CovidInCanadaAnalysis

May 5, 2020

1 AUTOMATIC

2020-04-03

1.1 CDF Fitting and testing rates

1.1.1 The Cruve for everywhere

1.1.2 Main calls

```
Last updated: 2020-05-05 22:46:17

    Waqar Muhammad - mwaqar@snolab.ca

    NOTE:
    All of the following was data is from Health Canada.
    The CDF fit is a logicitsts curve fit.
    The PDF fit is a simple gaussian fit.
    Day 0 is:
    -> 31-01-2020 for Canada
    -> 08-03-2020 for AB
    -> 31-01-2020 for BC
    -> 11-03-2020 for MN
    -> 11-03-2020 for NB
    -> 11-03-2020 for NL
    -> 11-03-2020 for NS
    -> 31-01-2020 for ON
    -> 11-03-2020 for PEI
    -> 01-03-2020 for QC
    -> 11-03-2020 for SW
```
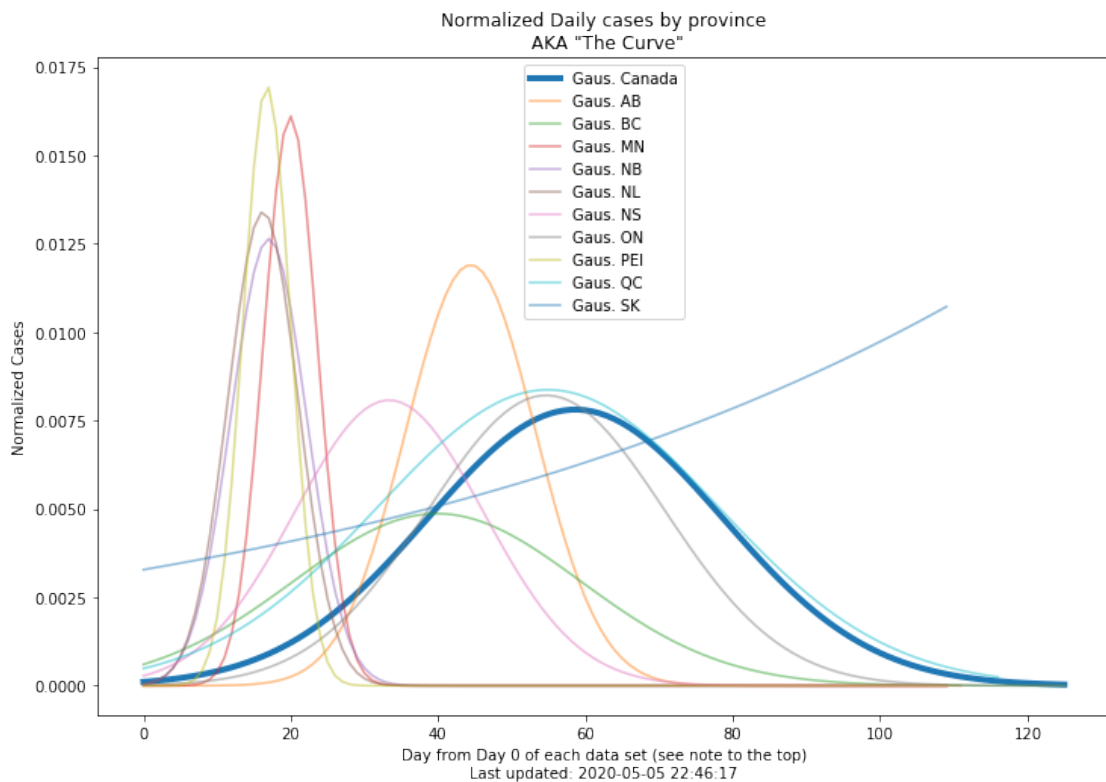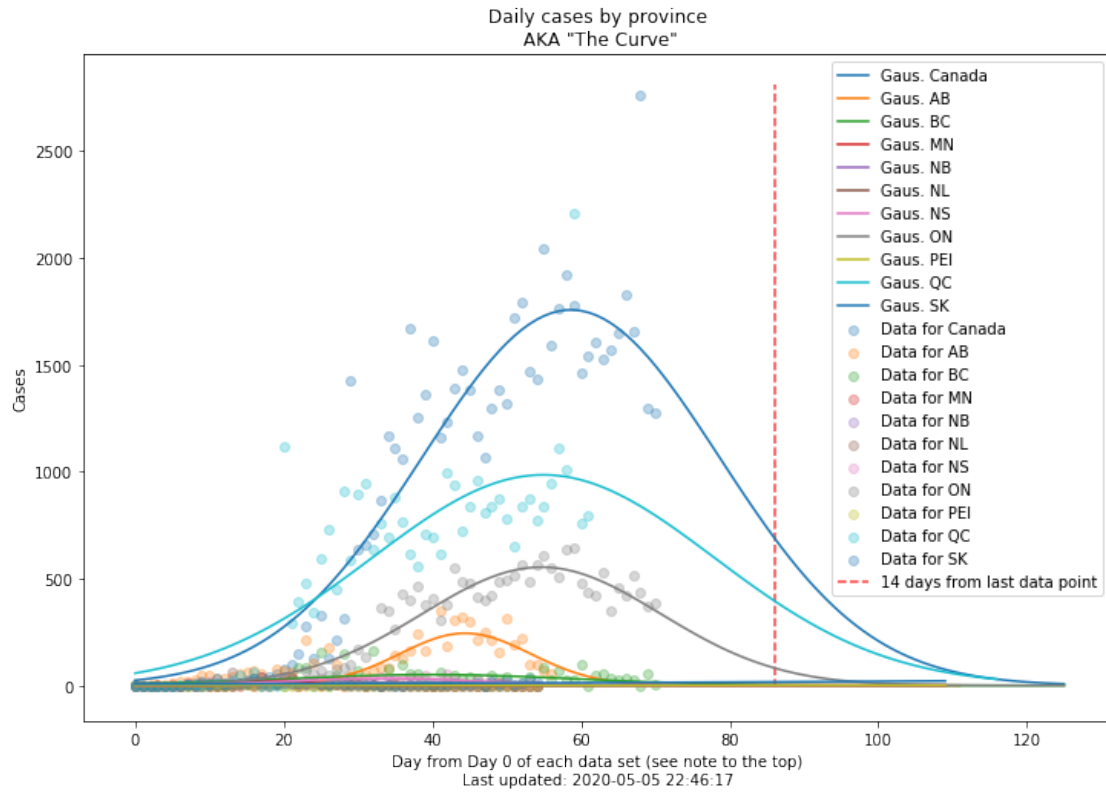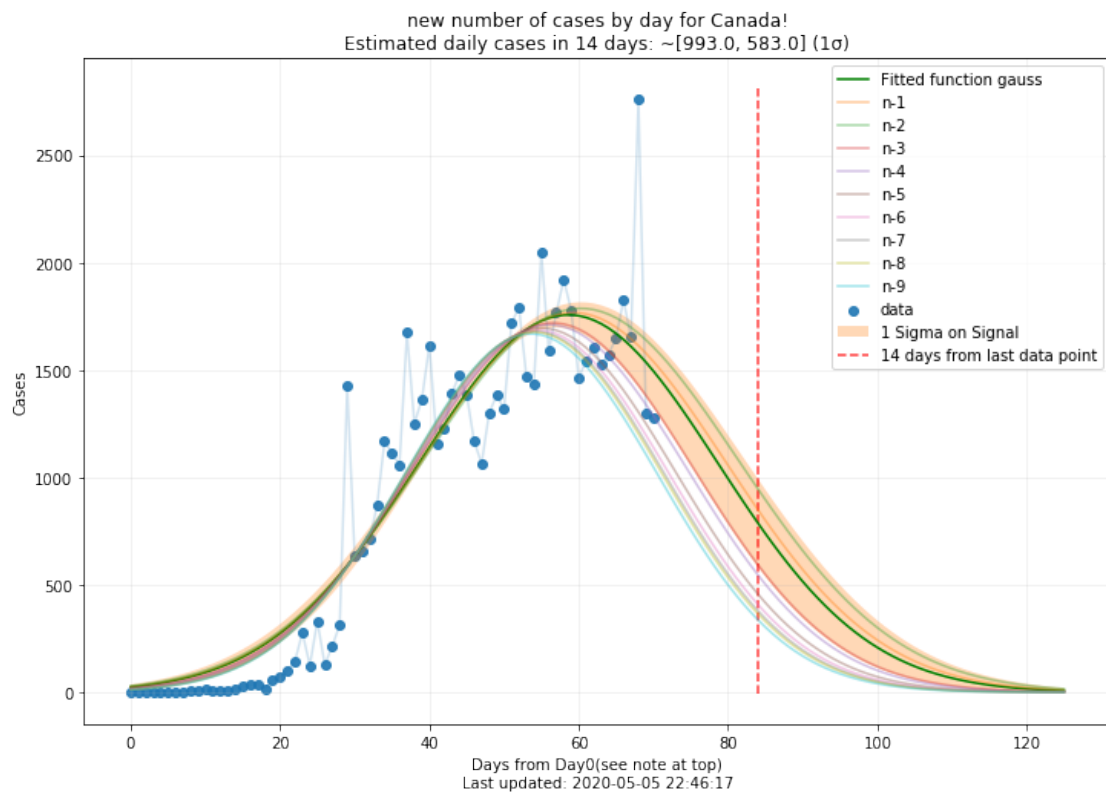
Daily cases by province
AKA "The Curve"

Last updated: 2020-05-05 22:46:17

Normalized Daily cases by province
AKA "The Curve"

Last updated: 2020-05-05 22:46:17

2

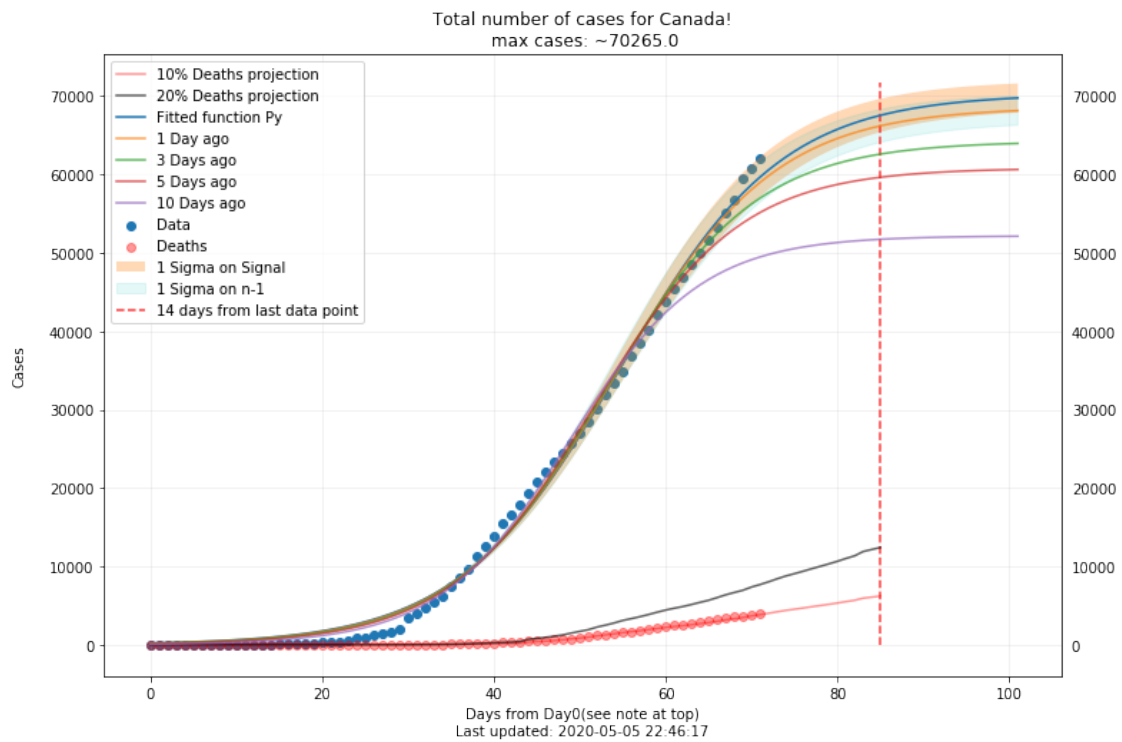The plot above shows total cases normalized to 1 for each province
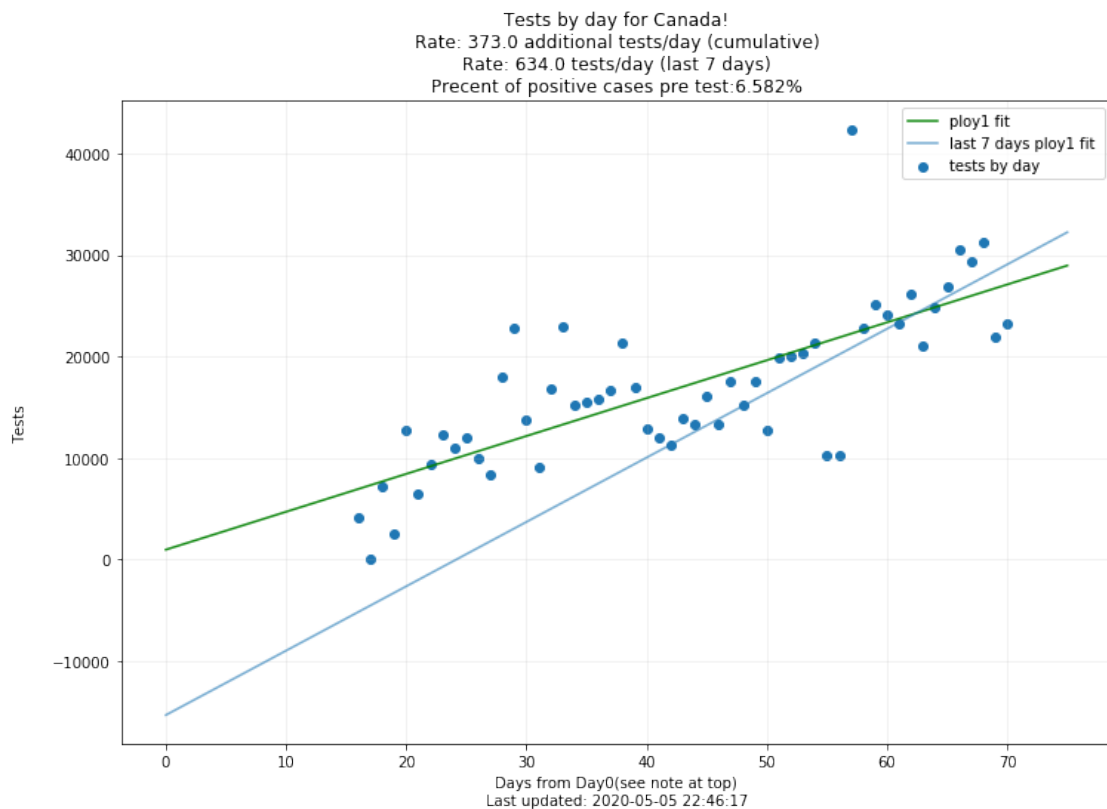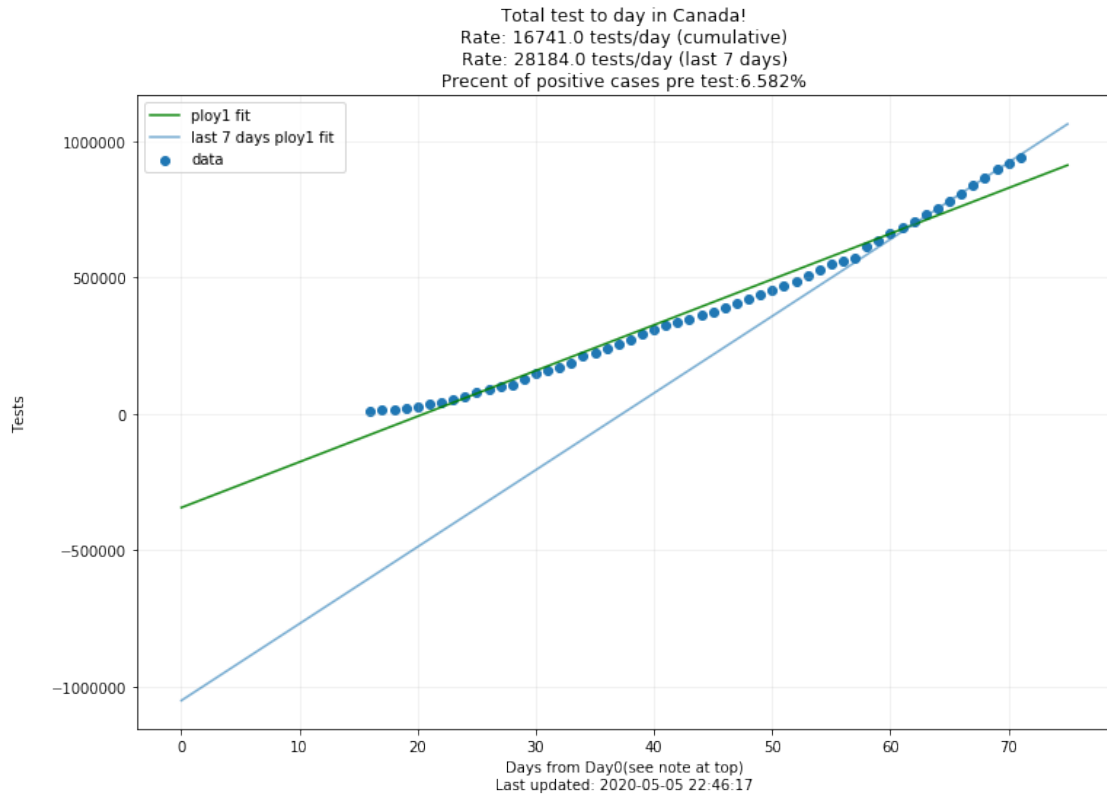
------------- Canada-------------
cases: [4.0000e+00 7.0000e+00 8.0000e+00 9.0000e+00 1.0000e+01 1.1000e+01
 1.2000e+01 1.3000e+01 1.5000e+01 2.4000e+01 3.3000e+01 4.5000e+01
 5.1000e+01 5.7000e+01 6.2000e+01 7.7000e+01 1.0300e+02 1.3800e+02
 1.7600e+02 1.9300e+02 2.4900e+02 3.2400e+02 4.2400e+02 5.6900e+02
 8.4600e+02 9.7100e+02 1.3020e+03 1.4300e+03 1.6460e+03 1.9590e+03
 3.3850e+03 4.0180e+03 4.6750e+03 5.3860e+03 6.2550e+03 7.4240e+03
 8.5360e+03 9.5950e+03 1.1268e+04 1.2519e+04 1.3882e+04 1.5496e+04
 1.6653e+04 1.7883e+04 1.9274e+04 2.0748e+04 2.2133e+04 2.3301e+04
 2.4365e+04 2.5663e+04 2.7046e+04 2.8364e+04 3.0081e+04 3.1872e+04
 3.3341e+04 3.4777e+04 3.6823e+04 3.8413e+04 4.0179e+04 4.2099e+04
 4.3877e+04 4.5341e+04 4.6884e+04 4.8489e+04 5.0015e+04 5.1587e+04
 5.3236e+04 5.5061e+04 5.6714e+04 5.9474e+04 6.0772e+04 6.2046e+04]

new number of cases by day for Canada!
Estimated daily cases in 14 days: ~[993.0, 583.0] (1σ)

