

Policy & Abortion EDA

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Abortion data

First I will see which years the states did not fully report the data under the below criteria:

** Reporting area did not report, or only reported by occurrence; because abortion numbers by residence are available only from other reporting areas where residents obtained abortions, data by state/area of maternal residence should be interpreted with caution.

```
## # A tibble: 5 x 2
##   state_location      nonreport_yrs
##   <chr>              <dbl>
## 1 California**        10
## 2 District of Columbia** 1
## 3 Florida**           7
## 4 Maryland**          9
## 5 New Hampshire**     10
```

```
## # A tibble: 5 x 2
##   state_location      years
##   <chr>              <list>
## 1 California**      <int [10]>
## 2 District of Columbia** <int [1]>
## 3 Florida**         <int [7]>
## 4 Maryland**        <int [9]>
## 5 New Hampshire**   <int [10]>
```

Next, I check whether or not these asterisks correspond with states that have missing in-state data. That appears to be the case in most instances, except there are two years where DC did not report any in-state abortions and 10 years where Wyoming did not report any in-state abortions.

```
## # A tibble: 6 x 2
## # Groups:   state_location [6]
##   state_location      n
##   <chr>              <int>
## 1 California        10
## 2 District of Columbia 2
## 3 Florida           7
## 4 Maryland          9
## 5 New Hampshire     10
## 6 Wyoming           10

## # A tibble: 28,118 x 4
##   state_location year state_residence count
##   <chr>          <int> <chr>          <int>
## 1 Illinois      2019 Missouri      4494
## 2 North Carolina 2010 South Carolina 4285
## 3 Kansas        2010 Missouri      4077
```

```

## 4 North Carolina 2018 South Carolina 4051
## 5 North Carolina 2019 South Carolina 4016
## 6 Kansas 2011 Missouri 3857
## 7 North Carolina 2017 South Carolina 3724
## 8 North Carolina 2015 South Carolina 3715
## 9 Kansas 2012 Missouri 3714
## 10 Kansas 2013 Missouri 3611
## # ... with 28,108 more rows

## # A tibble: 2,976 x 3
## # Groups:   state_location [55]
##   state_location state_residence count
##   <chr>         <chr>         <int>
## 1 Kansas Missouri 34368
## 2 North Carolina South Carolina 34347
## 3 Illinois Missouri 20013
## 4 Georgia South Carolina 17935
## 5 Tennessee Mississippi 13557
## 6 Georgia Alabama 12792
## 7 Illinois Indiana 12542
## 8 New York City New Jersey 10370
## 9 Alabama Mississippi 9606
## 10 New Jersey Pennsylvania 8760
## # ... with 2,966 more rows

## # A tibble: 520 x 4
##   state_location year state_residence count
##   <chr>         <int> <chr>         <int>
## 1 New York City 2010 Total By Location of Service 83750
## 2 New York City 2011 Total By Location of Service 80485
## 3 Florida** 2010 Total By Location of Service 79908
## 4 Texas 2010 Total By Location of Service 77463
## 5 Florida** 2011 Total By Location of Service 77166
## 6 Florida** 2012 Total By Location of Service 76151
## 7 New York City 2012 Total By Location of Service 73815
## 8 Florida** 2013 Total By Location of Service 72727
## 9 Texas 2011 Total By Location of Service 72332
## 10 Florida** 2014 Total By Location of Service 72107
## # ... with 510 more rows

## # A tibble: 55 x 2
##   state_location count
##   <chr>         <int>
## 1 New York City 652944
## 2 Texas 608425
## 3 Florida** 519852
## 4 Illinois 412133
## 5 Georgia 327047
## 6 Pennsylvania 325920
## 7 New York State 292624
## 8 North Carolina 266991
## 9 Michigan 257847
## 10 New Jersey 237688
## # ... with 45 more rows

