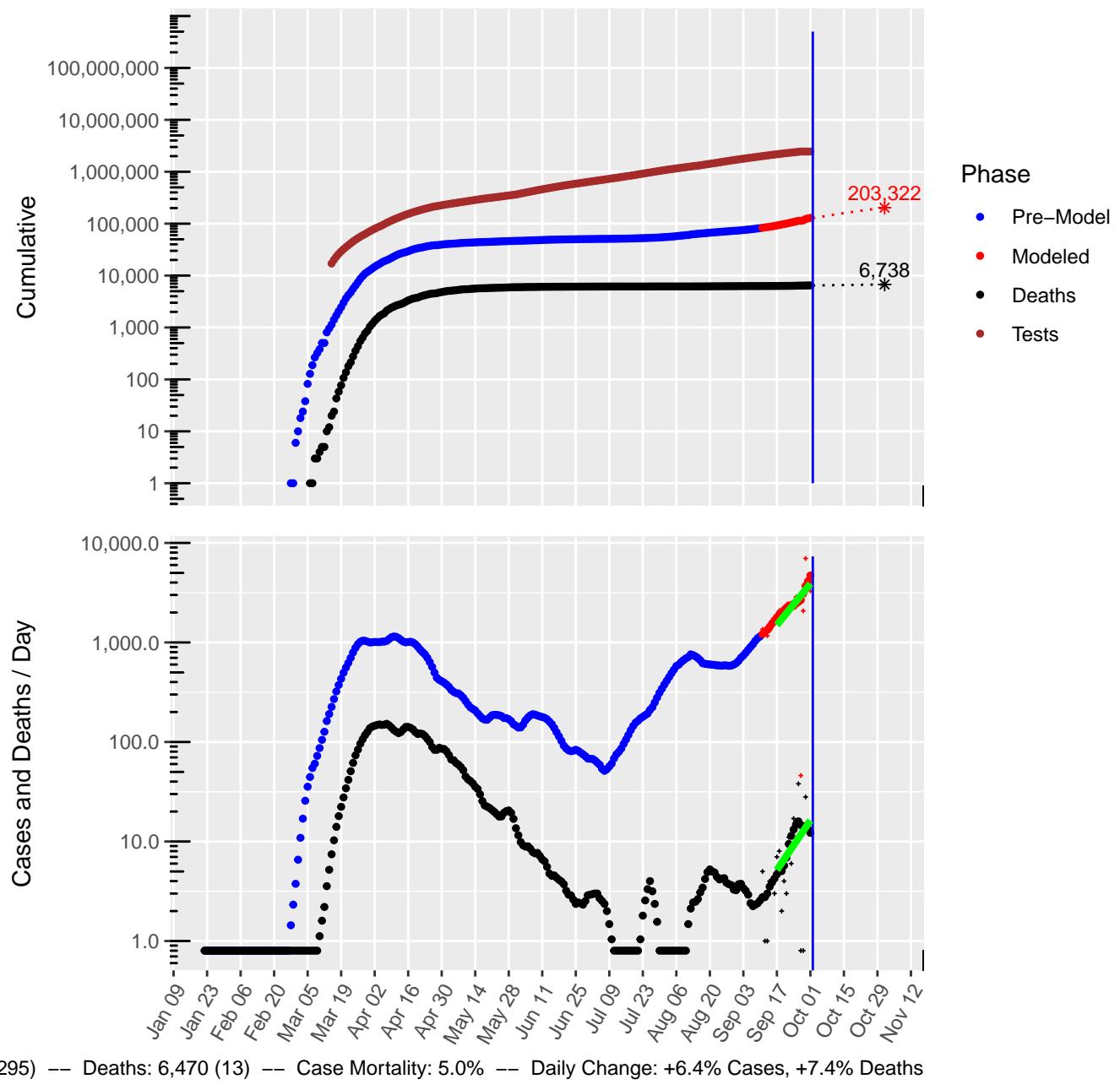
Switzerland projection as of 2020-10-02



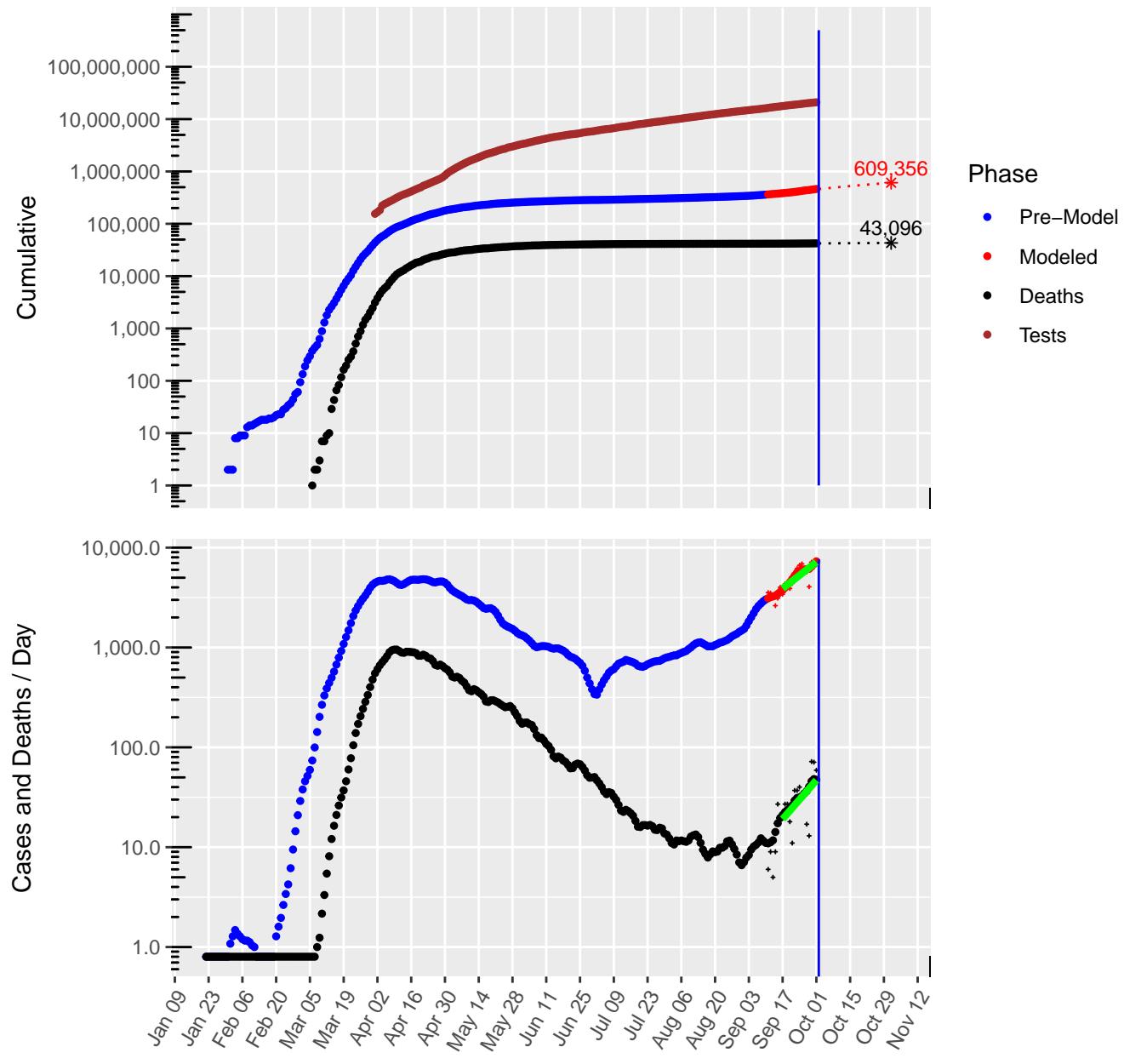
Austria projection as of 2020-10-02



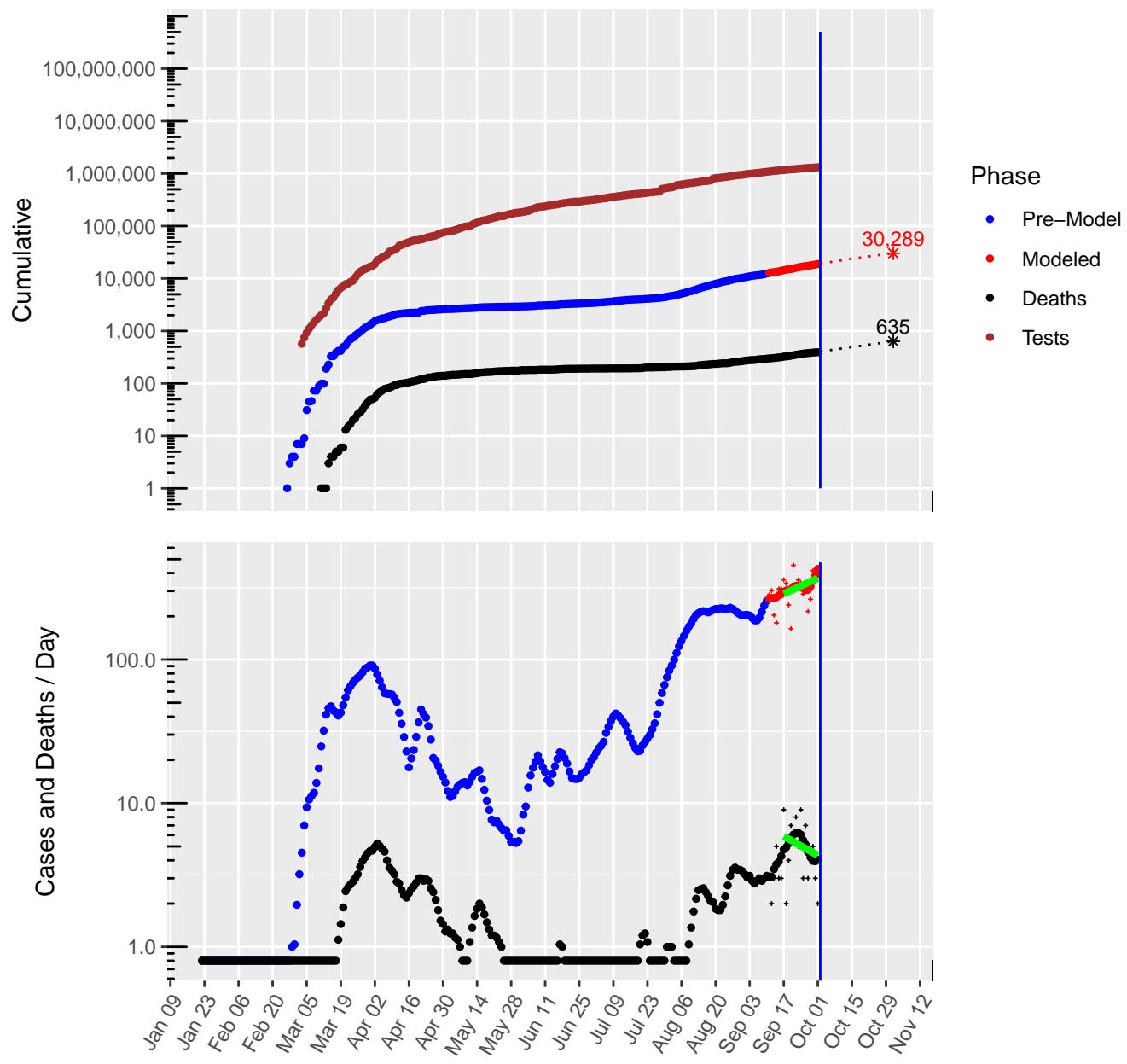
Netherlands projection as of 2020-10-02



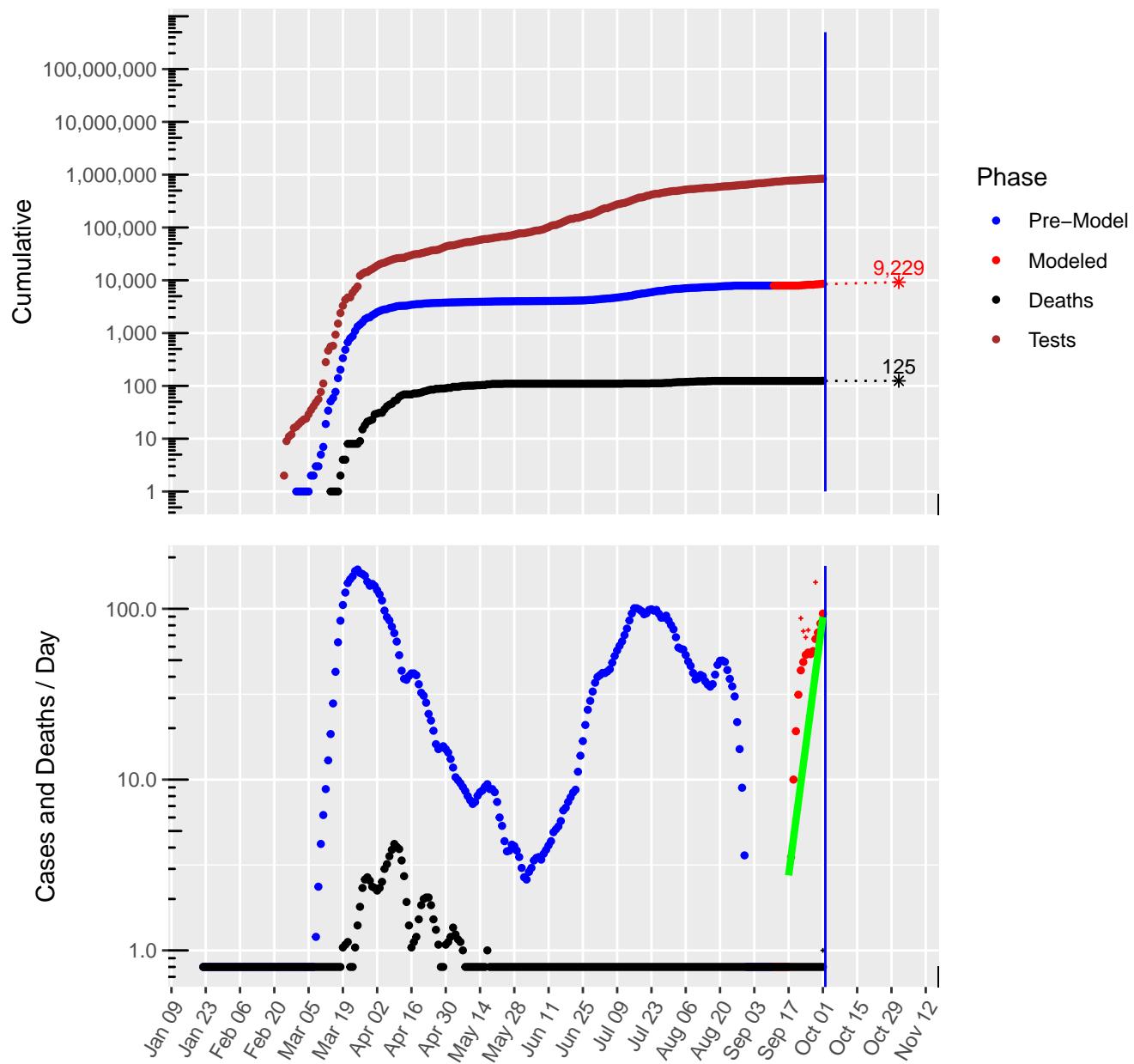
United Kingdom projection as of 2020-10-02