Last updated: 2020-05-05 22:46:17

```
sigma+: 63109.0
n+1: 60590.0
Sigma-: 58067.0
----


params PY:  [7.02648942e+04 1.05748700e-01 5.46512039e+01]
PY sigma:   [1.76666240e+03 3.20651749e-03 6.06281076e-01]
max cases:  70265.0
infection point:  55.0
infection point date:  2020-03-26
```


Total number of cases for Canada!
max cases: ~70265.0

Total test to day in Canada!
Rate: 16741.0 tests/day (cumulative)
Rate: 28184.0 tests/day (last 7 days)
Precent of positive cases pre test:6.582%

Last updated: 2020-05-05 22:46:17

Tests by day for Canada!
Rate: 373.0 additional tests/day (cumulative)
Rate: 634.0 tests/day (last 7 days)
Precent of positive cases pre test:6.582%
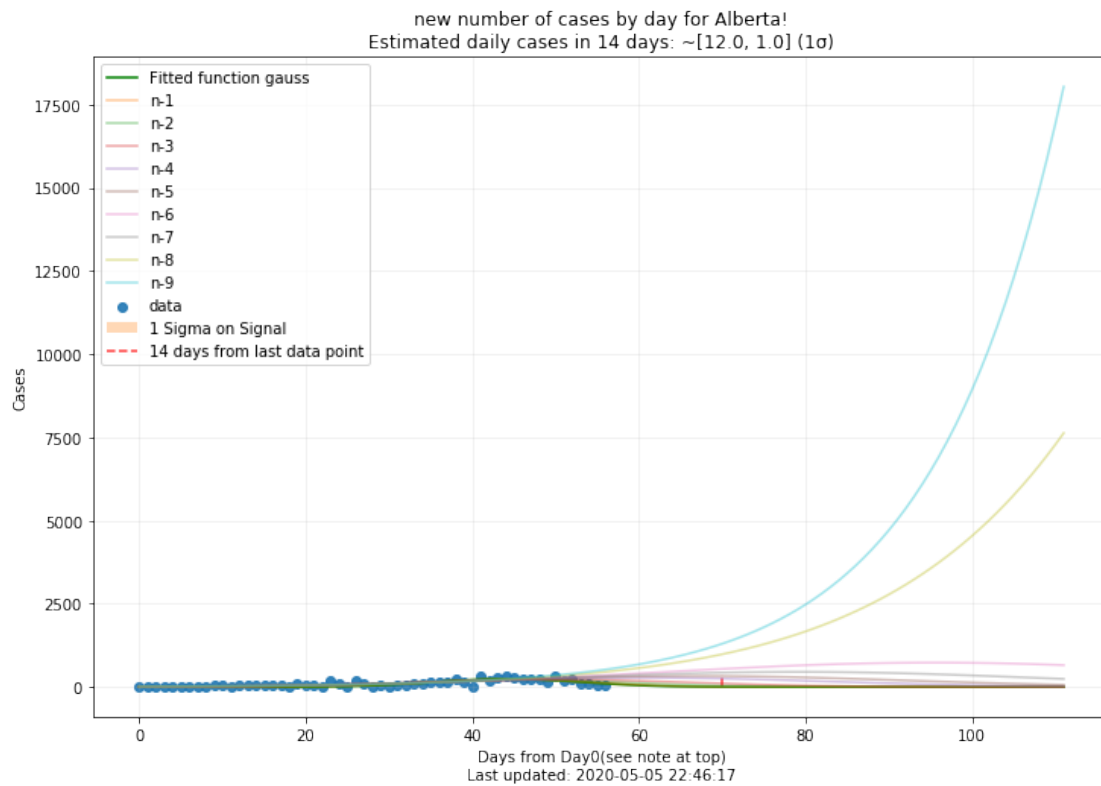
Last updated: 2020-05-05 22:46:17

Precent of positive cases pre test: 6.582 %

```
------------- Alberta-------------
cases:  [1.000e+00 7.000e+00 1.400e+01 1.900e+01 2.300e+01 2.900e+01 3.900e+01
 5.600e+01 7.400e+01 9.700e+01 1.460e+02 1.950e+02 2.260e+02 2.590e+02
 3.010e+02 3.580e+02 4.190e+02 4.860e+02 5.420e+02 5.420e+02 6.210e+02
 6.900e+02 7.540e+02 7.540e+02 9.680e+02 1.075e+03 1.075e+03 1.250e+03
 1.348e+03 1.373e+03 1.423e+03 1.451e+03 1.500e+03 1.569e+03 1.651e+03
 1.732e+03 1.870e+03 1.996e+03 2.158e+03 2.397e+03 2.562e+03 2.562e+03
 2.908e+03 3.095e+03 3.401e+03 3.720e+03 4.017e+03 4.233e+03 4.480e+03
 4.696e+03 4.850e+03 5.165e+03 5.355e+03 5.573e+03 5.670e+03 5.766e+03
 5.836e+03 5.893e+03]
```
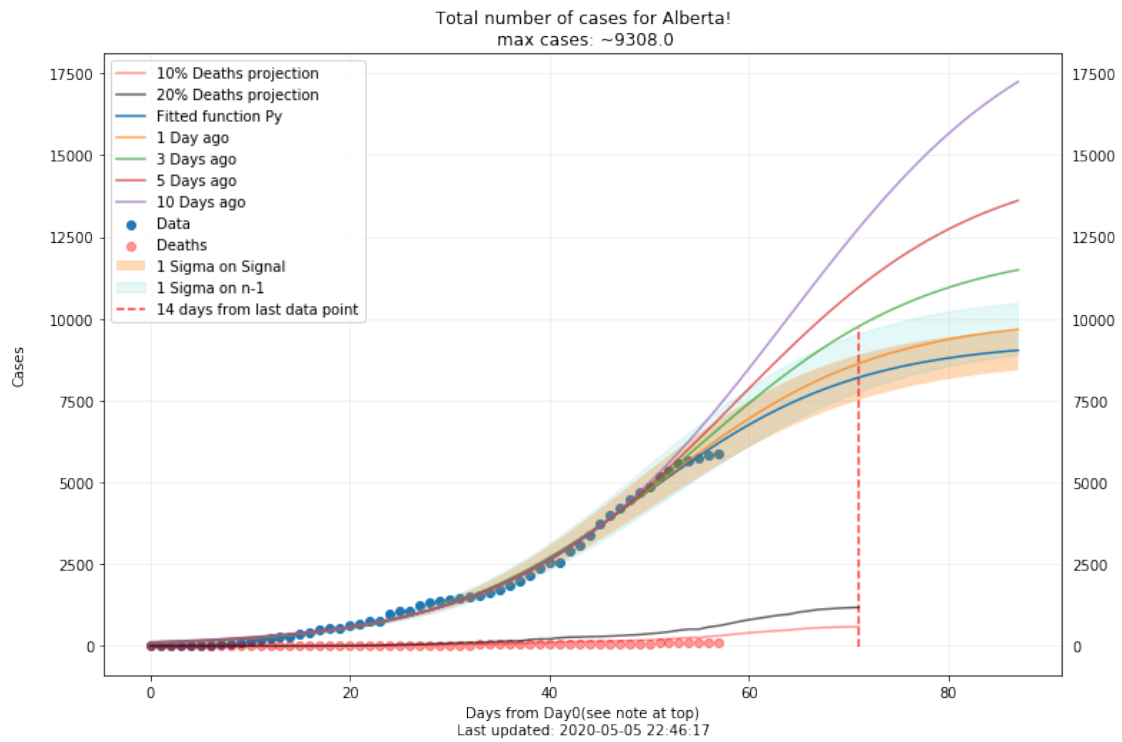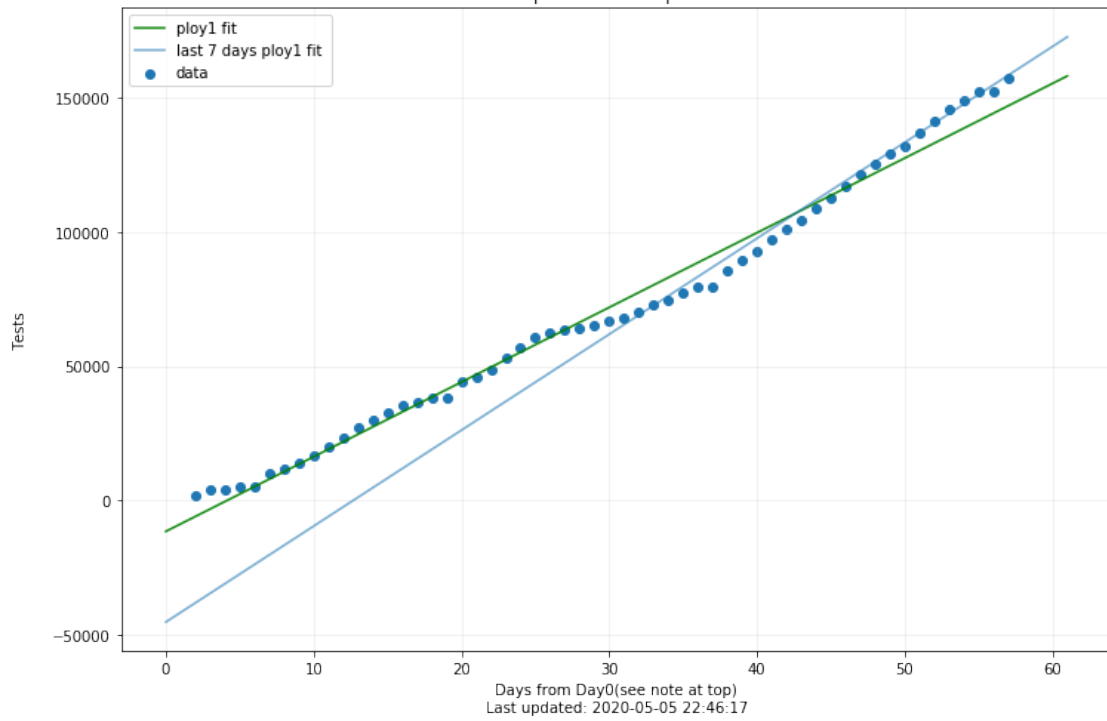

new number of cases by day for Alberta!
Estimated daily cases in 14 days: ~[12.0, 1.0] (1σ)

```
sigma+: 7116.0
n+1: 6399.0
Sigma-: 5720.0
----
```

```
params PY:  [9.30812559e+03 9.35374024e-02 4.95749257e+01]
PY sigma:  [5.59337213e+02 3.60229872e-03 1.35553574e+00]
max cases:  9308.0
infection point:  50.0
infection point date:  2020-03-21
```
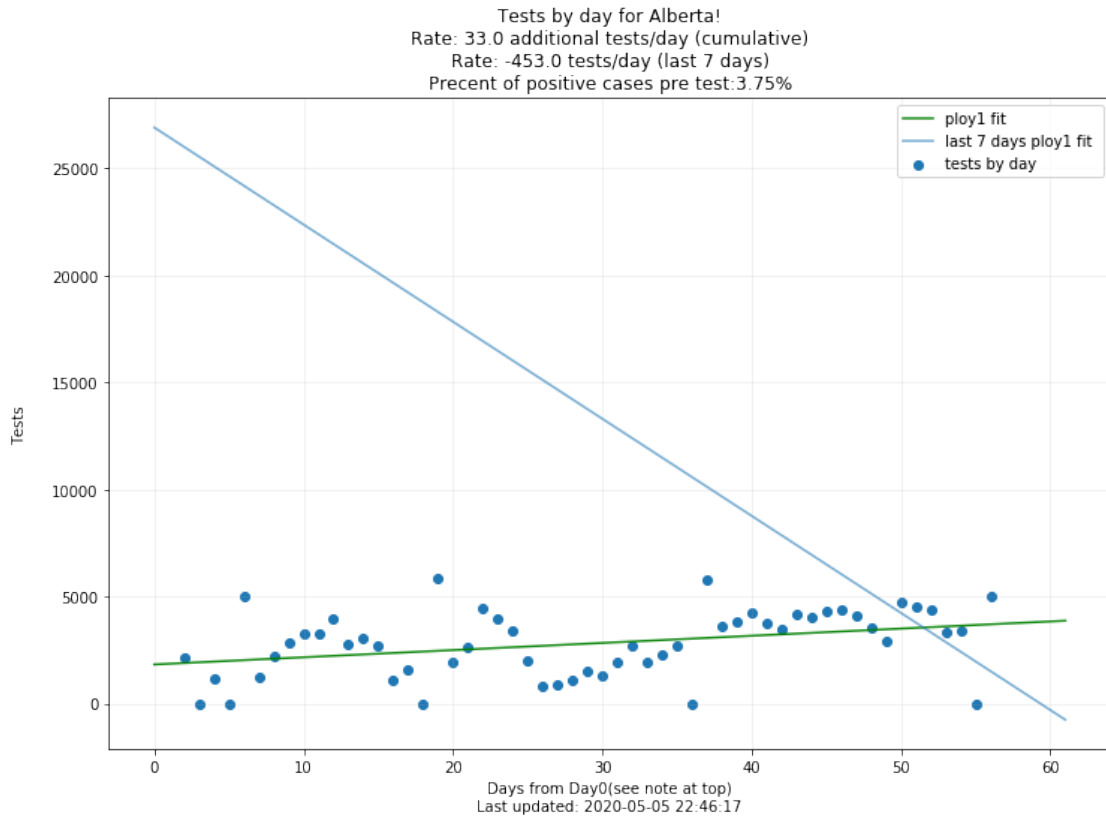

Total number of cases for Alberta!
max cases: ~9308.0

Total test to day in Alberta!
Rate: 2779.0 tests/day (cumulative)
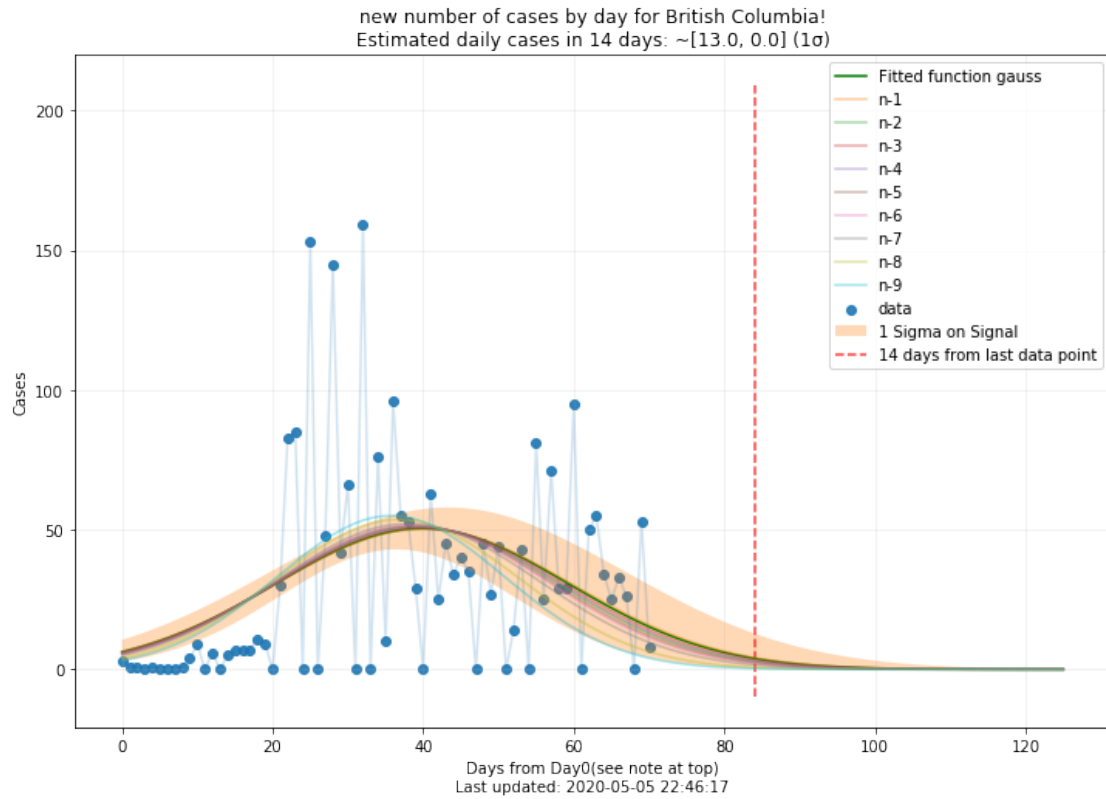Rate: 3571.0 tests/day (last 7 days)
Precent of positive cases pre test:3.75%

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Tests by day for Alberta!
Rate: 33.0 additional tests/day (cumulative)
Rate: -453.0 tests/day (last 7 days)
Precent of positive cases pre test:3.75%

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Precent of positive cases pre test: 3.75 %