```

Policy data

```
## # A tibble: 17 x 2
##   year as_of
##   <dbl> <date>
## 1 2006 2006-01-01
## 2 2007 2007-03-01
## 3 2008 2008-02-01
## 4 2009 2009-02-01
## 5 2010 2010-04-01
## 6 2011 2011-01-01
## 7 2012 2012-01-01
## 8 2013 2013-01-01
## 9 2014 2014-02-01
## 10 2015 2015-01-01
## 11 2016 2016-01-01
## 12 2017 2017-02-01
## 13 2018 2018-01-01
## 14 2019 2019-01-01
## 15 2020 2020-01-01
## 16 2021 2021-01-01
## 17 2022 2022-01-01

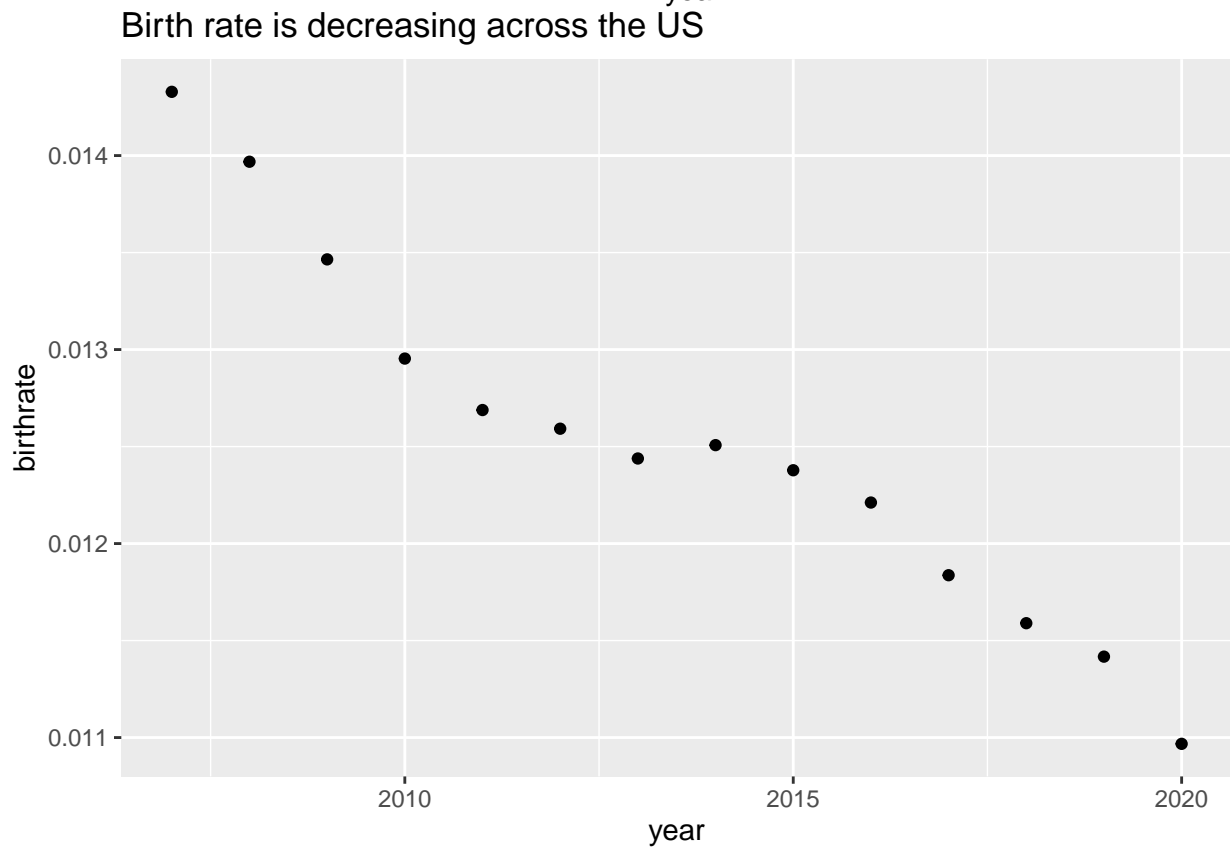
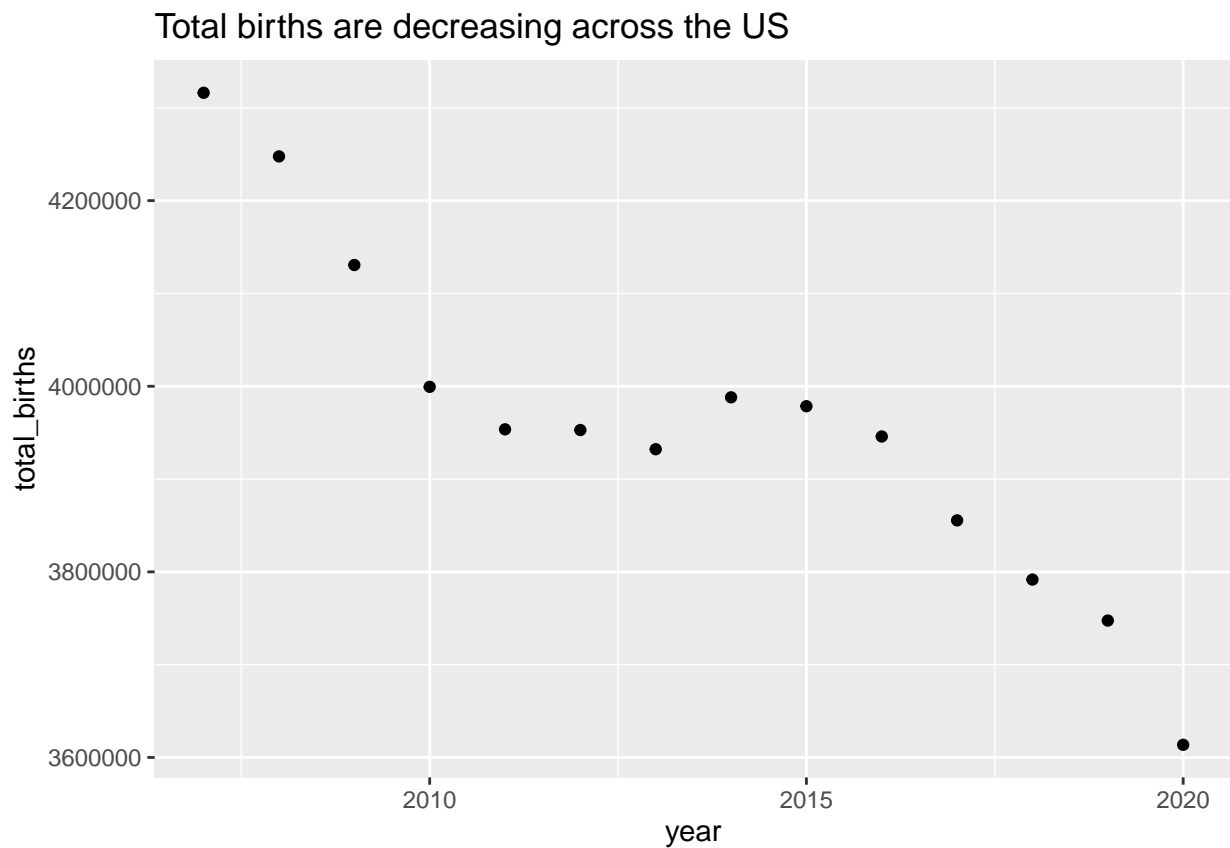
## # A tibble: 1,269 x 4
## # Groups:   year, policy [255]
##   year policy          in_place      n
##   <dbl> <chr>          <chr>    <int>
## 1 2006 fund_all_most      X        17
## 2 2006 fund_all_most      <NA>     34
## 3 2006 fund_life_rape_incest Life Only    1
## 4 2006 fund_life_rape_incest X         27
## 5 2006 fund_life_rape_incest X*         2
## 6 2006 fund_life_rape_incest X*,.