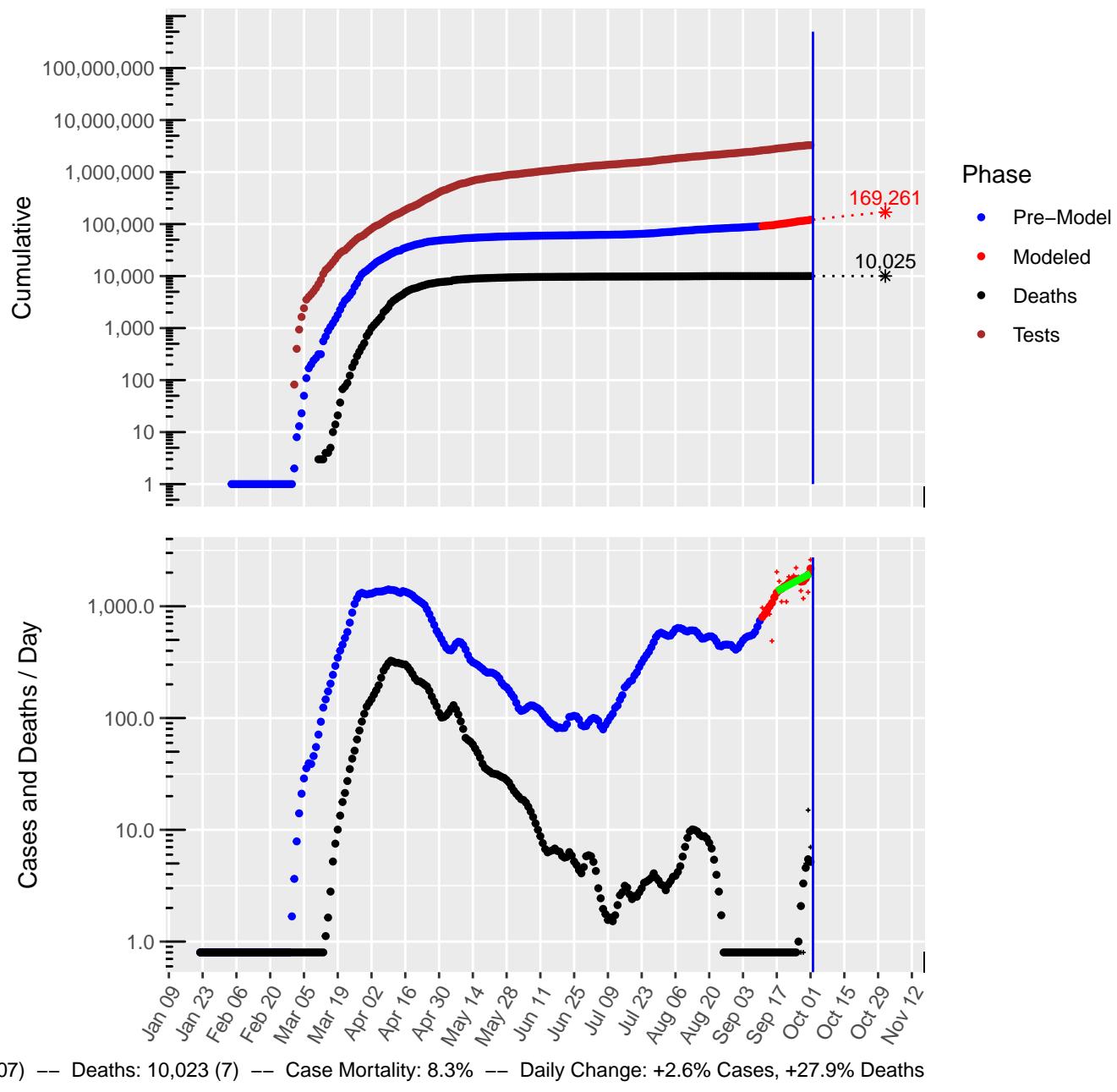
Greece projection as of 2020-10-02



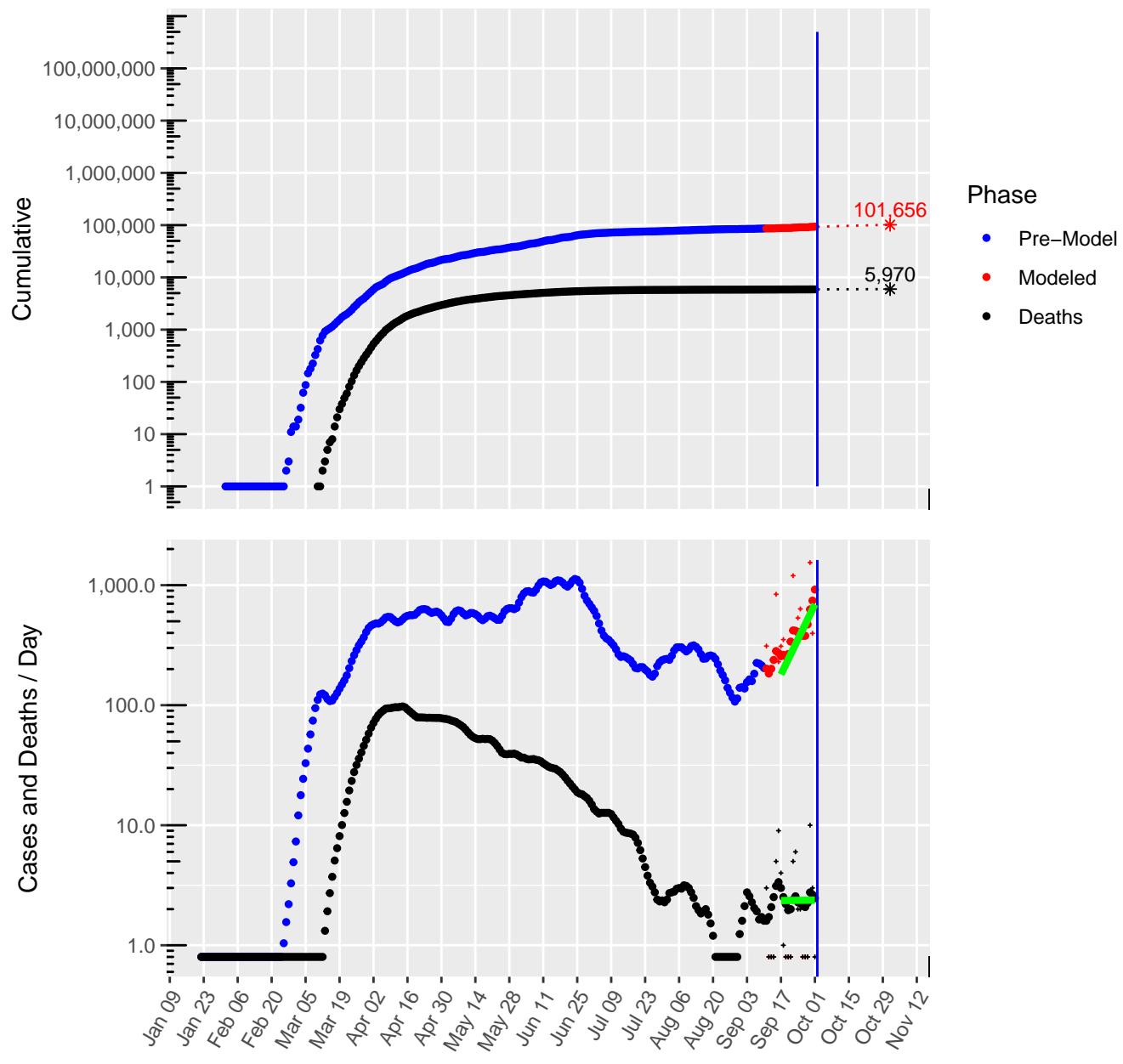
Luxembourg projection as of 2020-10-02



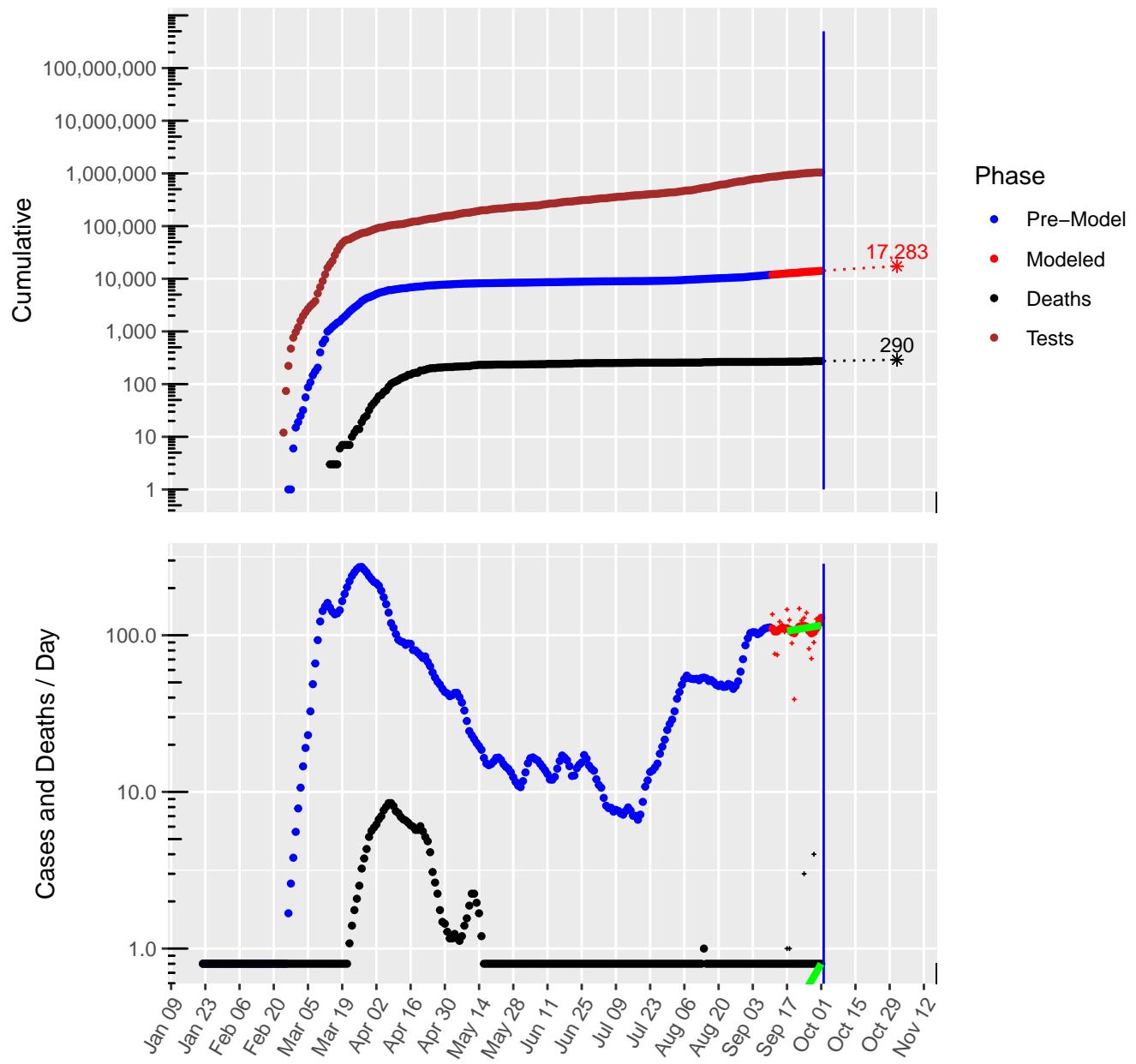
Belgium projection as of 2020-10-02



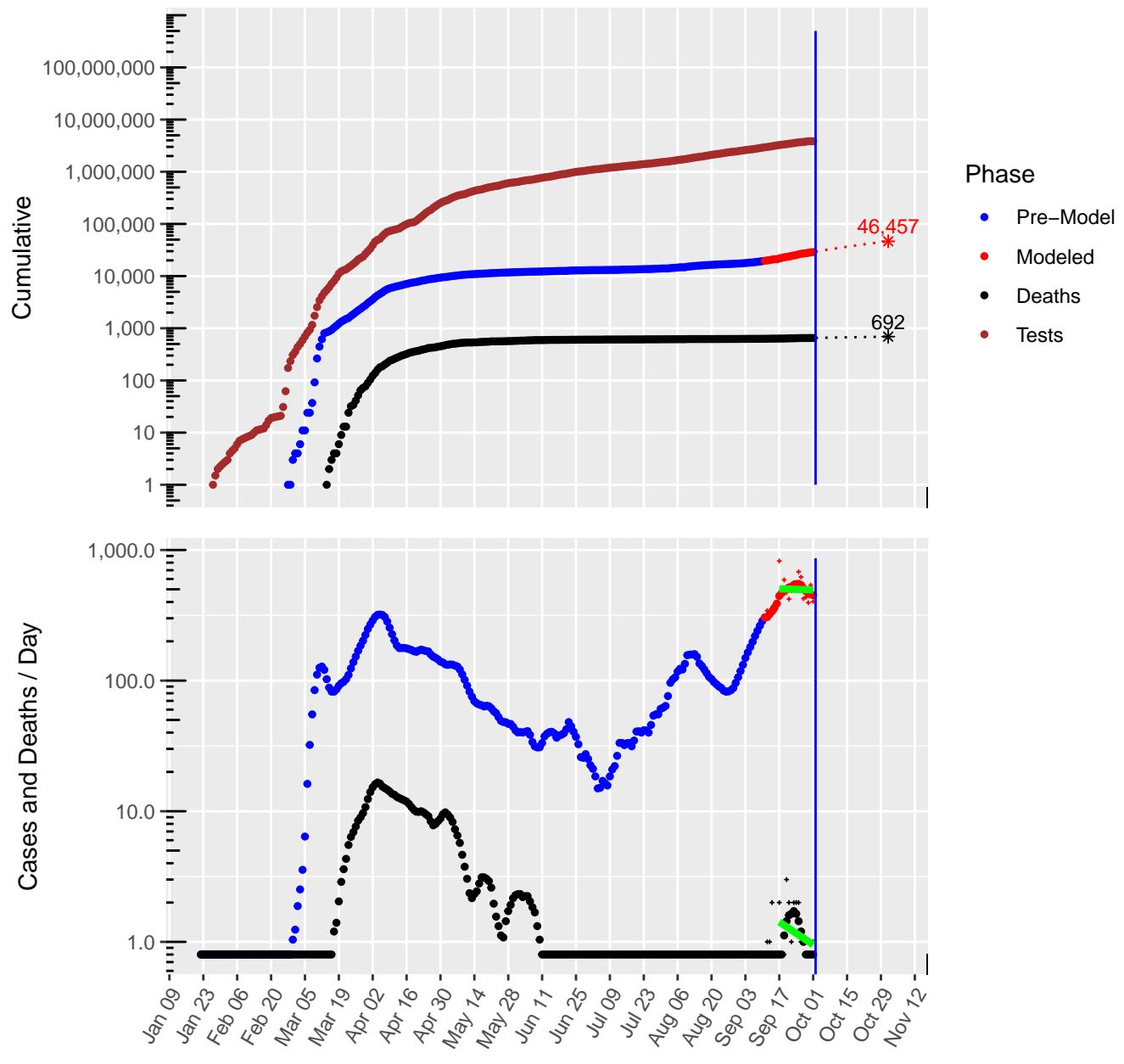
Sweden projection as of 2020-10-02



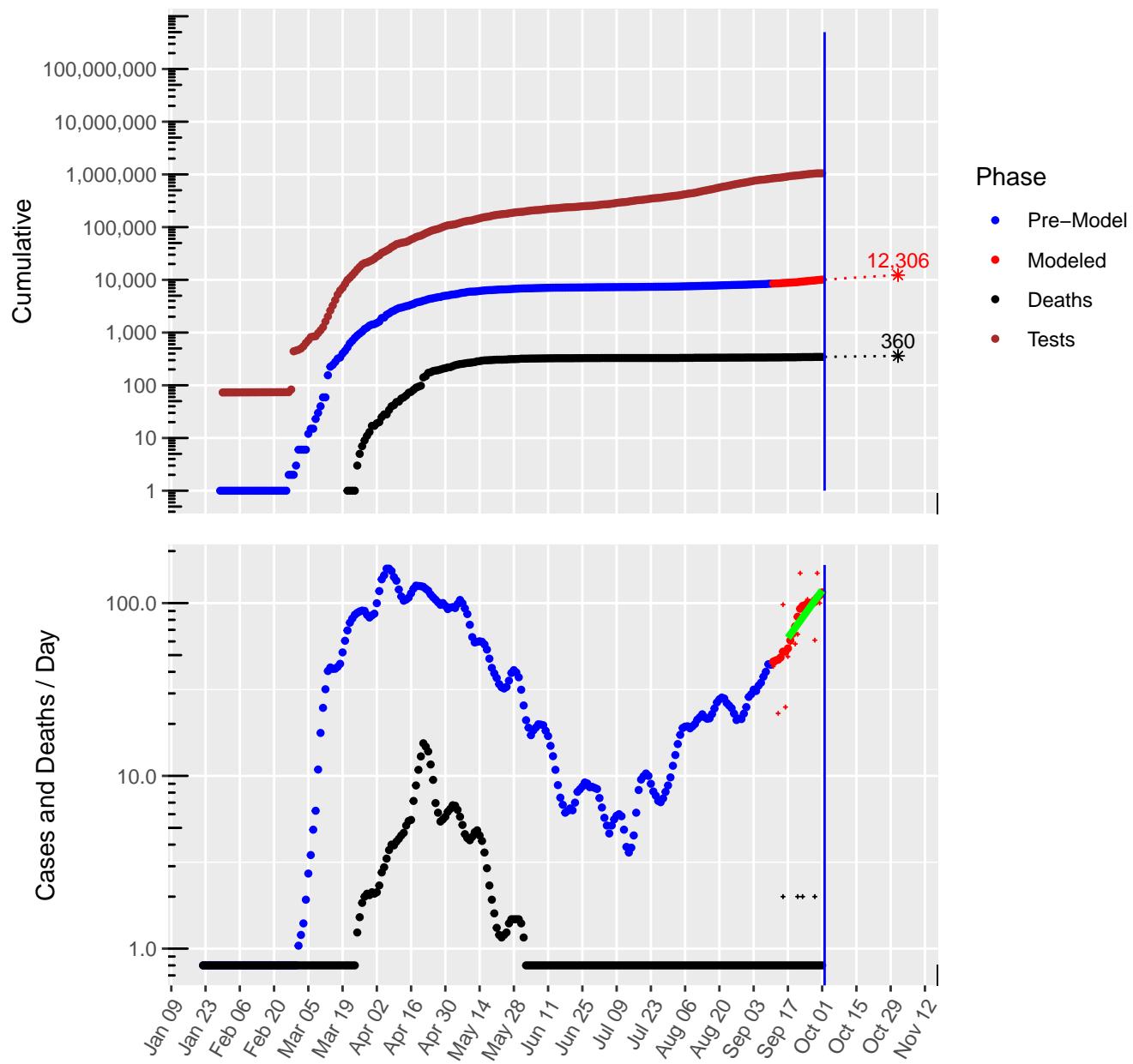
Norway projection as of 2020-10-02



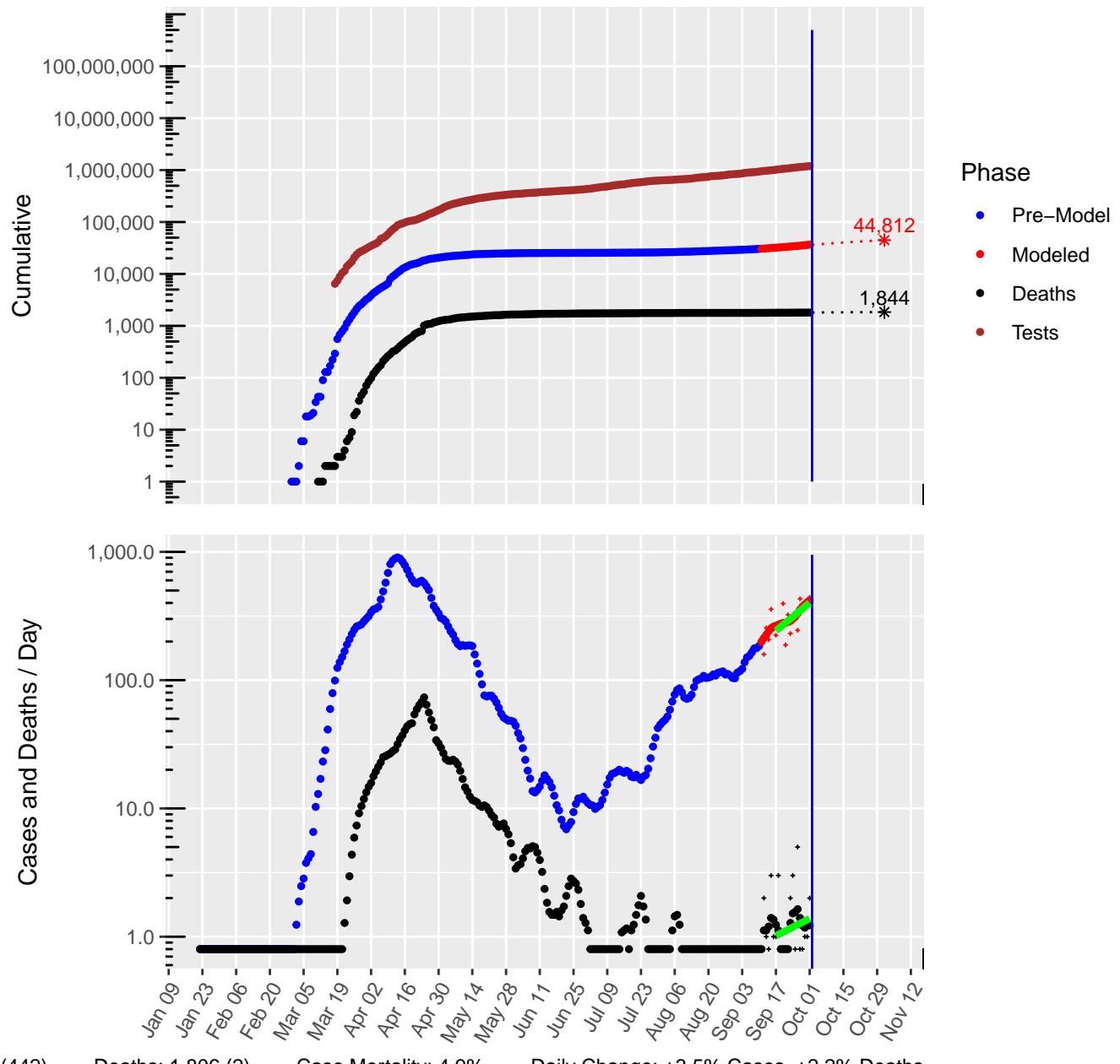
Denmark projection as of 2020-10-02



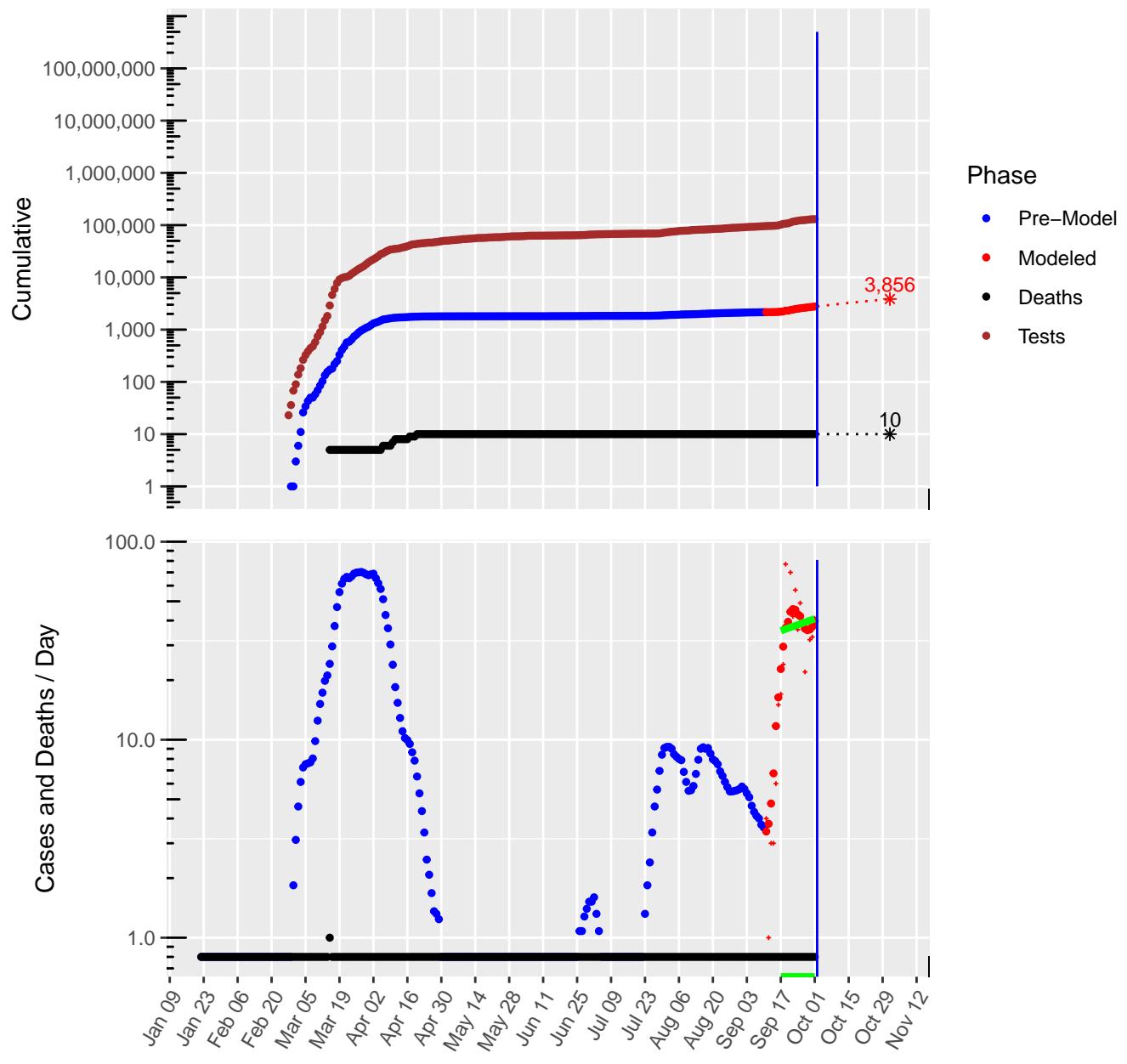
Finland projection as of 2020-10-02



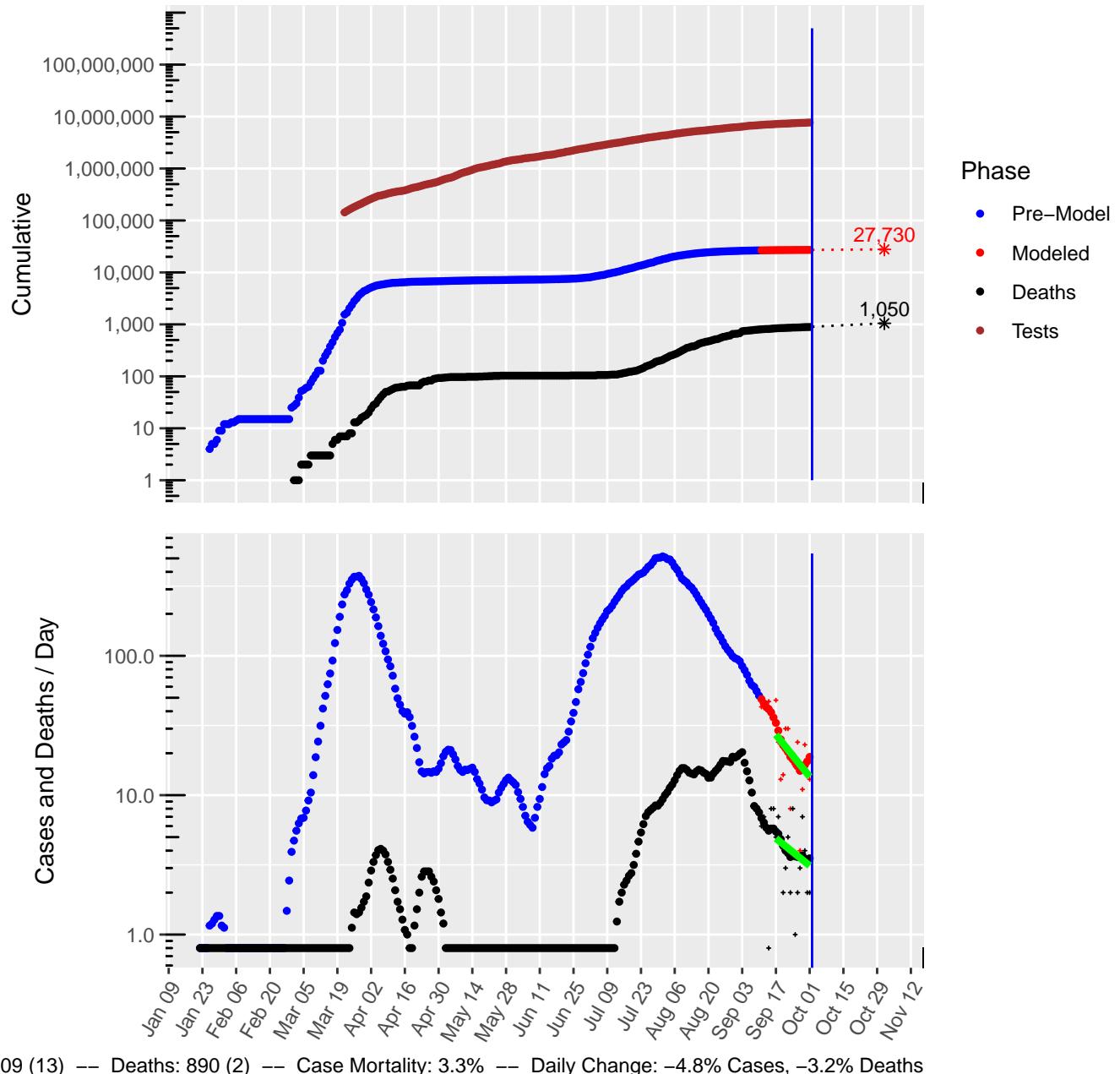
Ireland projection as of 2020-10-02



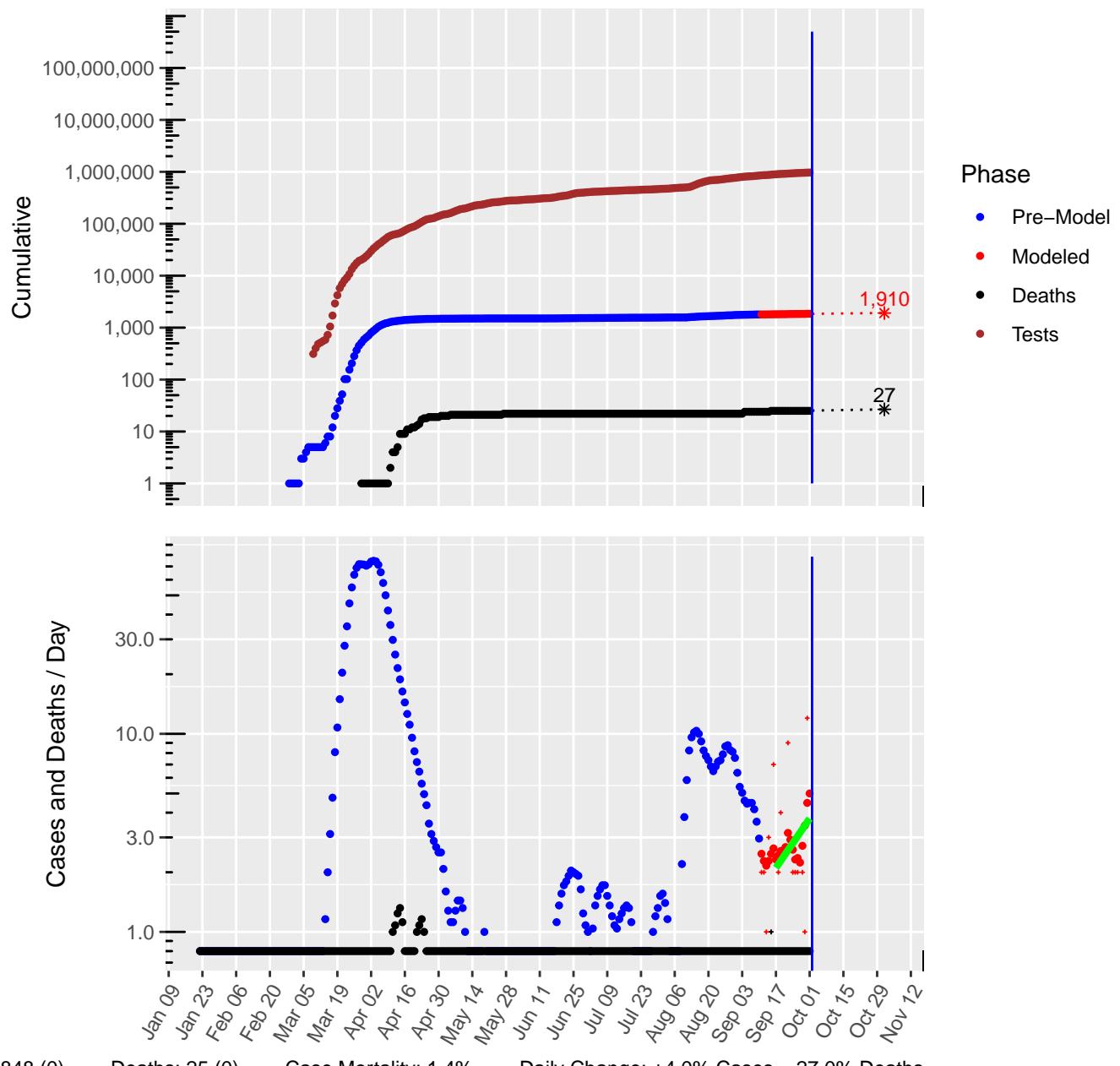
Iceland projection as of 2020-10-02



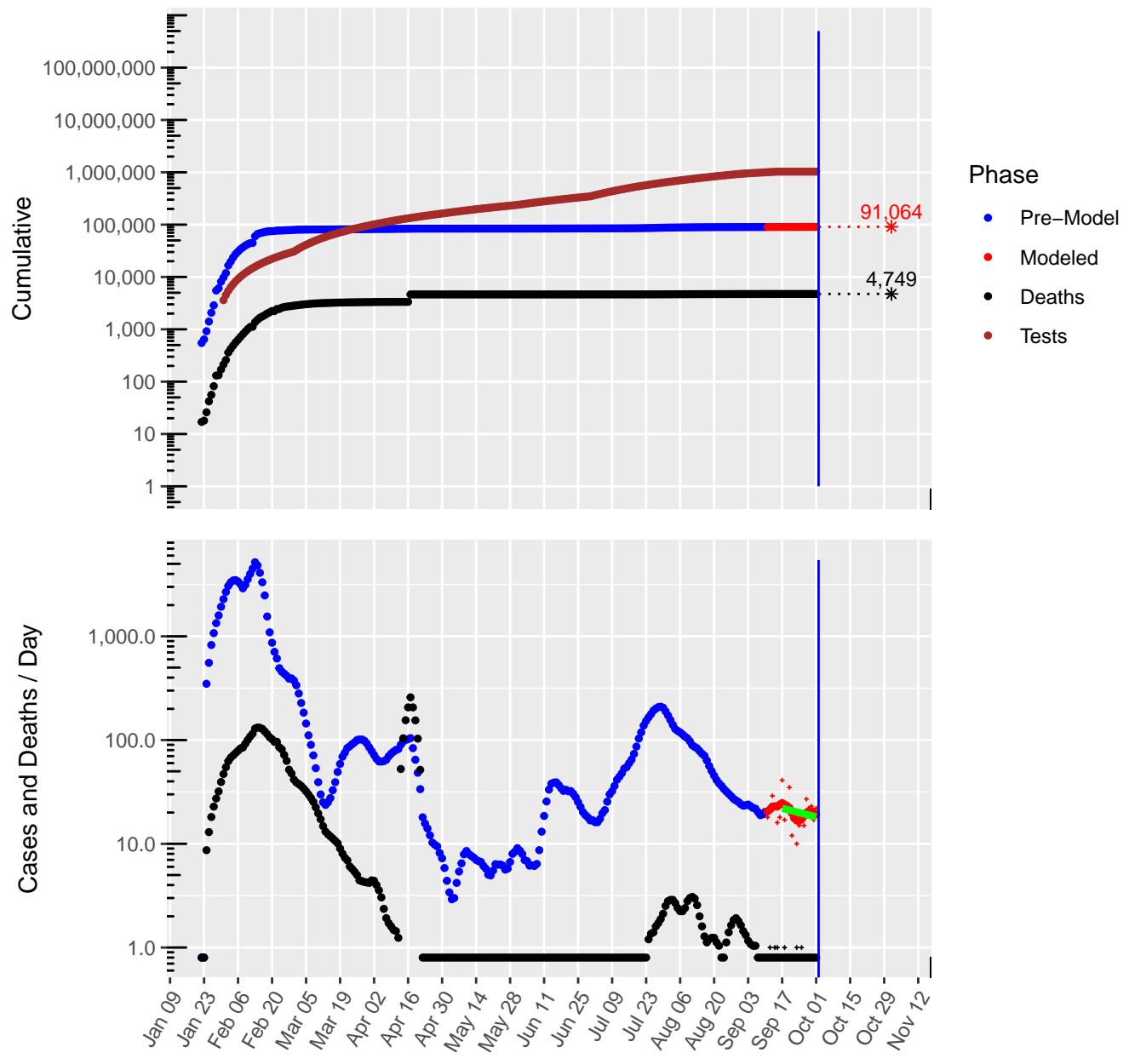