------------- British Columbia-------------
cases: [1.000e+00 4.000e+00 5.000e+00 6.000e+00 6.000e+00 7.000e+00 7.000e+00
 7.000e+00 7.000e+00 8.000e+00 1.200e+01 2.100e+01 2.100e+01 2.700e+01
 2.700e+01 3.200e+01 3.900e+01 4.600e+01 5.300e+01 6.400e+01 7.300e+01
 7.300e+01 1.030e+02 1.860e+02 2.710e+02 2.710e+02 4.240e+02 4.240e+02
 4.720e+02 6.170e+02 6.590e+02 7.250e+02 7.250e+02 8.840e+02 8.840e+02
 9.600e+02 9.700e+02 1.066e+03 1.121e+03 1.174e+03 1.203e+03 1.203e+03
 1.266e+03 1.291e+03 1.336e+03 1.370e+03 1.410e+03 1.445e+03 1.445e+03
 1.490e+03 1.517e+03 1.561e+03 1.561e+03 1.575e+03 1.618e+03 1.618e+03
 1.699e+03 1.724e+03 1.795e+03 1.824e+03 1.853e+03 1.948e+03 1.948e+03
 1.998e+03 2.053e+03 2.087e+03 2.112e+03 2.145e+03 2.171e+03 2.171e+03
 2.224e+03 2.232e+03]

new number of cases by day for British Columbia!
Estimated daily cases in 14 days: ~[13.0, 0.0] (1σ)
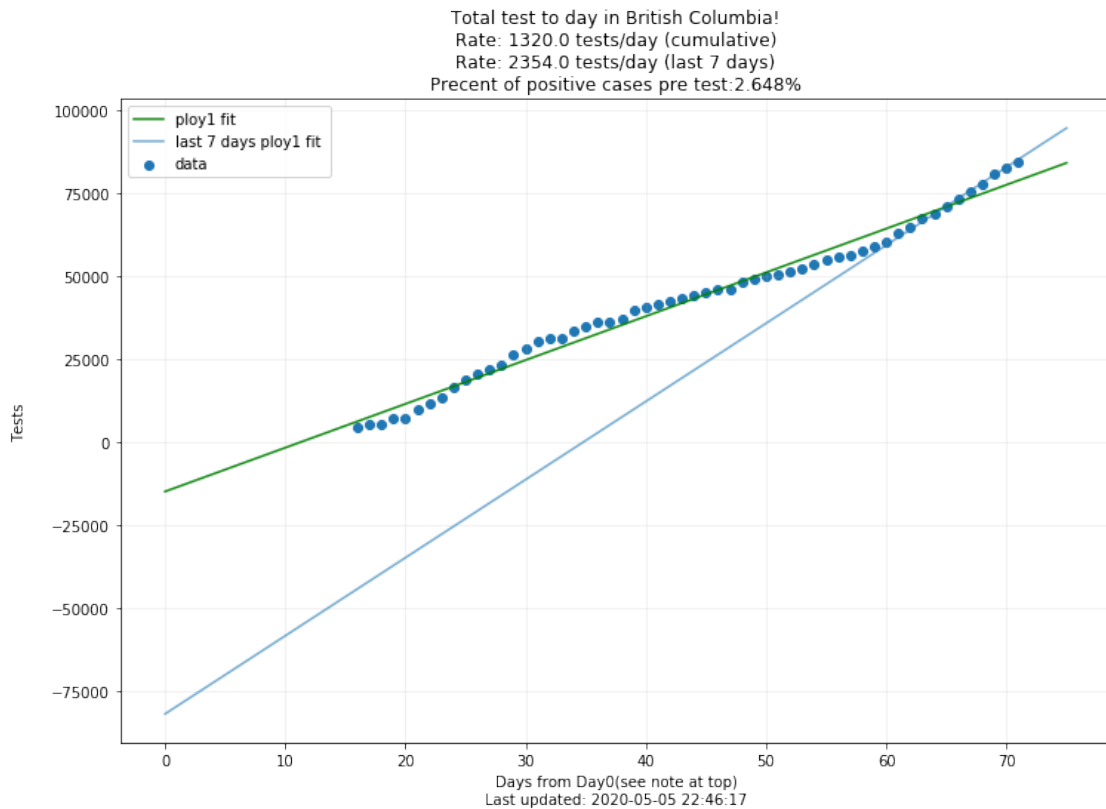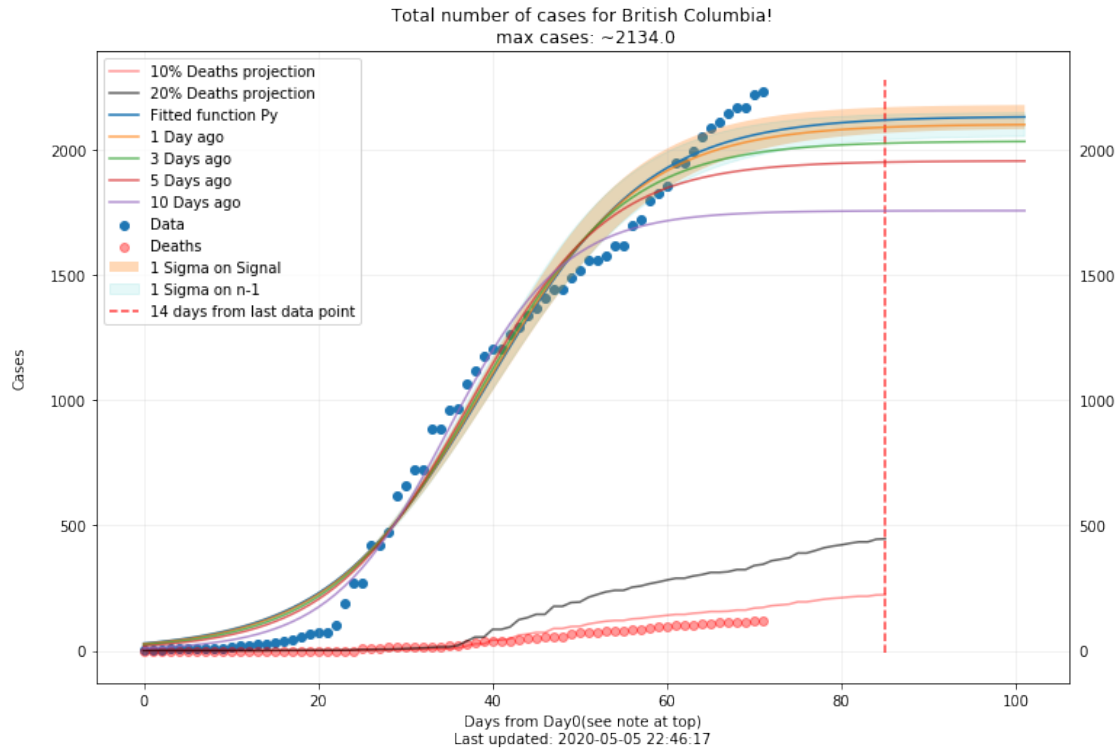
sigma+: 2134.0
n+1: 2074.0
Sigma-: 2012.0
----

params PY: [2.13427221e+03 1.08856800e-01 3.94539575e+01]
PY sigma: [4.67343825e+01 5.78685644e-03 6.78165800e-01]
max cases: 2134.0
infection point: 39.0
infection point date: 2020-03-10

Total number of cases for British Columbia!
max cases: ~2134.0

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Total test to day in British Columbia!
Rate: 1320.0 tests/day (cumulative)
Rate: 2354.0 tests/day (last 7 days)
Precent of positive cases pre test:2.648%

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Tests by day for British Columbia!
Rate: 7.0 additional tests/day (cumulative)
Rate: 83.0 tests/day (last 7 days)
Precent of positive cases pre test:2.648%

Last updated: 2020-05-05 22:46:17

Precent of positive cases pre test: 2.648 %

------------- Manitoba-------------
cases: [0.   0.   1.   1.   4.   4.   7.   8. 17. 17. 11. 11. 11. 11.
  11. 11. 25. 25. 69. 83. 91. 109. 152. 164. 172. 187. 190. 203.
 206. 207. 215. 226. 226. 229. 229. 231. 239. 239. 243. 245. 246. 246.
 246. 251. 252. 256. 260. 261. 261. 263. 275. 279. 280. 281. 281. 282.]

new number of cases by day for Manitoba!
Estimated daily cases in 14 days: ~[0.0, 0.0] (1σ)

Last updated: 2020-05-05 22:46:17

sigma+: 260.0
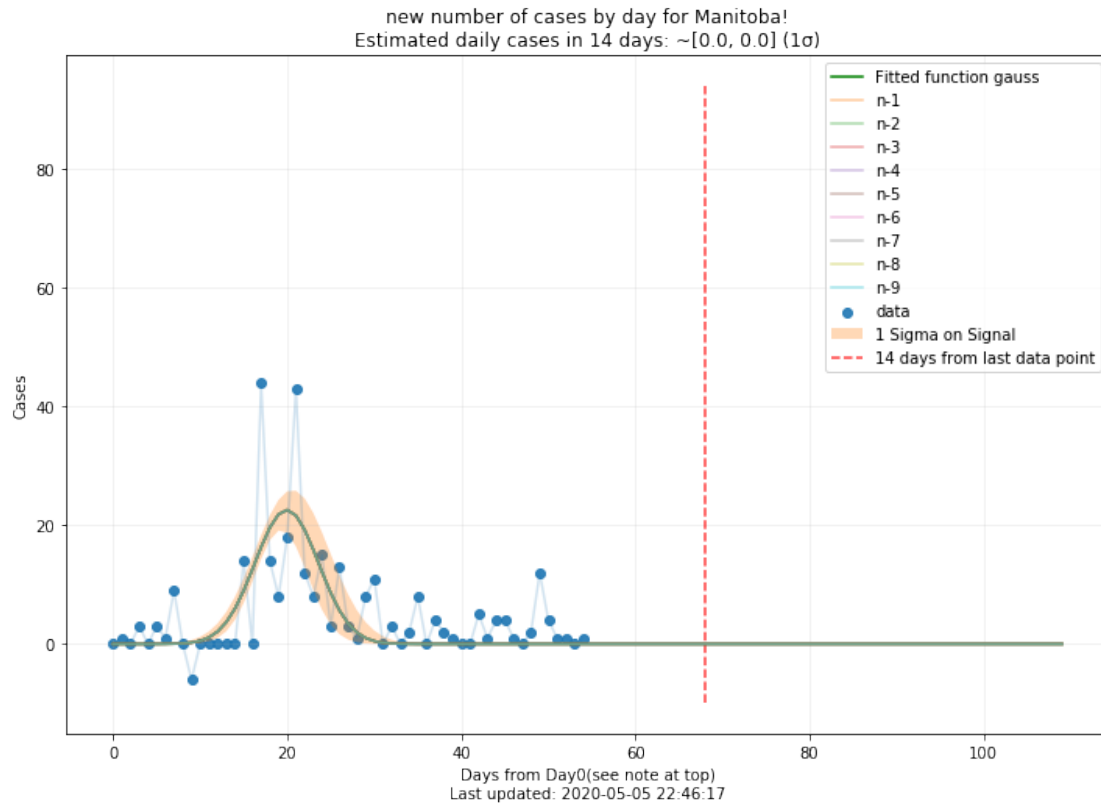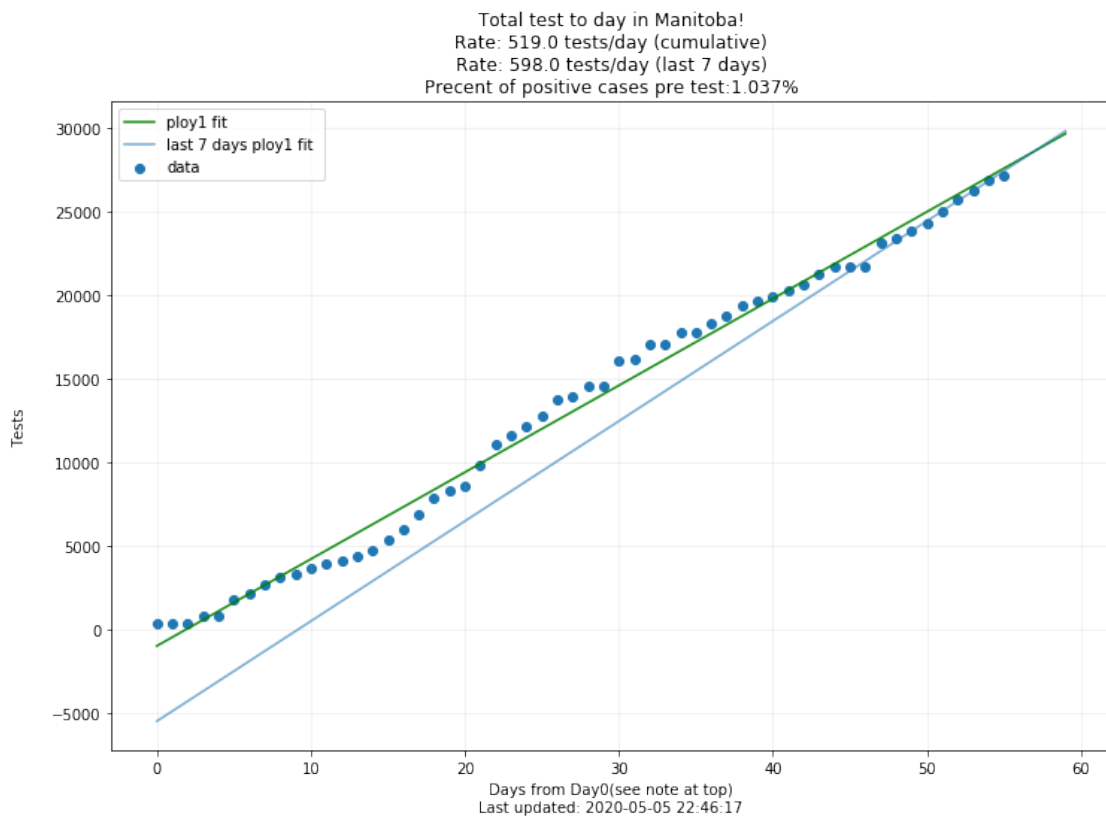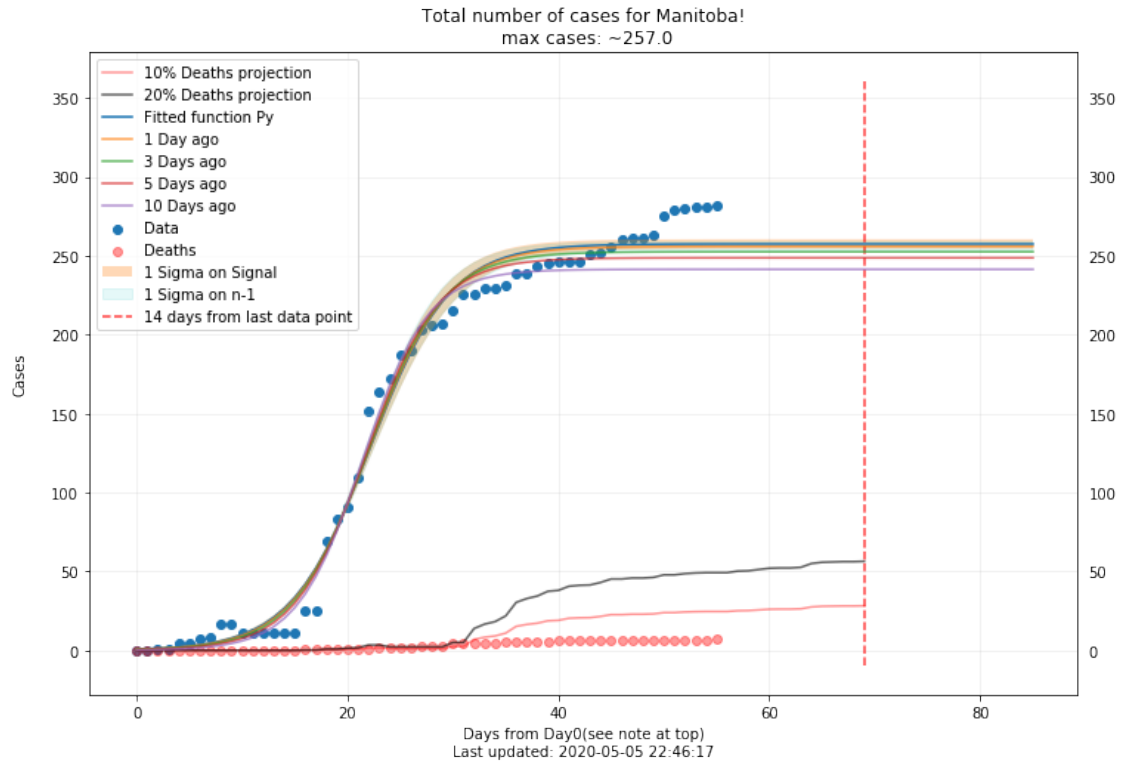n+1: 257.0
Sigma-: 254.0
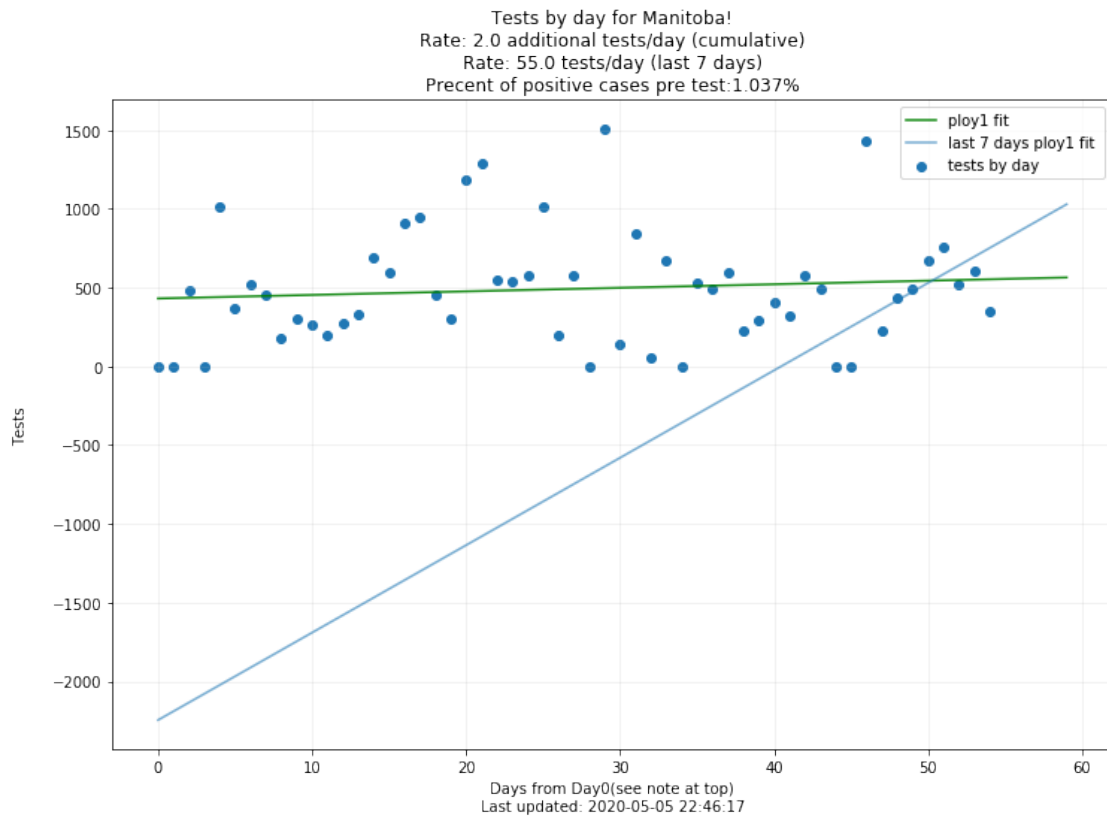----