Ω       1
## 7 2006 fund_life_rape_incest XΩ         3
## 8 2006 fund_life_rape_incest <NA>     17
## 9 2006 hospital_if        12 weeks    4
## 10 2006 hospital_if        14 weeks    2
## # ... with 1,259 more rows

## # A tibble: 107 x 3
##   policy          in_place      n
##   <chr>          <chr>    <int>
## 1 indiv_prov_refuse      X        775
## 2 licensed_physician      X        616
## 3 fund_life_rape_incest    X        459
## 4 instit_prov_refuse      X        452
## 5 hr_wait_post_counseling 24        334
## 6 parental_involv_minors  Consent   306
## 7 fund_all_most          X        285
## 8 instit_prov_refuse      Private   255
## 9 prohibited_except_death_if Viability  241
## 10 partial_birth_ban      X        227
## # ... with 97 more rows

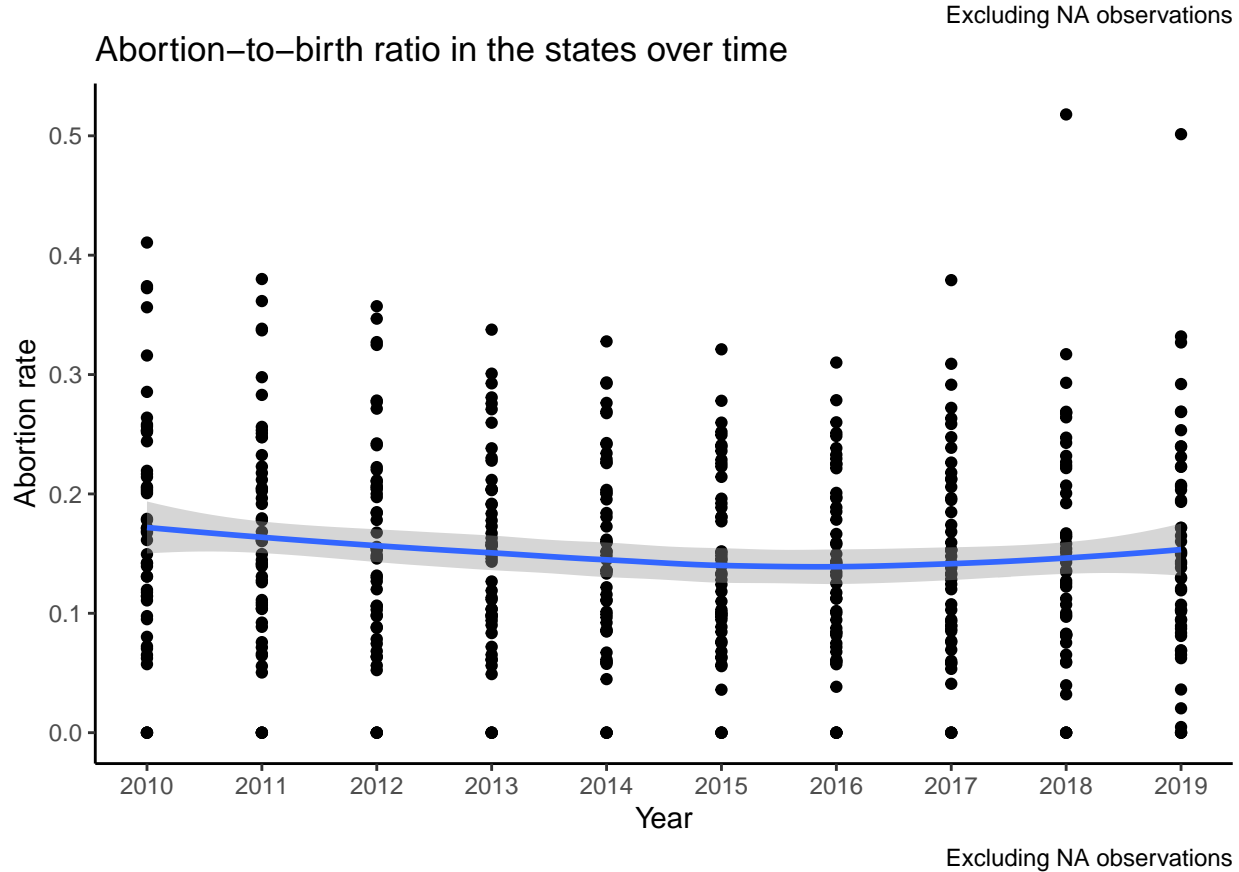
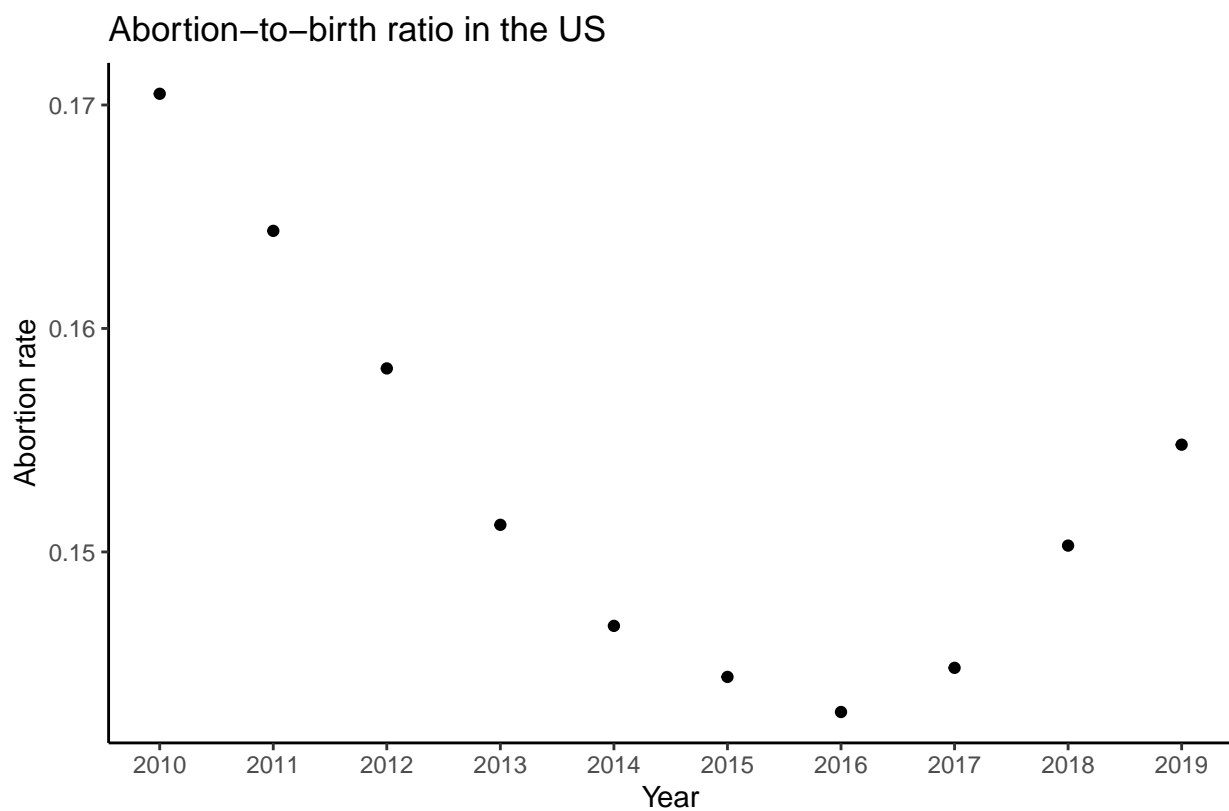
## # A tibble: 107 x 3
##   policy          in_place      n
```