Australia projection as of 2020-10-02



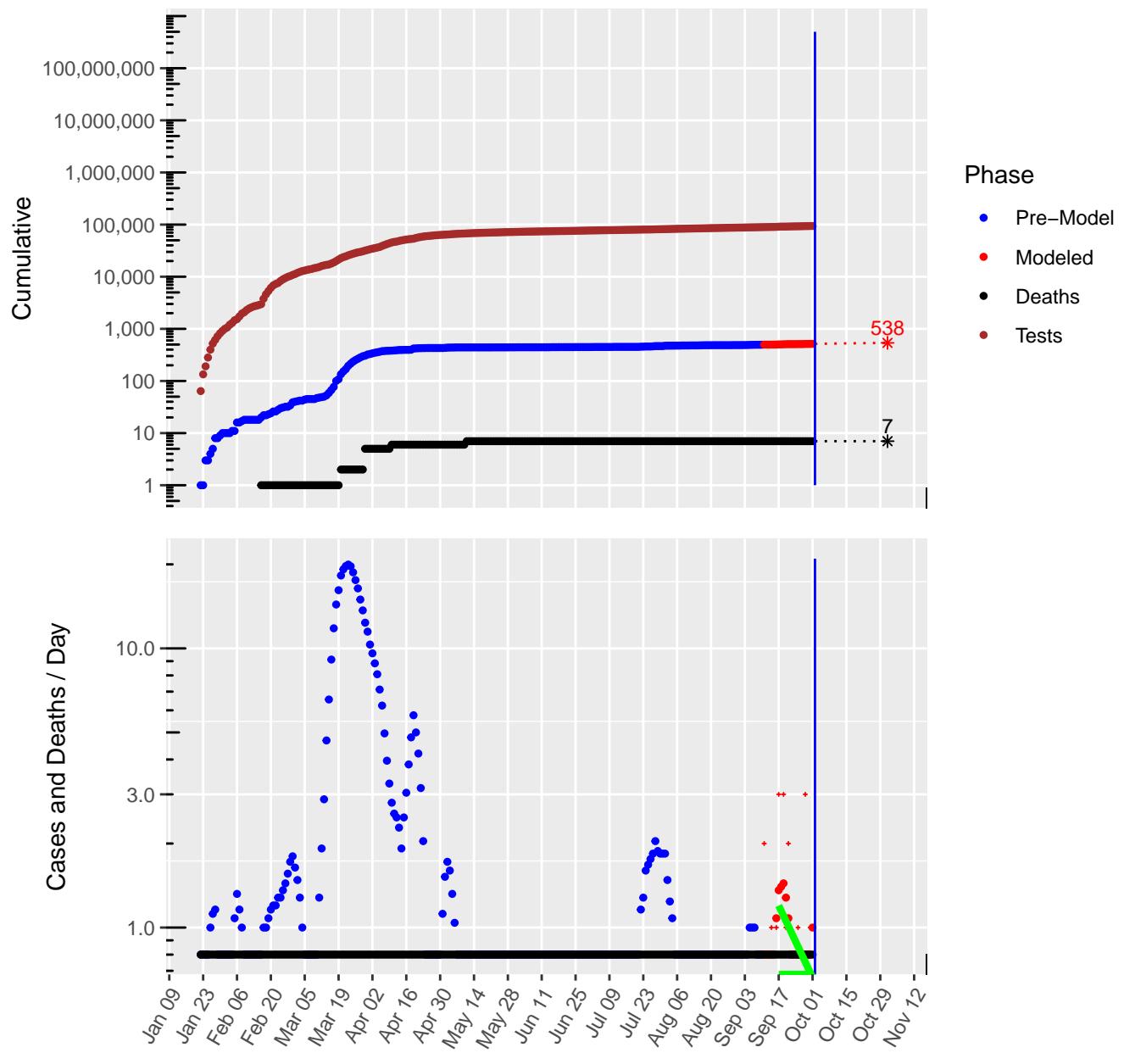
New Zealand projection as of 2020-10-02



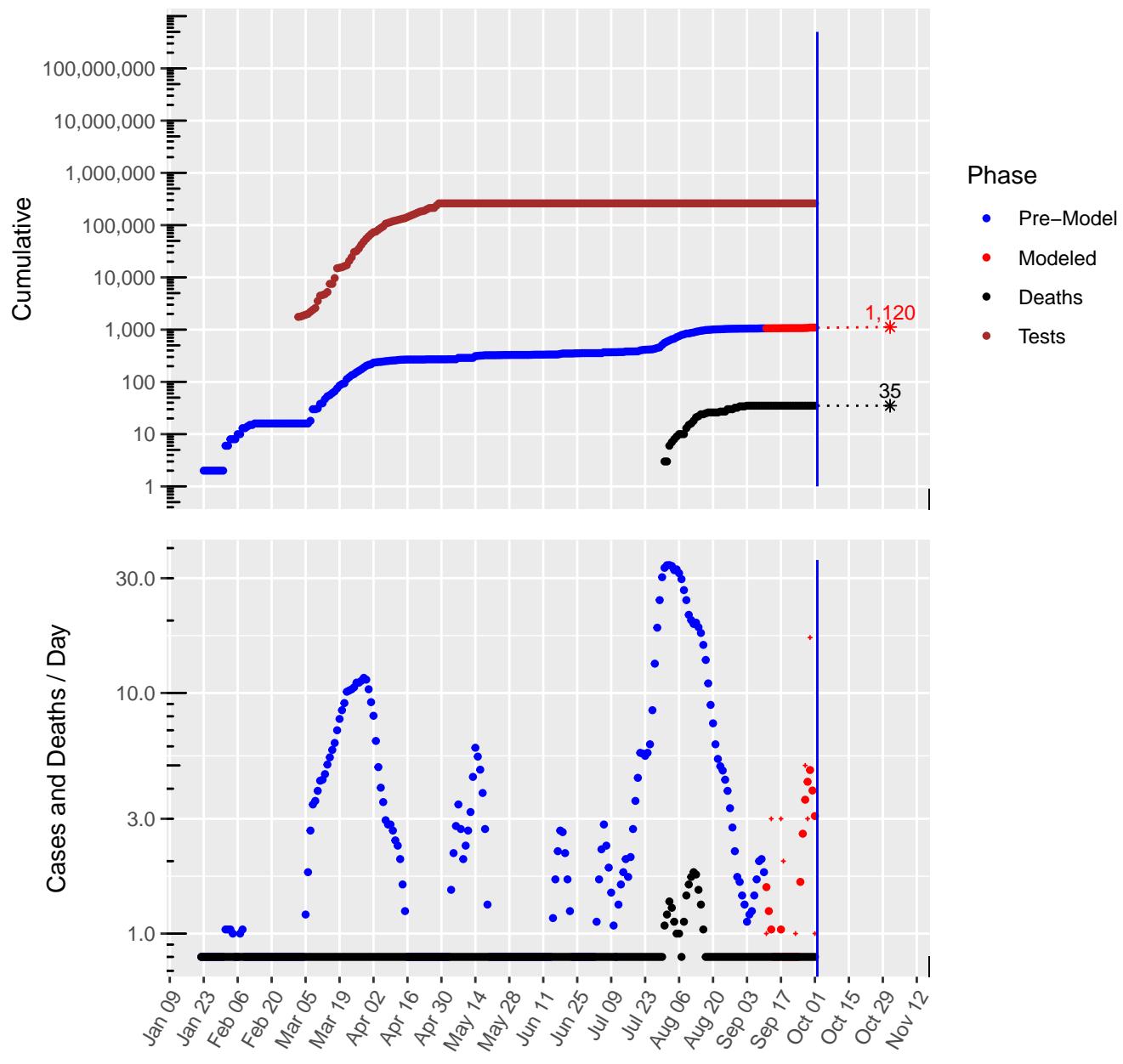
China projection as of 2020-10-02



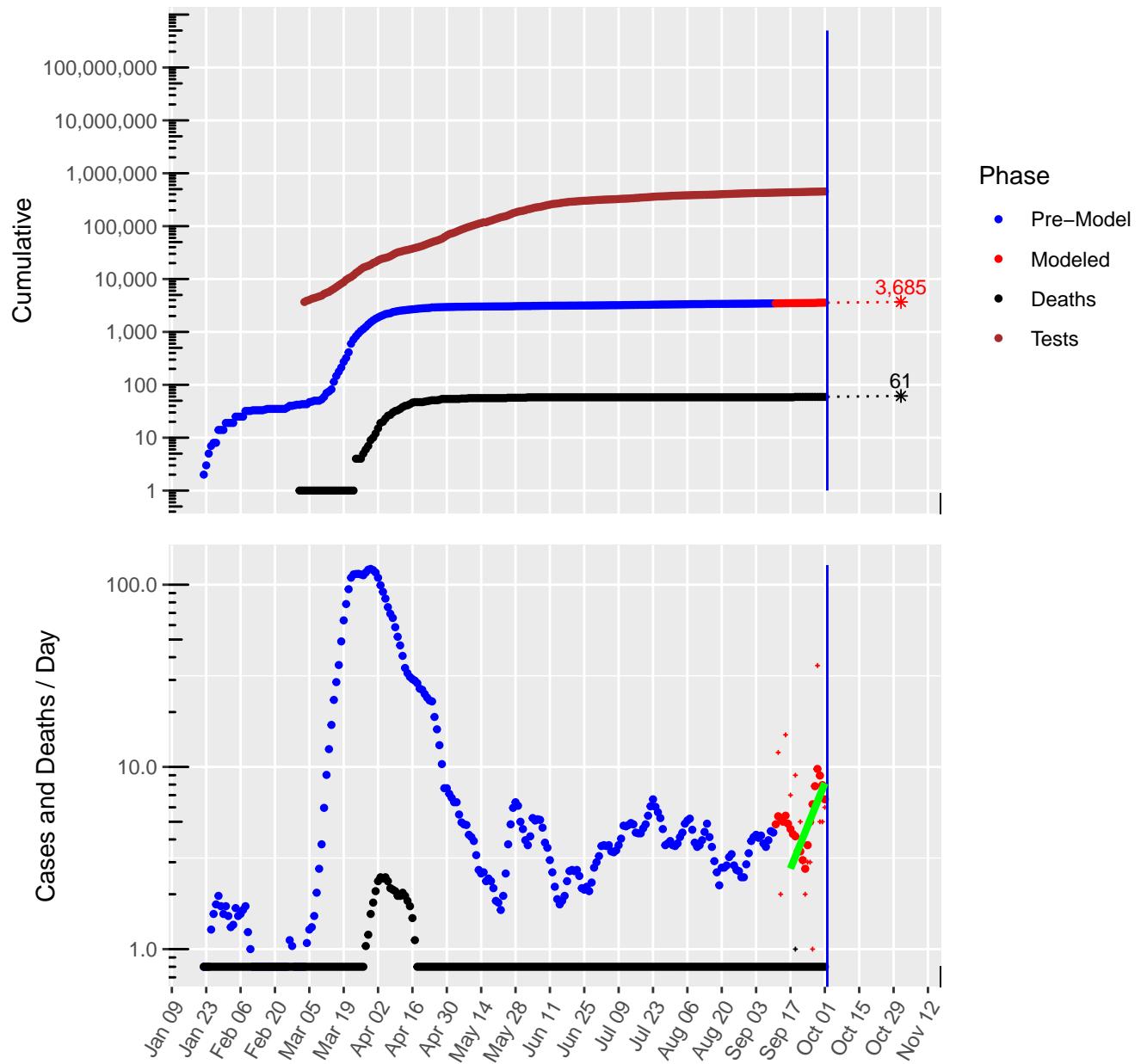
Taiwan projection as of 2020-10-02



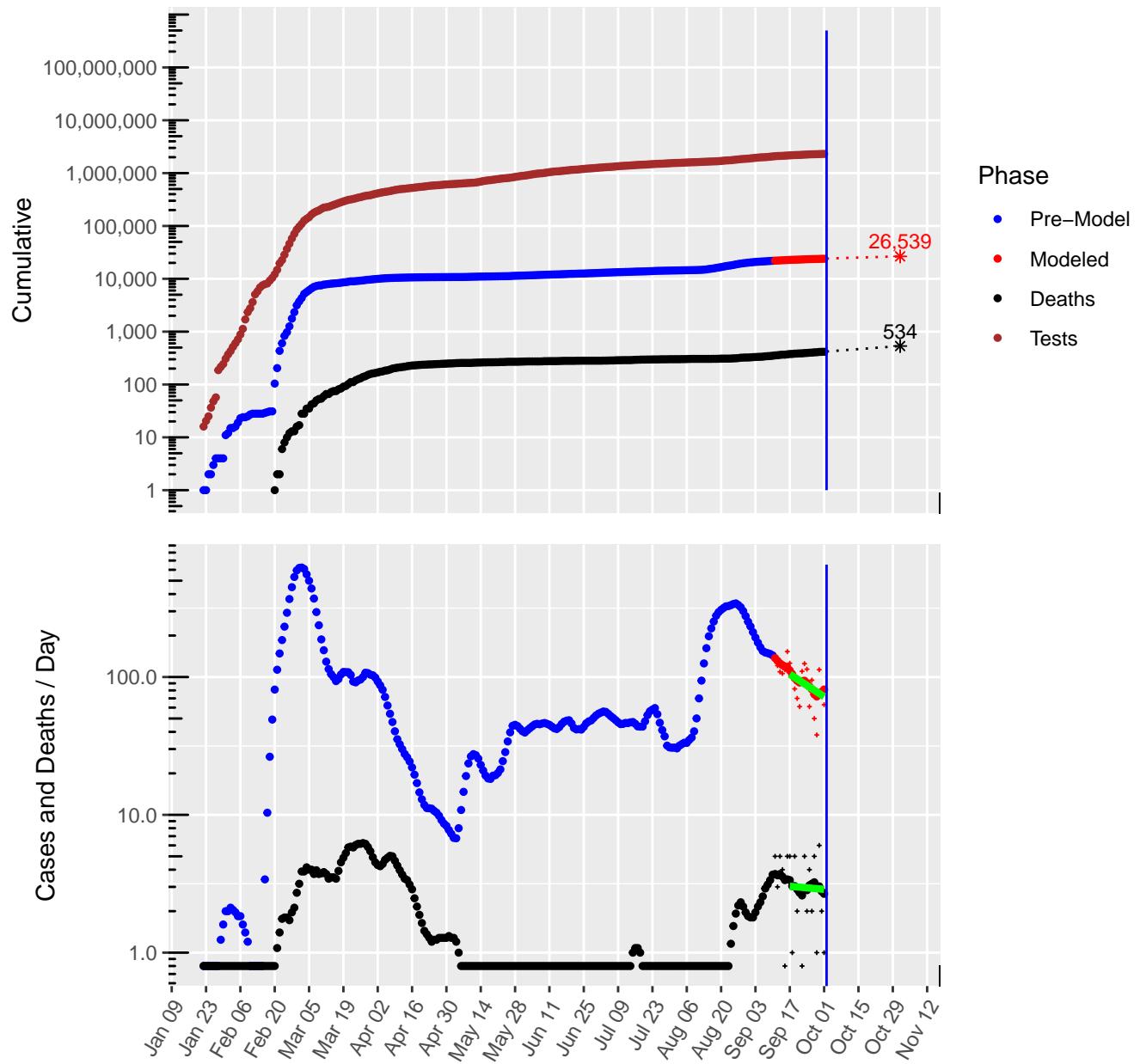
Vietnam projection as of 2020-10-02



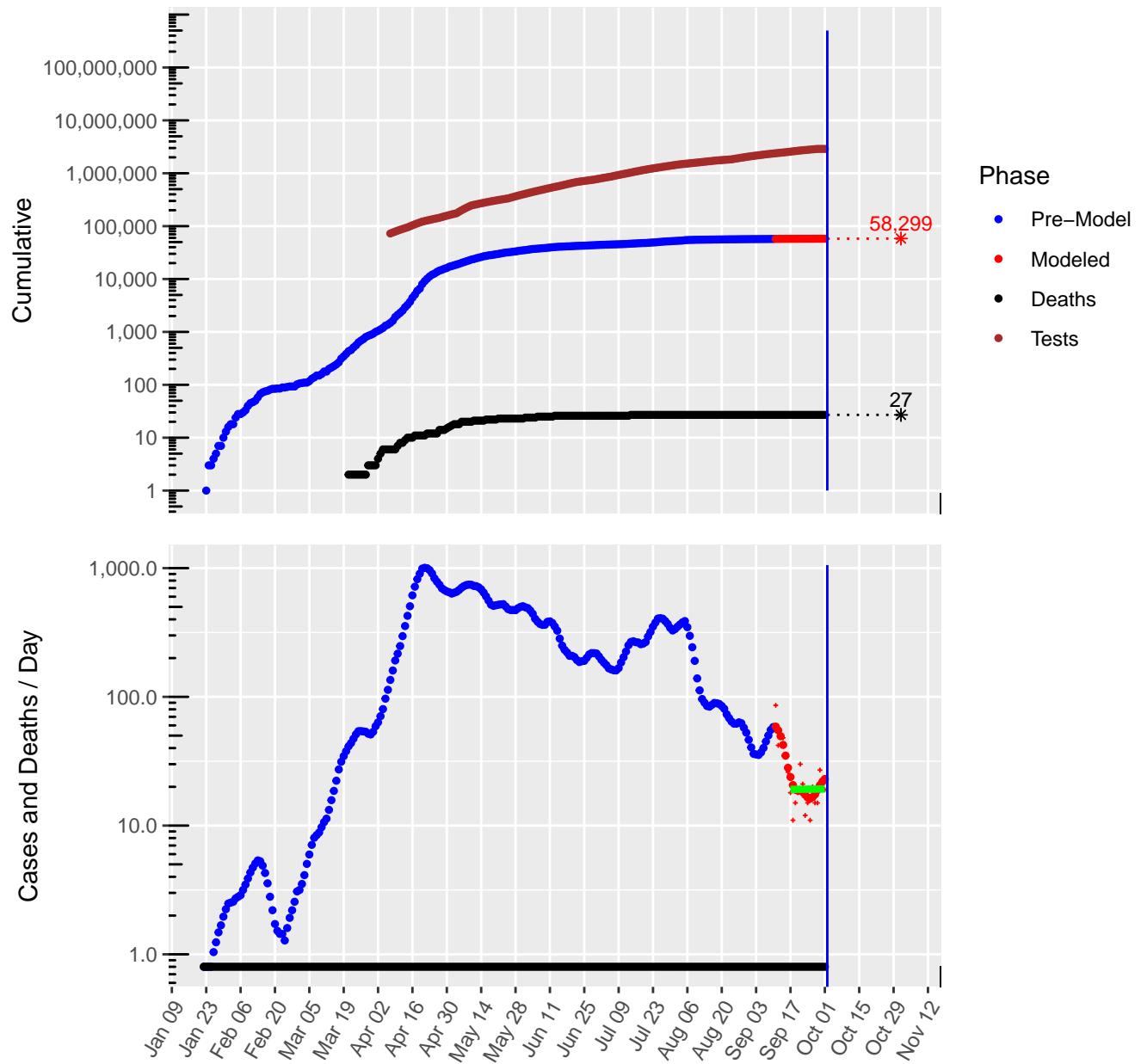
Thailand projection as of 2020-10-02



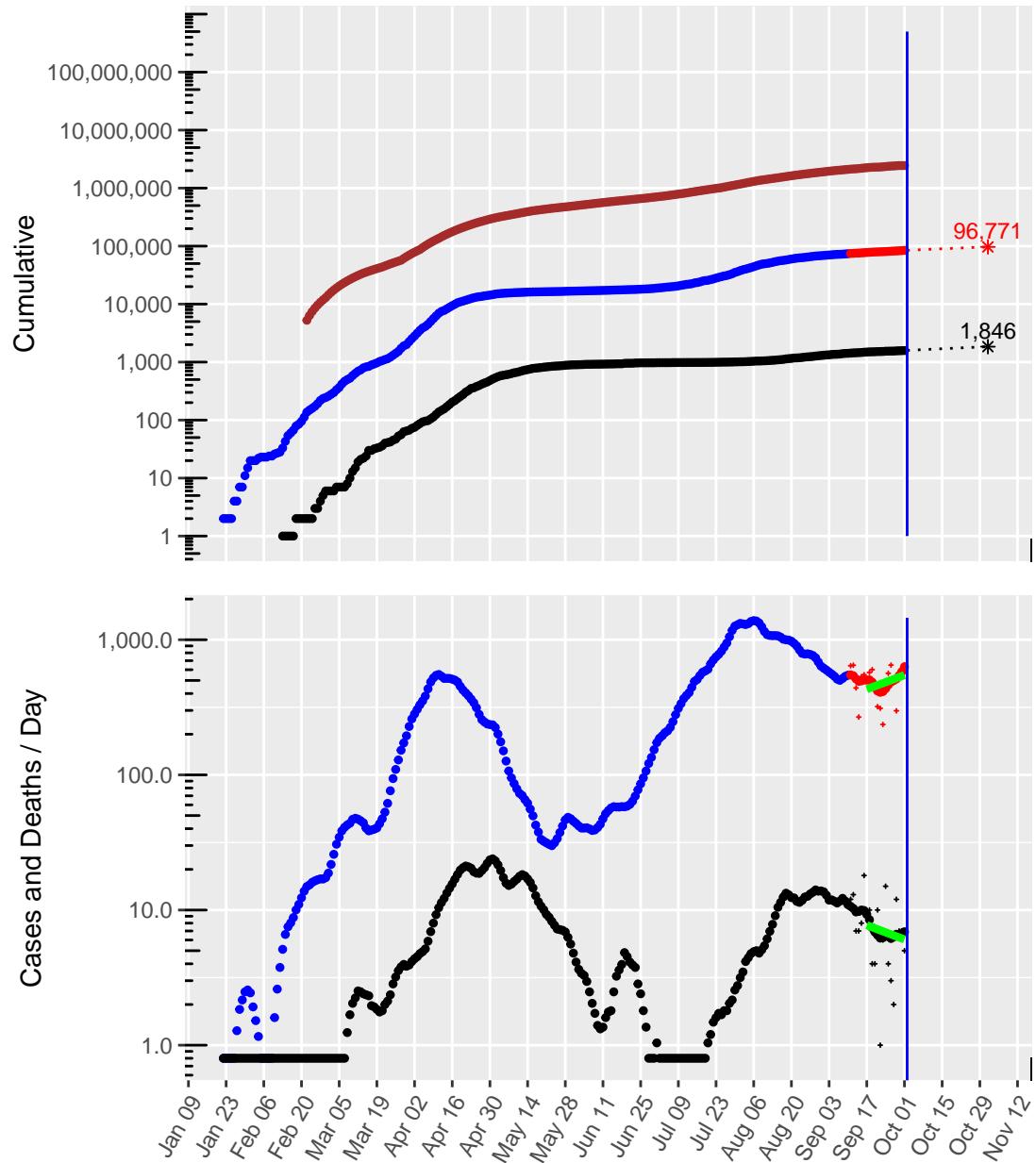
South Korea projection as of 2020-10-02



Singapore projection as of 2020-10-02

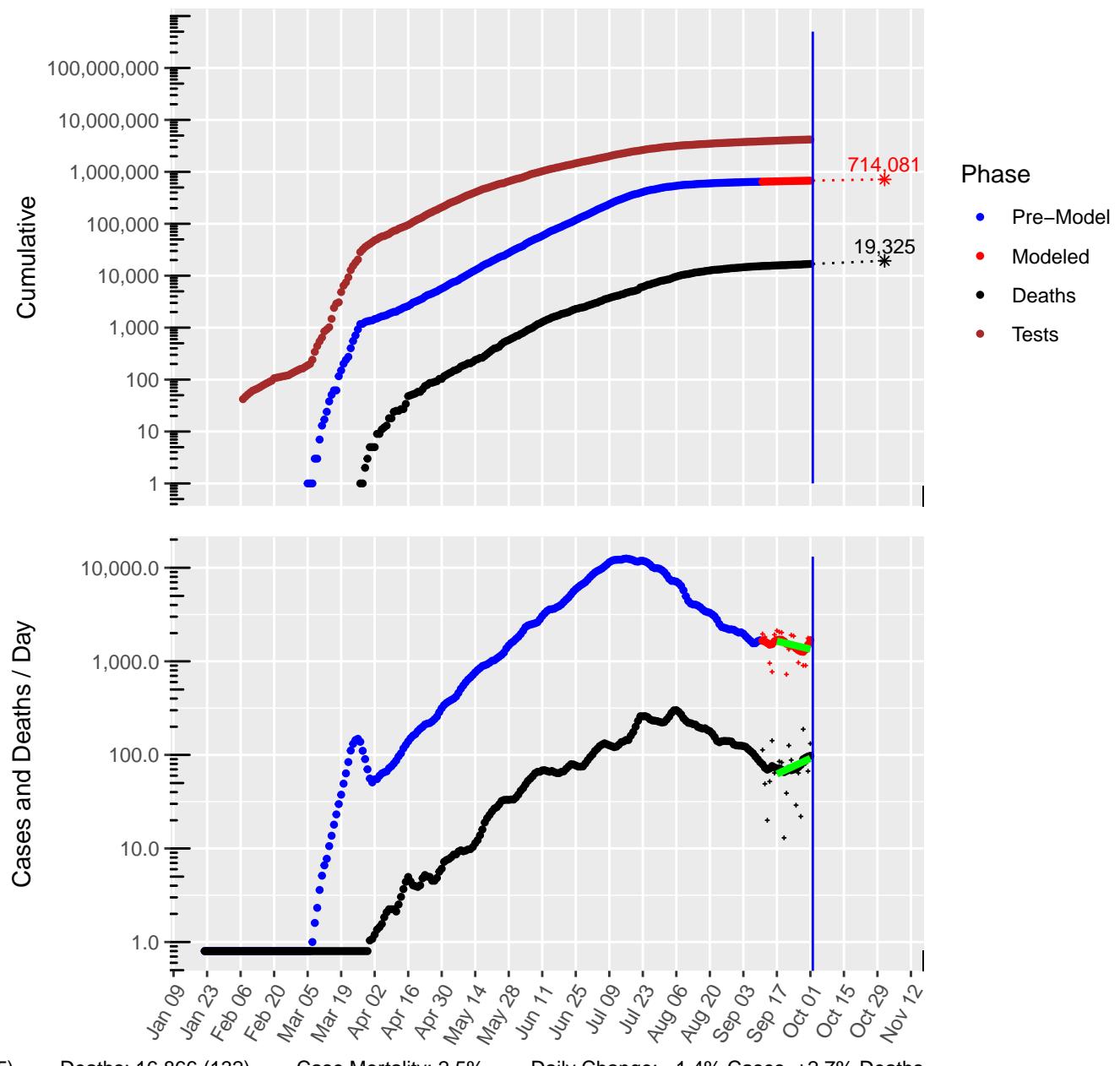


Japan projection as of 2020-10-02

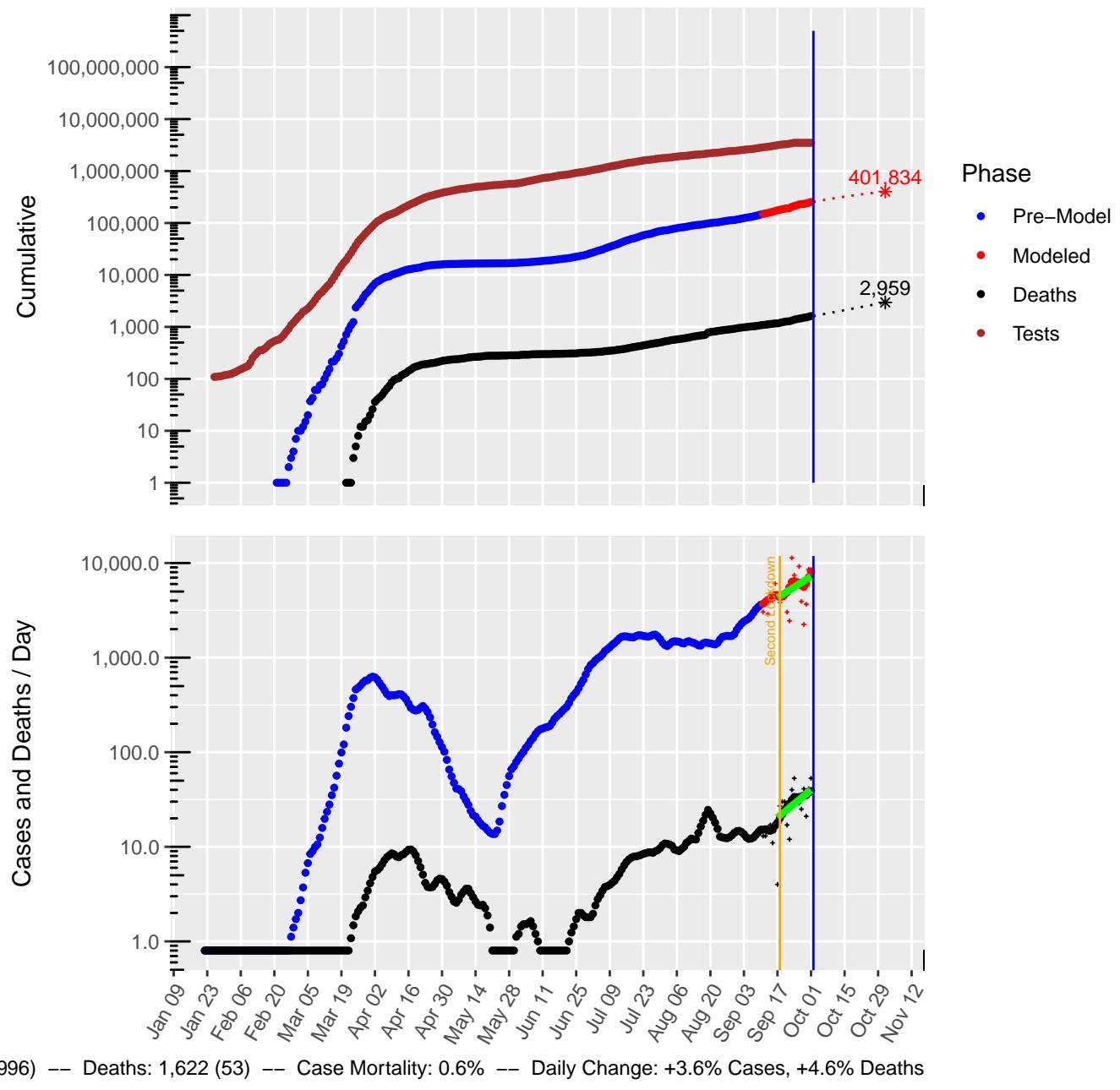


(653) — Deaths: 1,580 (5) — Case Mortality: 1.9% — Daily Change: +1.7% Cases, -1.7% Deaths