params PY: [257.45518904   0.26446982   22.17463214]
PY sigma: [2.9752248   0.01656856 0.27615934]
max cases: 257.0
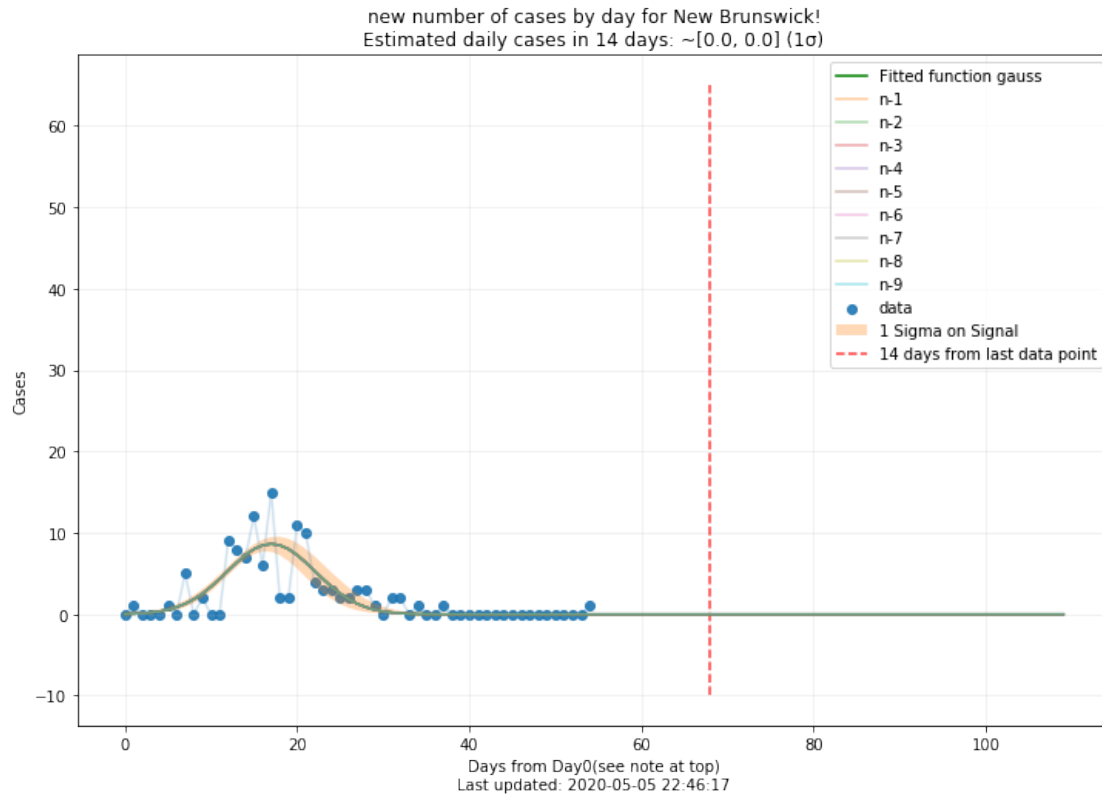infection point: 22.0
infection point date: 2020-02-22

Total number of cases for Manitoba!
max cases: ~257.0

Total test to day in Manitoba!
Rate: 519.0 tests/day (cumulative)
Rate: 598.0 tests/day (last 7 days)
Precent of positive cases pre test:1.037%

Tests by day for Manitoba!
Rate: 2.0 additional tests/day (cumulative)
Rate: 55.0 tests/day (last 7 days)
Precent of positive cases pre test:1.037%

Precent of positive cases pre test: 1.037 %

------------- New Brunswick-------------
cases: [0.   0.   1.   1.   1.   1.   2.   2.   7.   7.   9.   9.   9.   18.
   26.   33.   45.   51.   66.   68.   70.   81.   91.   95.   98. 101. 103. 105.
  108. 111. 112. 112. 114. 116. 116. 117. 117. 117. 118. 118. 118. 118.
  118. 118. 118. 118. 118. 118. 118. 118. 118. 118. 118. 118. 118. 119.]

new number of cases by day for New Brunswick!
Estimated daily cases in 14 days: ~[0.0, 0.0] (1σ)

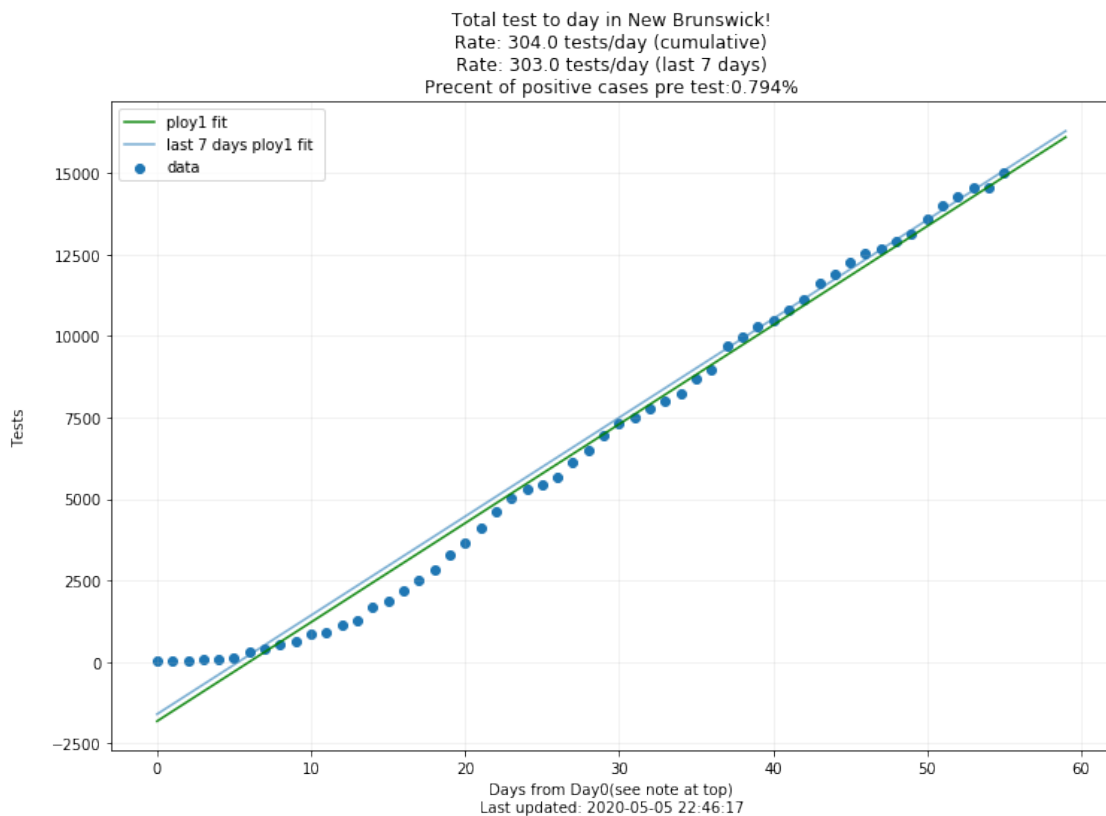sigma+: 118.0
n+1: 117.0
Sigma-: 117.0
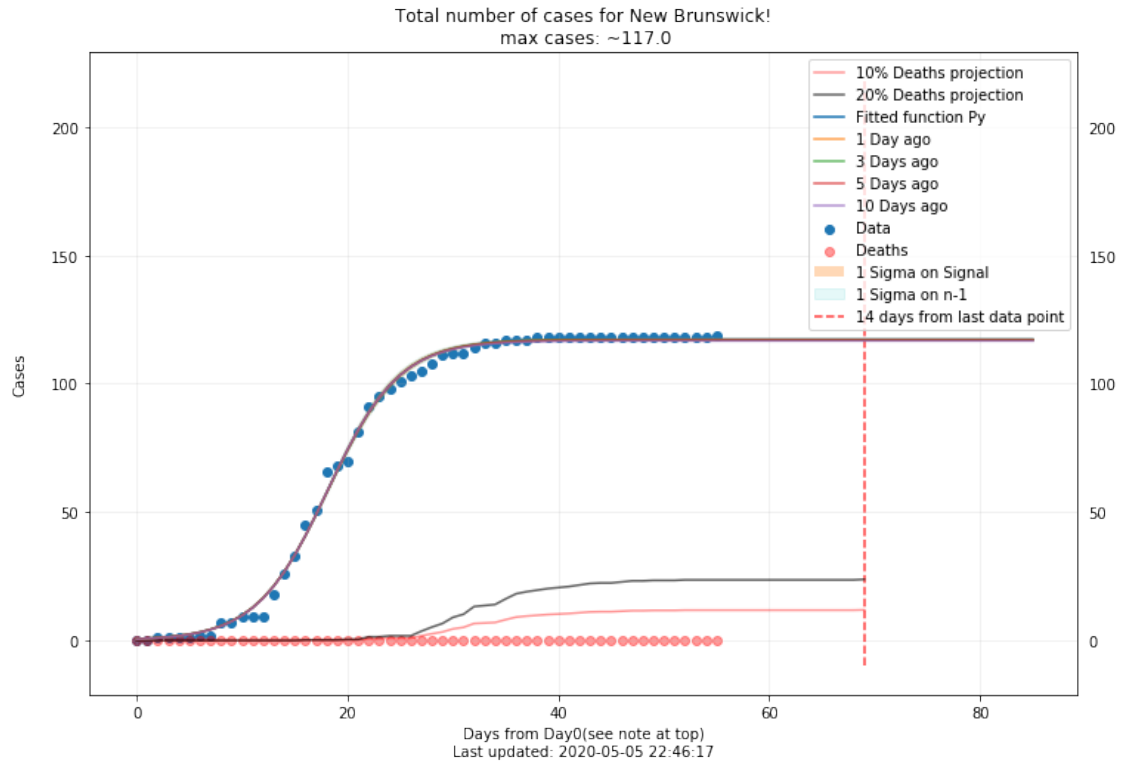----
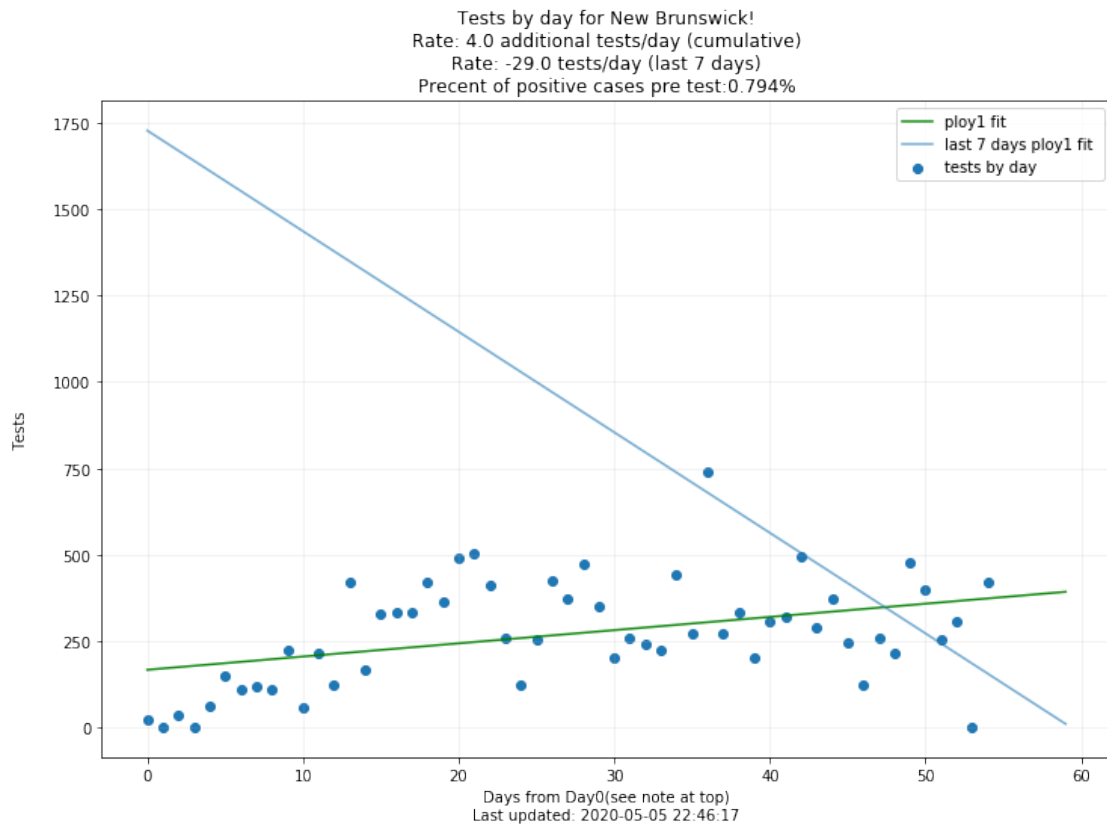
params PY: [117.27939312   0.29336579 18.14802883]
PY sigma: [0.47610951 0.0074755   0.10052057]
max cases: 117.0
infection point: 18.0
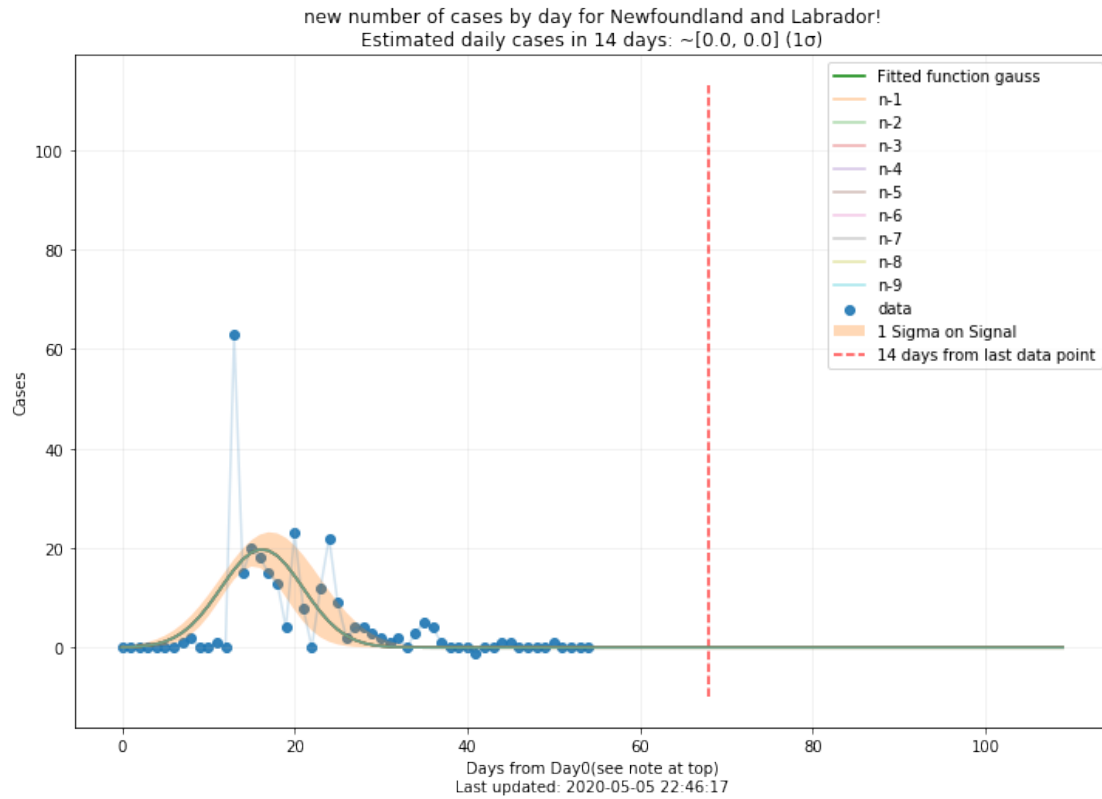infection point date: 2020-02-18

Total number of cases for New Brunswick!
max cases: ~117.0

Total test to day in New Brunswick!
Rate: 304.0 tests/day (cumulative)
Rate: 303.0 tests/day (last 7 days)
Precent of positive cases pre test:0.794%

Tests by day for New Brunswick!
Rate: 4.0 additional tests/day (cumulative)
Rate: -29.0 tests/day (last 7 days)
Precent of positive cases pre test:0.794%

Precent of positive cases pre test: 0.794 %

------------- Newfoundland and Labrador-------------
cases: [0.   0.   0.   0.   0.   0.   0.   0.   1.   3.   3.   3.   4.   4.
   67.   82. 102. 120. 135. 148. 152. 175. 183. 183. 195. 217. 226. 228.
  232. 236. 239. 241. 242. 244. 244. 247. 252. 256. 257. 257. 257. 257.
  256. 256. 256. 257. 258. 258. 258. 258. 258. 259. 259. 259. 259. 259.]

new number of cases by day for Newfoundland and Labrador!
Estimated daily cases in 14 days: ~[0.0, 0.0] (1σ)