##	<chr>	<chr>	<int>
## 1	fund_life_rape_incest	"X,Ñ¶"	1
## 2	fund_life_rape_incest	"X,Ñ¶,Äã"	1
## 3	hr_wait_post_counseling	"72,Äã"	1
## 4	licensed_physician	"§"	1
## 5	licensed_physician	"X-§,Äã"	1
## 6	licensed_physician	"X£æ,Äã"	1
## 7	parental_involv_minors	"Consent£æ,Äã"	1
## 8	parental_involv_minors	"Notice√æ,Äã"	1
## 9	priv_insurance_limit	",ñº"	1
## 10	priv_insurance_limit	"X\uf0b7"	1
## #	... with 97 more rows		

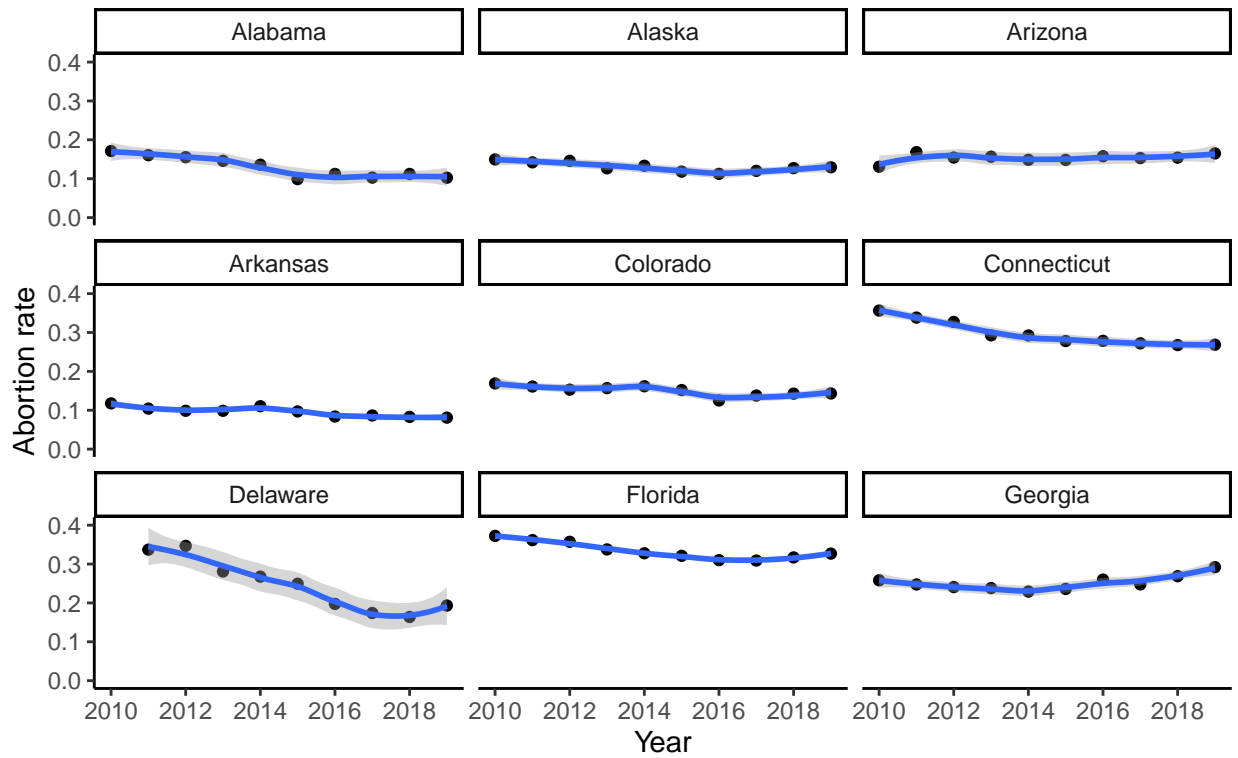
Birth data



Abortions & births

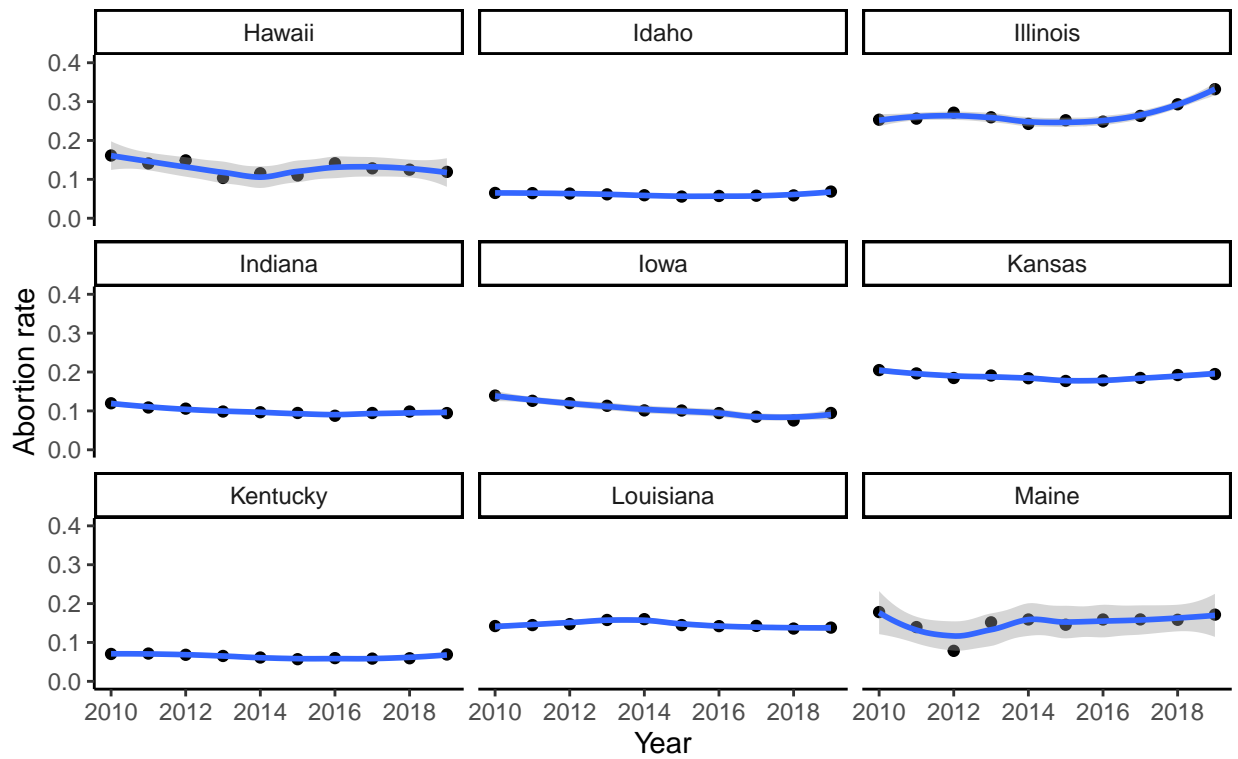


Abortion-to-birth ratio in the states over time



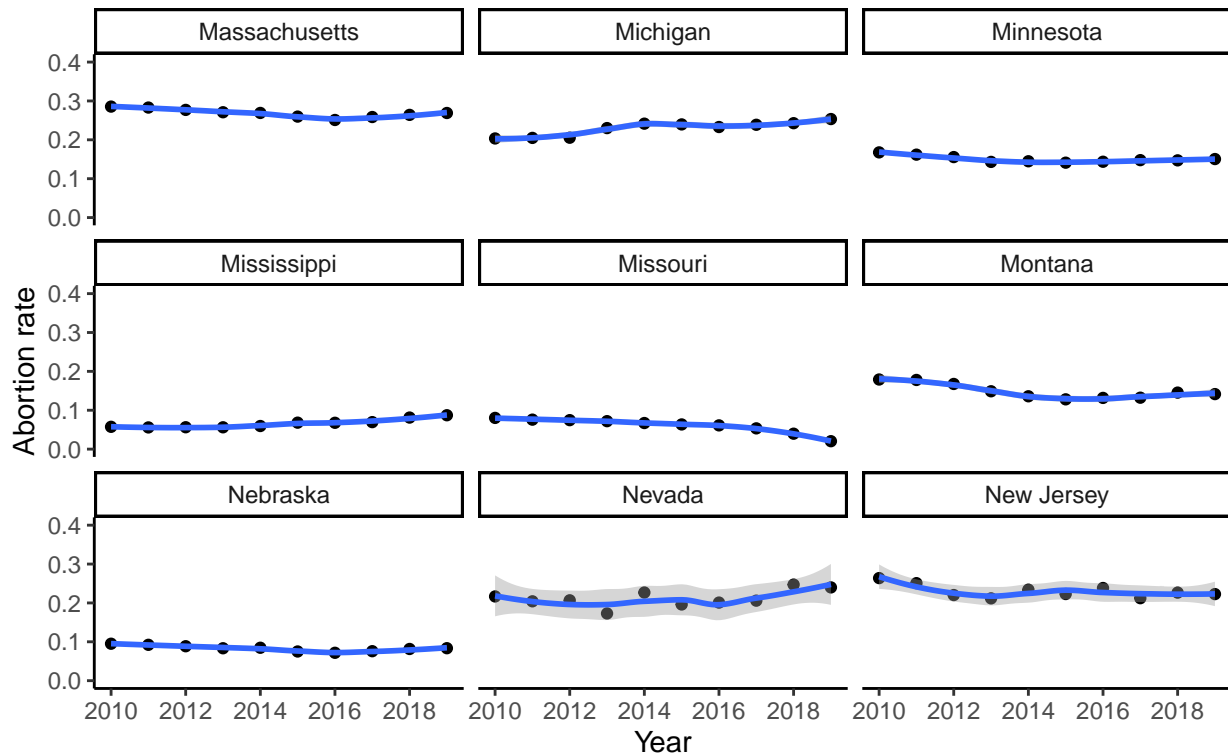
Excluding NA observations

Abortion-to-birth ratio in the states over time



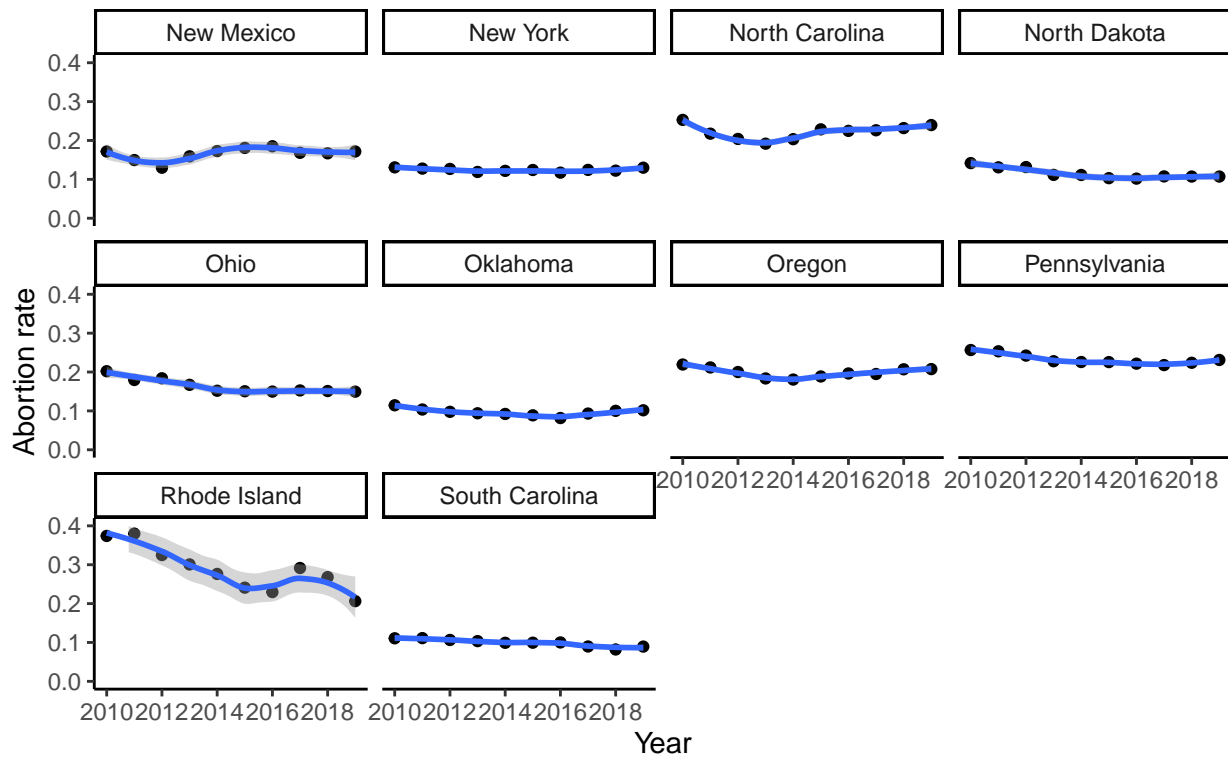
Excluding NA observations

Abortion-to-birth ratio in the states over time



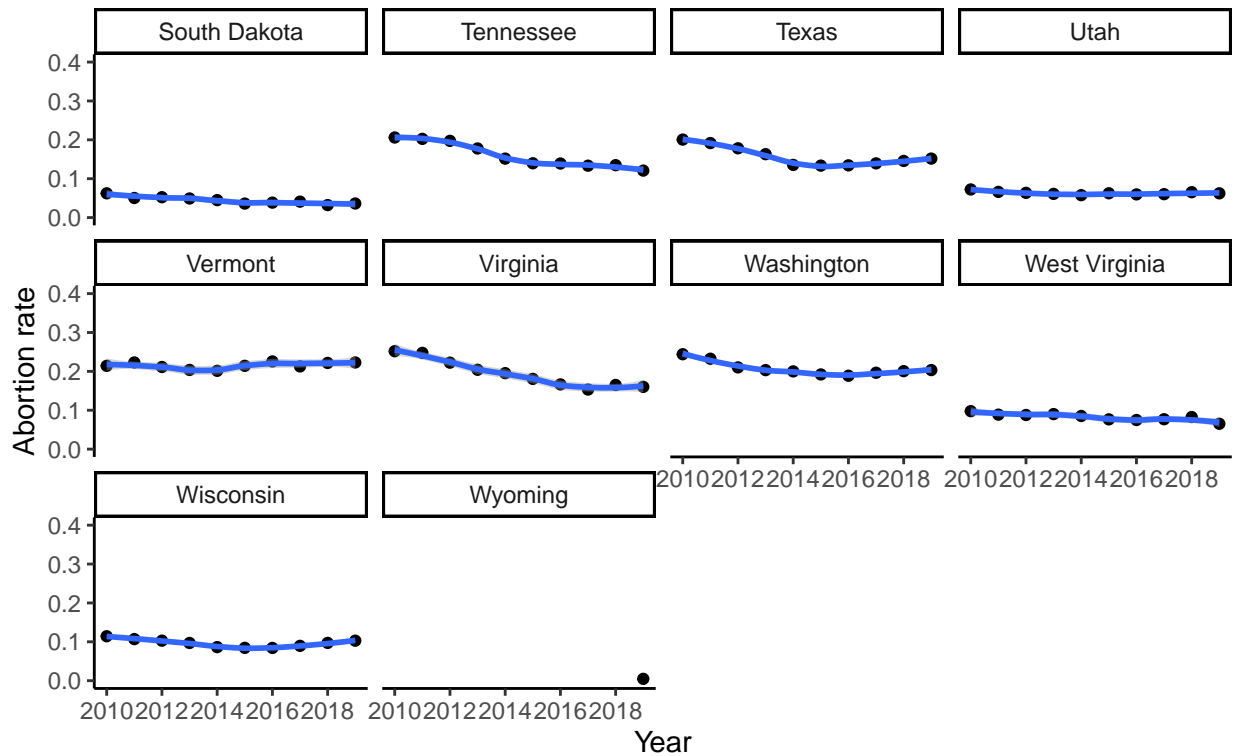
Excluding NA observations

Abortion-to-birth ratio in the states over time

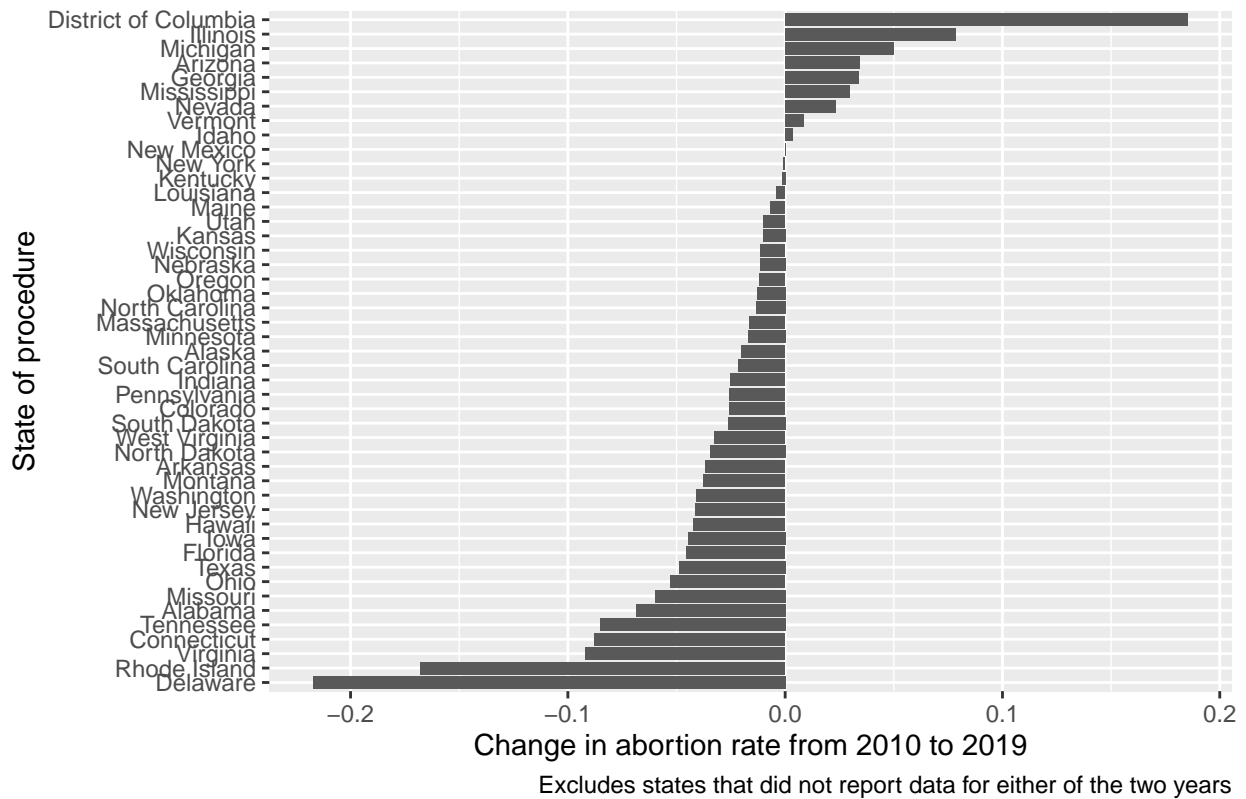


Excluding NA observations

Abortion-to-birth ratio in the states over time

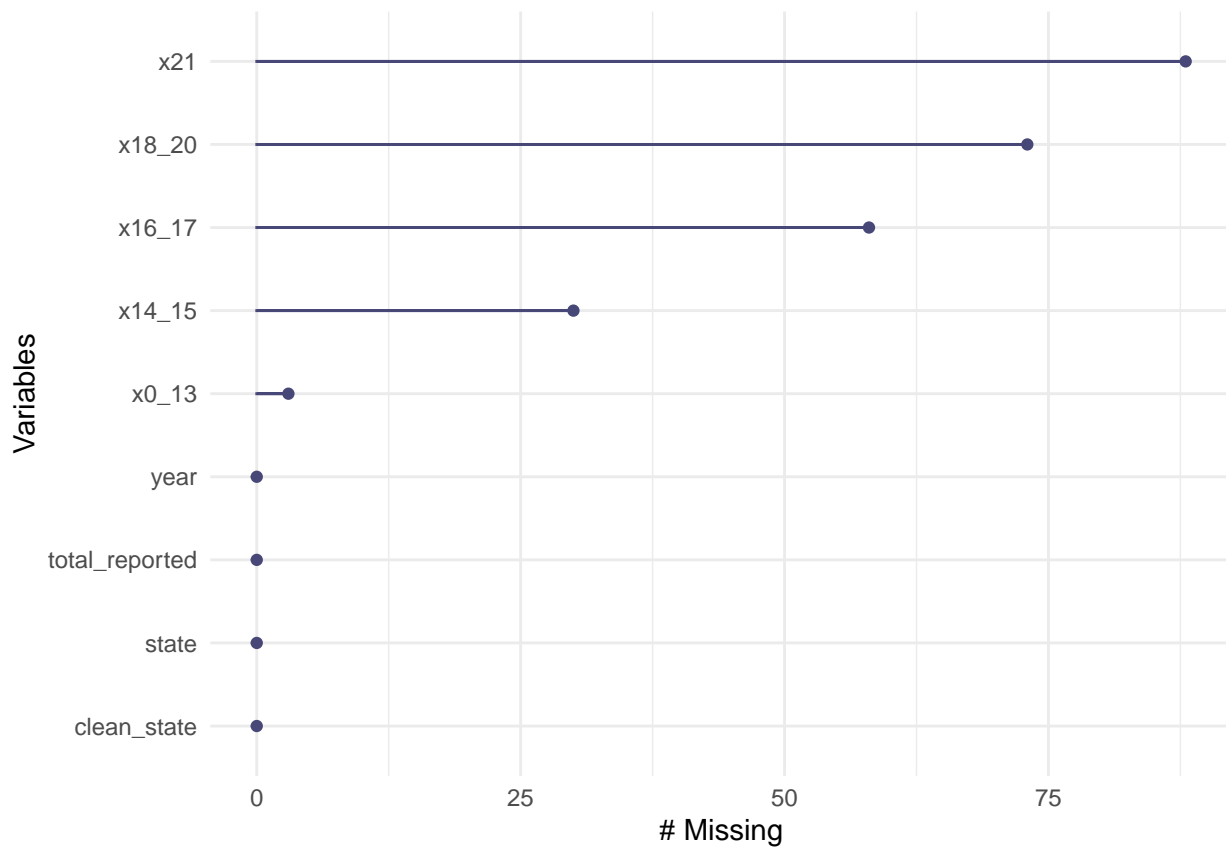