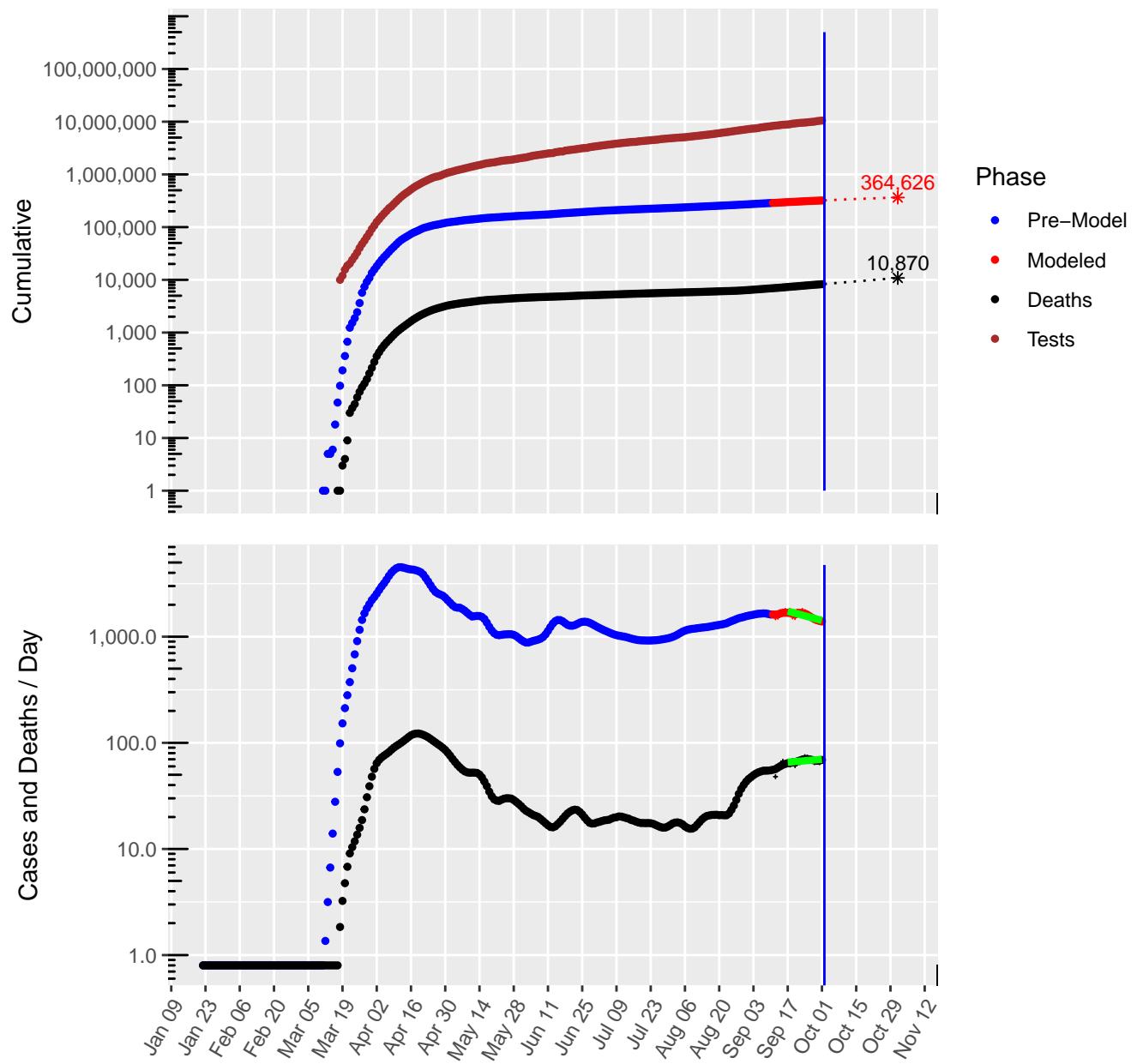
South Africa projection as of 2020-10-02



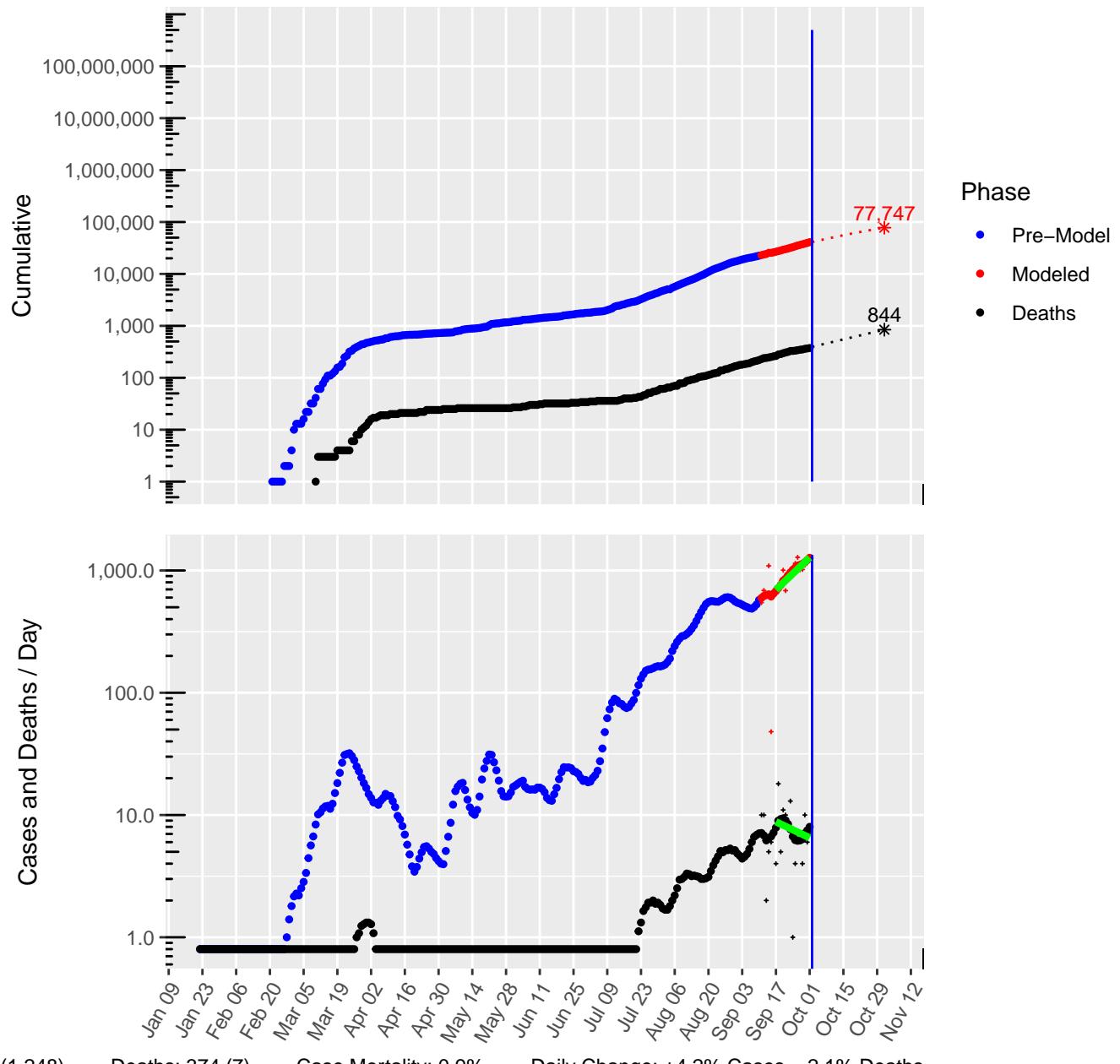
Israel projection as of 2020-10-02



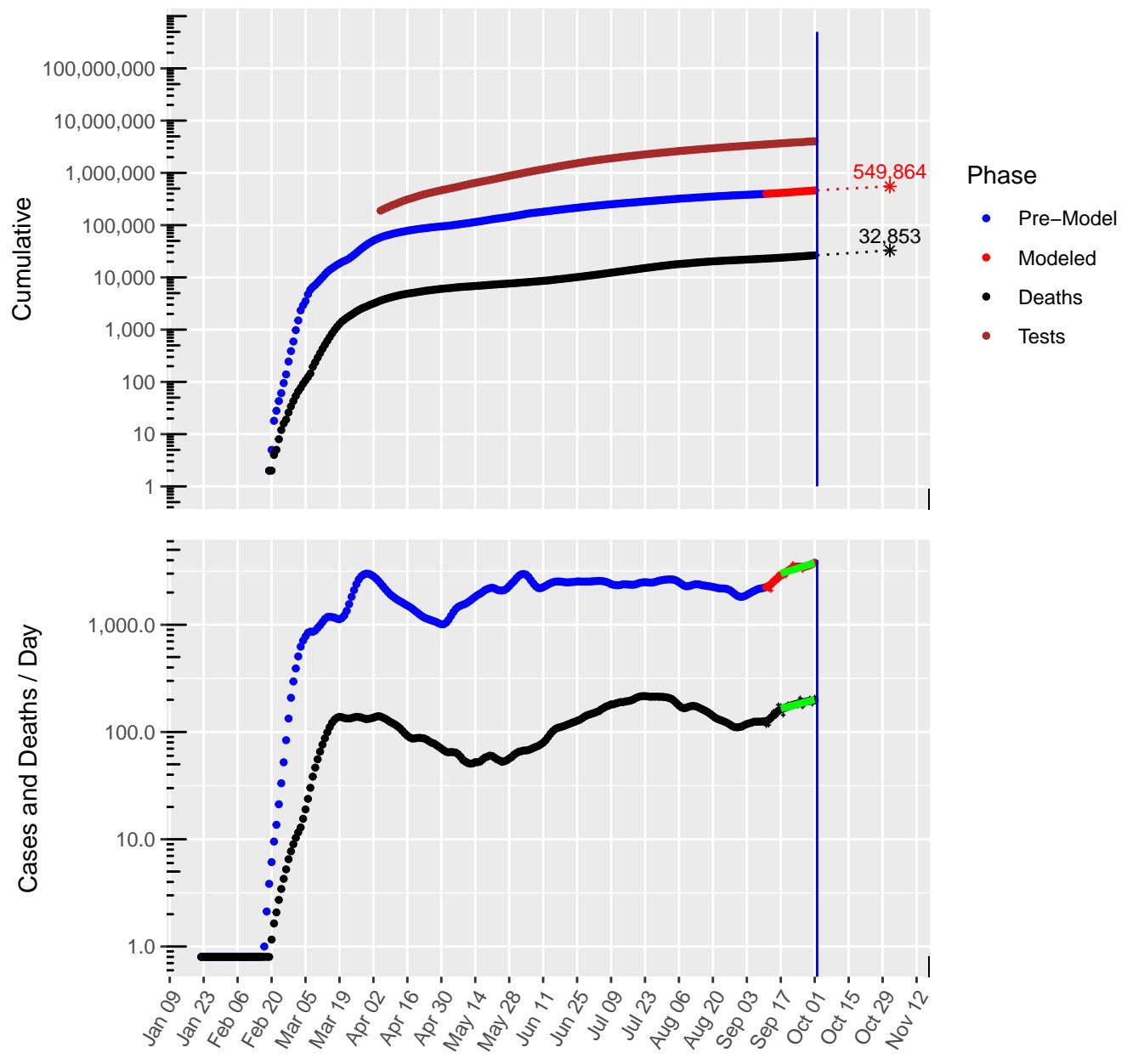
Turkey projection as of 2020-10-02



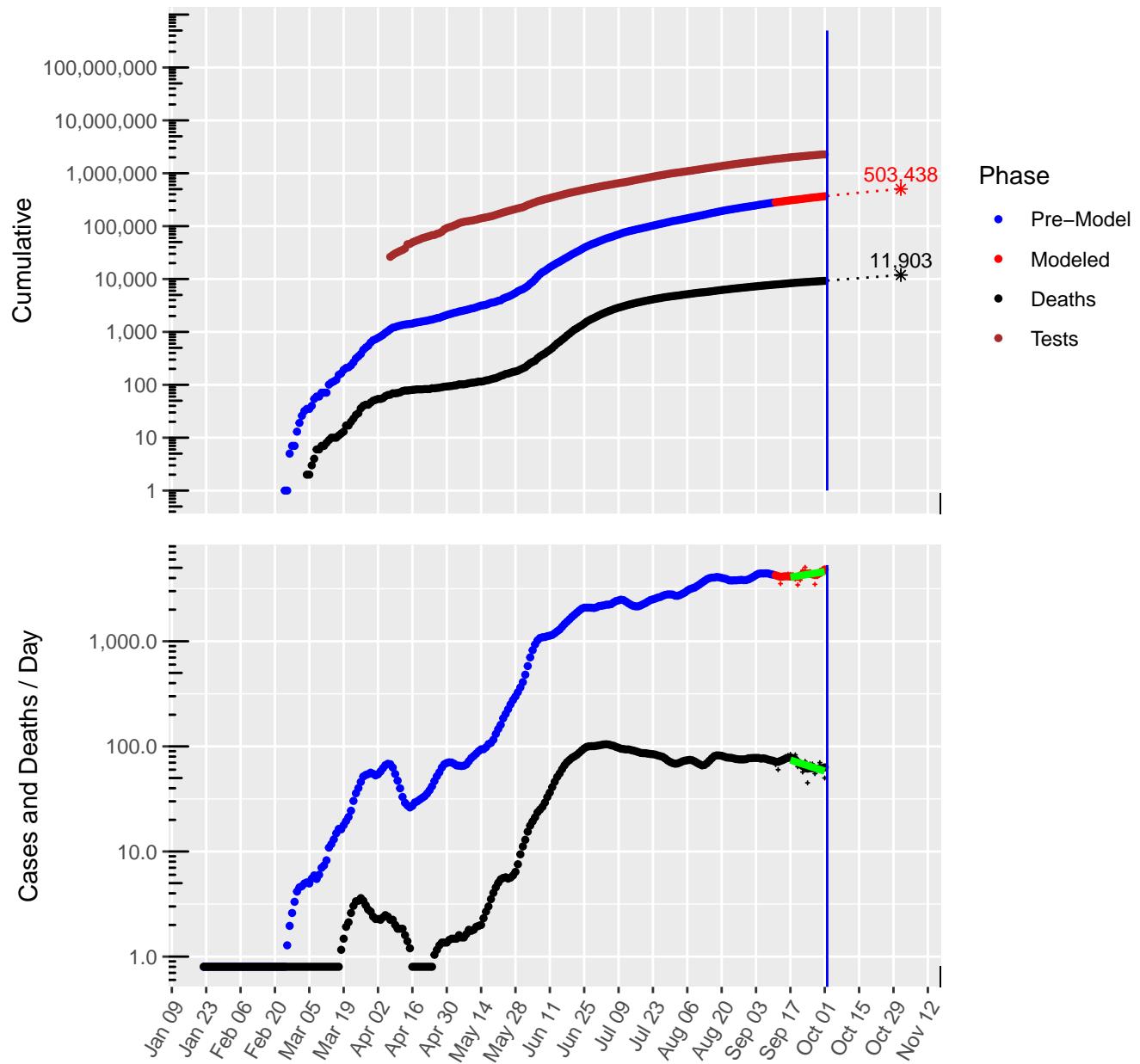
Lebanon projection as of 2020-10-02



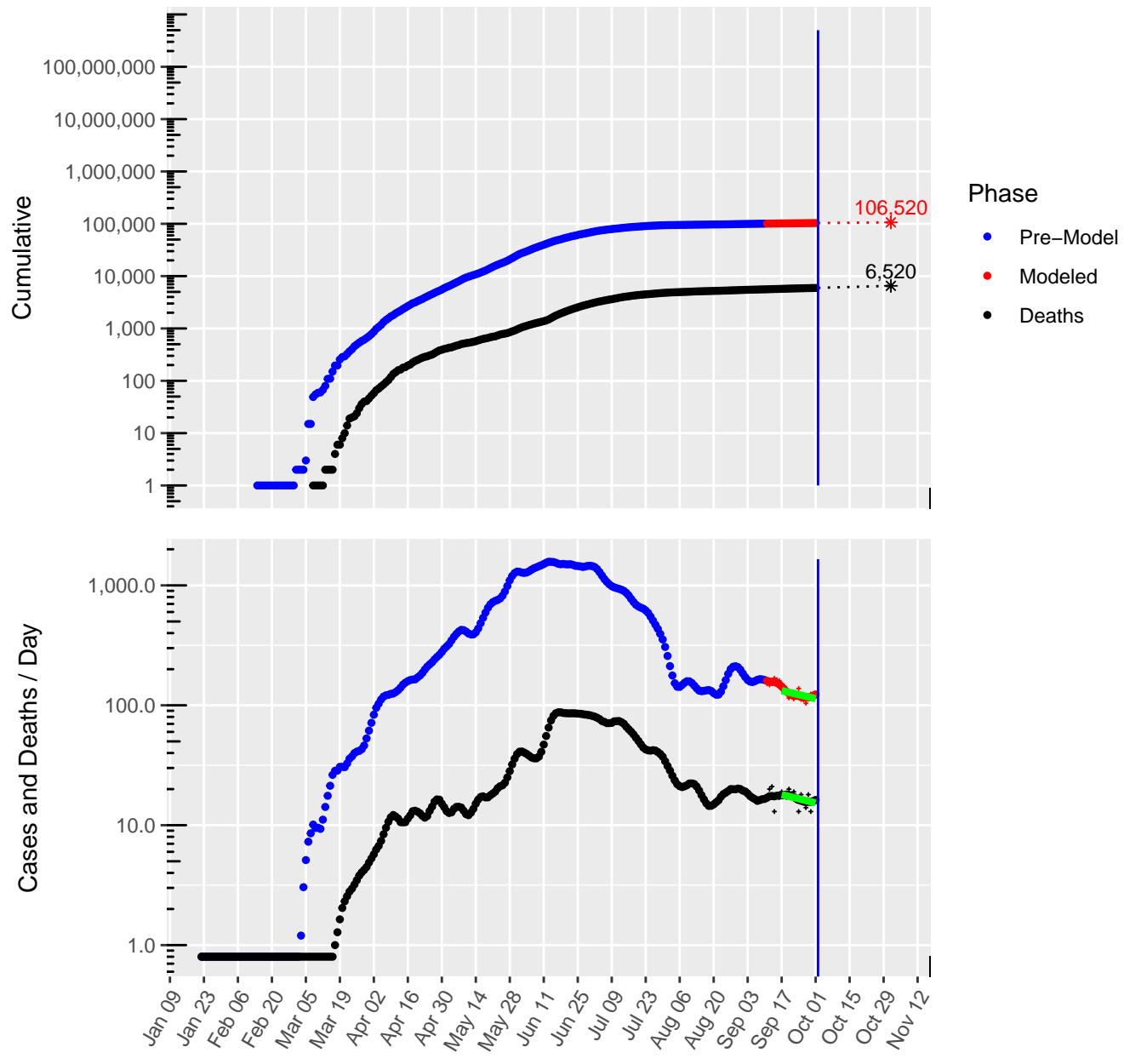
Iran projection as of 2020-10-02



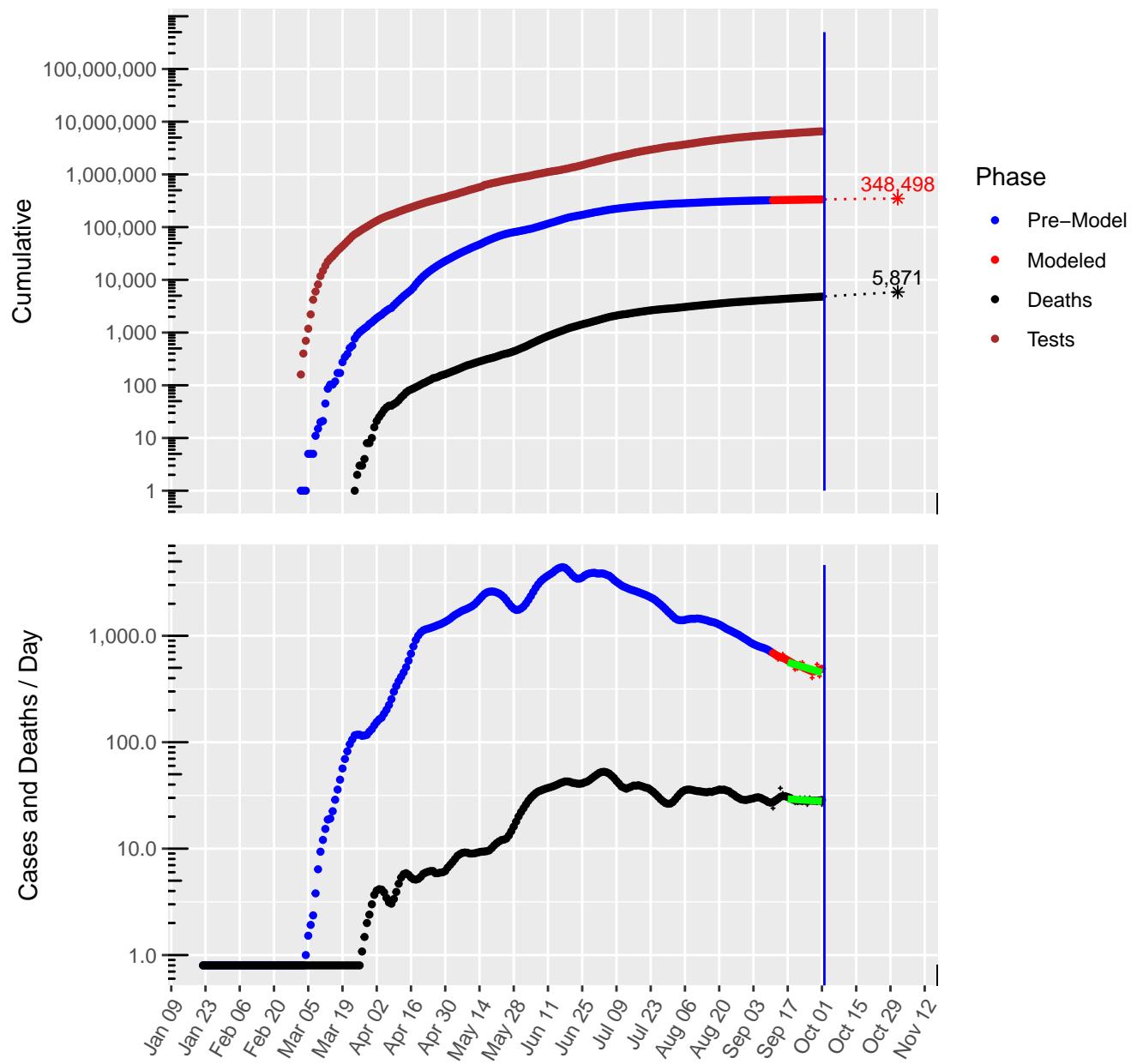
Iraq projection as of 2020-10-02



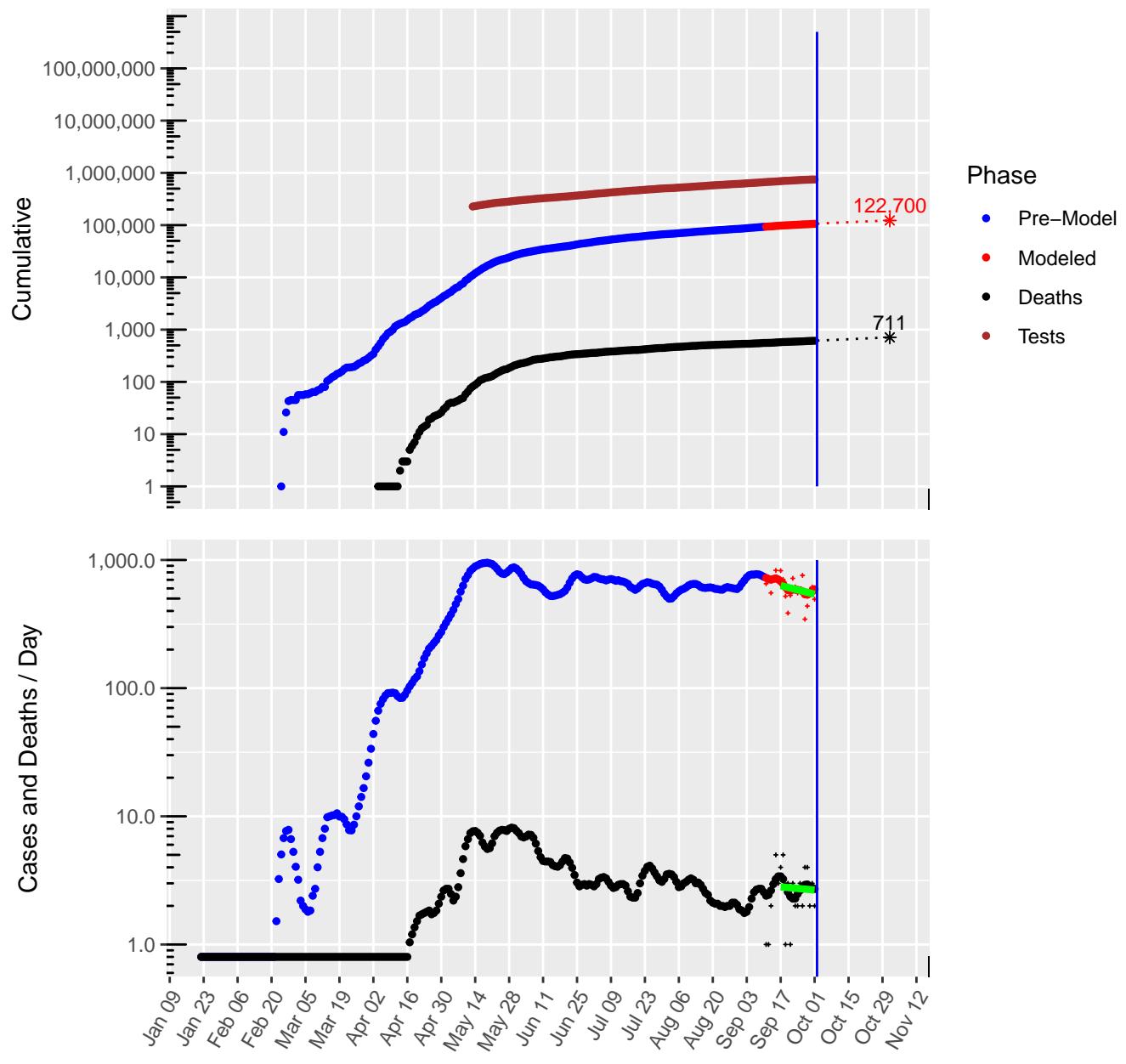
Egypt projection as of 2020-10-02



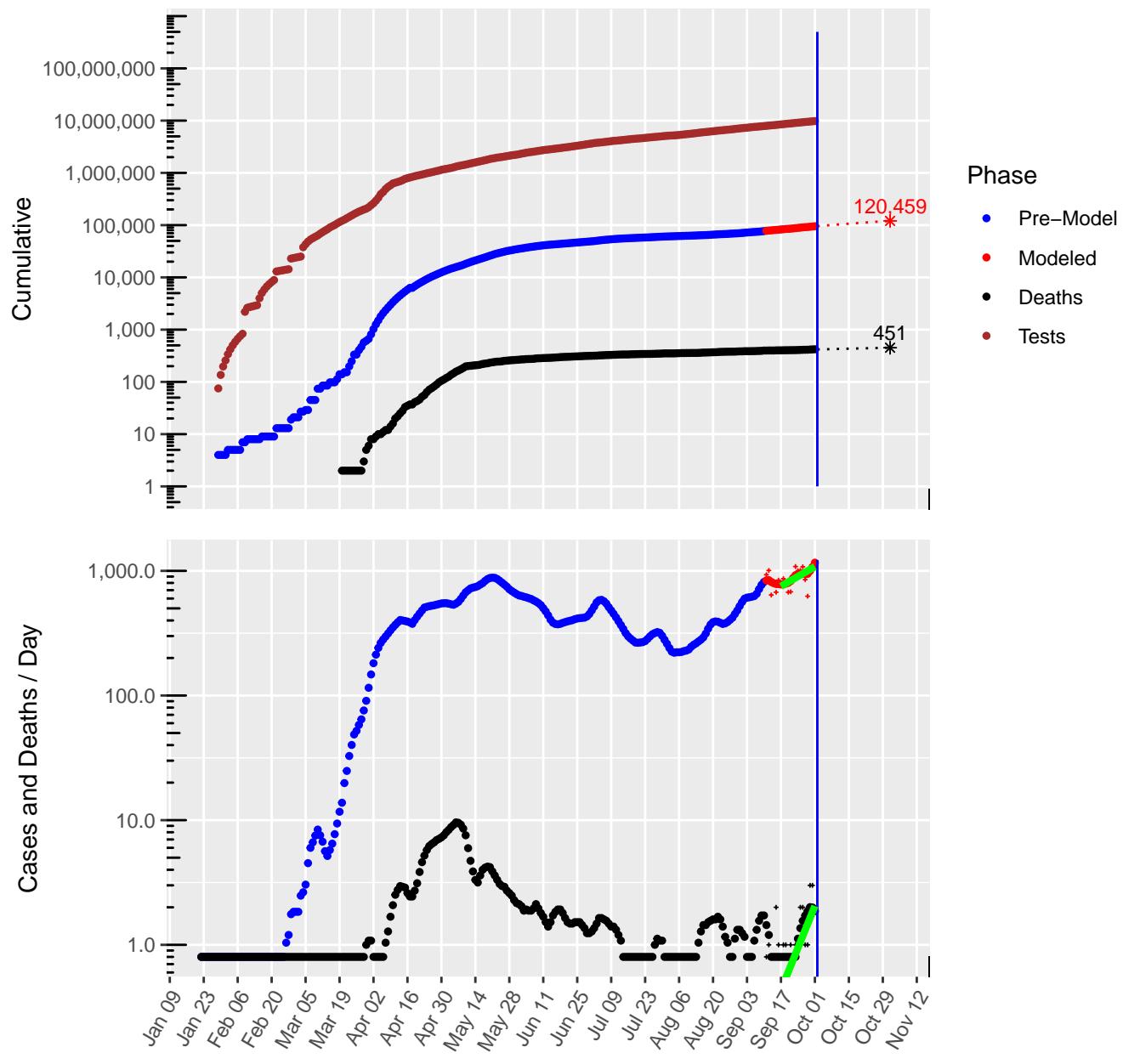
Saudi Arabia projection as of 2020-10-02



