

# COVID-19 and re-opening the economy

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“The grumpy economist”



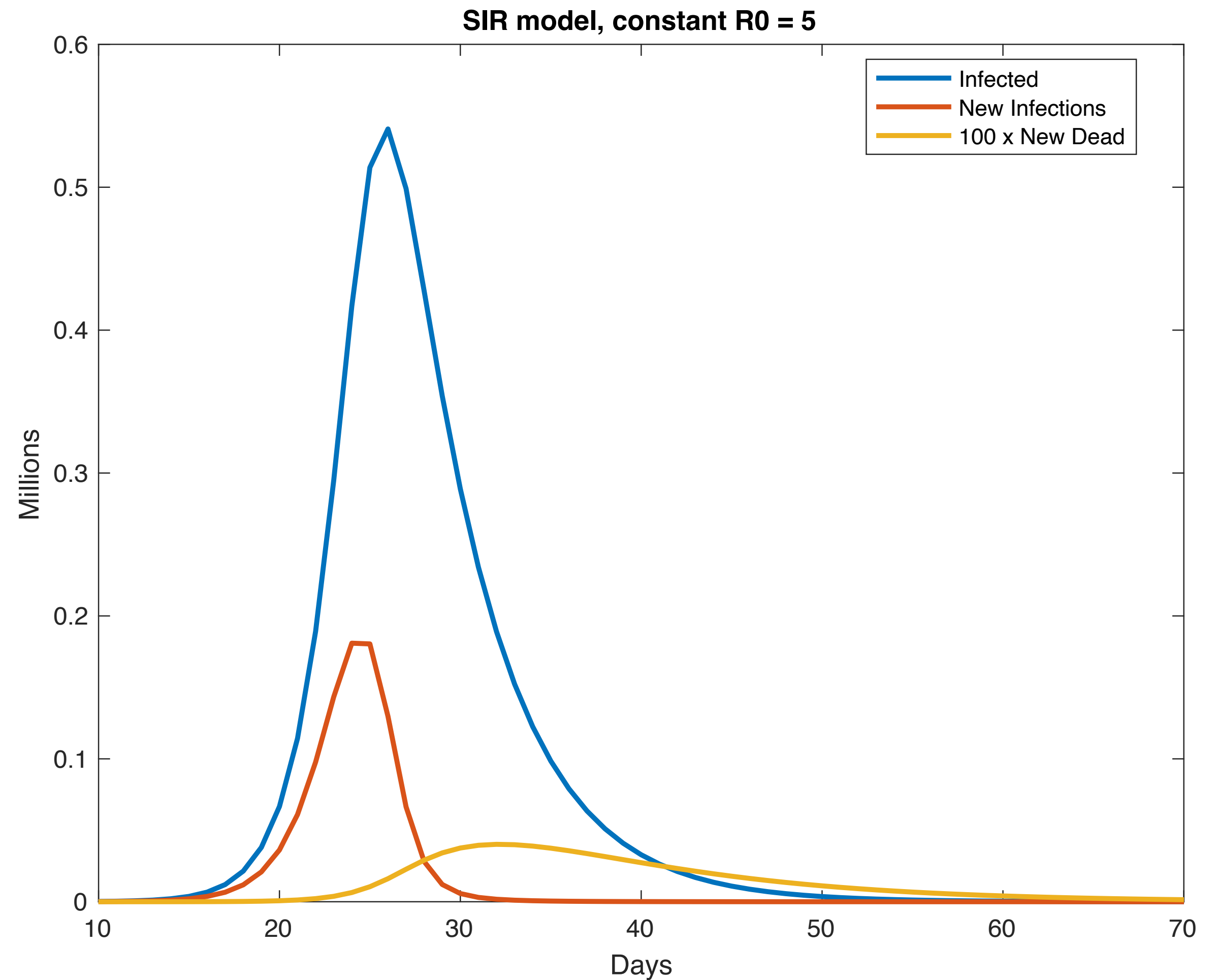
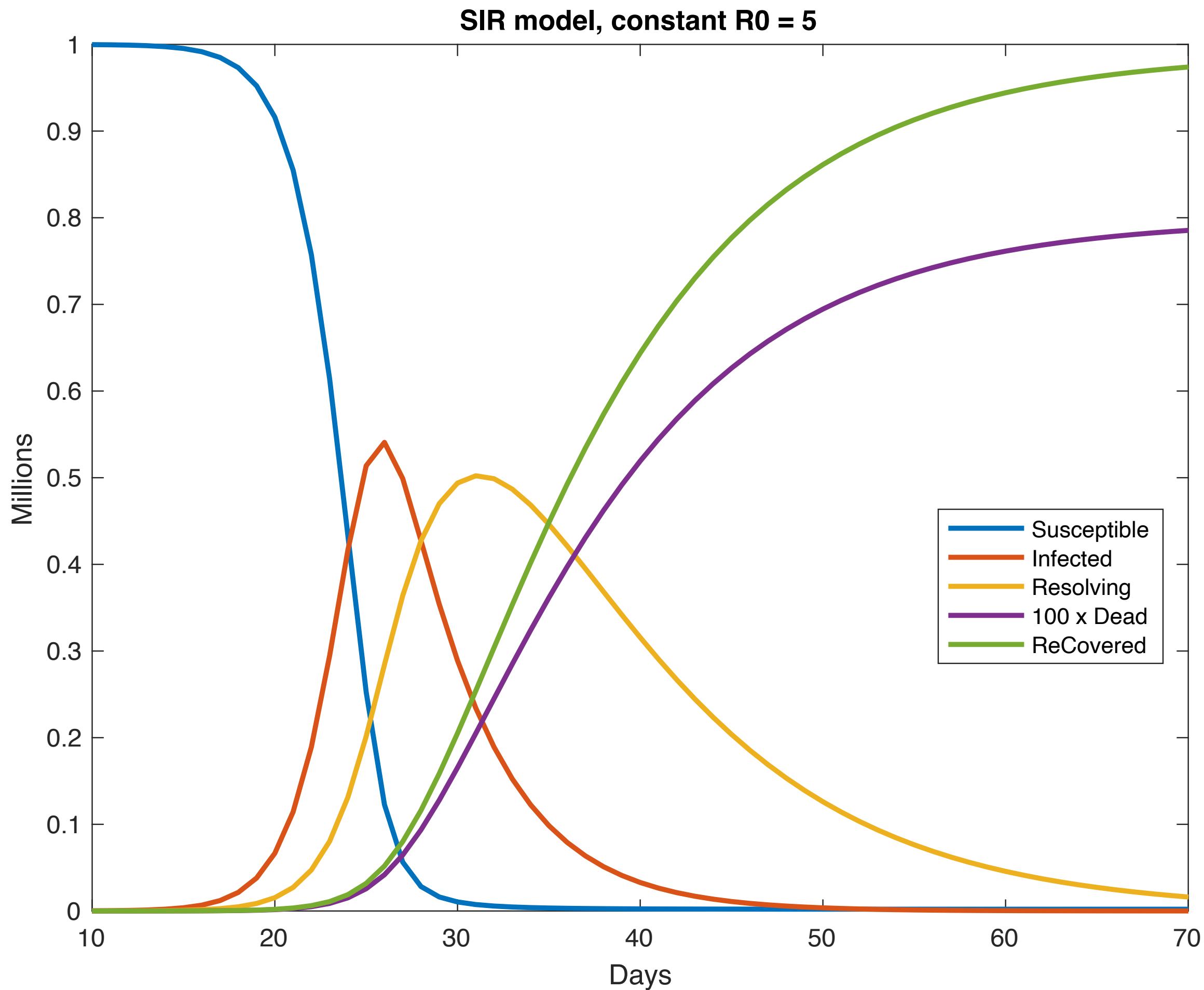
# The dumb reopening