Change in abortion-to-birth ratio from 2010 to 2019
Excluding NA observations

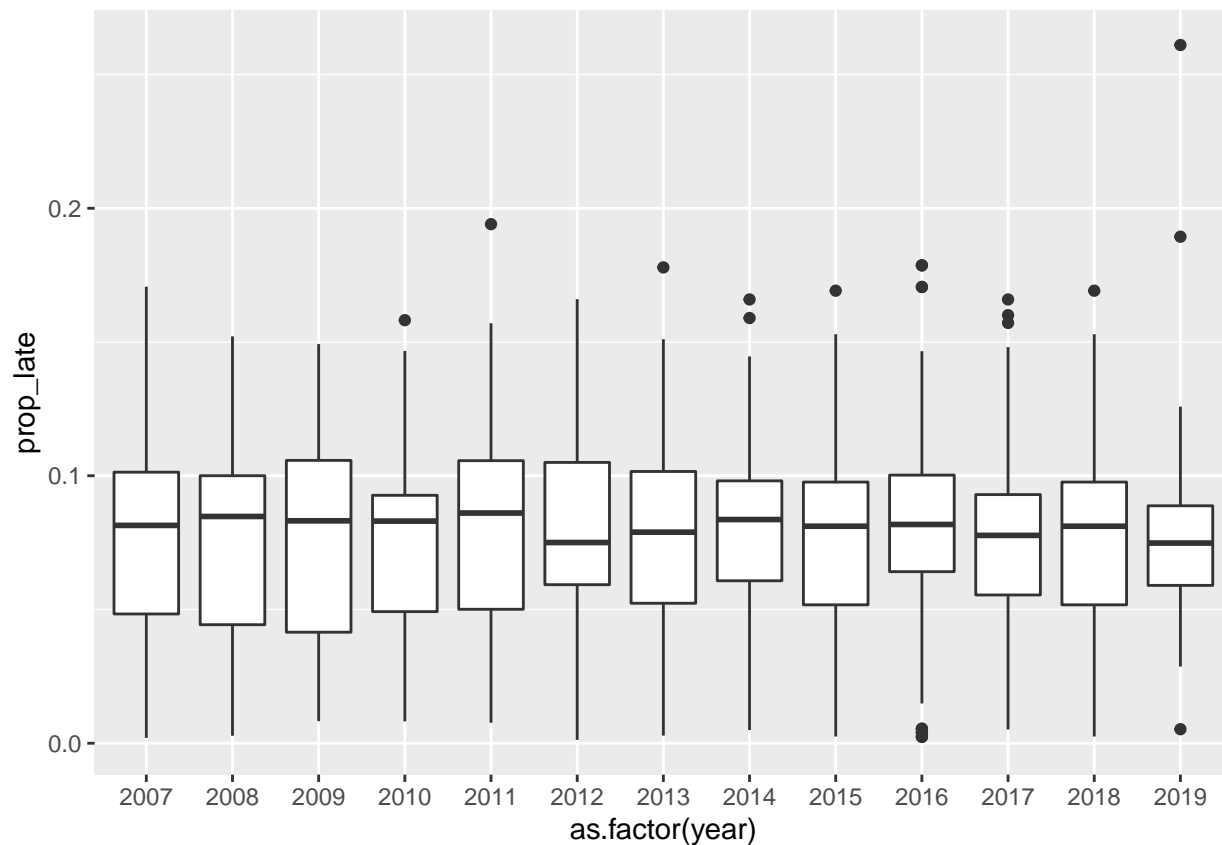


Gestational counts

```
## # A tibble: 580 x 9
##   state      x0_13 x14_15 x16_17 x18_20  x21 total_reported year clean_state
##   <chr>      <dbl>  <dbl>  <dbl>  <dbl>  <dbl>      <dbl> <dbl>  <chr>
## 1 Alabama    10266    487    270    214    11      11248  2007 Alabama
## 2 Alaska      1686     NA     NA      0    10       1700  2007 Alaska
## 3 Arizona     9990    256    171    185   103      10705  2007 Arizona
## 4 Arkansas    4266    202     NA    203    NA       4844  2007 Arkansas
## 5 Colorado   10581    338    224     90   104      11337  2007 Colorado
## 6 Delaware~   3267     99     65     42    33       3506  2007 Delaware
## 7 District~   1969    231      0    152     0       2352  2007 District of ~
## 8 Georgia    27368   1125    736    825   984      31038  2007 Georgia
## 9 Hawaii      3332     96    105    151    31       3715  2007 Hawaii
## 10 Idaho      1415      7     NA     10    NA       1438  2007 Idaho
## # ... with 570 more rows
```