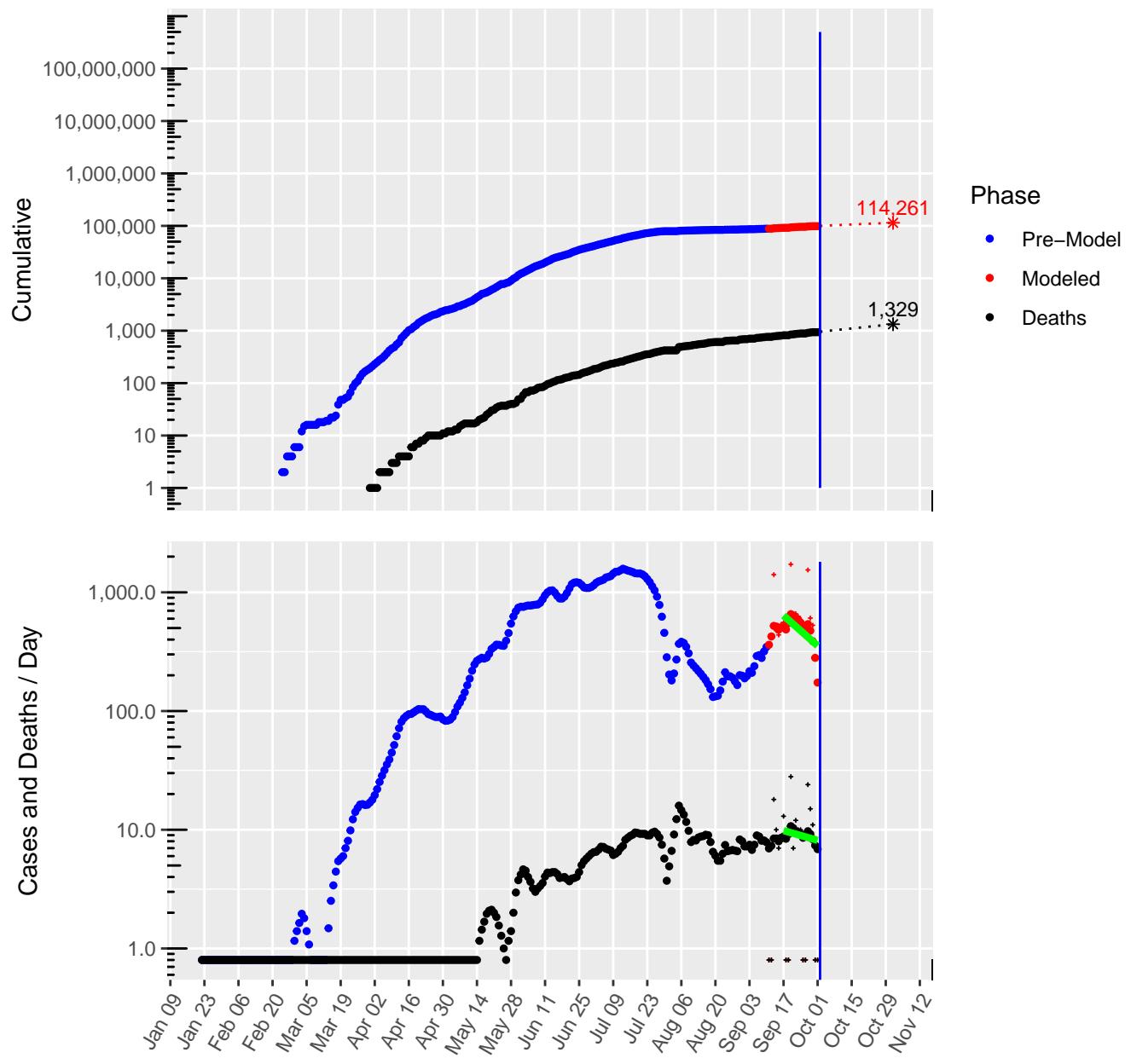
Kuwait projection as of 2020-10-02



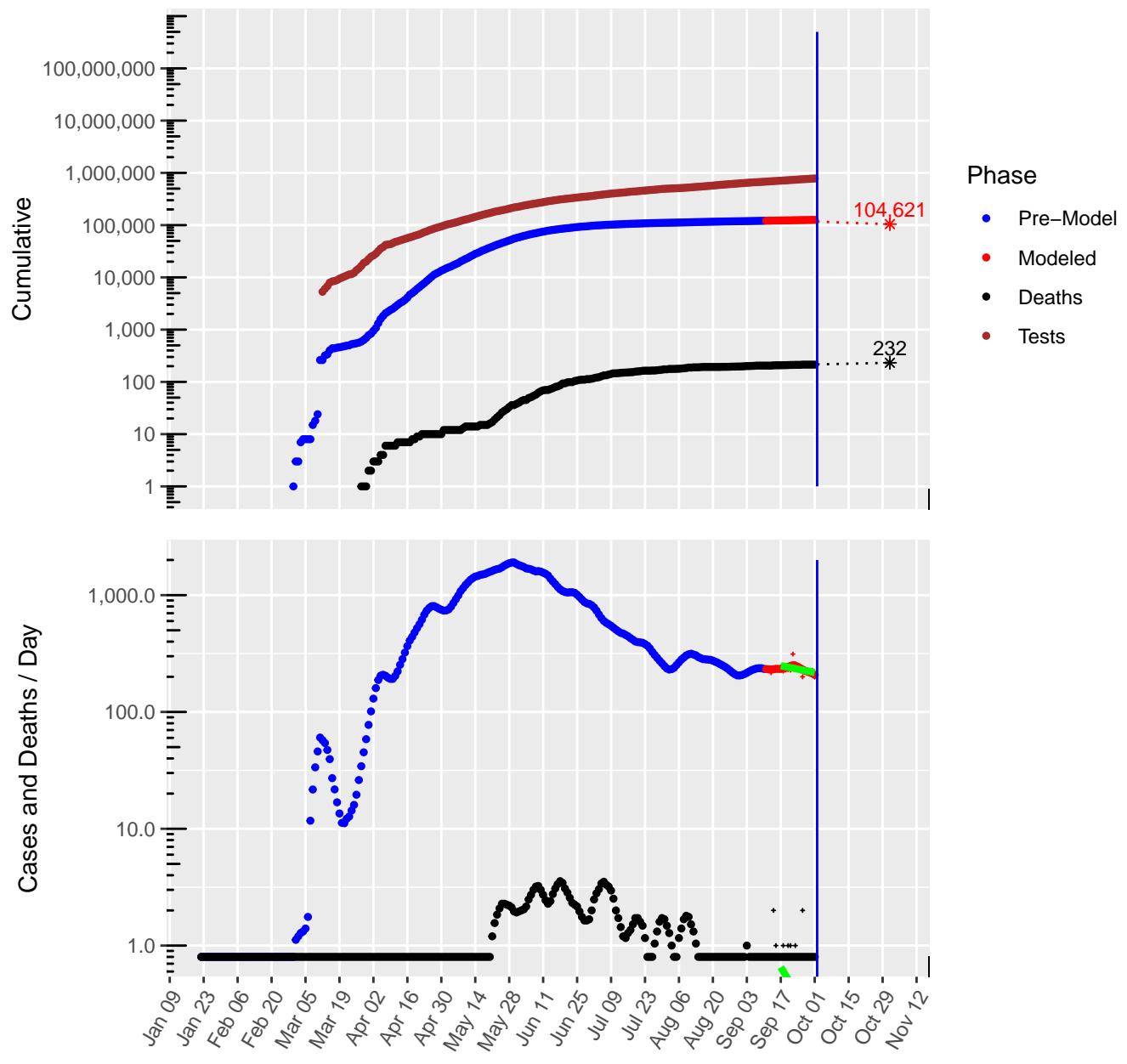
United Arab Emirates projection as of 2020-10-02



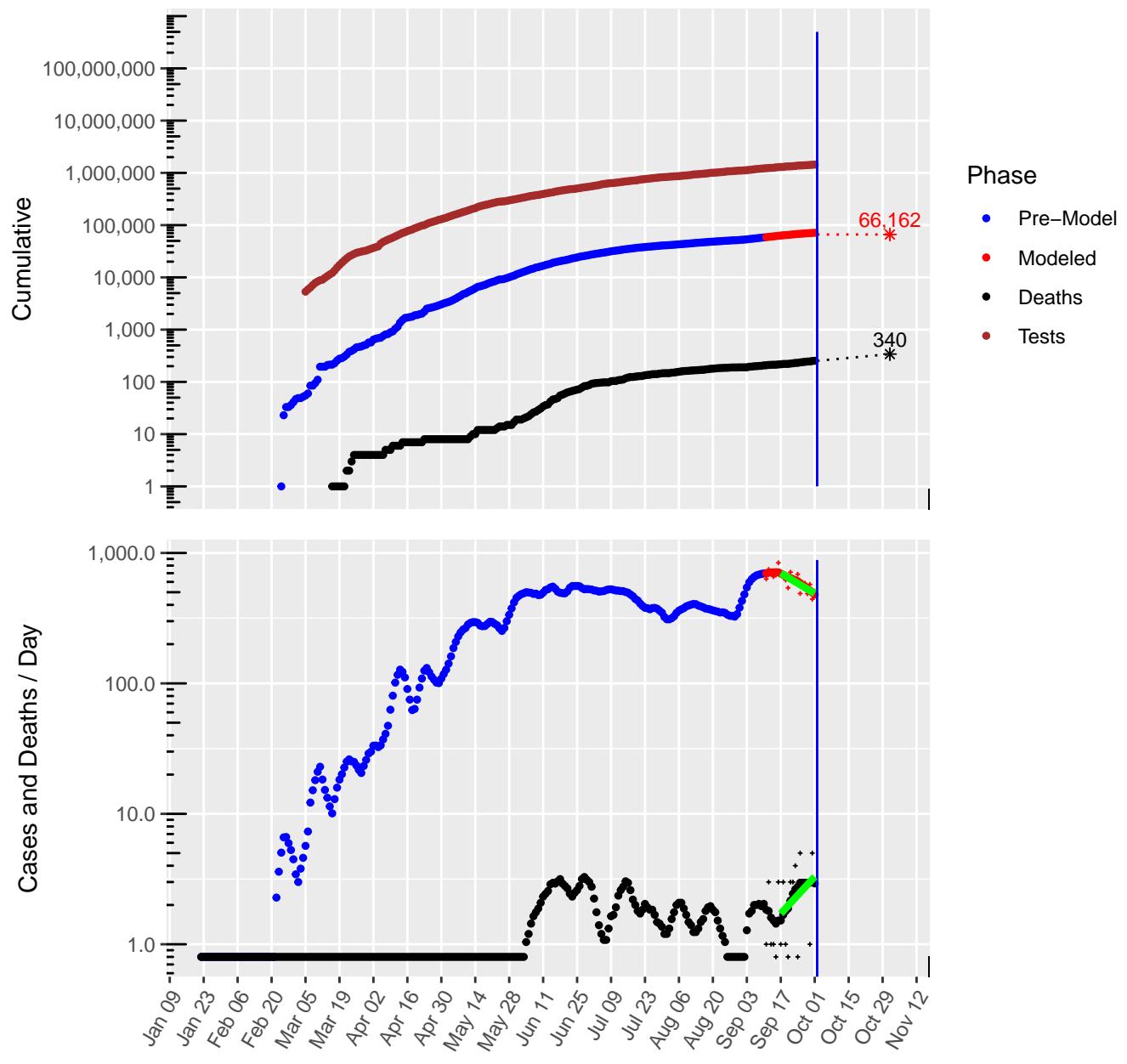
Oman projection as of 2020-10-02



Qatar projection as of 2020-10-02

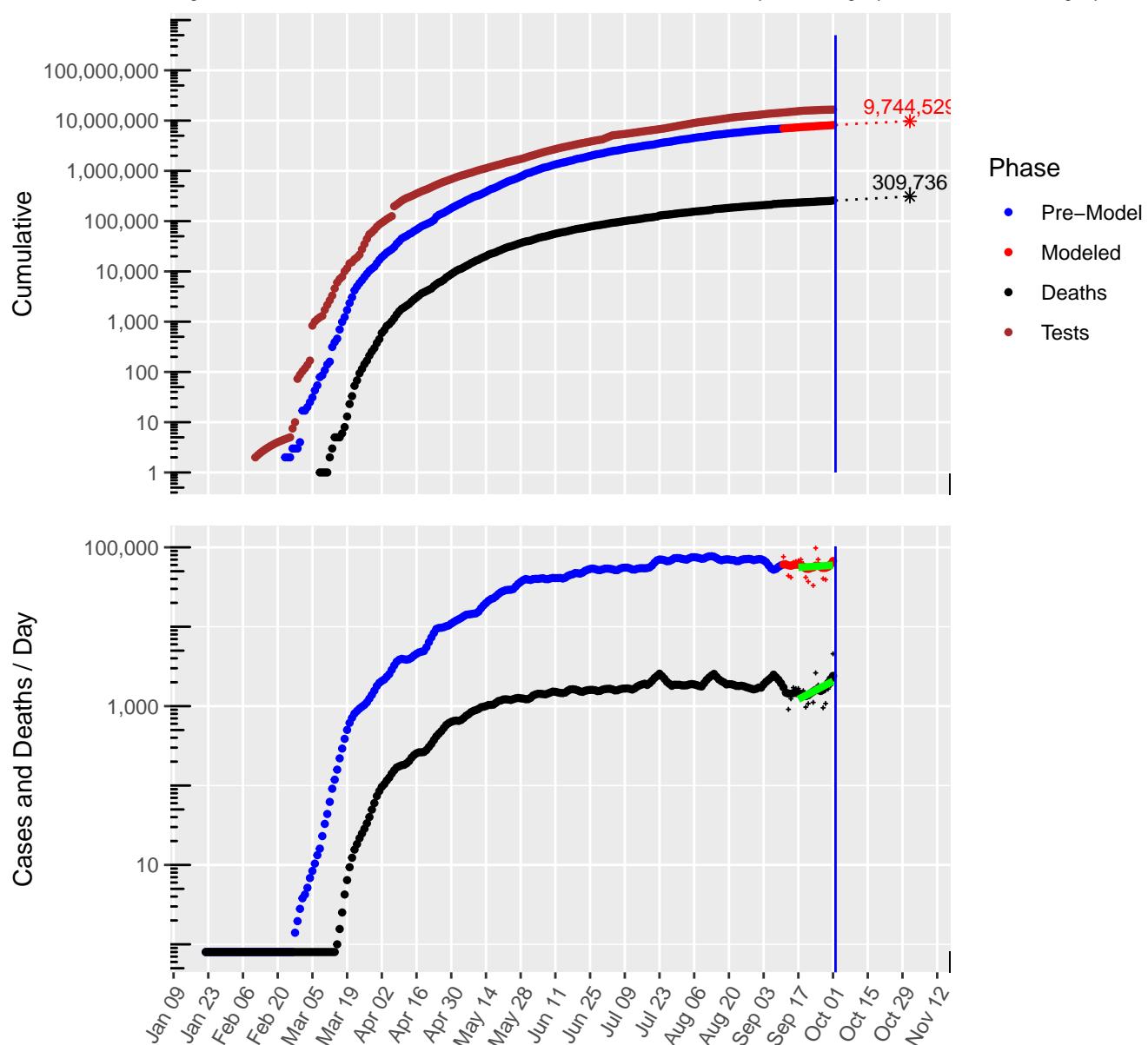


Bahrain projection as of 2020-10-02



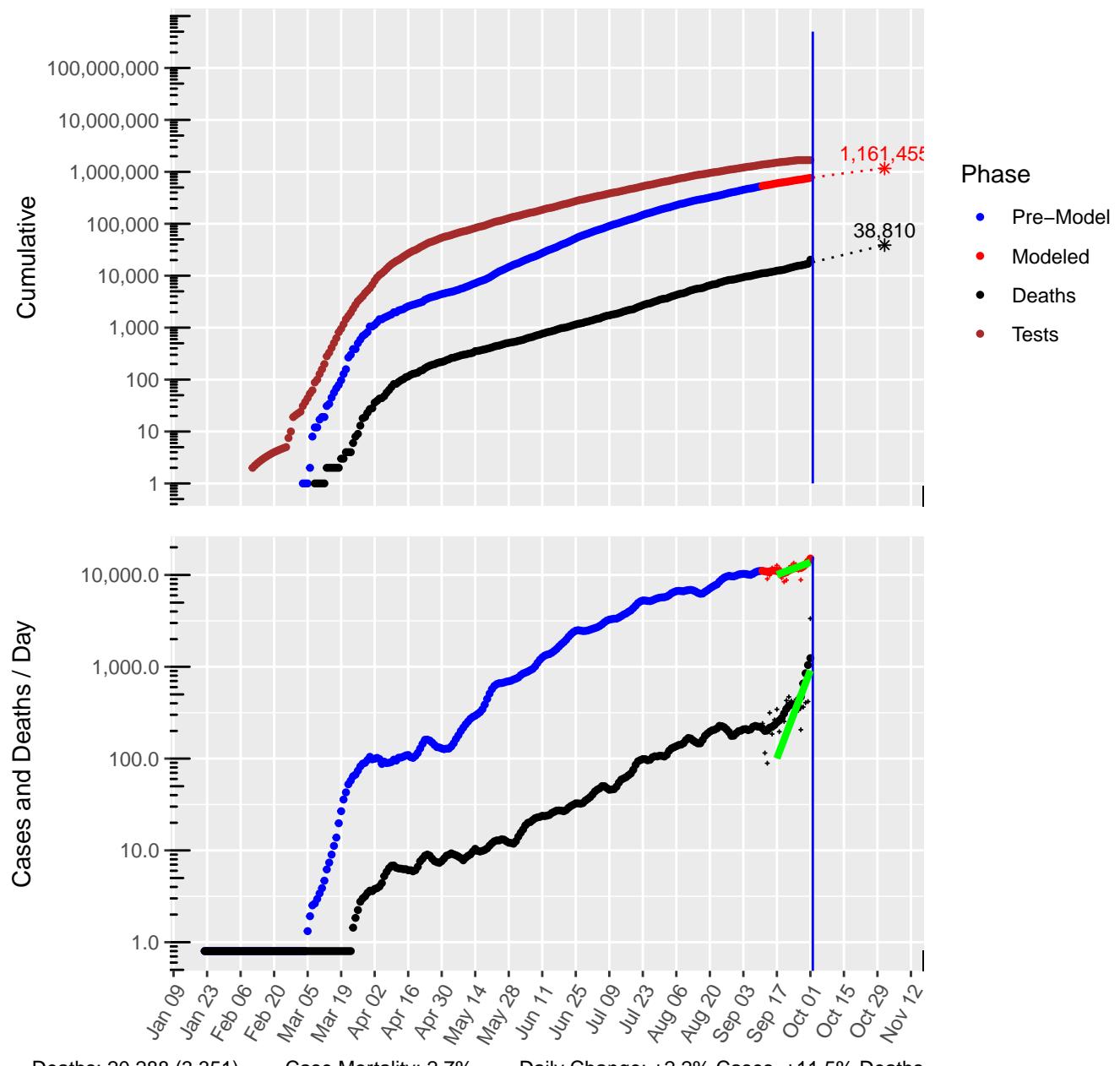
South America projection as of 2020-10-02

Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela

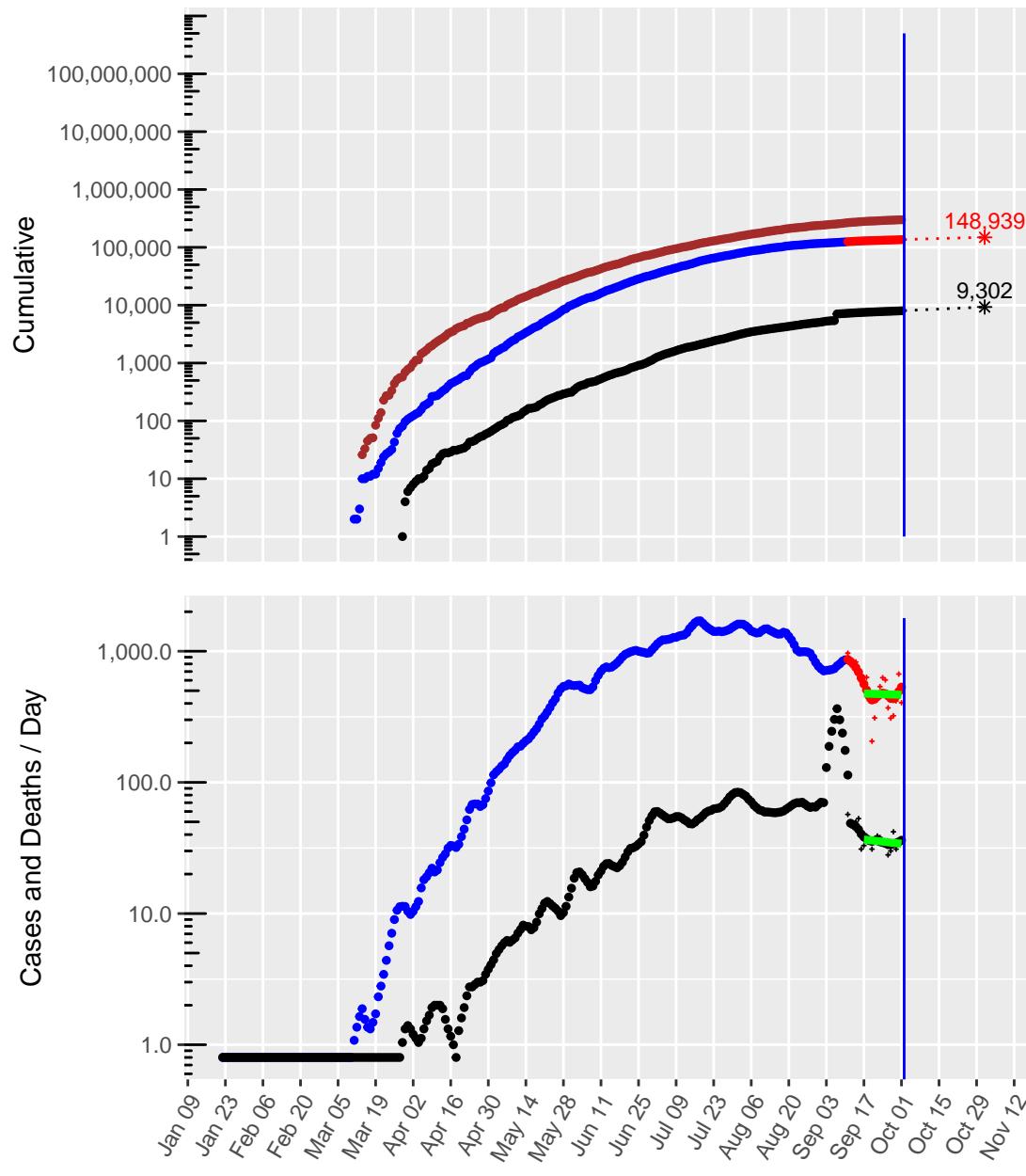


-- Deaths: 257,689 (4,562) -- Case Mortality: 3.2% -- Daily Change: +0.4% Cases, +3.7% Deaths