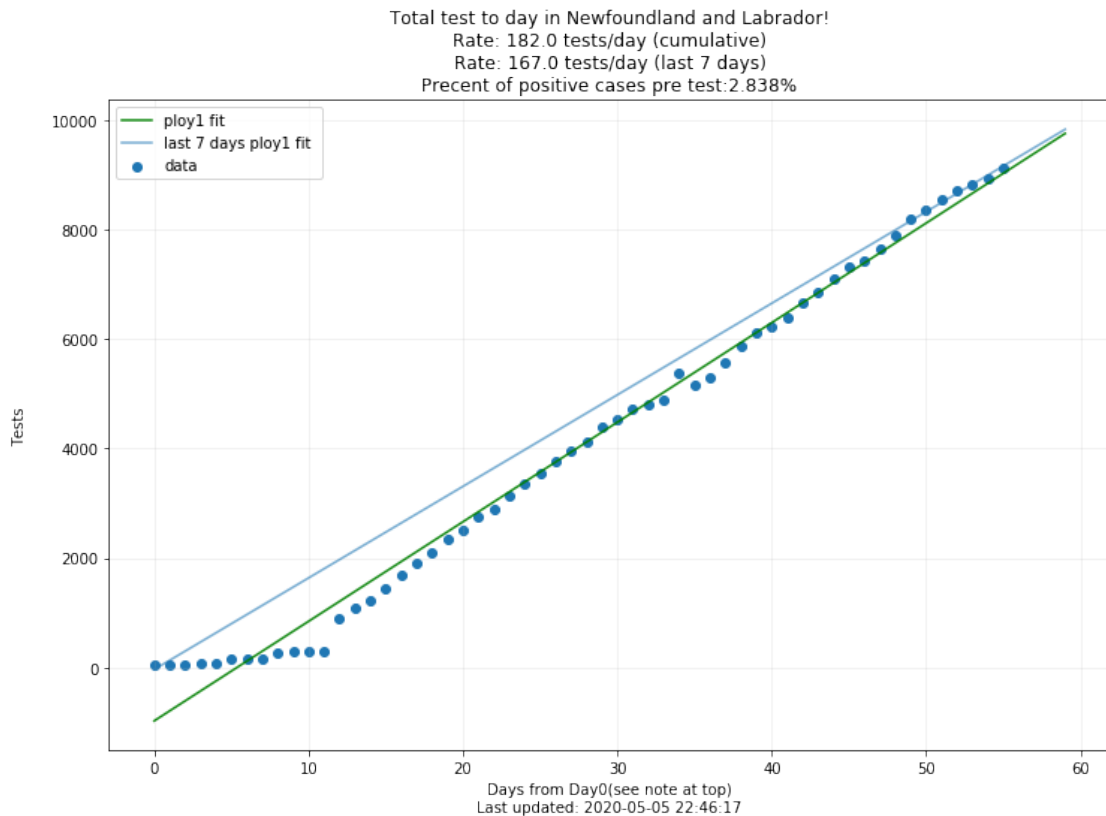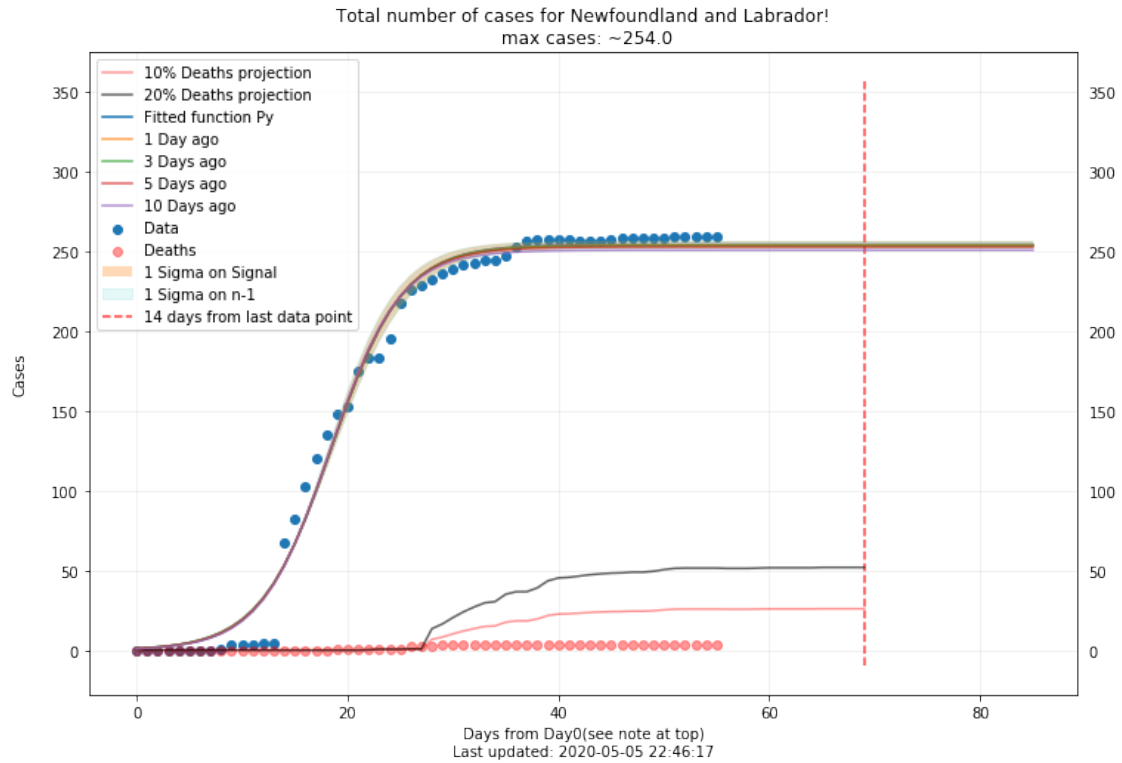sigma+: 256.0
n+1: 254.0
Sigma-: 252.0
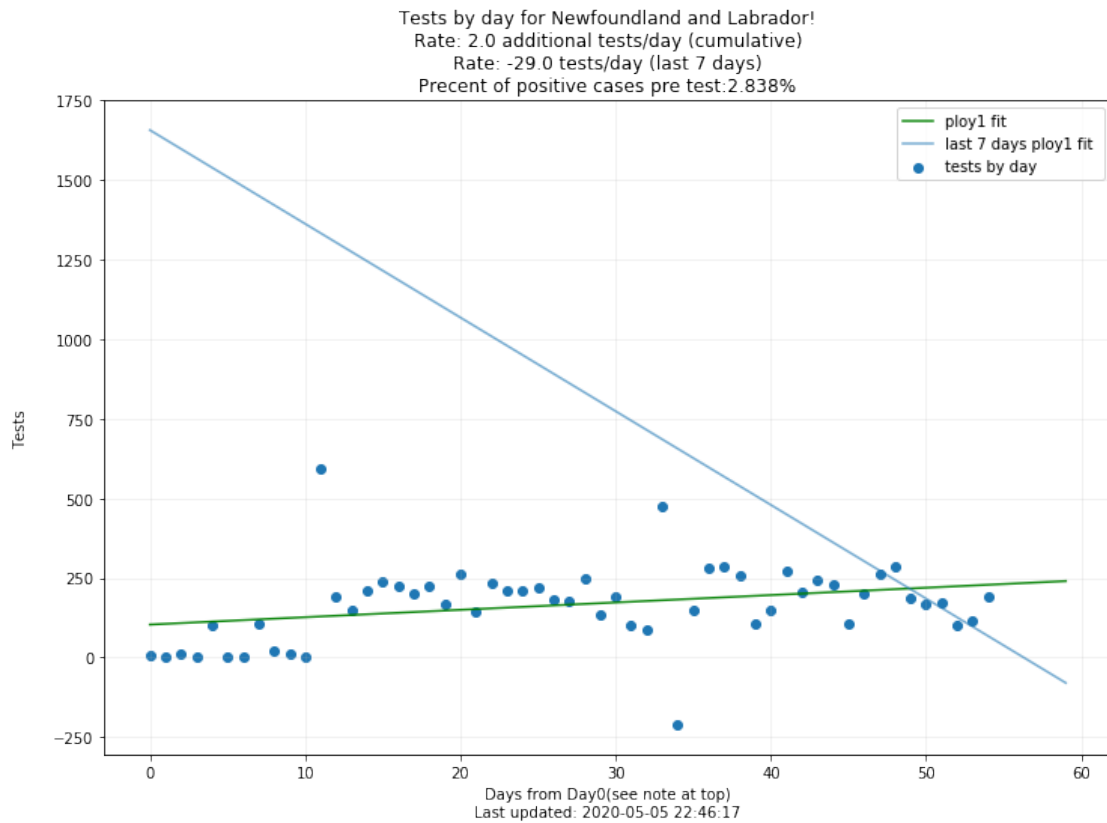----

params PY: [253.84304737   0.2950995   18.49487854]
PY sigma: [2.22403502 0.01619047 0.21521071]
max cases: 254.0
infection point: 18.0
infection point date: 2020-02-18

Total number of cases for Newfoundland and Labrador!
max cases: ~254.0

Legend:
- 10% Deaths projection
- 20% Deaths projection
- Fitted function Py
- 1 Day ago
- 3 Days ago
- 5 Days ago
- 10 Days ago
- Data
- Deaths
- 1 Sigma on Signal
- 1 Sigma on n-1
- 14 days from last data point

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Total test to day in Newfoundland and Labrador!
Rate: 182.0 tests/day (cumulative)
Rate: 167.0 tests/day (last 7 days)
Precent of positive cases pre test:2.838%

Legend:
- ploy1 fit
- last 7 days ploy1 fit
- data

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Tests by day for Newfoundland and Labrador!
Rate: 2.0 additional tests/day (cumulative)
Rate: -29.0 tests/day (last 7 days)
Precent of positive cases pre test:2.838%

Last updated: 2020-05-05 22:46:17
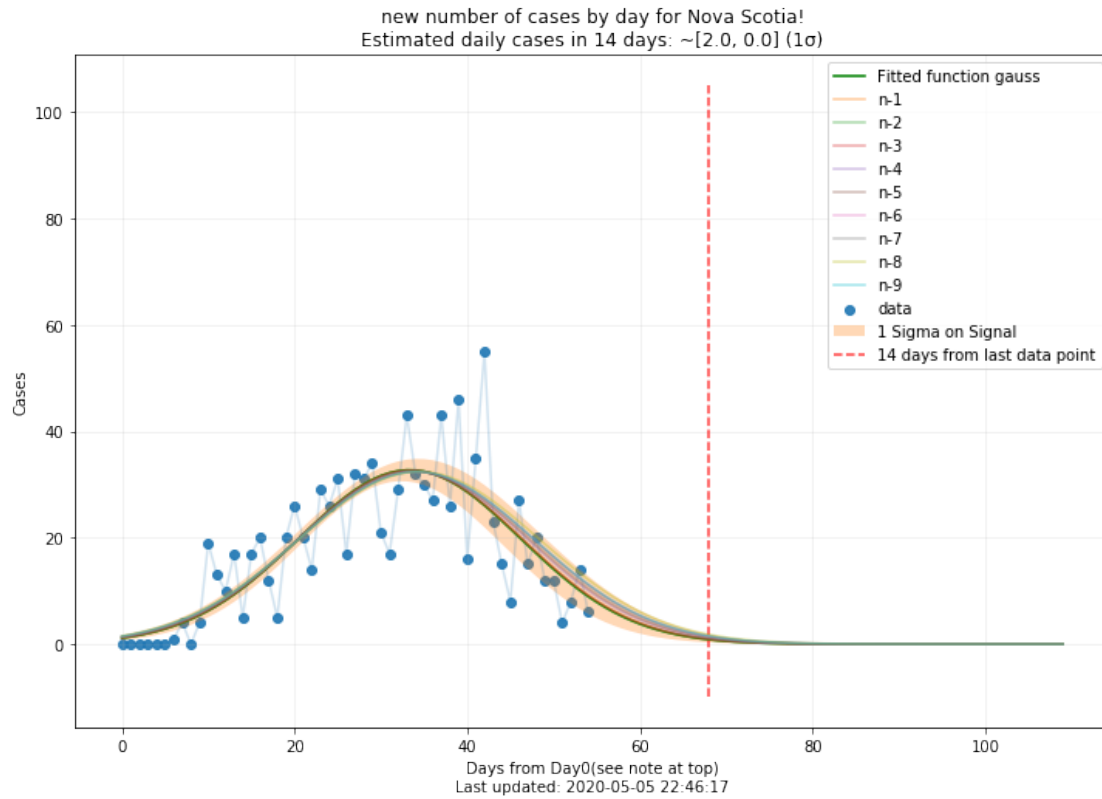
Precent of positive cases pre test: 2.838 %

------------- Nova Scotia-------------
cases: [0.   0.   0.   0.   0.   0.   0.   1.   5.   5.   9.   28.   41.   51.
   68.   73.   90. 110. 122. 127. 147. 173. 193. 207. 236. 262. 293. 310.
  342. 373. 407. 428. 445. 474. 517. 549. 579. 606. 649. 675. 721. 737.
  772. 827. 850. 865. 873. 900. 915. 935. 947. 959. 963. 971. 985. 991.]

new number of cases by day for Nova Scotia!
Estimated daily cases in 14 days: ~[2.0, 0.0] (1σ)

sigma+: 1017.0
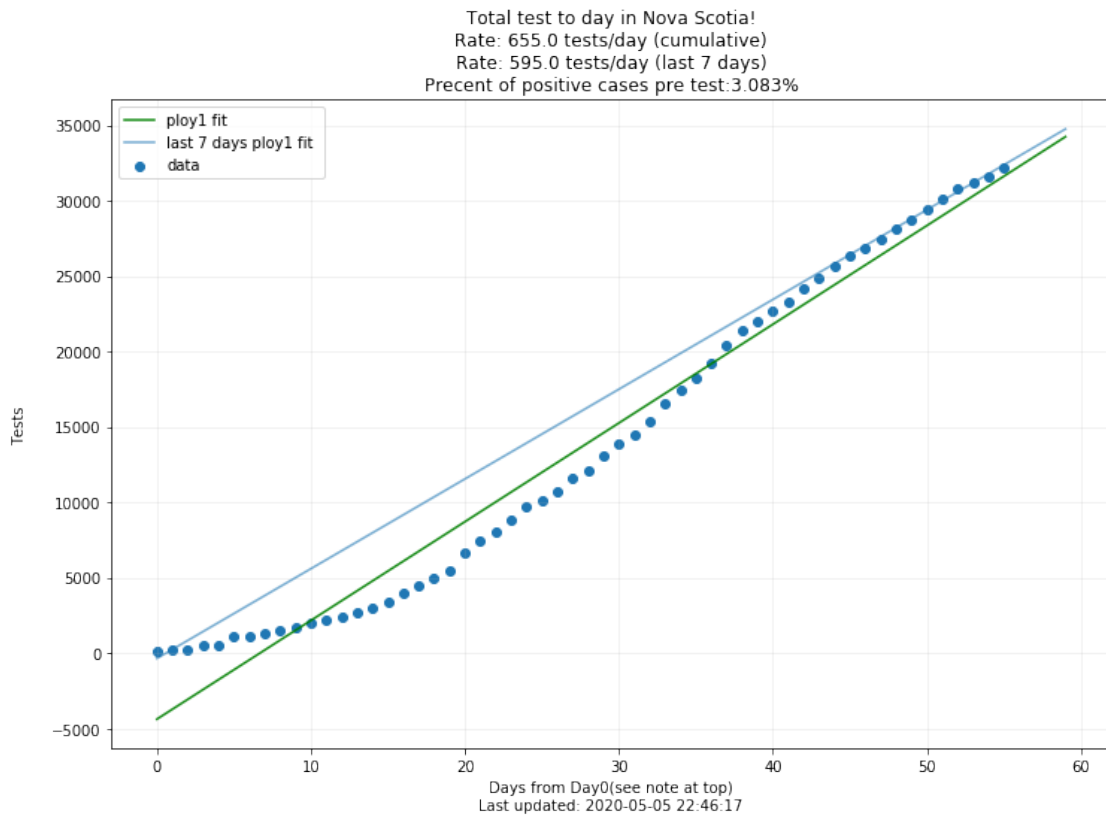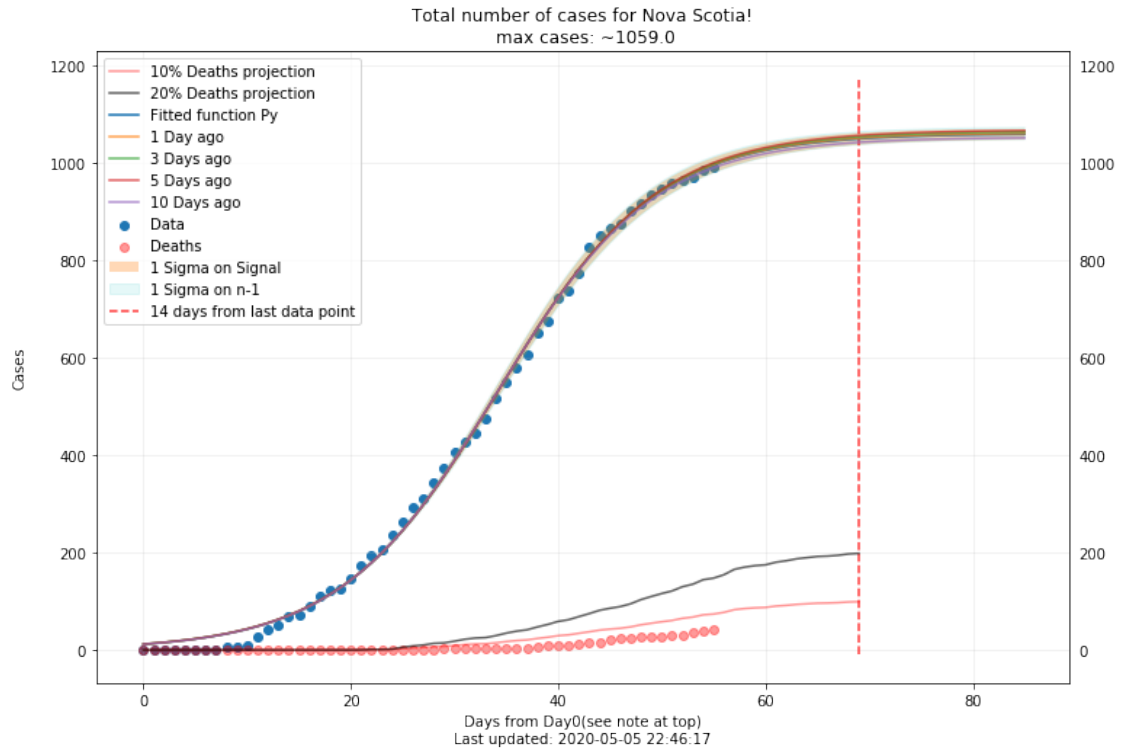n+1: 1002.0
Sigma-: 987.0
----