```
## [1] 0.7948276
```



```
## # A tibble: 58 x 3
## # Groups:   state [22]
##   state      category     n
##   <chr>      <chr>   <int>
## 1 South Dakota x0_13      1
## 2 Wyoming     x0_13      2
## 3 Alaska      x14_15     10
## 4 Idaho       x14_15      3
## 5 Indiana     x14_15      2
## 6 South Carolina x14_15      2
## 7 South Dakota x14_15     11
## 8 Wyoming     x14_15      2
## 9 Alaska      x16_17      8
## 10 Arkansas    x16_17      3
## # ... with 48 more rows
## [1] 13
```

Abortion & gestation combined

```
## # A tibble: 6,960 x 6
##   year state_location state_residence abortions births total_population
##   <int> <chr>          <chr>          <int> <int>          <dbl>
## 1 2010 California    Alabama        NA 510198      37253956
## 2 2010 California    Alaska         NA 510198      37253956
## 3 2010 California    Arizona        NA 510198      37253956
## 4 2010 California    Arkansas       NA 510198      37253956
```

```
## 5 2010 California California NA 510198 37253956
## 6 2010 California Colorado NA 510198 37253956
## 7 2010 California Connecticut NA 510198 37253956
## 8 2010 California Delaware NA 510198 37253956
## 9 2010 California District of Columbia NA 510198 37253956
## 10 2010 California Florida NA 510198 37253956
## # ... with 6,950 more rows
```

Gestation & policies combined

```
##
## Call:
## glm(formula = prop_late ~ interstate_score + intrastate_score +
##       abortions_per_thousand_births, family = binomial, data = combine_all_late)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -0.39749  -0.10400  -0.00061   0.08014   0.57797
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -2.25703     0.20041  -11.262  <2e-16 ***
## interstate_score     0.03425     0.08666   0.395   0.693
## intrastate_score    -0.03813     0.02856  -1.335   0.182
## abortions_per_thousand_births -36.22411 1072.23054  -0.034   0.973
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 48.938  on 2051  degrees of freedom
## Residual deviance: 47.026  on 2048  degrees of freedom
## (380 observations deleted due to missingness)
## AIC: 338.27
##
## Number of Fisher Scoring iterations: 5
##
##           interstate_score      intrastate_score
##           1.002307           1.029790
## abortions_per_thousand_births
##           1.027907
##
## (Intercept) interstate_score intrastate_score
## 7.552527e-02 2.141594e-03 -6.158968e-05
##
## Linear mixed model fit by REML ['lmerMod']
## Formula: prop_late ~ interstate_score + intrastate_score + (1 | year) +
##          (1 | state)
## Data: combine_all_late
##
## REML criterion at convergence: -13585.8
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0726  -0.5167  -0.0214   0.4501   8.7871
```

```

##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   state    (Intercept) 1.350e-03 0.036743
##   year      (Intercept) 4.639e-06 0.002154
##   Residual                1.909e-04 0.013818
## Number of obs: 2425, groups:  state, 42; year, 10
##
## Fixed effects:
##               Estimate Std. Error t value
## (Intercept)      7.553e-02  6.213e-03  12.155
## interstate_score  2.142e-03  4.895e-04   4.375
## intrastate_score -6.159e-05  4.323e-04  -0.142
##
## Correlation of Fixed Effects:
##              (Intr) interstt_scr
## interstt_scr  0.024
## intrastt_scr -0.391 -0.066

```