Argentina projection as of 2020-10-02

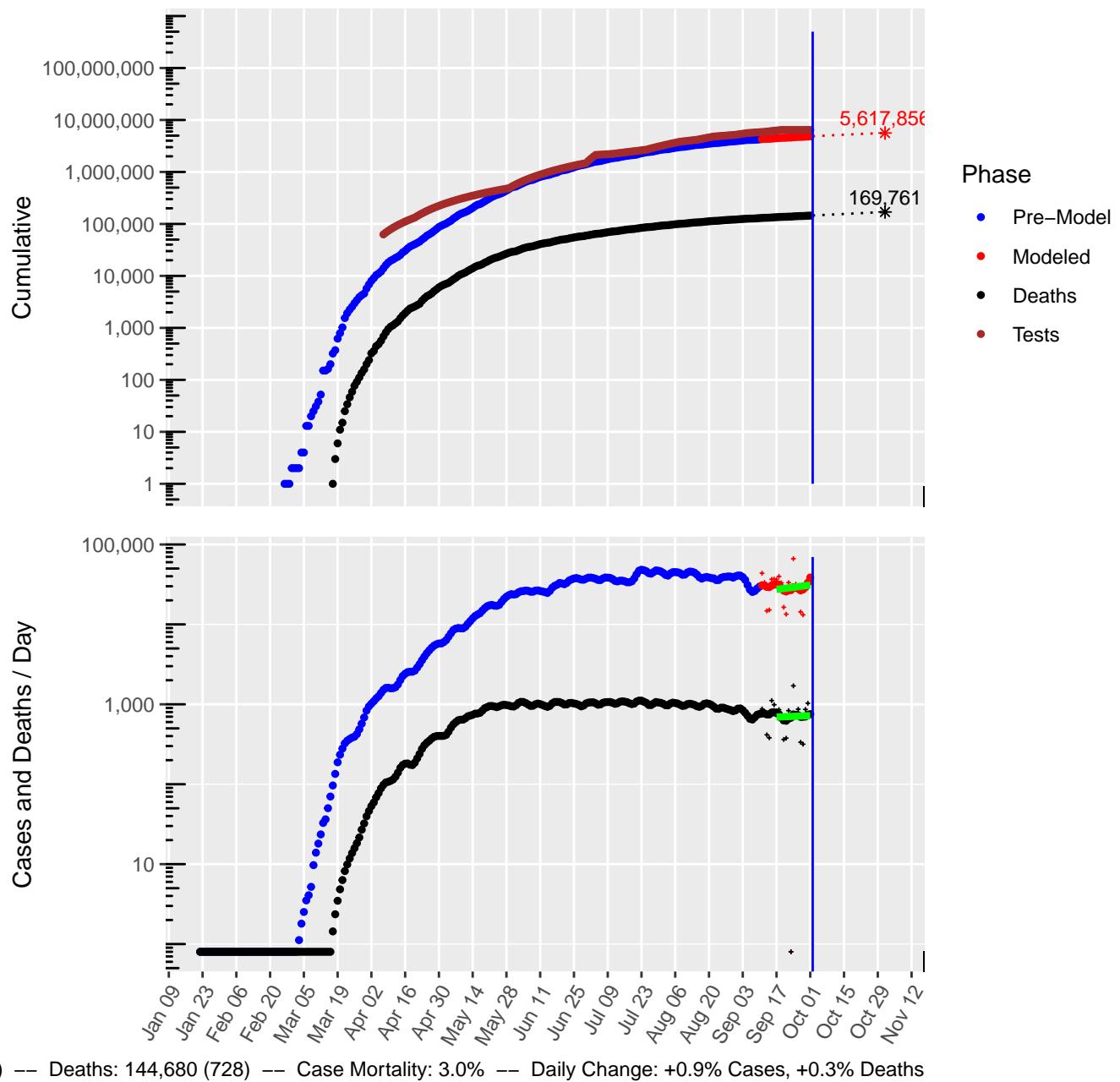


Bolivia projection as of 2020-10-02

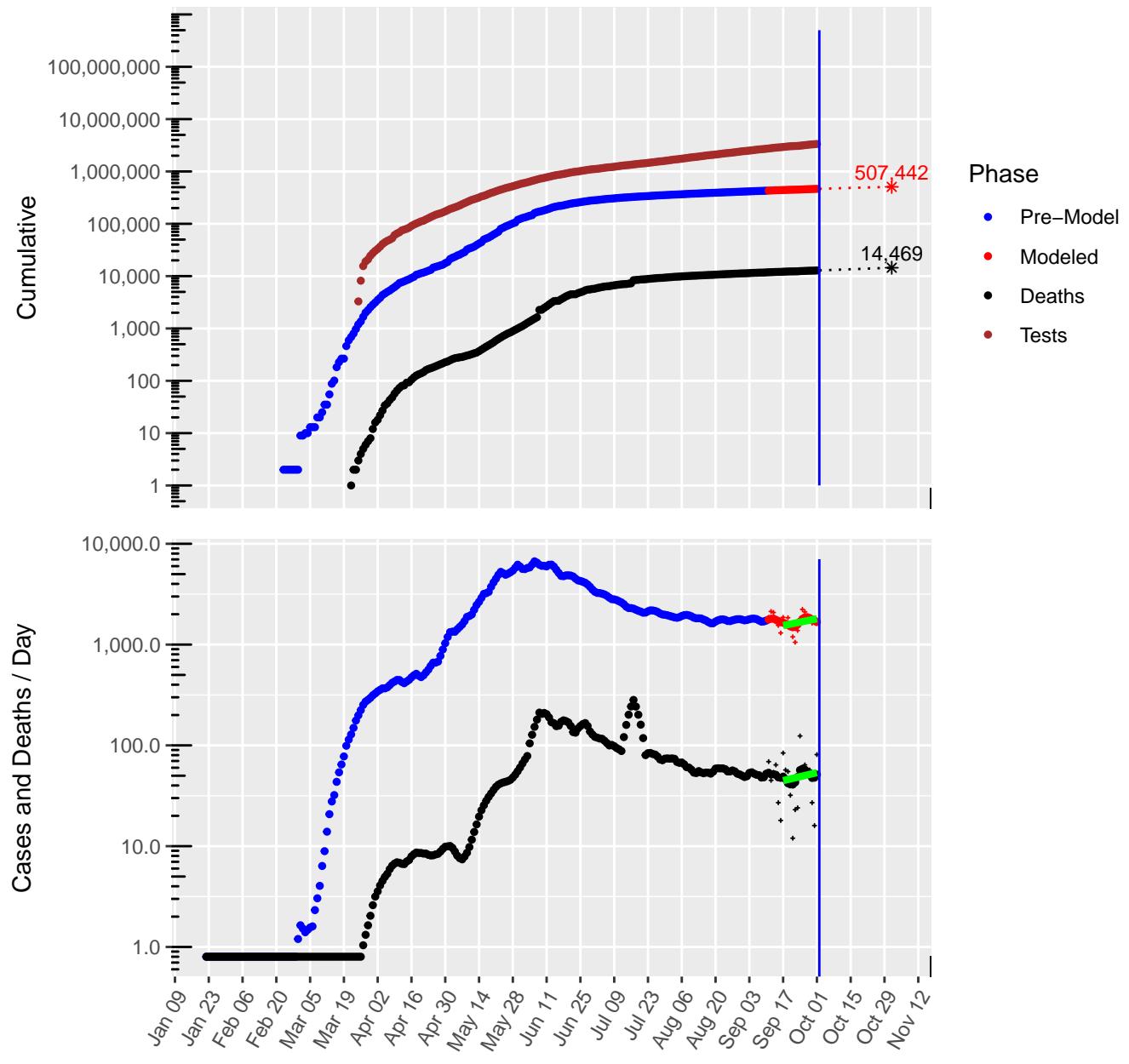


- Phase
- Pre-Model
 - Modeled
 - Deaths
 - Tests

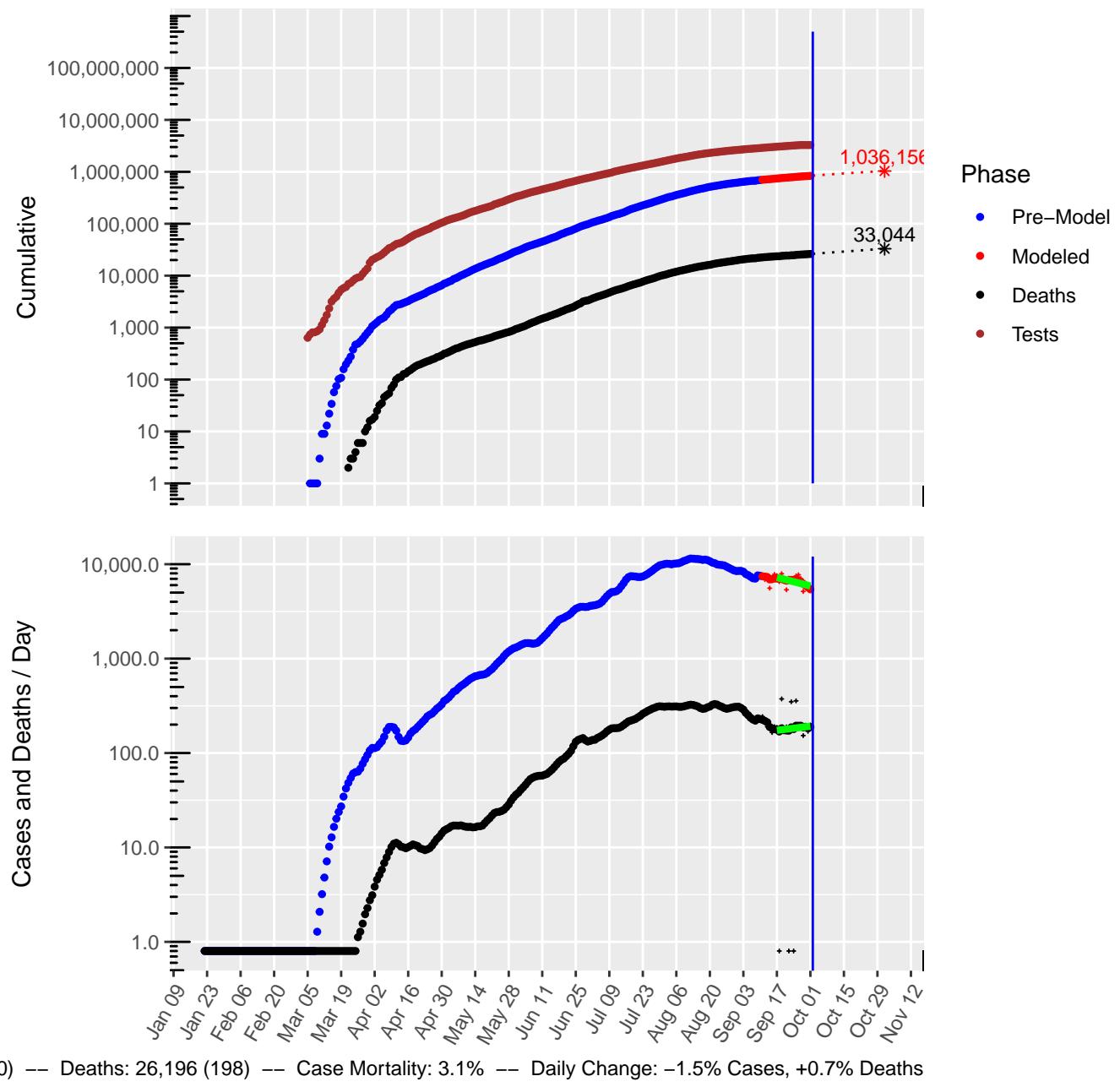
Brazil projection as of 2020-10-02



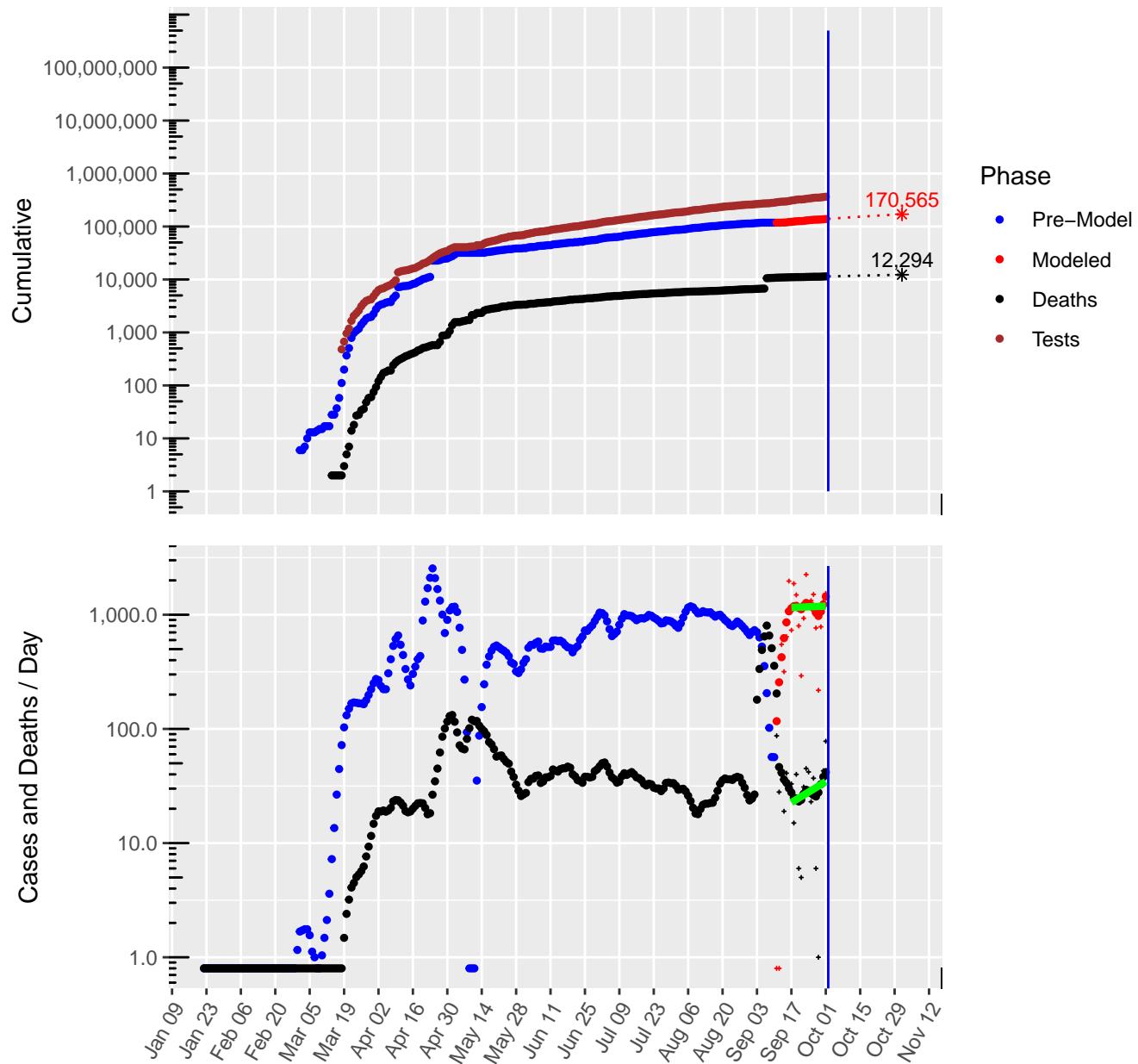
Chile projection as of 2020-10-02



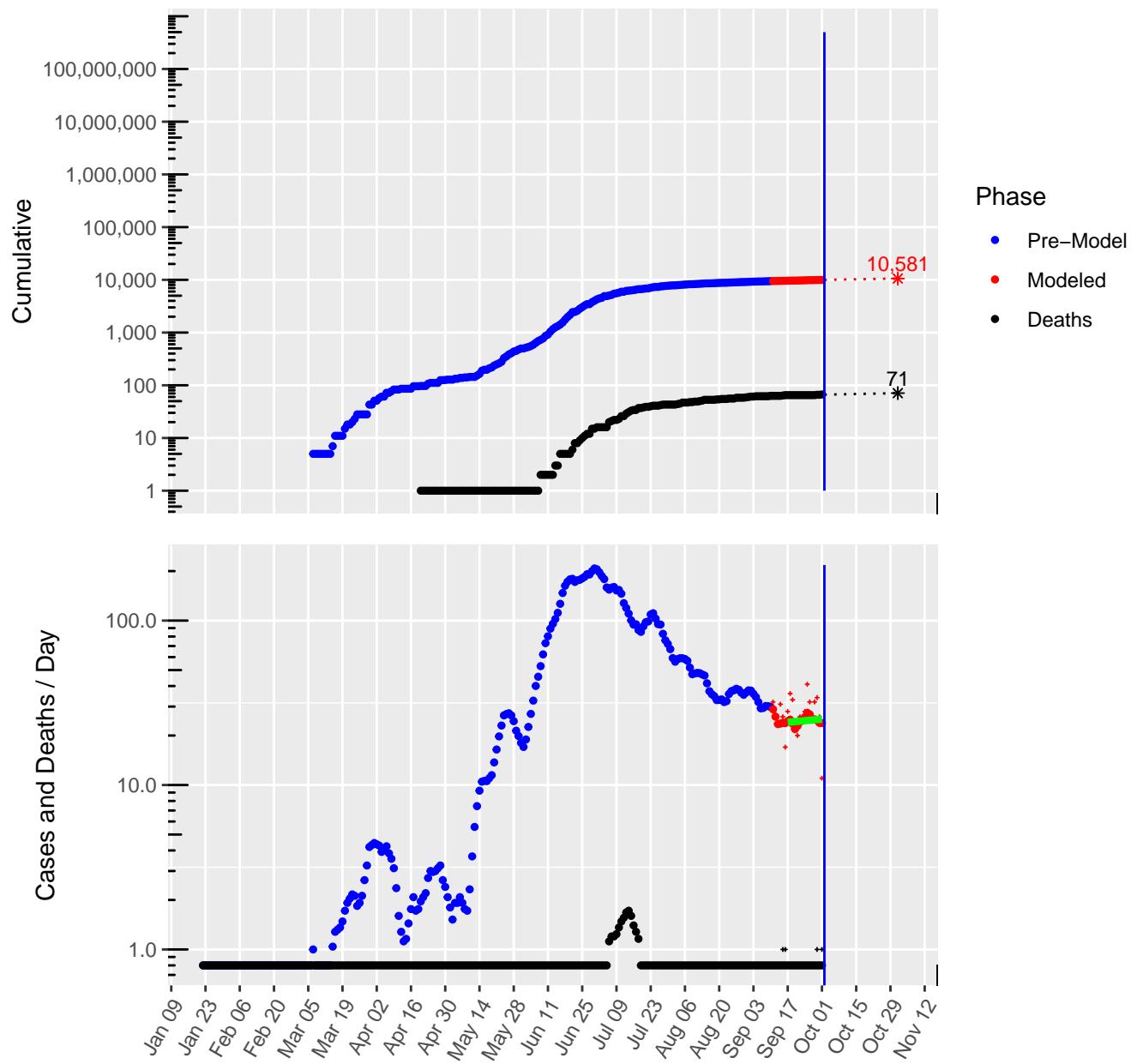
Colombia projection as of 2020-10-02



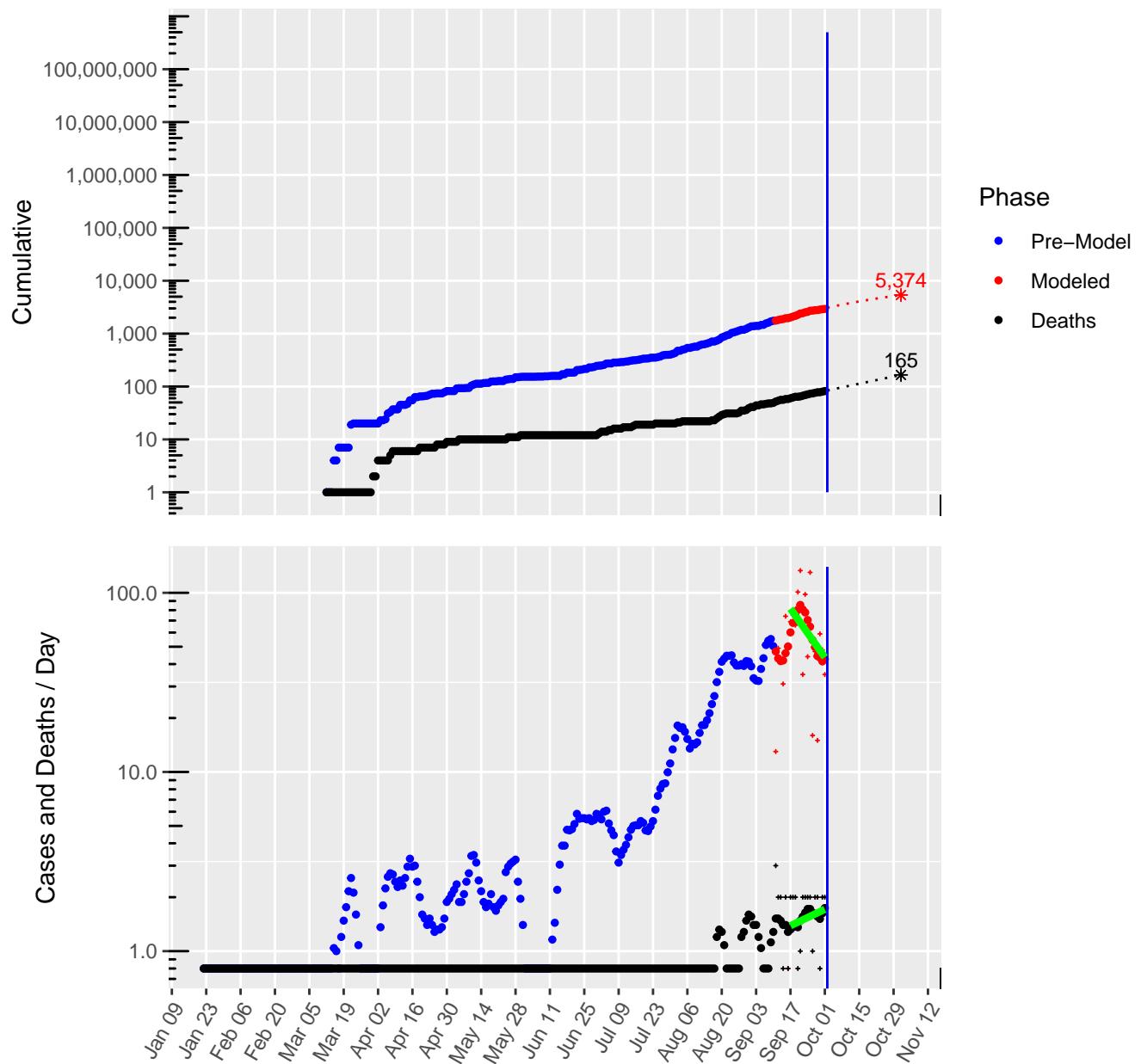
Ecuador projection as of 2020-10-02



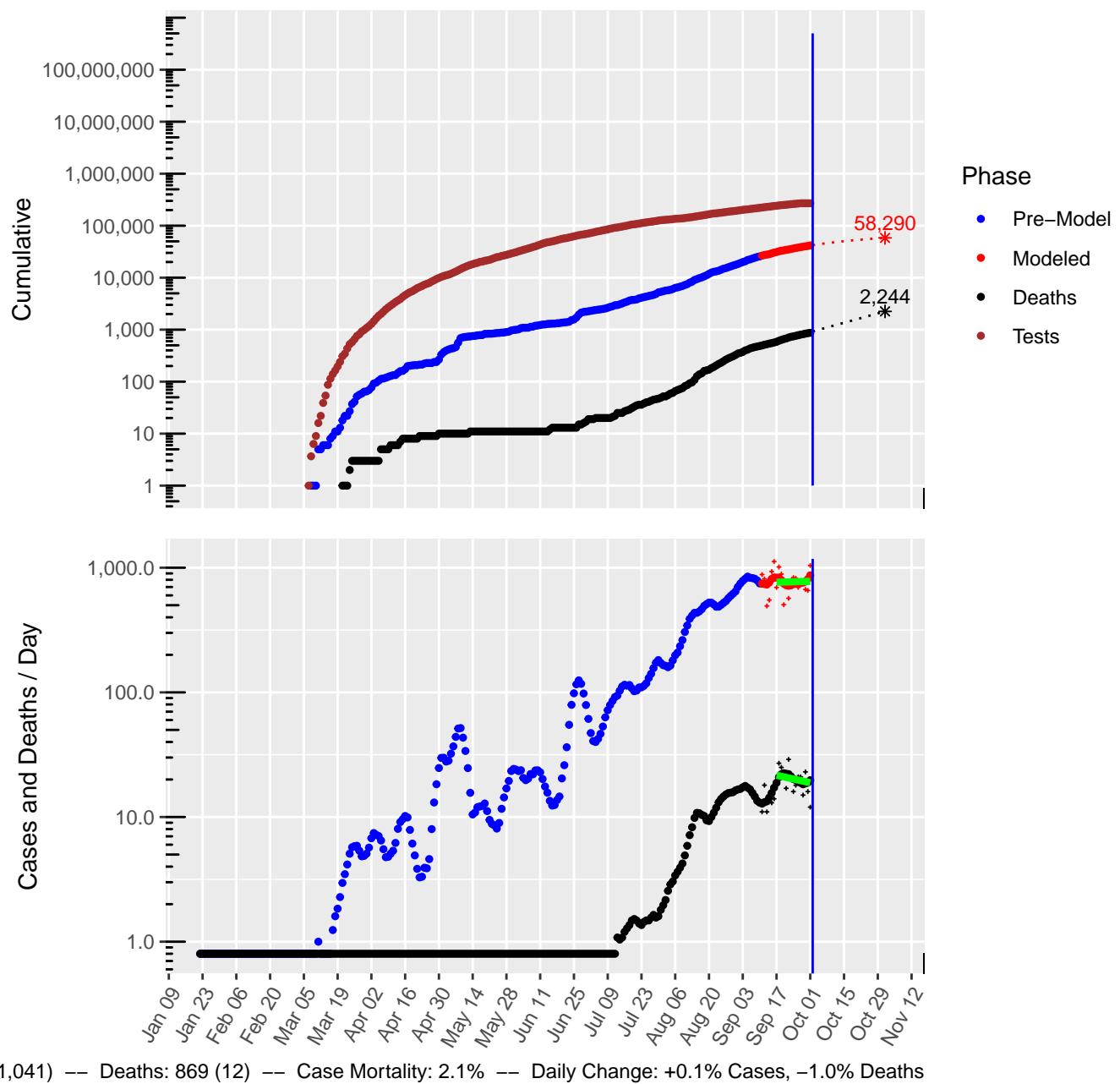
French Guiana projection as of 2020-10-02



