鑽石公主號的估計 :

Bata(鑽石公主號):

1. [[2.43177520e-04]
2. [1.35464644e-04]
3. [1.84145520e-04]
4. [1.28530299e-05]
5. [2.35414133e-05]
6. [1.34642472e-04]
7. [6.33695027e-05]
8. [5.77826689e-05]
9. [6.86187155e-05]
10. [5.87553929e-05]
11. [6.69516960e-05]
12. [5.12343400e-05]
13. [3.95678153e-05]
14. [8.20168770e-06]
15. [3.35027345e-05]]

平均Beta : 7.878727682554501e-05

=====================================================================去掉極端值的Beta :

[[6.33695027e-05]

[5.77826689e-05]

[6.86187155e-05]

[5.87553929e-05]

[6.69516960e-05]

[5.12343400e-05]]

去掉極端值的Beta平均 : 6.111871934461365e-05

=====================================================================

R0 (Gamma = 1/20) :

1. [[18.0486355 ]
2. [10.05418586]
3. [13.66728049]
4. [ 0.95395188]
5. [ 1.74724369]
6. [ 9.99316431]
7. [ 4.70328449]
8. [ 4.28862968]
9. [ 5.09288106]
10. [ 4.36082526]
11. [ 4.96915488]
12. [ 3.80261272]
13. [ 2.93672325]
14. [ 0.60872926]
15. [ 2.48657295]]

=====================================================================

R0 (無條件捨去取整數) :

1. [[18]
2. [10]
3. [13]
4. [ 0]
5. [ 1]
6. [ 9]
7. [ 4]
8. [ 4]
9. [ 5]
10. [ 4]
11. [ 4]
12. [ 3]
13. [ 2]
14. [ 0]
15. [ 2]]

=====================================================================

利用差分方程所估計並去掉極端值的平均 Beta : 6.111871934461365e-05

=====================================================================

Beta = 去掉極端值並且取平均, Gamma = 1/4(參考自 Journal of Travel Medicine), R0 = 0.9072462699514451

Beta = 去掉極端值並且取平均, Gamma = 1/10(參考自 Journal of Travel Medicine), R0 = 2.268115674878613

Beta = 去掉極端值並且取平均, Gamma = 1/20(參考自 Lancet),

R0 = 4.536231349757226

=====================================================================

Logistic curve fitting 所得出的 Beta : 0.0001285167026920737

=====================================================================

Beta = 羅吉斯迴歸所得出, Gamma = 1/4(參考自 Journal of Travel Medicine),

R0 = 1.907701934761142

Beta = 羅吉斯迴歸所得出, Gamma = 1/10(參考自 Journal of Travel Medicine), R0 = 4.769254836902855

Beta = 羅吉斯迴歸所得出, Gamma = 1/20(參考自 Lancet),

R0 = 9.53850967380571

==========================================================================================================================================

2003 香港 SARS 估計 :

Gamma(2003 香港 SARS):

1. [[0.00638298]
2. [0.01428571]
3. [0.2281746 ]
4. [0.15421304]
5. [0.21653819]
6. [0.21301775]
7. [0.10800508]
8. [0.11614907]
9. [0.05788177]
10. [0.03660769]
11. [0.02909091]]

平均Gamma : 0.1073042542963298

=====================================================================

週累積病例數 :

1. [[ 229]
2. [ 480]
3. [ 720]
4. [1258]
5. [1702]
6. [2180]
7. [2598]
8. [2821]
9. [3044]
10. [3152]
11. [3227]
12. [3286]]

=====================================================================

週累積病例數之最大值假設為總人數 N : 3286

=====================================================================

Logistic curve fitting 所得出的 Beta : [0.00048611]

=====================================================================

Computer output:

>>G:/SCUMATH\_Project/Project\_ver2/Diamond\_2003SARS/Analysis.py:482: RuntimeWarning: overflow encountered in exp

return 3286 / (1 + 3285 \* np.exp(-r \* (t-5)))

利用周一和王庭萱所用的估計方法所得出的 Beta : 0.14029214850882532

此數值估計方法發生數據 overflow 問題。

=====================================================================

Beta (2003 香港 SARS):

1. [[0.00036985]
2. [0.00018198]
3. [0.00029952]
4. [0.0002172 ]
5. [0.00023988]
6. [0.00026485]
7. [0.0002131 ]
8. [0.00030468]
9. [0.00027719]
10. [0.00034464]
11. [0.00061013]]

=====================================================================

R0 (2003 香港 SARS):

1. [[190.40110768]
2. [ 41.8592378 ]
3. [ 4.3134805 ]
4. [ 4.62808107]
5. [ 3.64019904]
6. [ 4.08553509]
7. [ 6.48351584]
8. [ 8.61983615]
9. [ 15.73650354]
10. [ 30.93610994]
11. [ 68.91778523]]

=====================================================================

Pauline van den Driessche 的書上資料之 R0 (2003 香港 SARS) :3.5

去掉極端值10以下之平均 R0 (2003 香港 SARS) : 5.295107948401484

羅吉斯迴歸所估計之 R0 (2003 香港 SARS) : 14.886193333386808

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2. J. Rocklöv, J. Rocklöv, J. Rocklöv, COVID-19 outbreak on the Diamond Princess cruise ship : estimating the epidemic potential and effectiveness of public health countermeasures, Journal of Travel Medicine, P.11

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4. 周一, 王庭萱, Logistic curve fitting to dengue fever data