Currently Infected Cases: $I^{(k)}$

Spline-smoothed Detected Transmission Rates ($DT^{(h)}(h)$) and Ascertainment Rates ($A^{(h)}(h)$)

Detected Transmission Rates: $DT^{(k)}$

Fit a regression function from $DT^{(k)}(h)$ to $A^{(k)}(h)$

Ascertainment Rates: $A^{(k+1)}$

Actual Daily New Cases: $AC^{(k+1)}$

Currently Infected Cases: $I^{(k+1)}$

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B

Daily Confirmed New Cases/Deaths*

US, as of 2020−09−03: 40,319 / 858

1. Initialization

Initial Estimated Time Courses

US, as of 2020−09−03

Est−currently infected cases  Est−new cases  Est−recovered  Confirmed new cases

(Initial) Ascertainment Rates and Detected Transmission Rates

US, as of 2020−09−03

Estimated Currently Infected/New Cases

US, as of 2020−09−03: 3,073,341 / 71,912

(Converged) Ascertainment Rates and Detected Transmission Rates

US, as of 2020−09−03, spline Par: 1.6

Daily Rate of Deaths Per Initial Est-Infections

US, as of 2020−09−03, CV of death rates: 40%

Daily Rate of Deaths Per Est-Infections

US, as of 2020−09−03, CV of death rates: 28%

3. Calculate Confidence Intervals

Estimated*/Confirmed New Cases

US, as of 2020−09−03: 71,912 / 40,319 [40,726–121,698]

Estimated Currently Infected Cases*

US, as of 2020−09−03: 3,073,341 (0.93% of pop.) [1,561,253–5,207,578] [0.47%–1.58%]

*Under-reporting−adjusted number of new infected individuals on each day

*Under-reporting−adjusted number of cases which have not yet an outcome (recovery or death)