params PY: [1.05941698e+03 1.31180747e-01 3.41469321e+01]
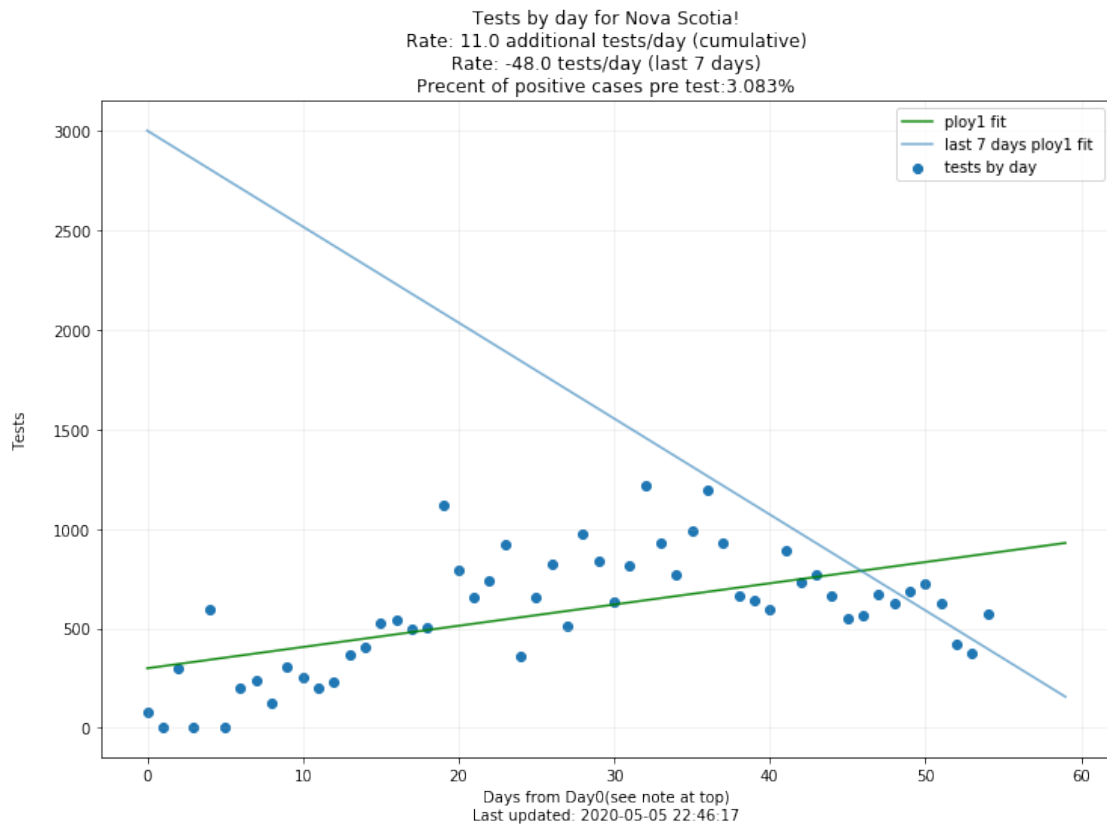PY sigma: [1.09692073e+01 2.60781890e-03 2.37891250e-01]
max cases: 1059.0
infection point: 34.0
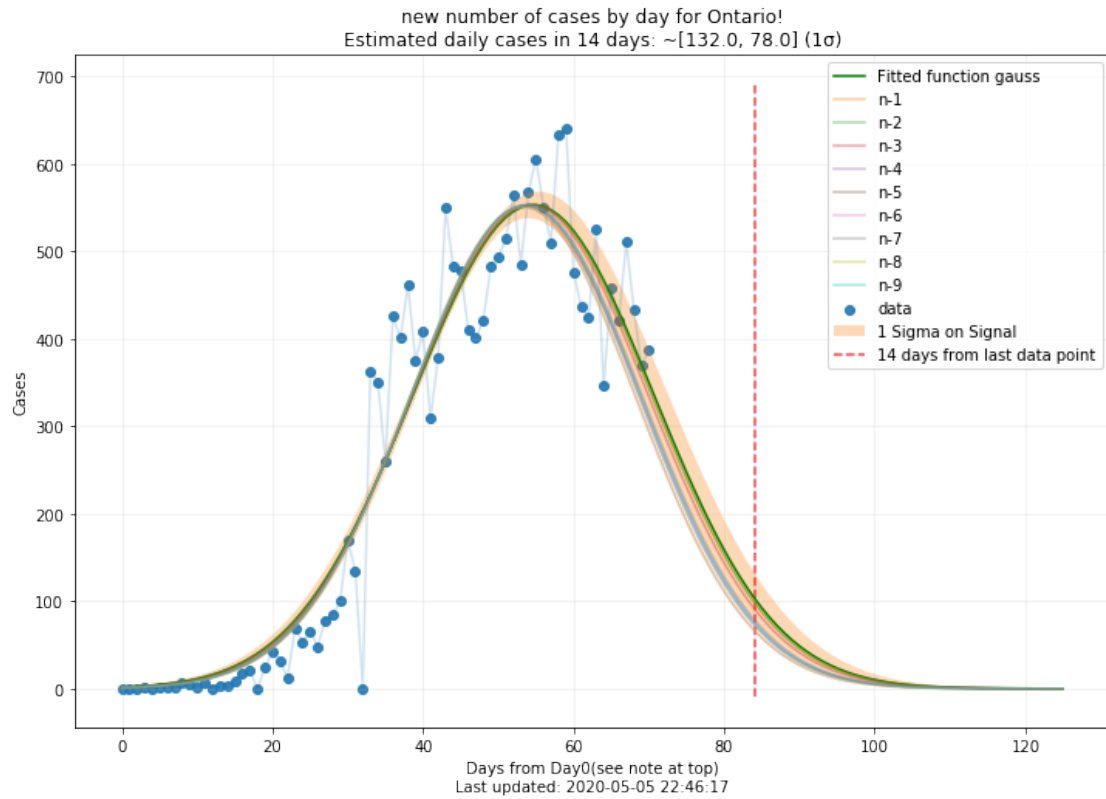infection point date: 2020-03-05

Total number of cases for Nova Scotia!
max cases: ~1059.0

Total test to day in Nova Scotia!
Rate: 655.0 tests/day (cumulative)
Rate: 595.0 tests/day (last 7 days)
Precent of positive cases pre test:3.083%

Tests by day for Nova Scotia!
Rate: 11.0 additional tests/day (cumulative)
Rate: -48.0 tests/day (last 7 days)
Precent of positive cases pre test:3.083%

Precent of positive cases pre test: 3.083 %

------------ Ontario------------
cases: [3.0000e+00 3.0000e+00 3.0000e+00 3.0000e+00 4.0000e+00 4.0000e+00
 5.0000e+00 6.0000e+00 8.0000e+00 1.5000e+01 2.0000e+01 2.2000e+01
 2.8000e+01 2.8000e+01 3.1000e+01 3.4000e+01 4.2000e+01 5.9000e+01
 7.9000e+01 7.9000e+01 1.0300e+02 1.4500e+02 1.7700e+02 1.8900e+02
 2.5800e+02 3.1100e+02 3.7700e+02 4.2500e+02 5.0300e+02 5.8800e+02
 6.8800e+02 8.5800e+02 9.9300e+02 9.9300e+02 1.3550e+03 1.7060e+03
 1.9660e+03 2.3920e+03 2.7930e+03 3.2550e+03 3.6300e+03 4.0380e+03
 4.3470e+03 4.7260e+03 5.2760e+03 5.7590e+03 6.2370e+03 6.6480e+03
 7.0490e+03 7.4700e+03 7.9530e+03 8.4470e+03 8.9610e+03 9.5250e+03
 1.0010e+04 1.0578e+04 1.1184e+04 1.1735e+04 1.2245e+04 1.2879e+04
 1.3519e+04 1.3995e+04 1.4432e+04 1.4856e+04 1.5381e+04 1.5728e+04
 1.6187e+04 1.6608e+04 1.7119e+04 1.7553e+04 1.7923e+04 1.8310e+04]

new number of cases by day for Ontario!
Estimated daily cases in 14 days: ~[132.0, 78.0] (1σ)

sigma+: 18488.0
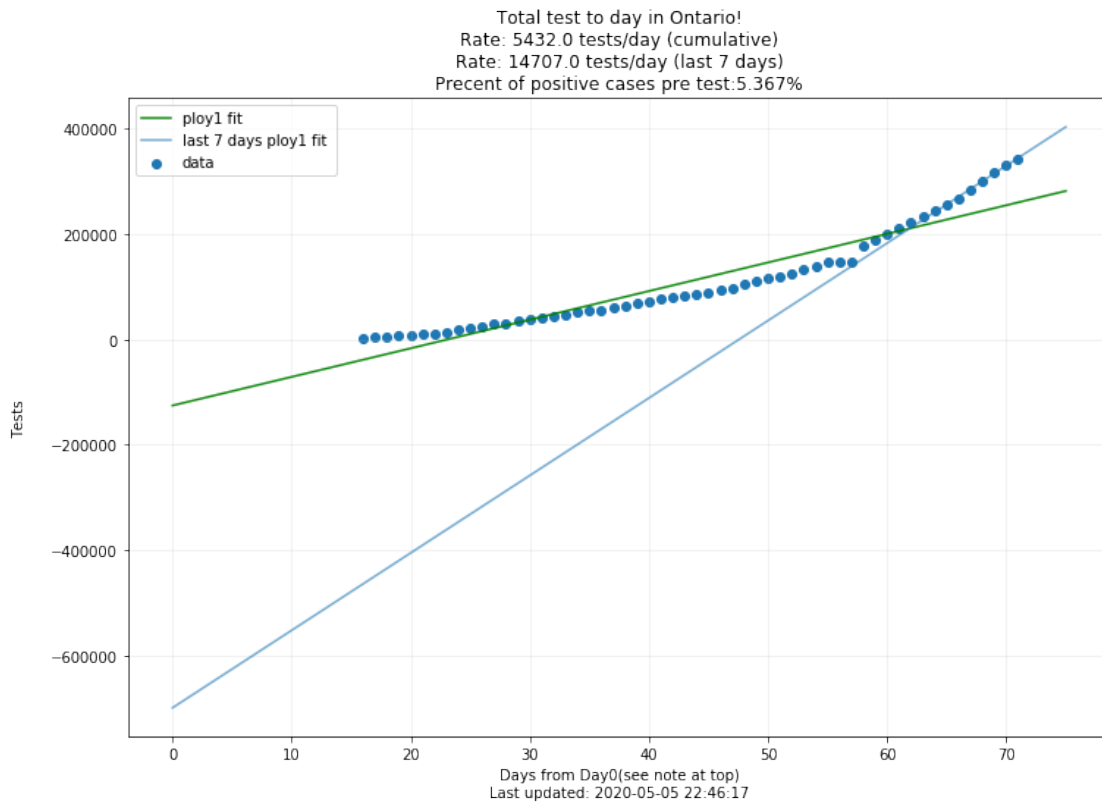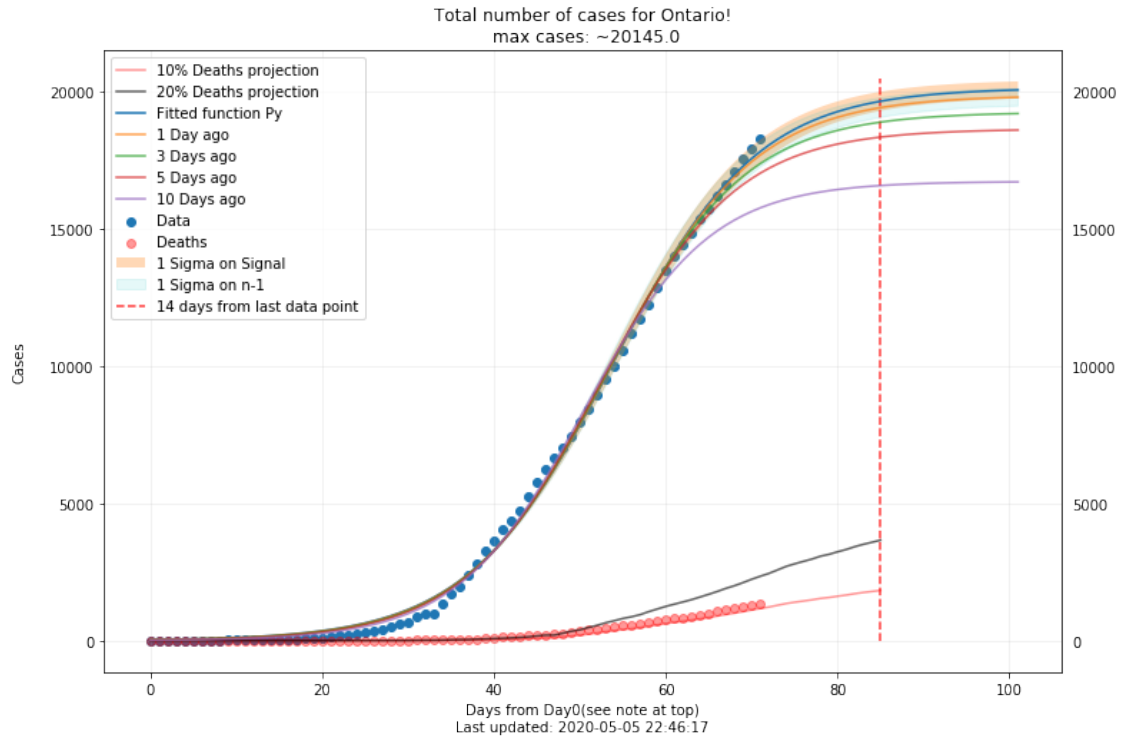n+1: 18060.0
Sigma-: 17629.0
----

params PY: [2.01445464e+04 1.18498667e-01 5.37790896e+01]
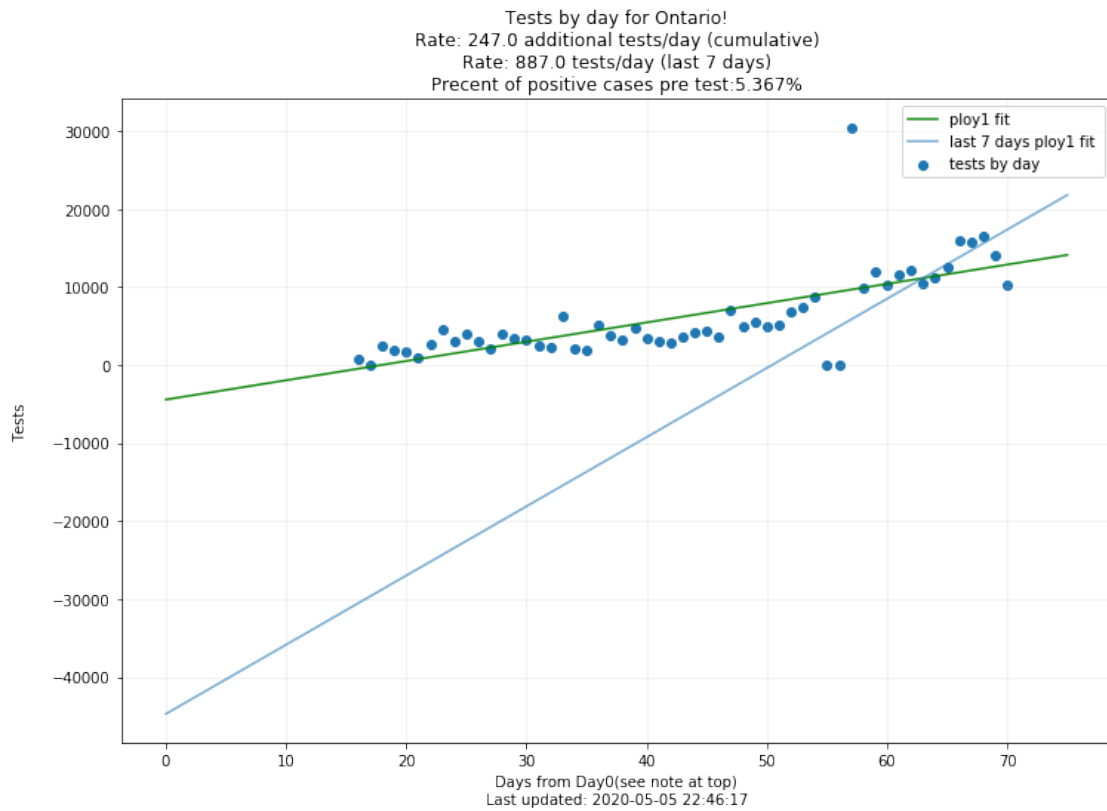PY sigma: [3.00193159e+02 2.49984607e-03 3.38197647e-01]
max cases: 20145.0
infection point: 54.0
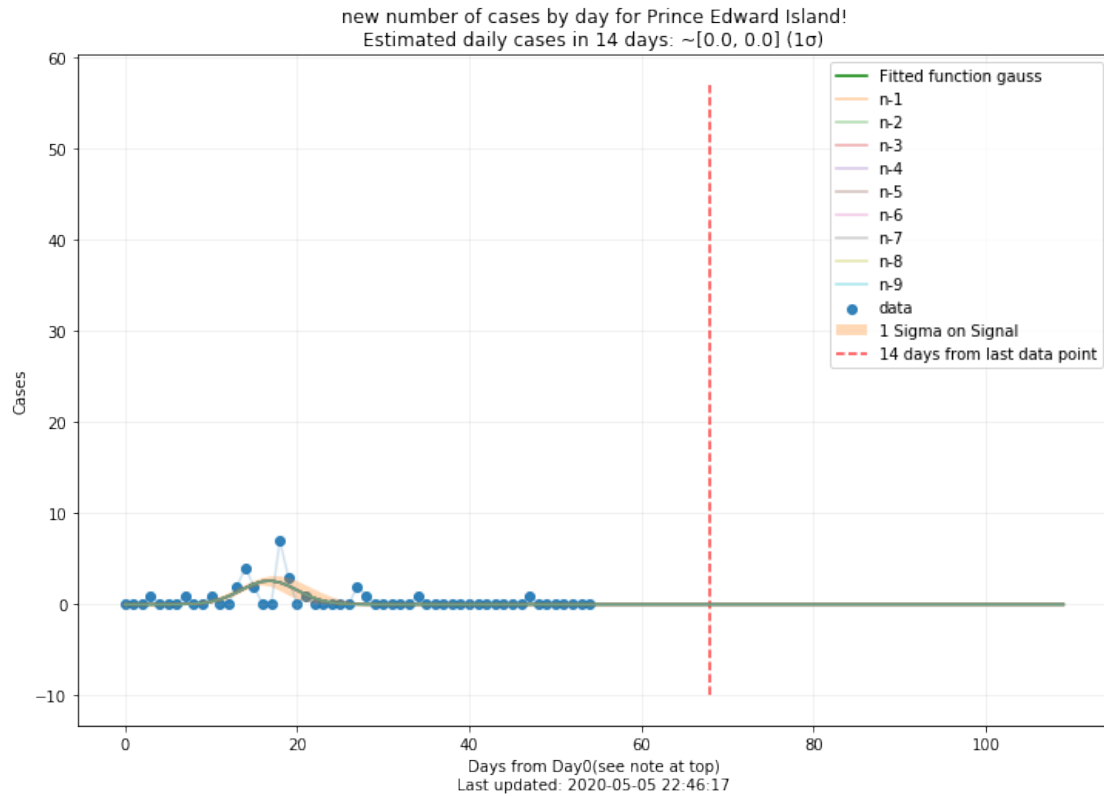infection point date: 2020-03-25