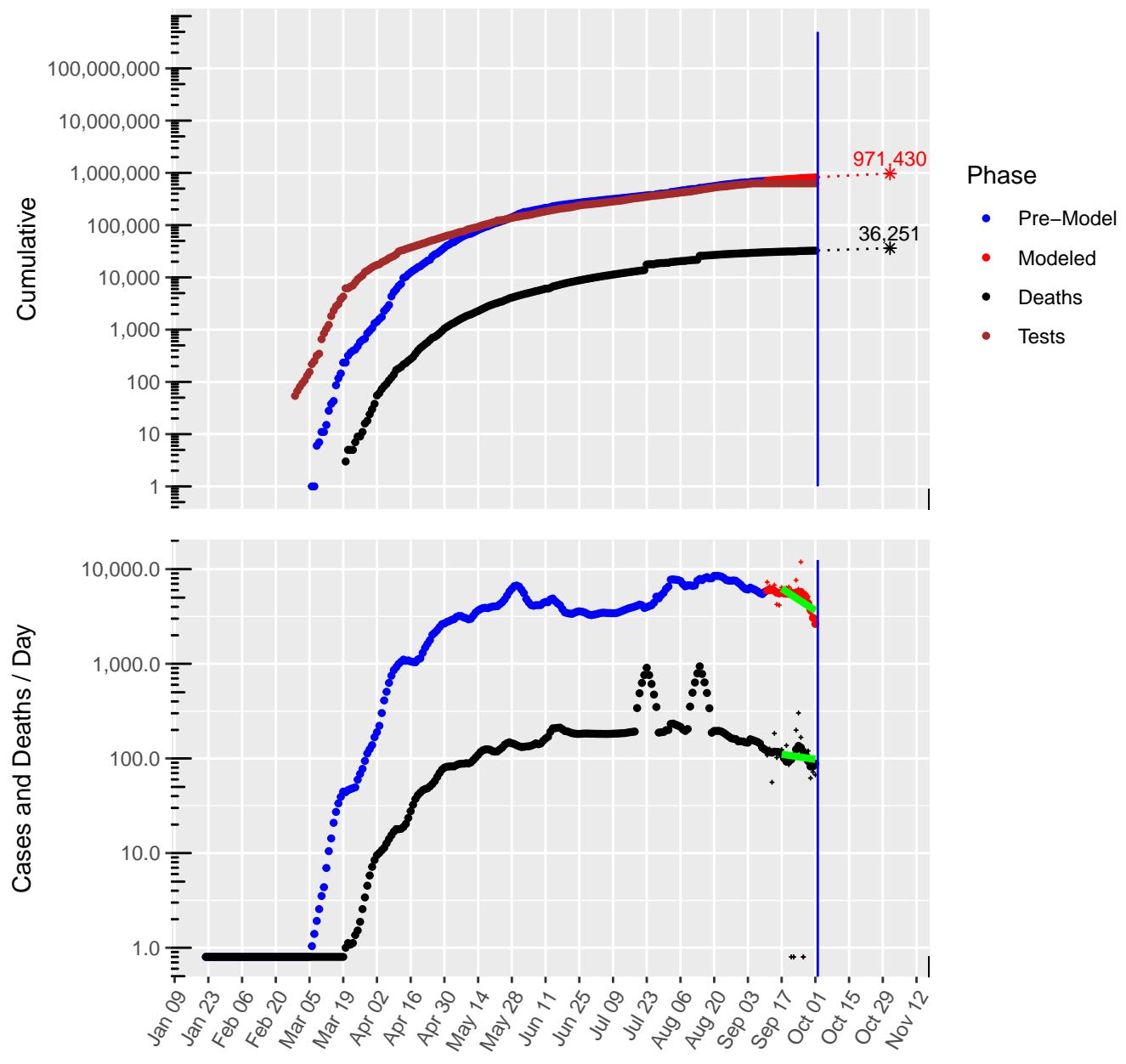
Guyana projection as of 2020-10-02



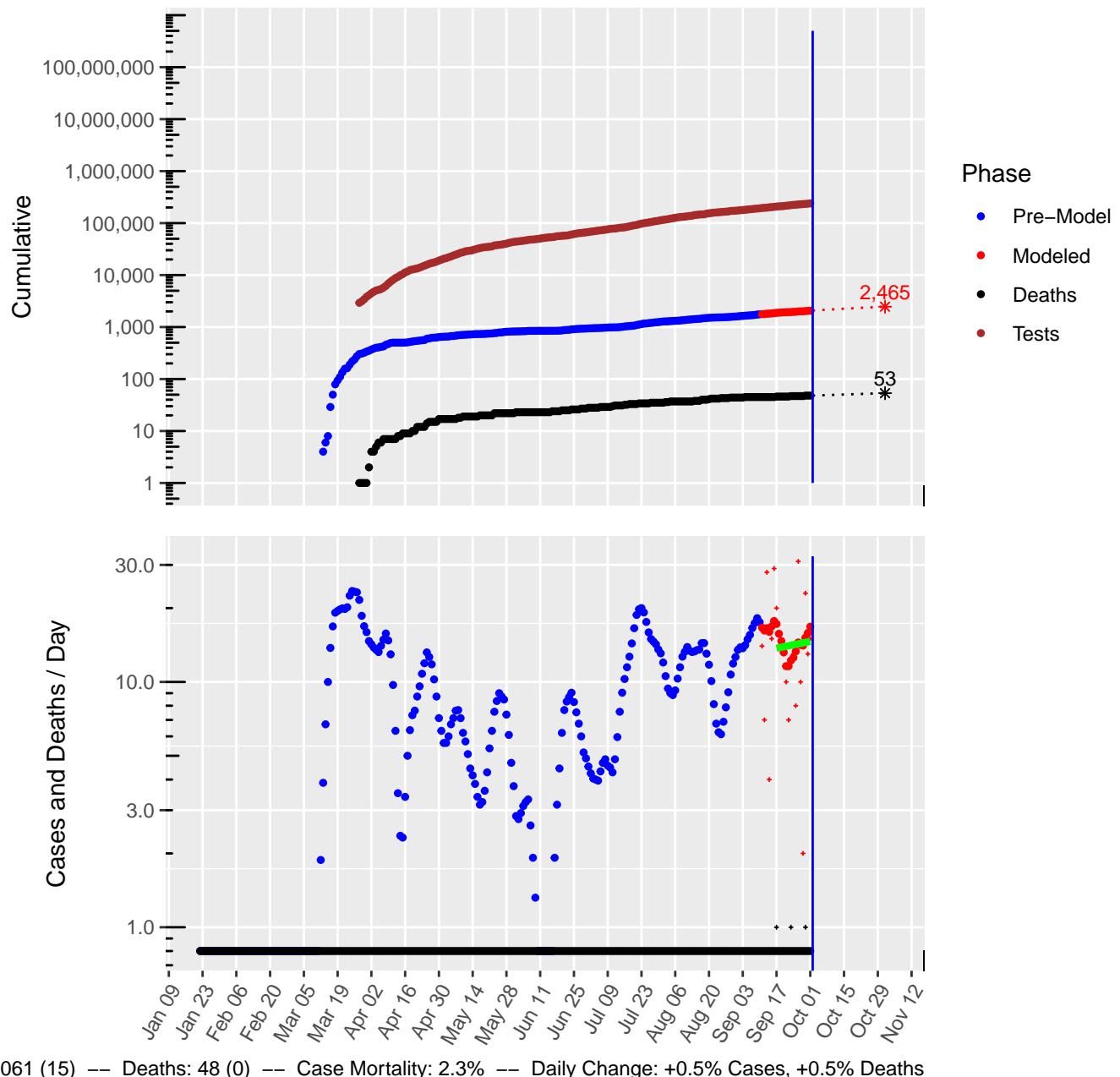
Paraguay projection as of 2020-10-02



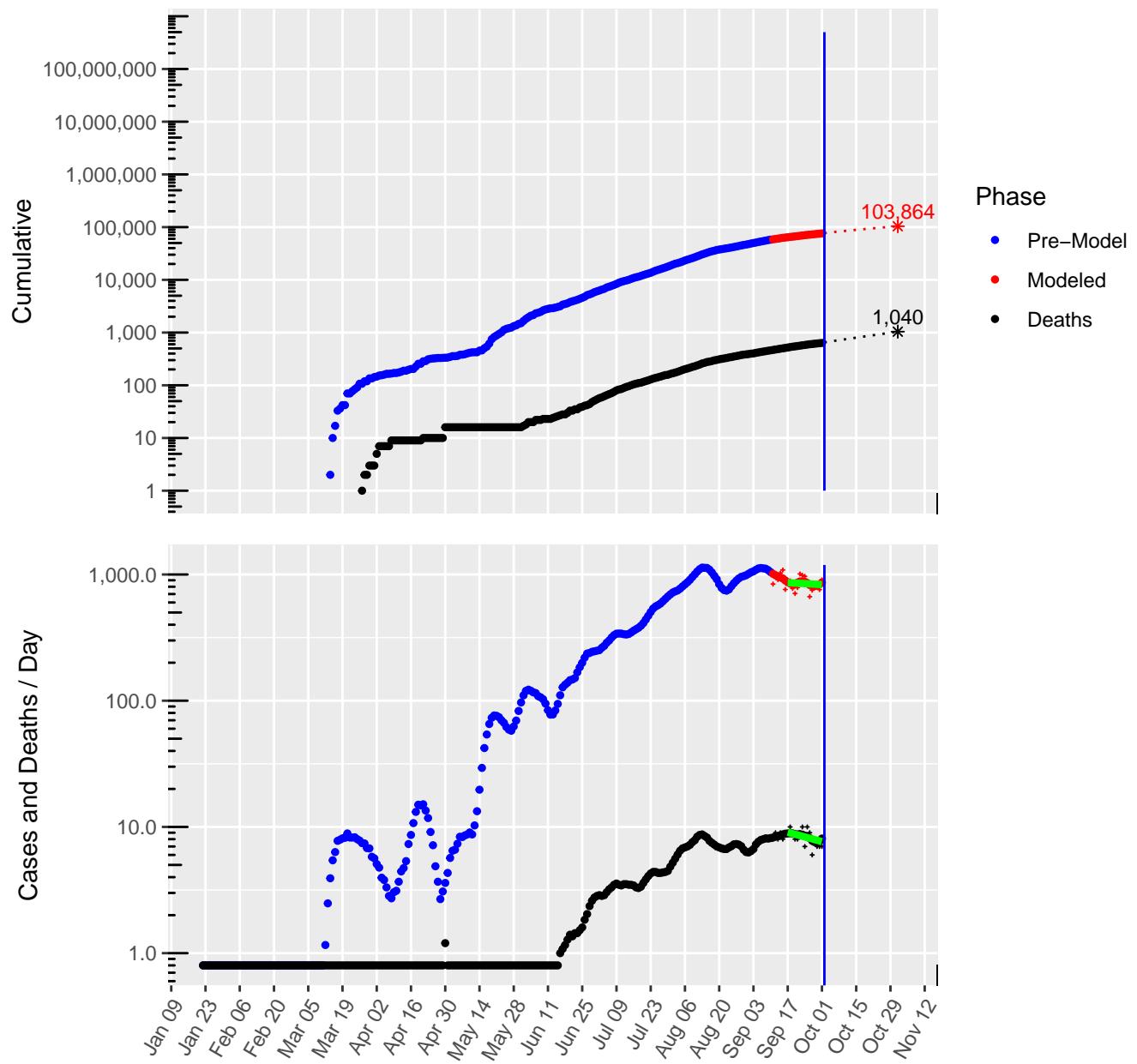
Peru projection as of 2020-10-02



Uruguay projection as of 2020-10-02

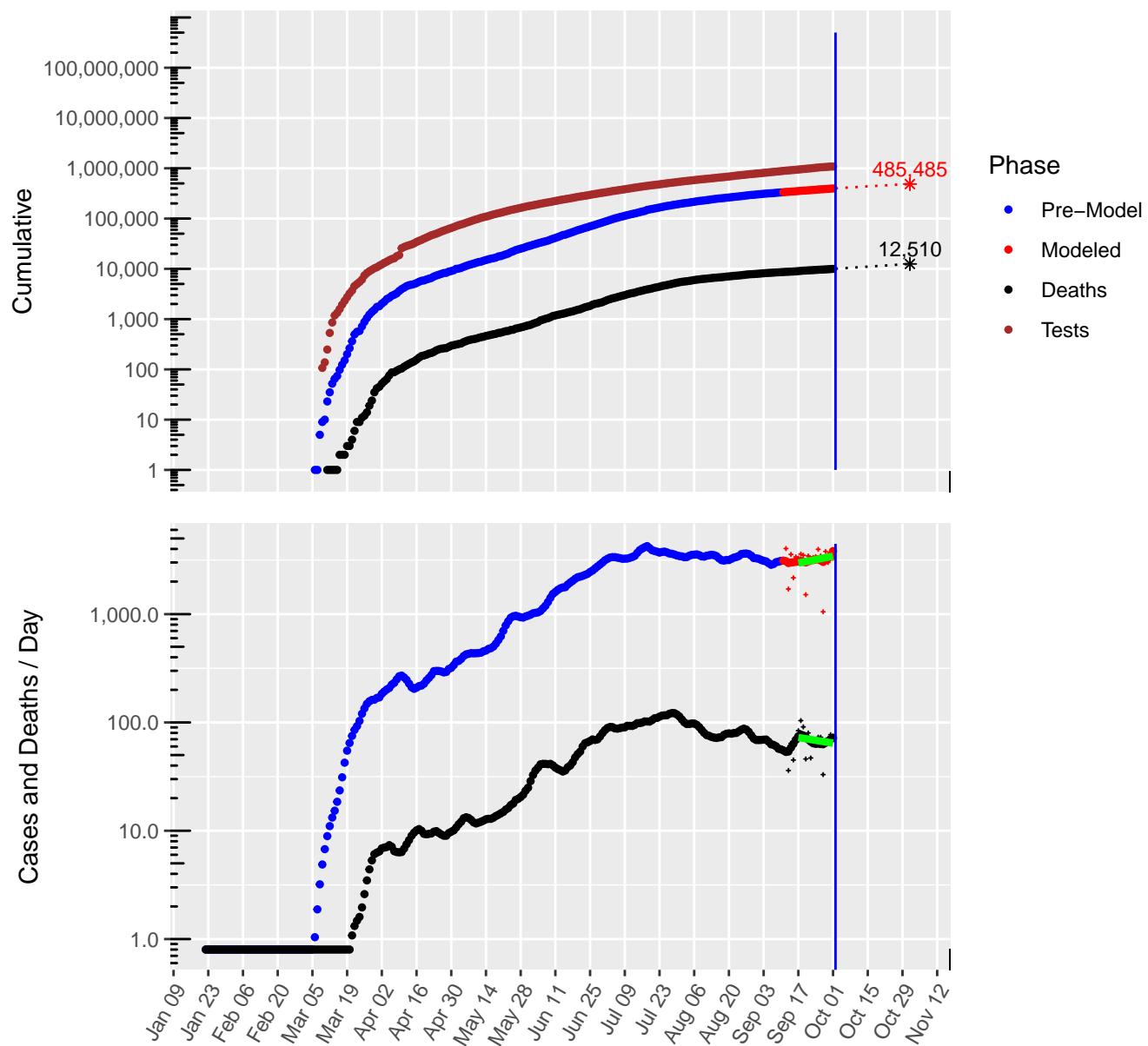


Venezuela projection as of 2020-10-02



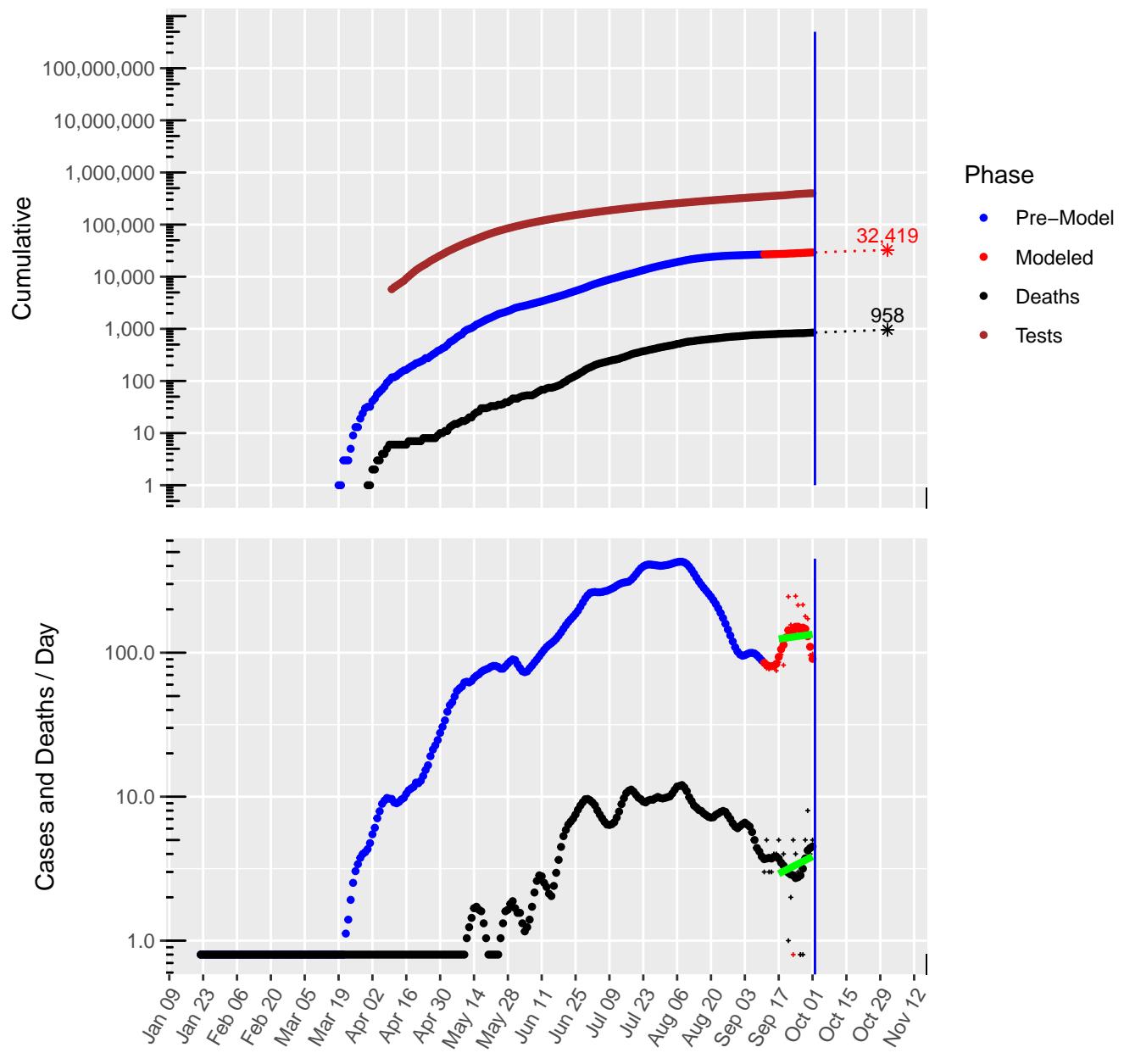
Central America projection as of 2020-10-02

El Salvador, Costa Rica, Belize, Guatemala, Honduras, Nicaragua, and Panama

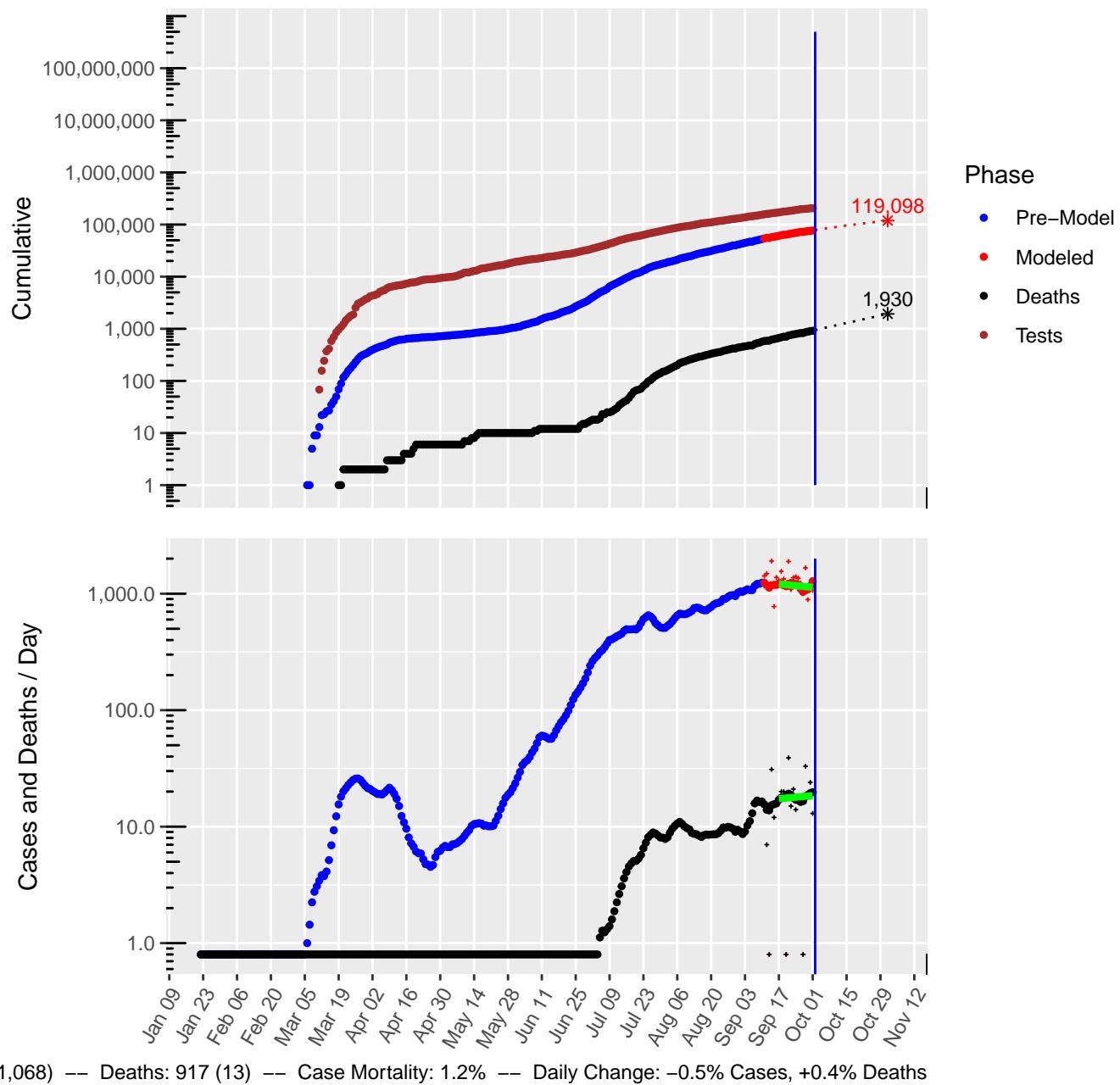


274) -- Deaths: 9,971 (75) -- Case Mortality: 2.5% -- Daily Change: +1.0% Cases, -0.8% Deaths