Total number of cases for Ontario!
max cases: ~20145.0

Legend:
- 10% Deaths projection
- 20% Deaths projection
- Fitted function Py
- 1 Day ago
- 3 Days ago
- 5 Days ago
- 10 Days ago
- Data
- Deaths
- 1 Sigma on Signal
- 1 Sigma on n-1
- 14 days from last data point

Cases (y-axis)

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Total test to day in Ontario!
Rate: 5432.0 tests/day (cumulative)
Rate: 14707.0 tests/day (last 7 days)
Precent of positive cases pre test:5.367%

Legend:
- ploy1 fit
- last 7 days ploy1 fit
- data

Tests (y-axis)

Days from Day0(see note at top)
Last updated: 2020-05-05 22:46:17

Tests by day for Ontario!
Rate: 247.0 additional tests/day (cumulative)
Rate: 887.0 tests/day (last 7 days)
Precent of positive cases pre test:5.367%

Last updated: 2020-05-05 22:46:17

Precent of positive cases pre test: 5.367 %

------------- Prince Edward Island-------------
cases: [0. 0. 0. 0. 1. 1. 1. 1. 2. 2. 2. 3. 3. 3. 5. 9. 11. 11.
 11. 18. 21. 21. 22. 22. 22. 22. 22. 22. 24. 25. 25. 25. 25. 25. 25. 26.
 26. 26. 26. 26. 26. 26. 26. 26. 26. 26. 26. 26. 27. 27. 27. 27. 27. 27.
 27. 27.]

new number of cases by day for Prince Edward Island!
Estimated daily cases in 14 days: ~[0.0, 0.0] (1σ)
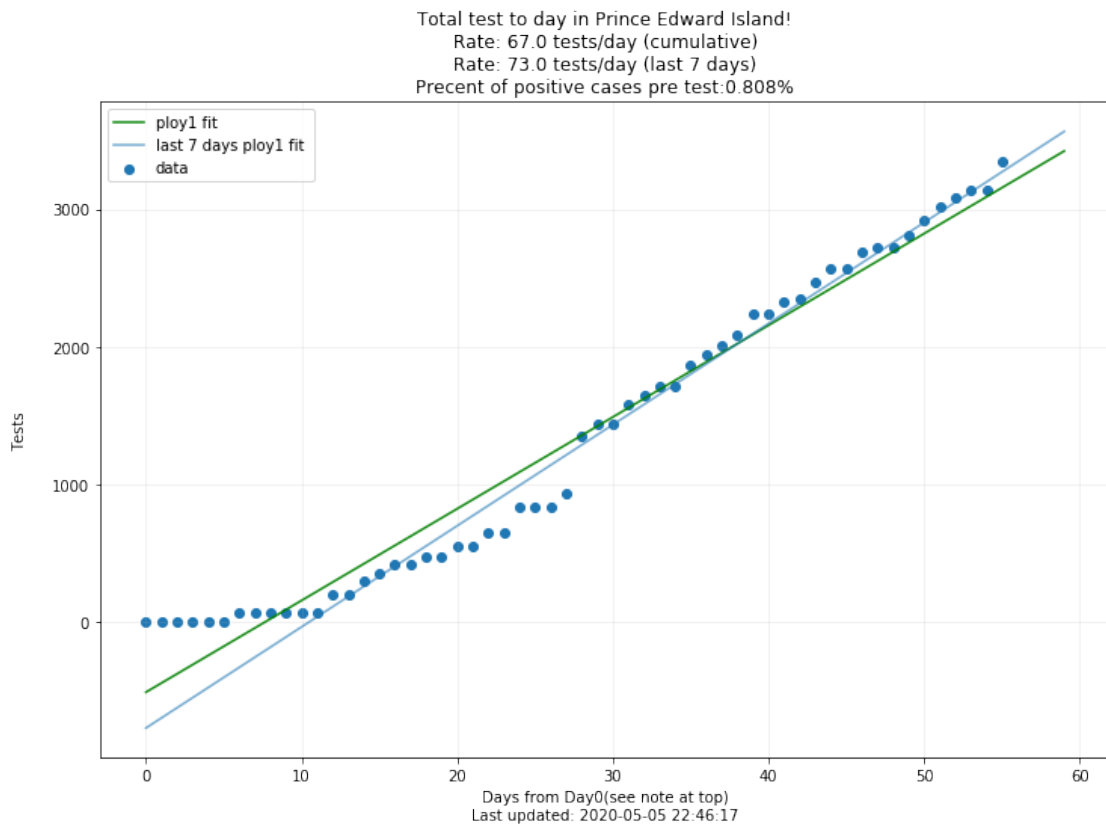
```
sigma+: 26.0
n+1: 26.0
Sigma-: 26.0
----

params PY:  [25.98585727  0.31738049 17.54639149]
PY sigma:   [0.21856807 0.01779605 0.20406864]
max cases:  26.0
infection point:  18.0
infection point date:  2020-02-18
```
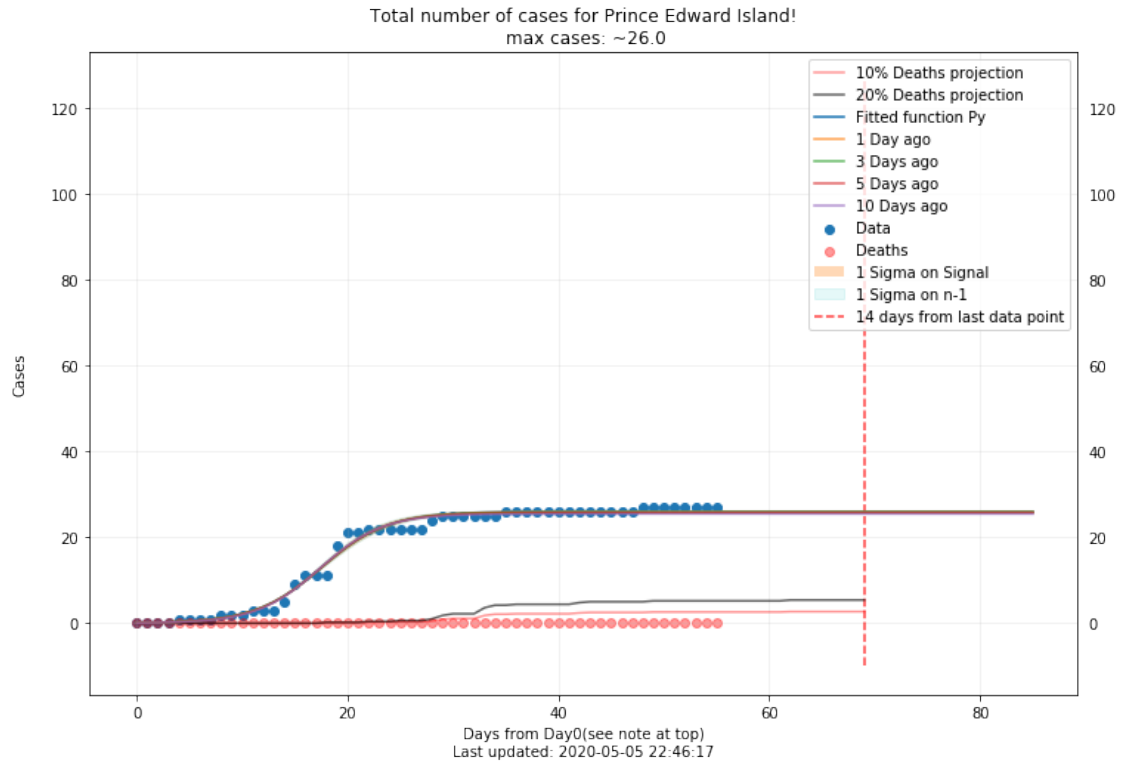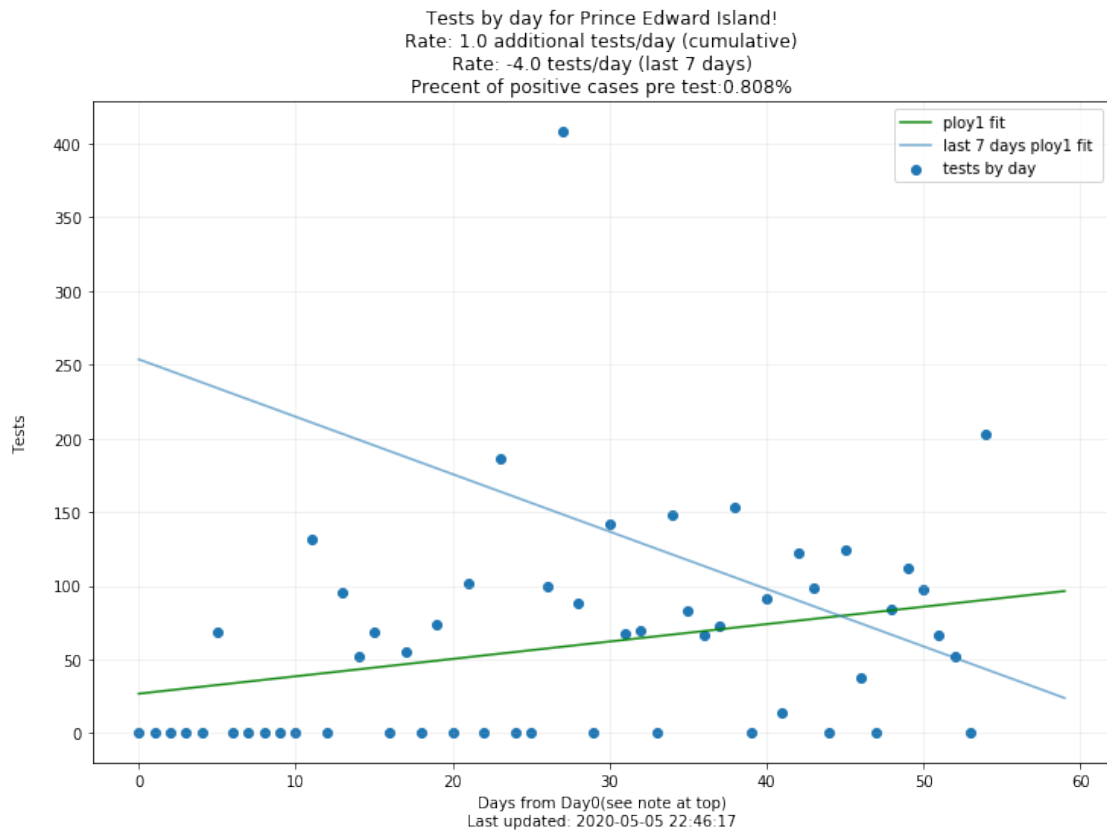
Total number of cases for Prince Edward Island!
max cases: ~26.0

Total test to day in Prince Edward Island!
Rate: 67.0 tests/day (cumulative)
Rate: 73.0 tests/day (last 7 days)
Precent of positive cases pre test:0.808%

Tests by day for Prince Edward Island!
Rate: 1.0 additional tests/day (cumulative)
Rate: -4.0 tests/day (last 7 days)
Precent of positive cases pre test:0.808%

Precent of positive cases pre test: 0.808 %

------------- Quebec-------------
cases: [1.0000e+00 1.0000e+00 2.0000e+00 2.0000e+00 2.0000e+00 3.0000e+00
 4.0000e+00 7.0000e+00 1.3000e+01 1.7000e+01 1.7000e+01 2.4000e+01
 3.9000e+01 5.0000e+01 7.4000e+01 1.2100e+02 1.3900e+02 2.0200e+02
 2.2100e+02 2.2100e+02 2.2100e+02 1.3390e+03 1.6290e+03 2.0210e+03
 2.4980e+03 2.8400e+03 3.4300e+03 4.1620e+03 4.6110e+03 5.5180e+03
 6.1010e+03 6.9970e+03 7.9440e+03 8.5800e+03 9.3400e+03 1.0031e+04
 1.0912e+04 1.1677e+04 1.2292e+04 1.2846e+04 1.3557e+04 1.4248e+04
 1.4860e+04 1.5857e+04 1.6798e+04 1.7521e+04 1.8357e+04 1.9319e+04
 2.0126e+04 2.0965e+04 2.1838e+04 2.2616e+04 2.3267e+04 2.4107e+04
 2.4982e+04 2.5757e+04 2.6594e+04 2.7538e+04 2.8648e+04 2.9656e+04
 3.1865e+04 3.2623e+04 3.3417e+04]

new number of cases by day for Quebec!
Estimated daily cases in 14 days: ~[902.0, 383.0] (1σ)
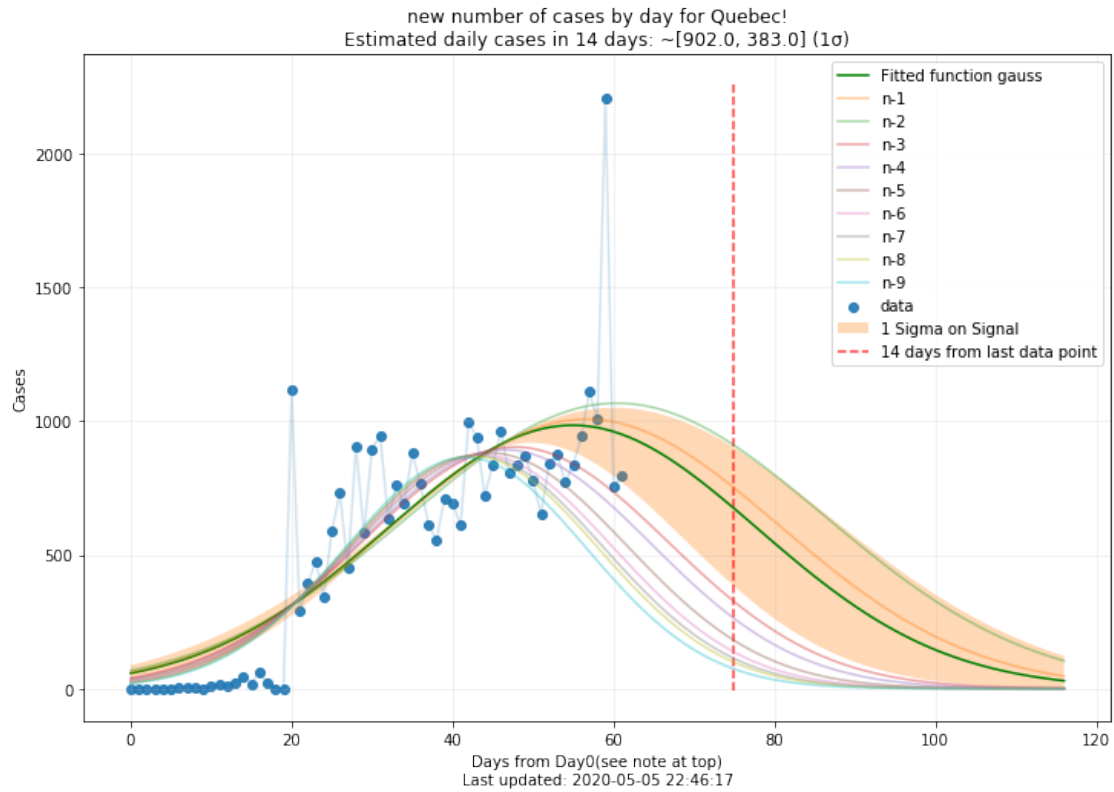
sigma+: 33710.0
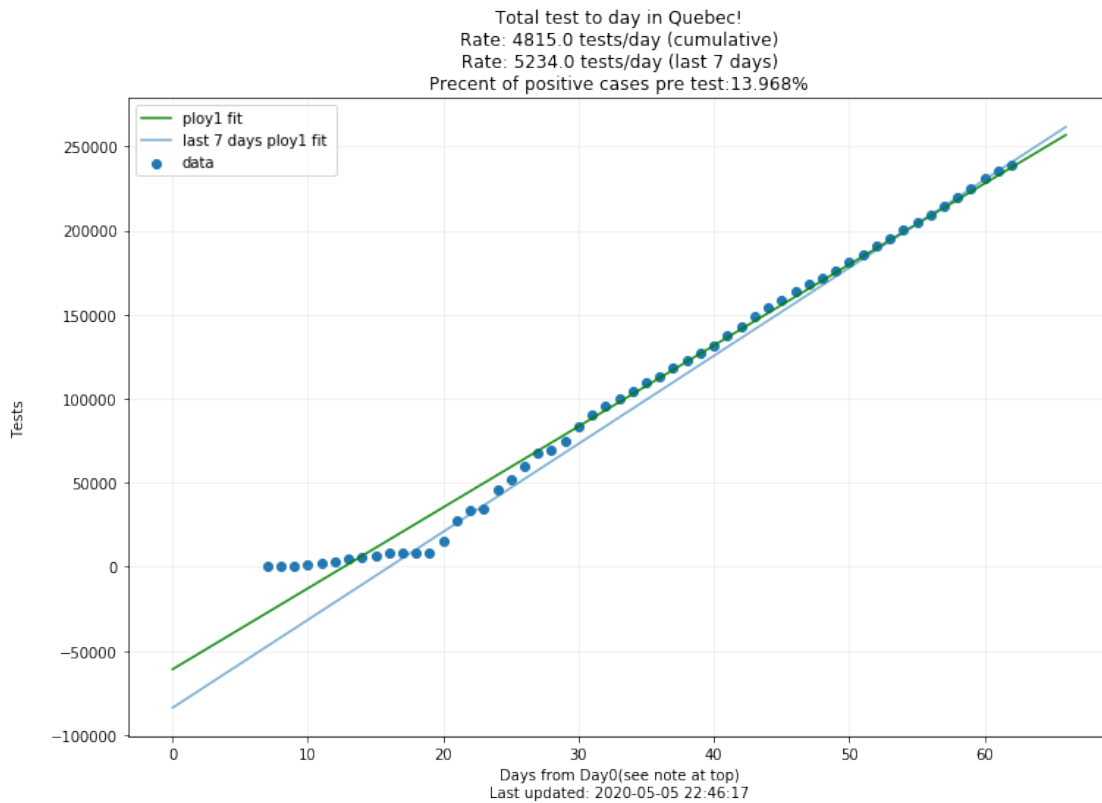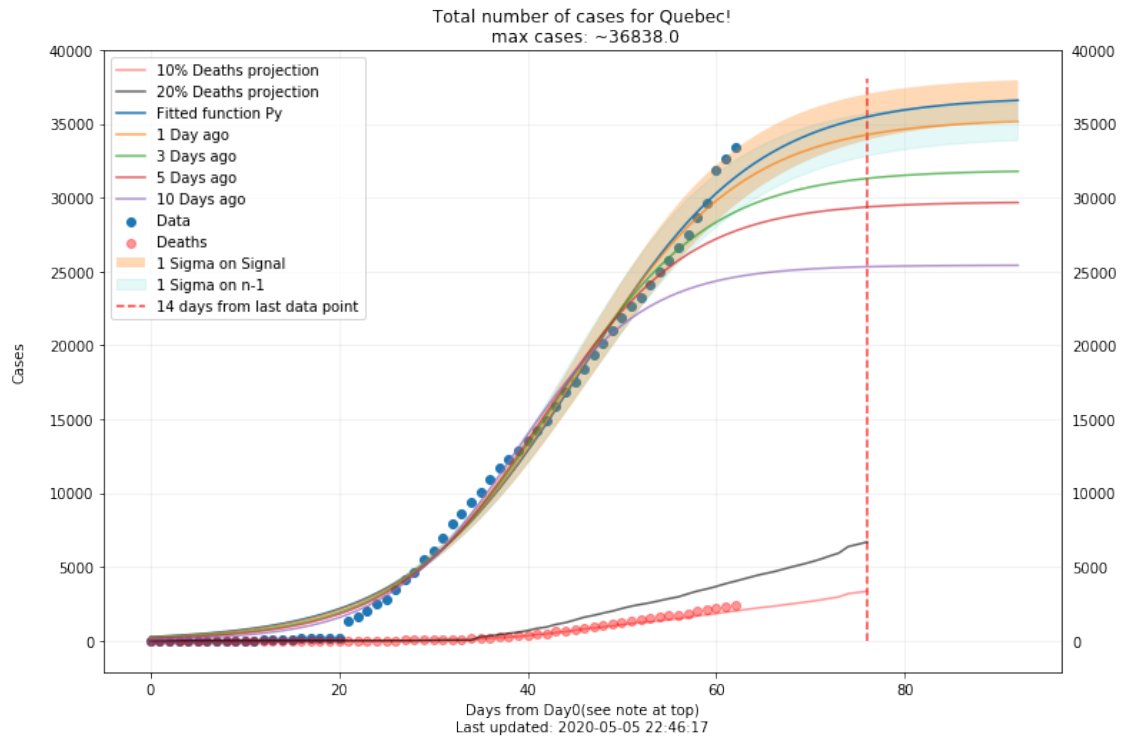n+1: 31851.0
Sigma-: 29986.0
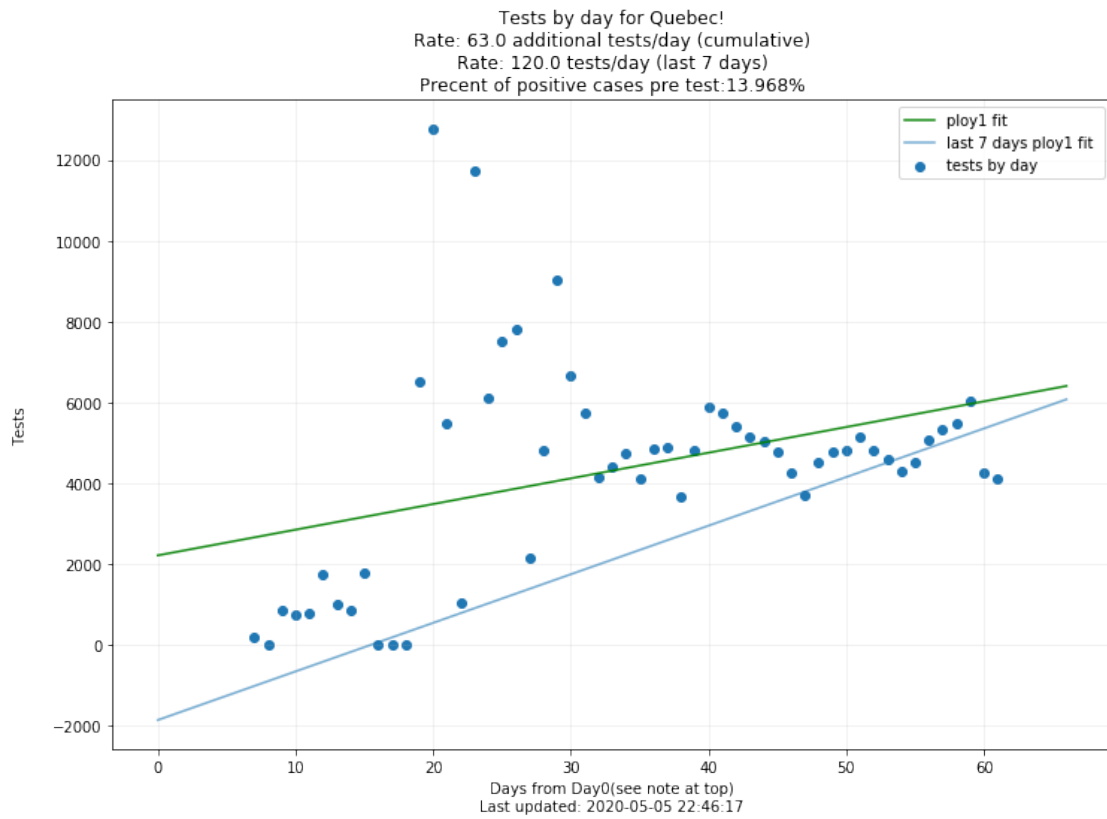----

params PY: [3.68375570e+04 1.07735122e-01 4.57880039e+01]
PY sigma: [1.30479534e+03 4.65483296e-03 8.40840136e-01]
max cases: 36838.0
infection point: 46.0
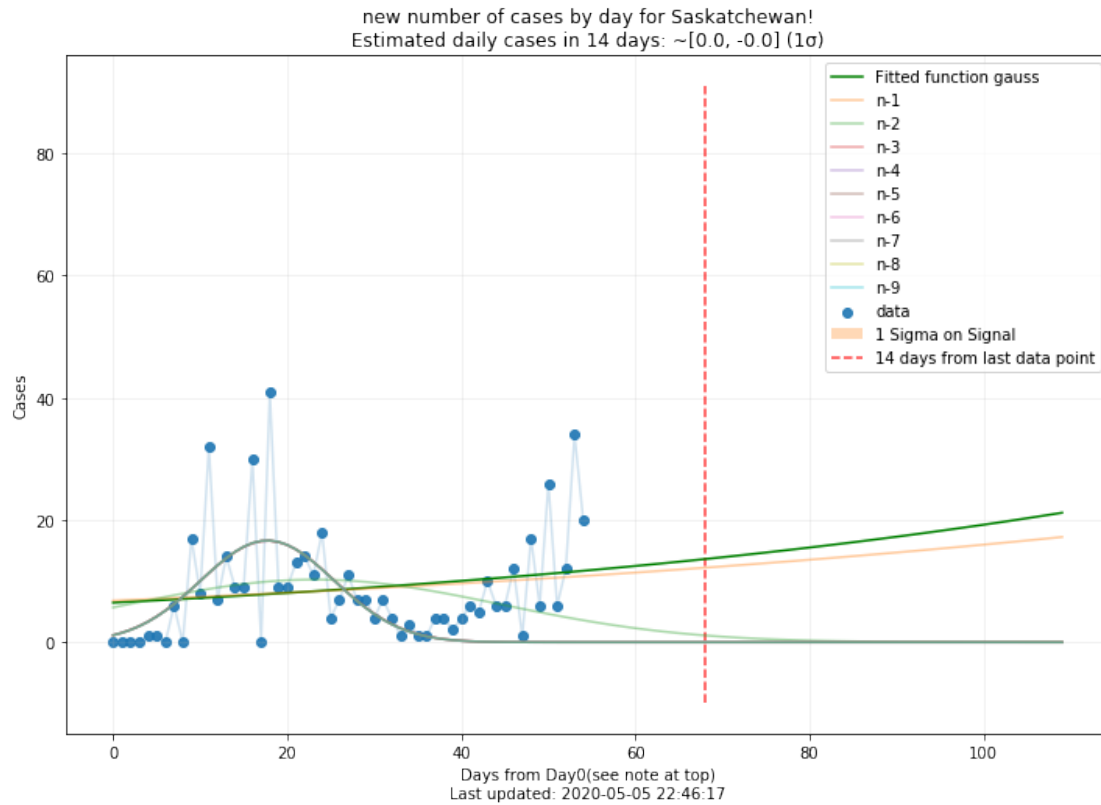infection point date: 2020-03-17

Total number of cases for Quebec!
max cases: ~36838.0

Total test to day in Quebec!
Rate: 4815.0 tests/day (cumulative)
Rate: 5234.0 tests/day (last 7 days)
Precent of positive cases pre test:13.968%

Tests by day for Quebec!
Rate: 63.0 additional tests/day (cumulative)
Rate: 120.0 tests/day (last 7 days)
Precent of positive cases pre test:13.968%

Precent of positive cases pre test: 13.968 %

------------- Saskatchewan-------------
cases: [0.   0.   0.   0.   0.   1.   2.   2.   8.   8. 25. 33. 65. 72.
  86. 95. 104. 134. 134. 175. 184. 193. 206. 220. 231. 249. 253. 260.
 271. 278. 285. 289. 296. 300. 301. 304. 305. 306. 310. 314. 316. 320.
 326. 331. 341. 347. 353. 365. 366. 383. 389. 415. 421. 433. 467. 487.]

new number of cases by day for Saskatchewan!
Estimated daily cases in 14 days: ~[0.0, -0.0] (1σ)

Last updated: 2020-05-05 22:46:17

sigma+: 399.0
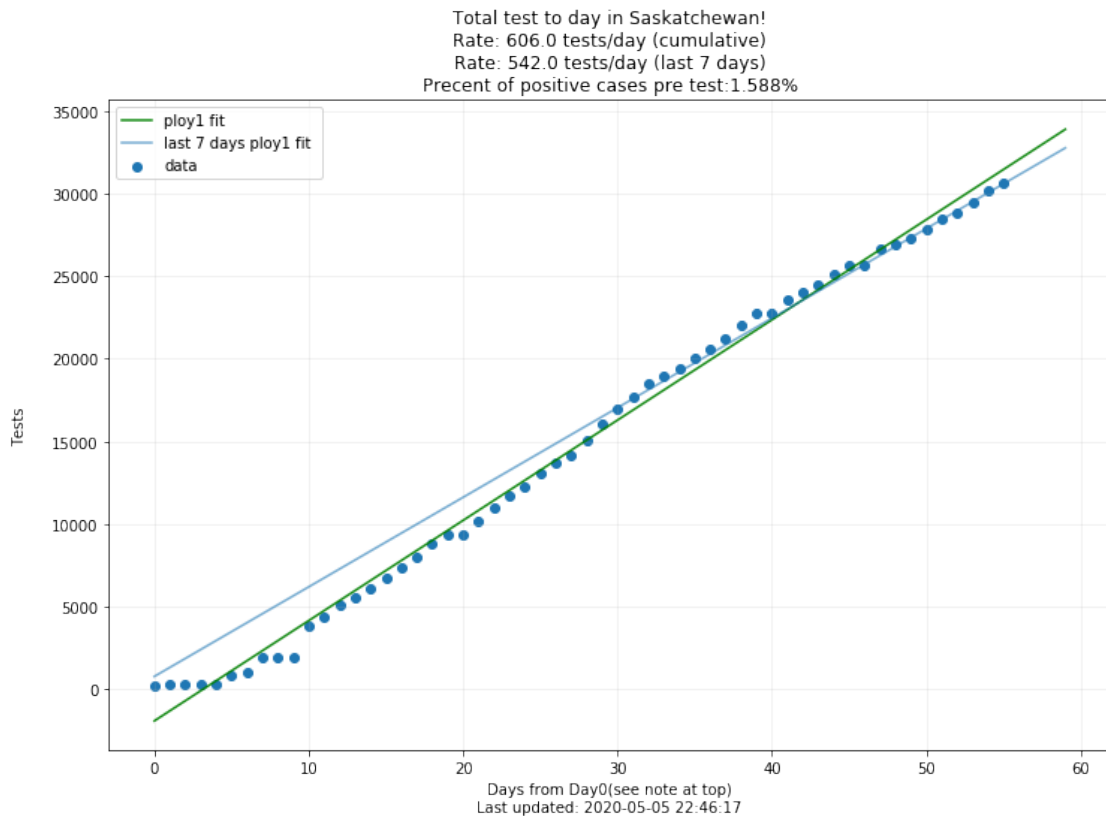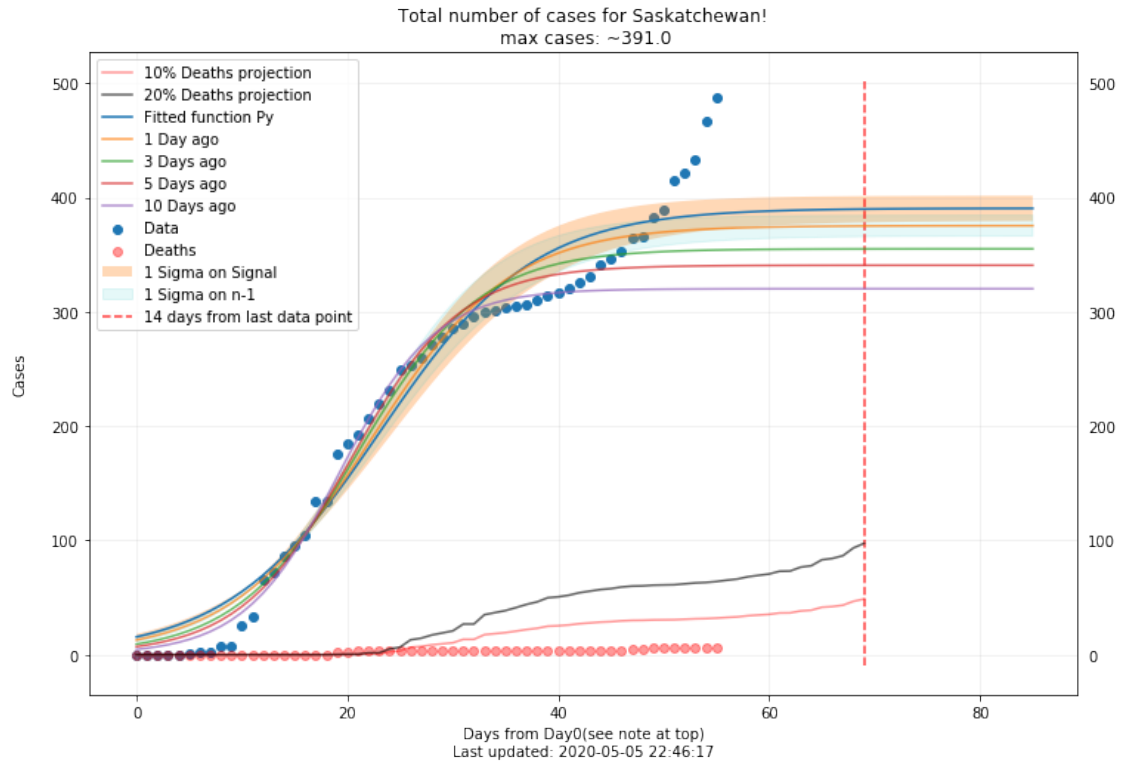n+1: 386.0
Sigma-: 373.0

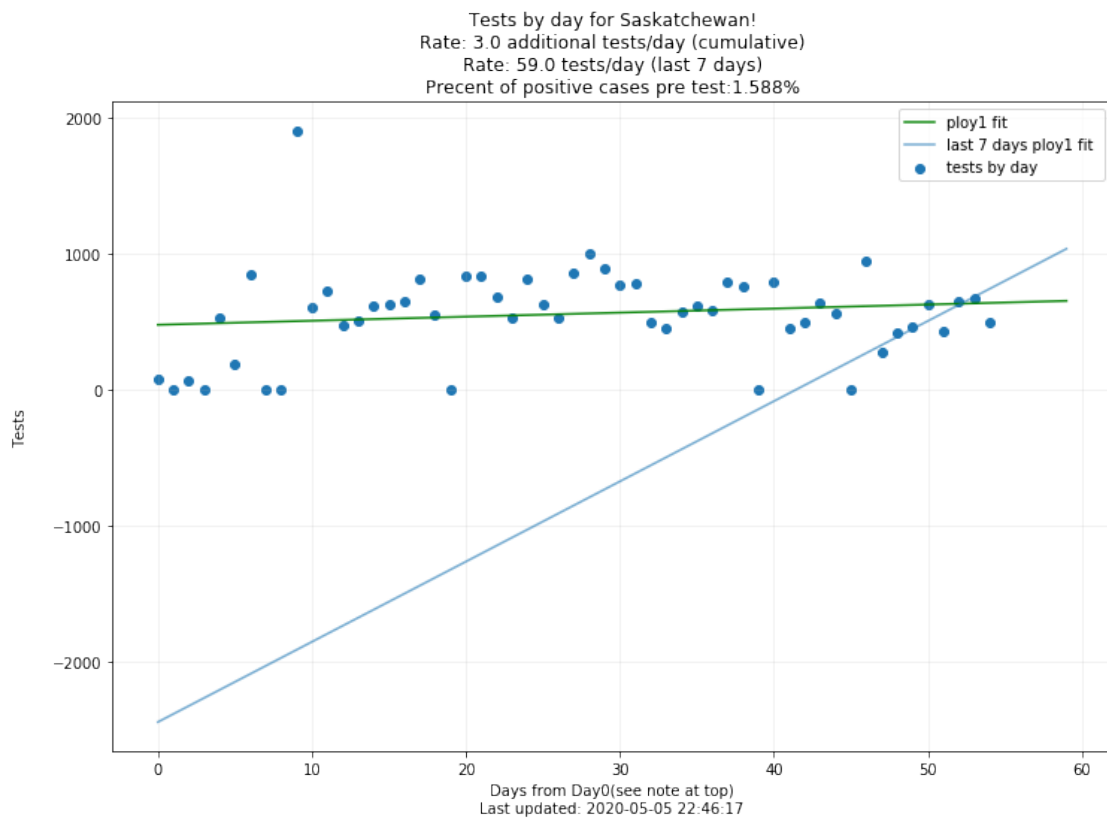params PY: [3.90562854e+02 1.37582342e-01 2.31152804e+01]
PY sigma: [11.01087817 0.01228923 0.79949657]
max cases: 391.0
infection point: 23.0
infection point date: 2020-02-23

Total number of cases for Saskatchewan!
max cases: ~391.0

Total test to day in Saskatchewan!
Rate: 606.0 tests/day (cumulative)
Rate: 542.0 tests/day (last 7 days)
Precent of positive cases pre test:1.588%

Tests by day for Saskatchewan!
Rate: 3.0 additional tests/day (cumulative)
Rate: 59.0 tests/day (last 7 days)
Precent of positive cases pre test:1.588%

Precent of positive cases pre test: 1.588 %