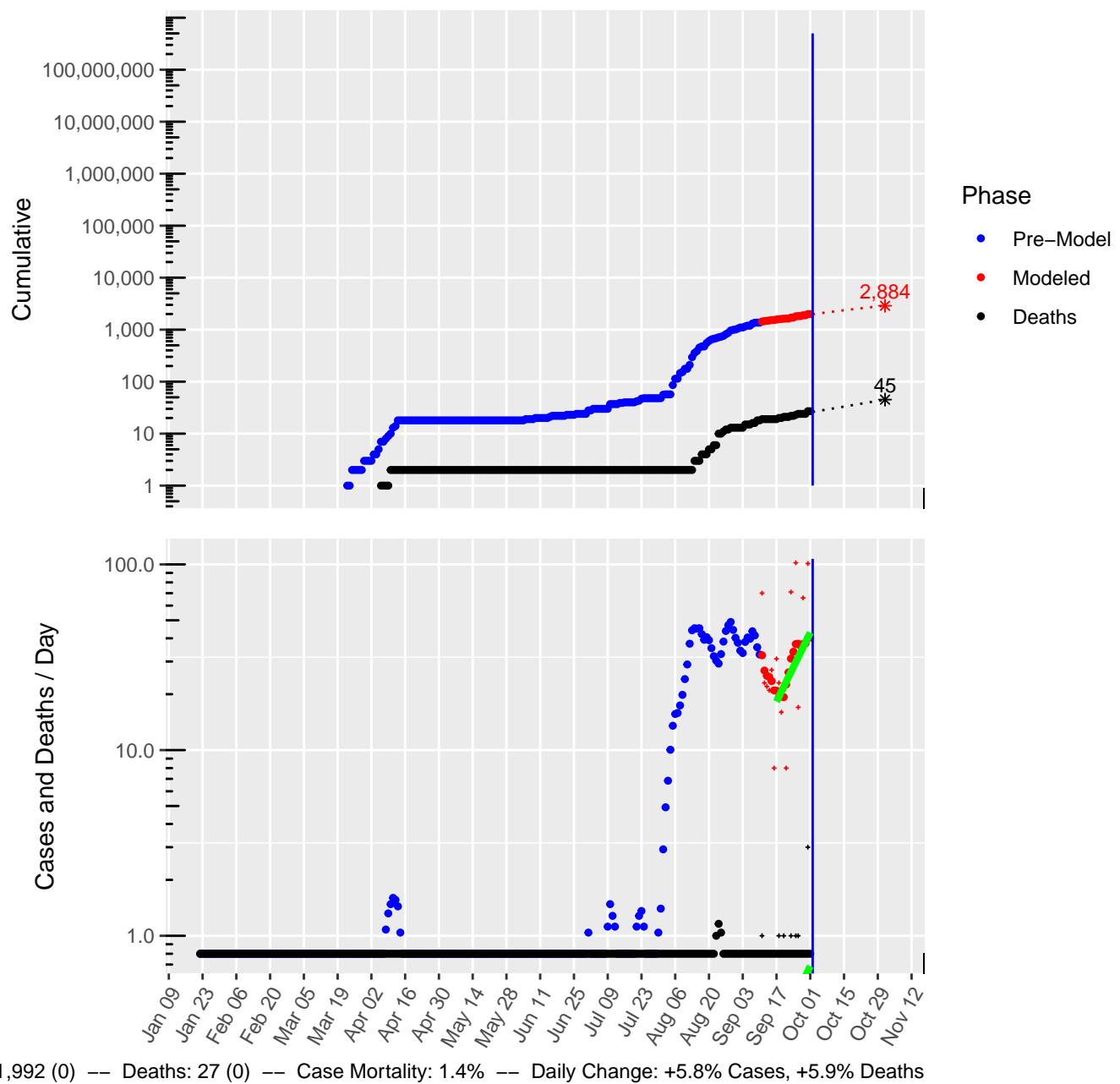
El Salvador projection as of 2020-10-02



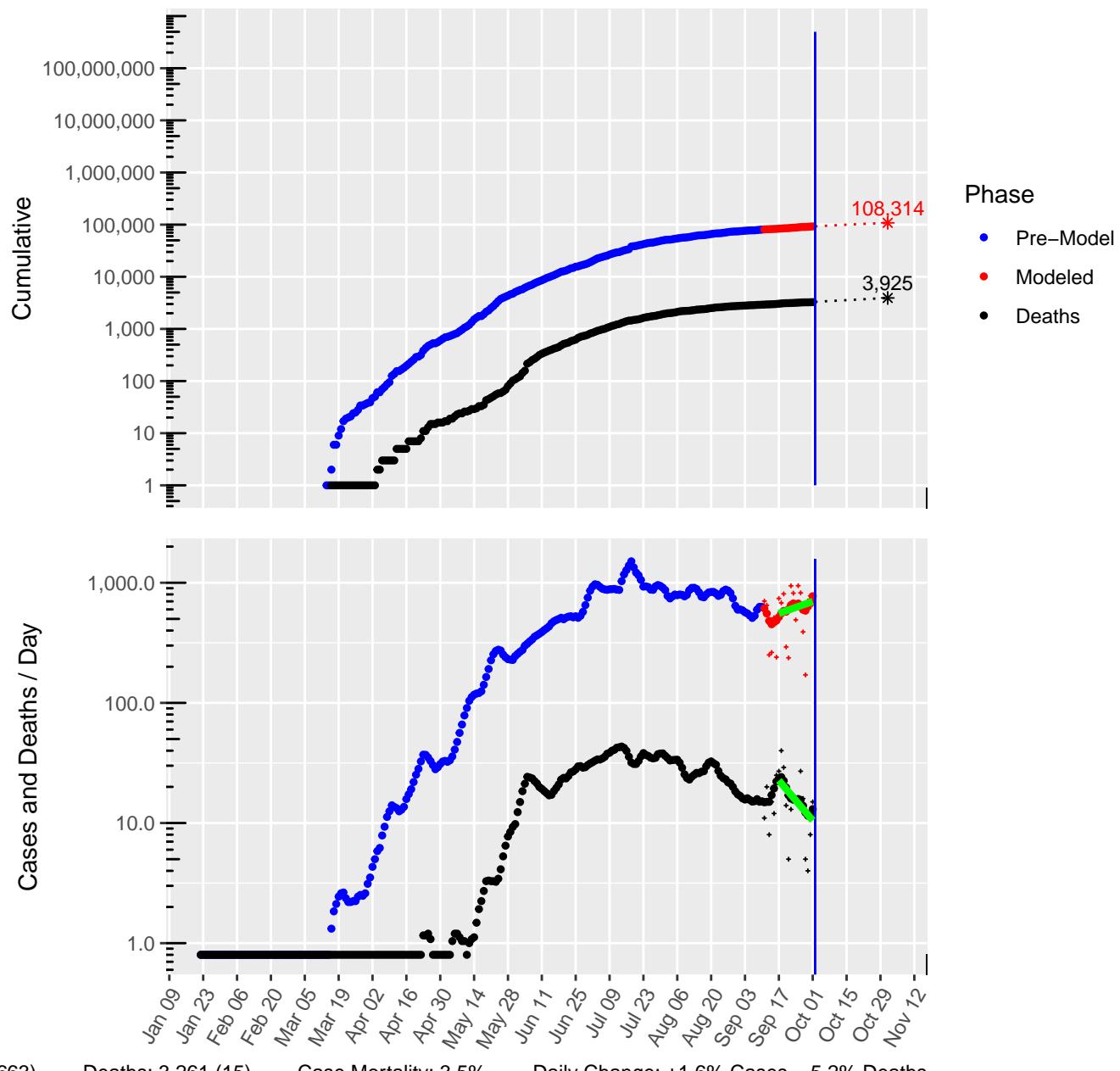
Costa Rica projection as of 2020-10-02



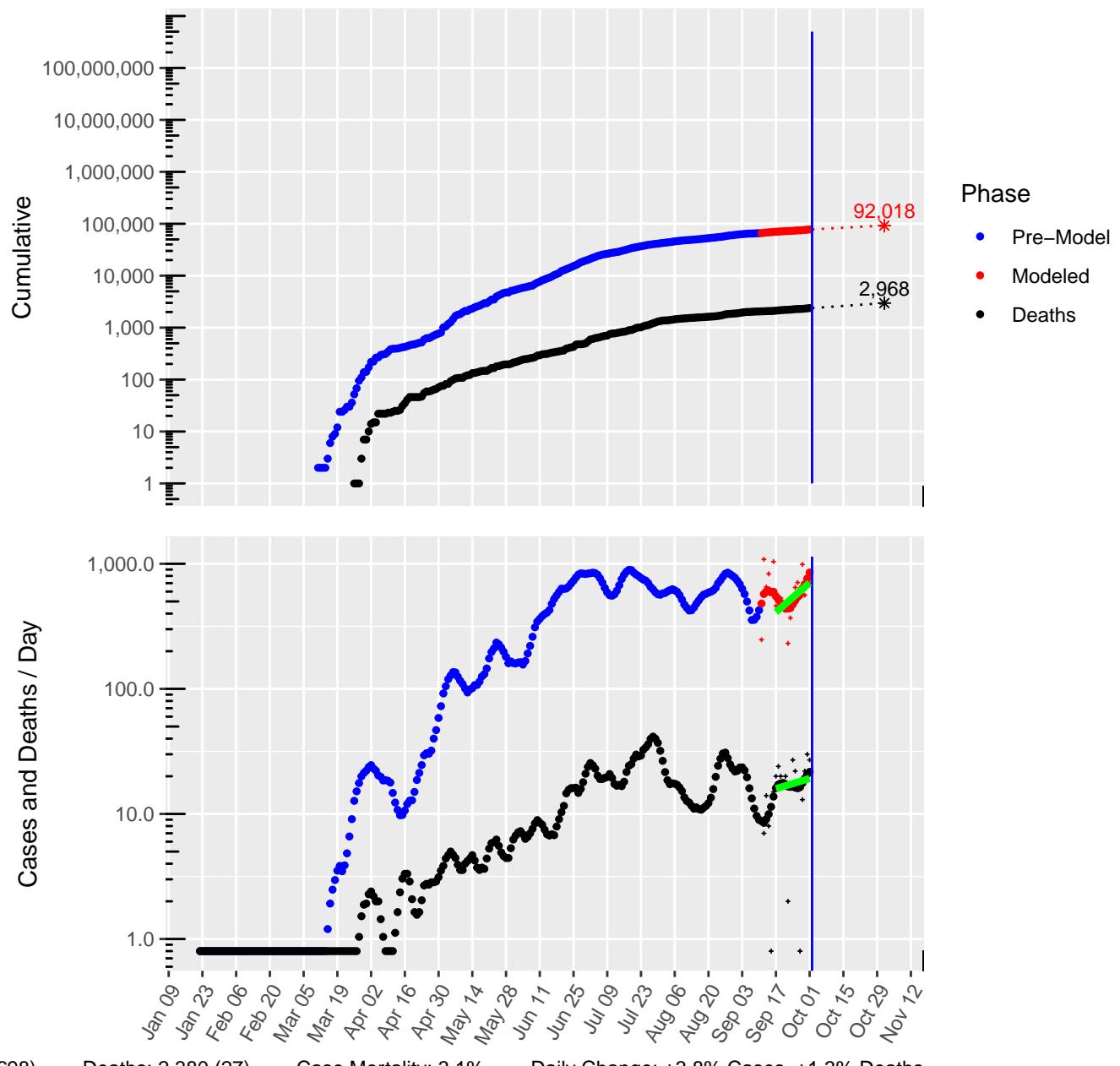
Belize projection as of 2020-10-02



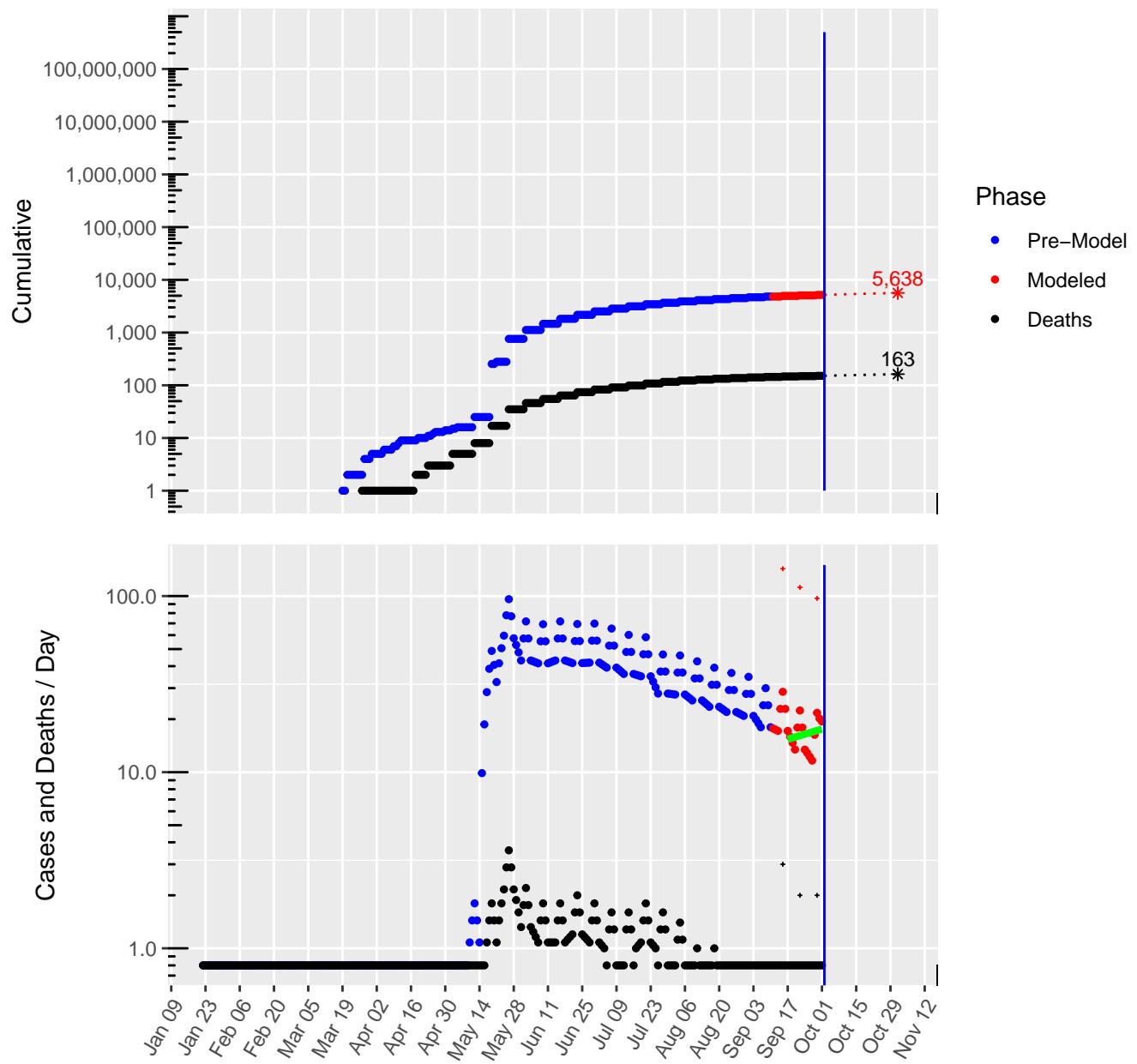
Guatemala projection as of 2020-10-02



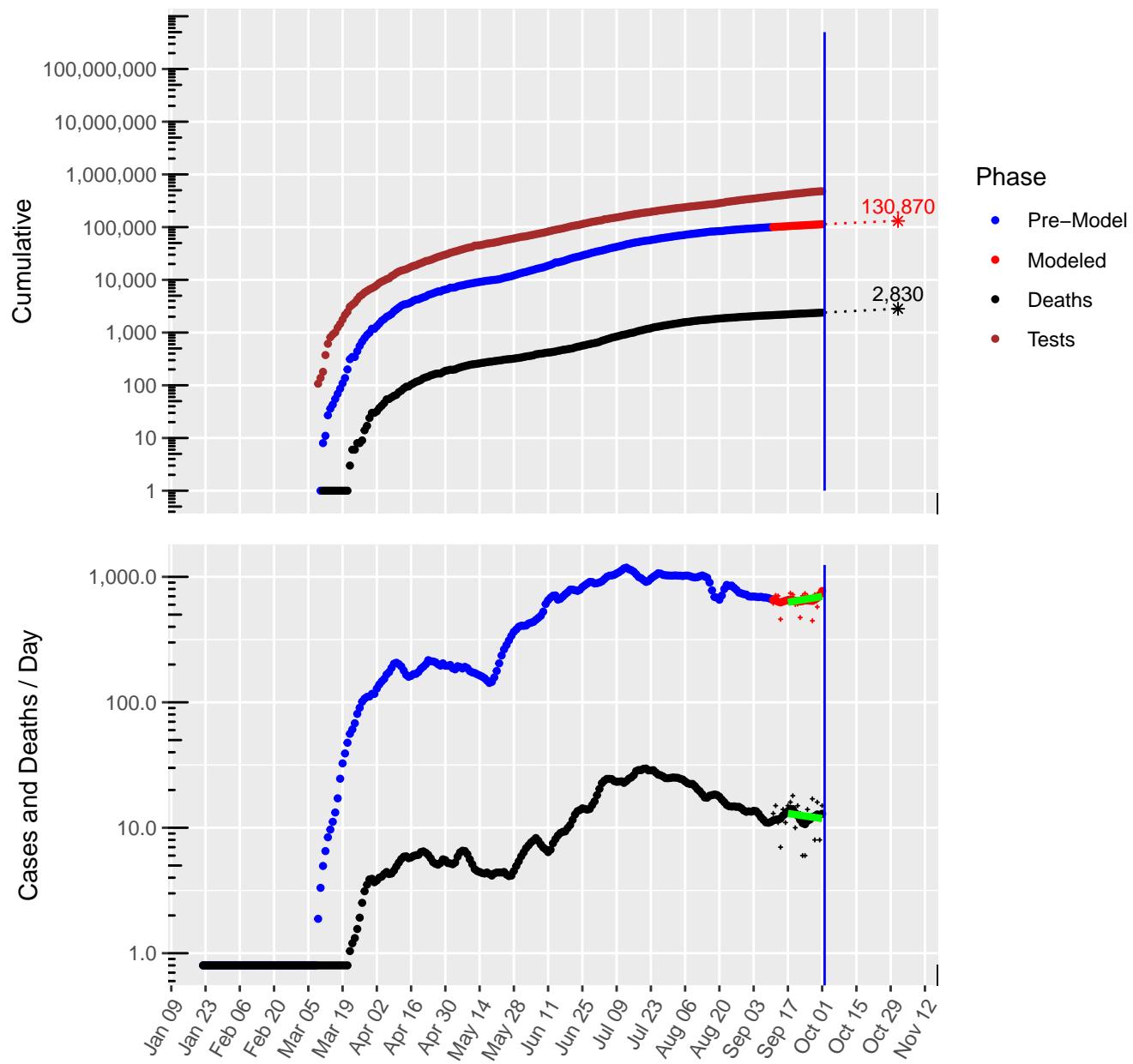
Honduras projection as of 2020-10-02



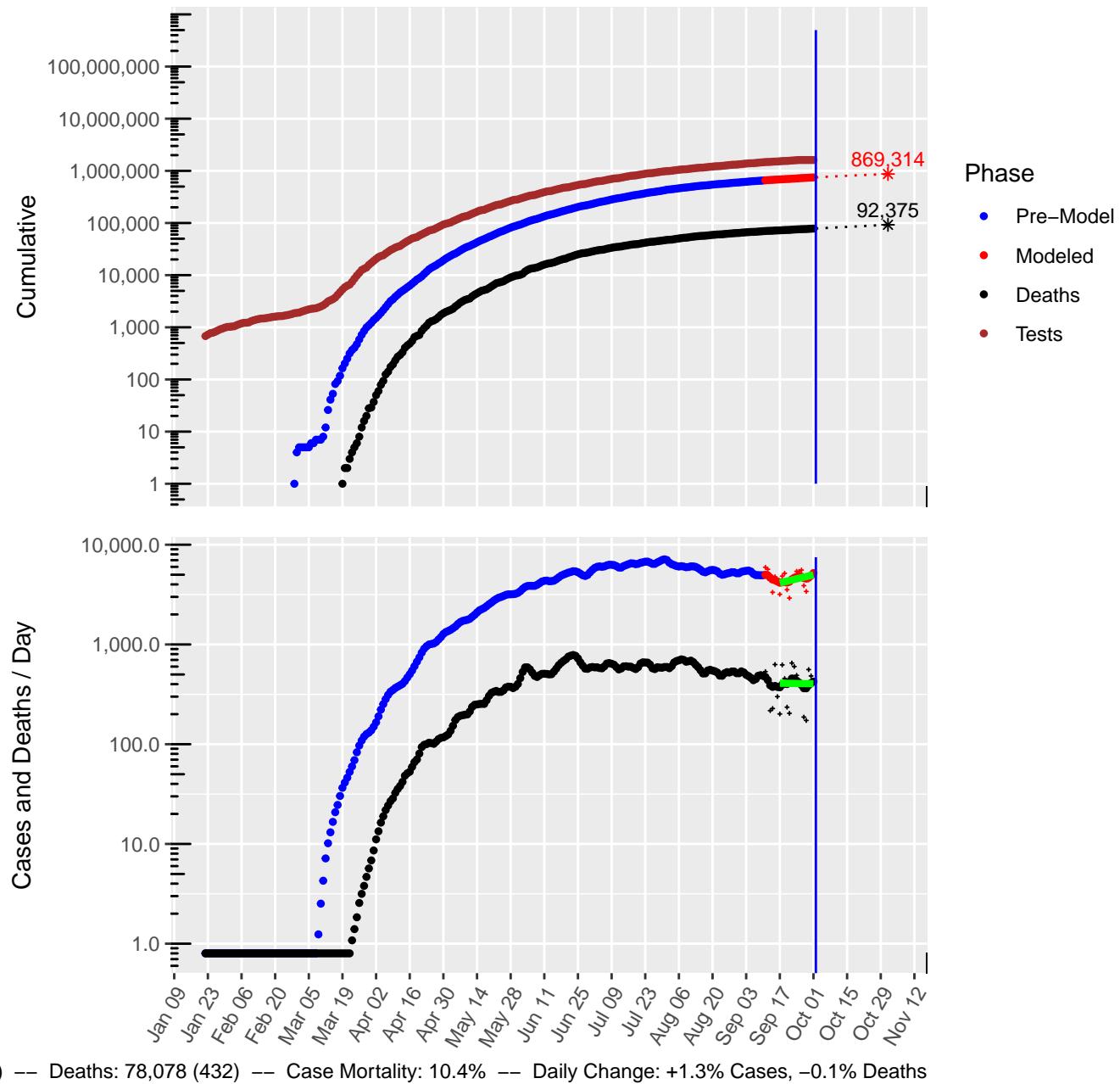
Nicaragua projection as of 2020-10-02



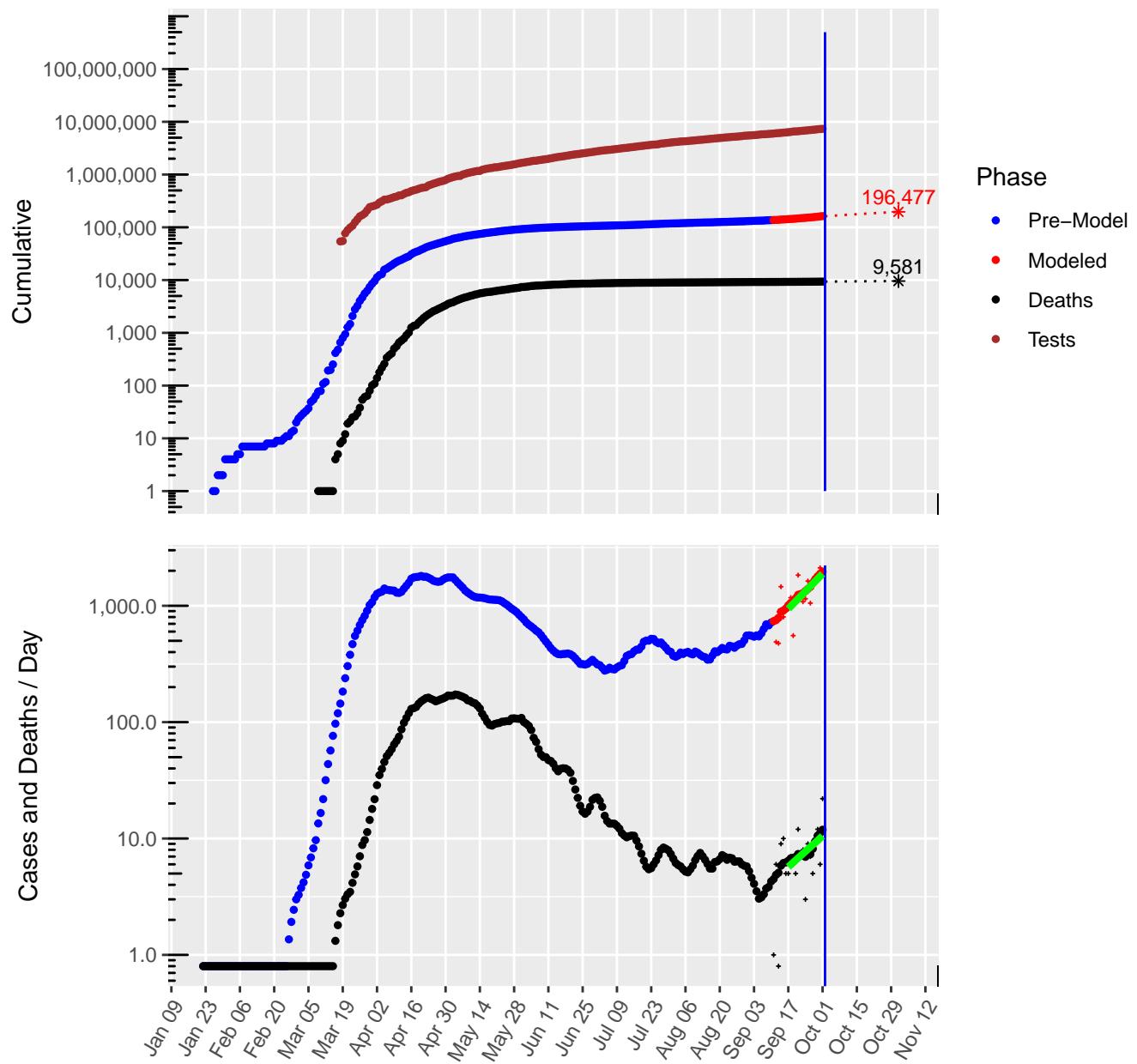
Panama projection as of 2020-10-02



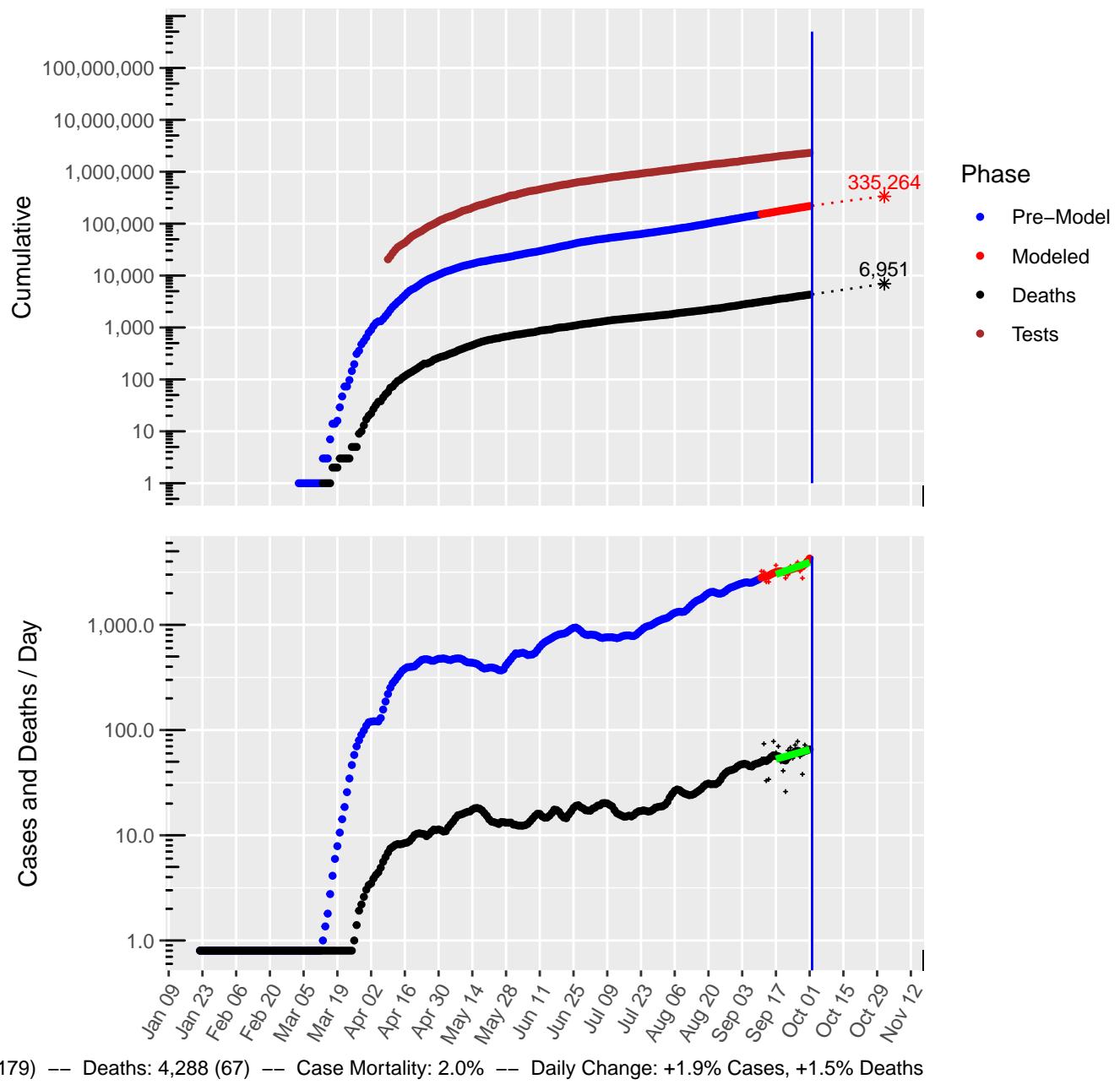
Mexico projection as of 2020-10-02



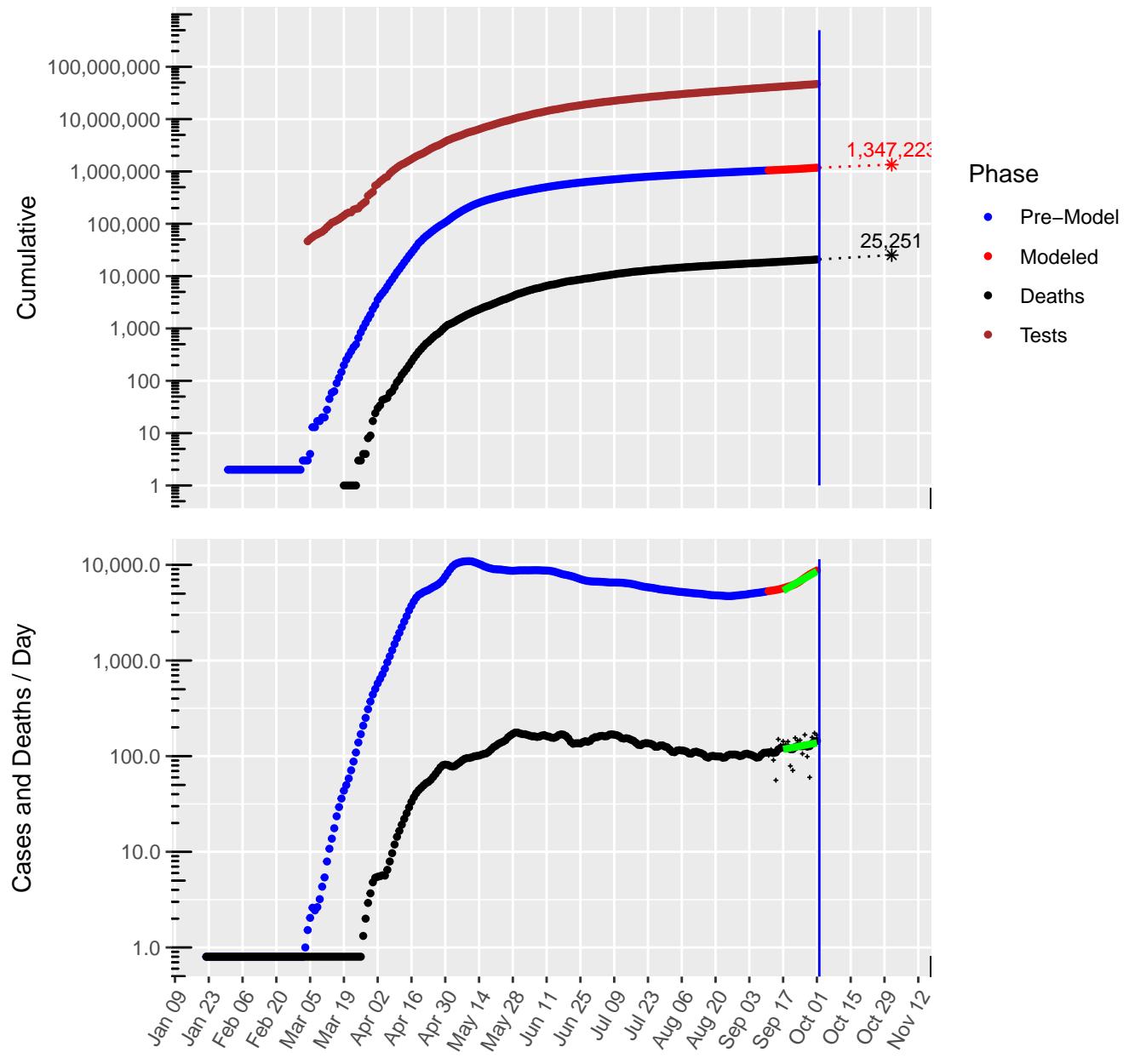
Canada projection as of 2020-10-02



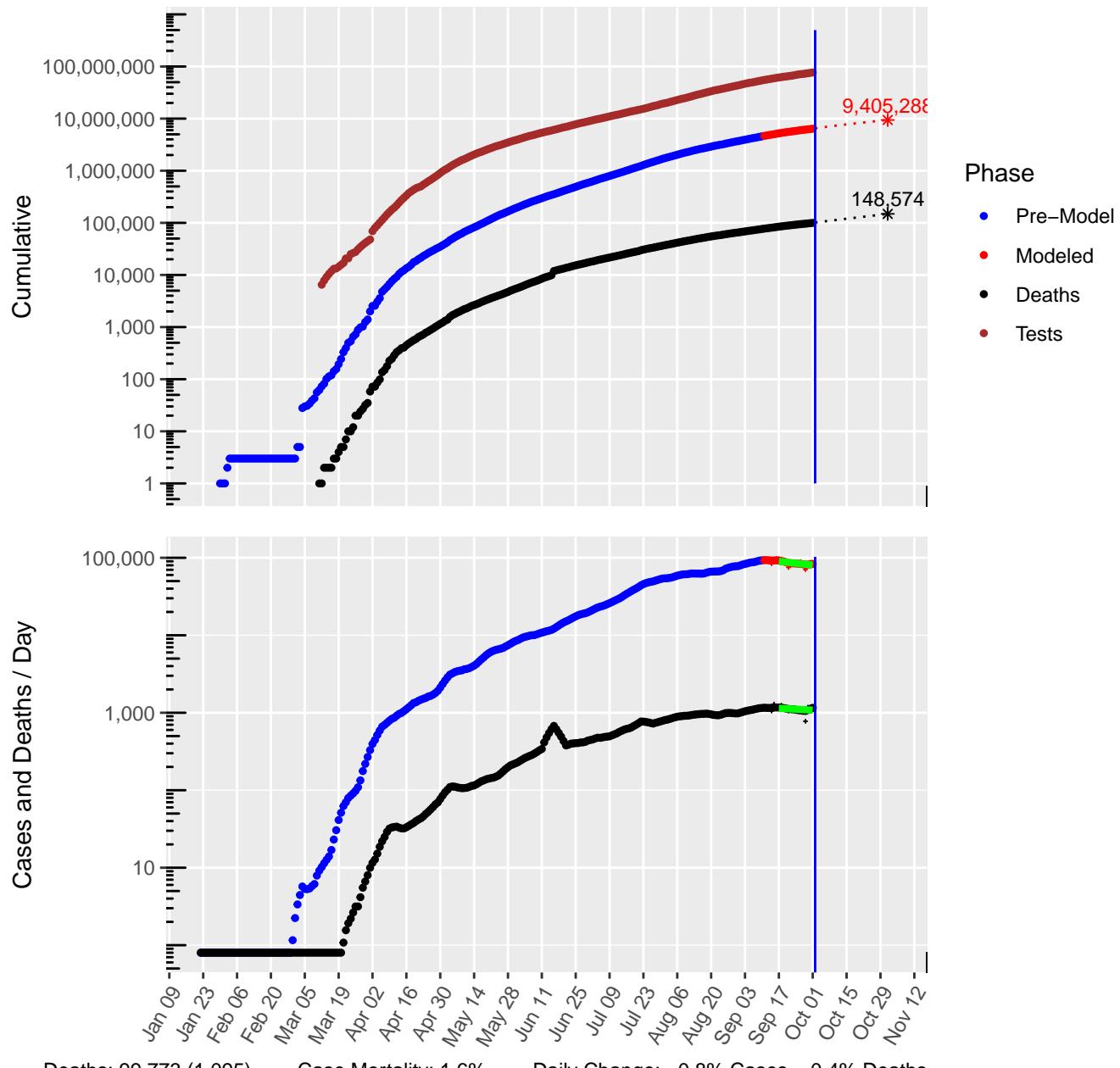
Ukraine projection as of 2020-10-02



Russia projection as of 2020-10-02



India projection as of 2020-10-02



Pakistan projection as of 2020-10-02