- Ready or not, a dumb reopening: No widespread test, trace, isolate, or vaccine; no smart public health.
- Fizzle out vs. second wave? Models were completely wrong last time.
- Prelude to economic prognostication.
- Key points: 1) Models left out *behavior*, and *heterogeneity* (superspreading). 2) Adaptation to virus and shifts in demand are *costly*.

# SIR model (February)

$\Delta S_{t+1} = -\beta S_t I_t / N$	Susceptible
$\Delta I_{t+1} = \beta S_t I_t / N - \gamma I_t$	Infected
$\Delta R_{t+1} = \gamma I_t - \theta R_t$	Resolving (sick)
$\Delta D_{t+1} = \delta \theta R_t$	Dead
$\Delta C_{t+1} = (1 - \delta) \theta R_t$	ReCovered

- Exponential growth, until herd immunity
- R brought down by contact with immune.
- Sweeps through in months. 60-80% get it. 2% = 5 million die. Ends swiftly.
- Utterly wrong. Why? *Behavior and Heterogeneity.*



# Behavioral SIR models

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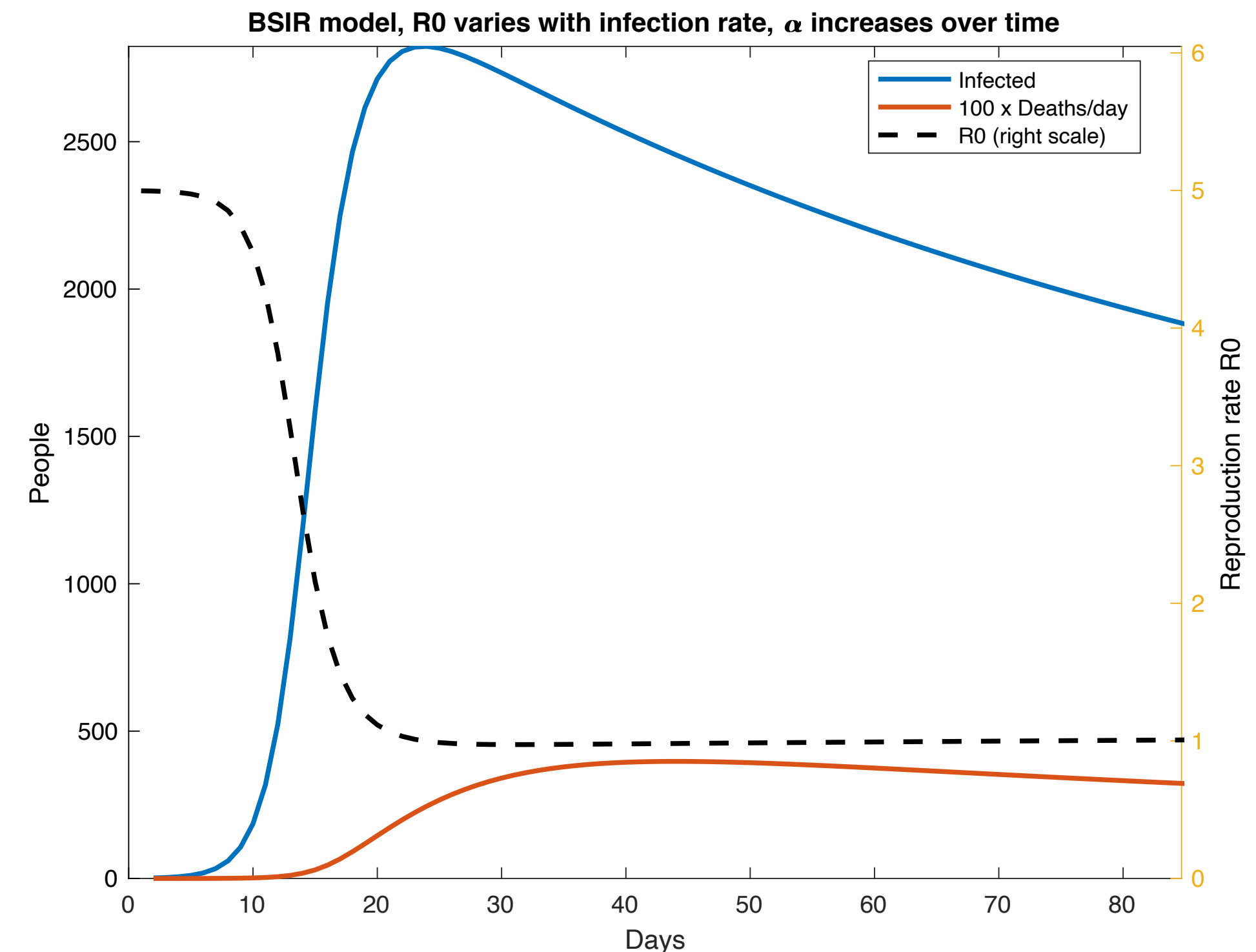
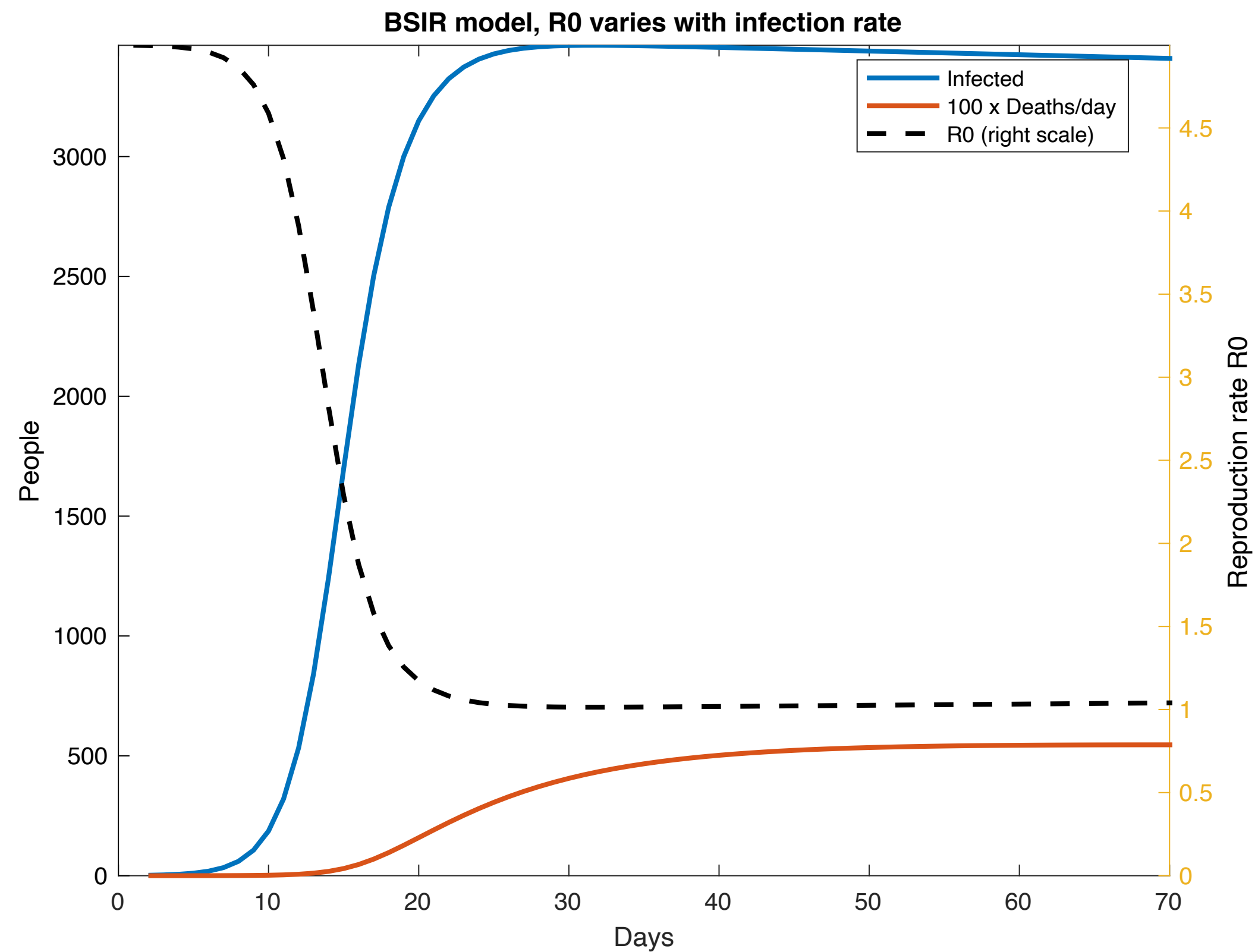
- Behavior: People and governments change behavior.
- More infected people around: Work harder to avoid contact.
- Private behavior vs. business shutdown sledgehammer.
- Fundamentally different mechanism for limiting R.
- *Converges to R=1*. Getting better at it = slow recovery.
- Bad news: with us a long time absent magic bullet.
- It's all about  $R < 1$ , cost of lower R.

People respond to current infection rate

$$\log(\beta_t) = \log \beta_0 - \alpha_I I_t / N_t$$

People get better at cost-effective mitigation

$\alpha$  Doubles over time



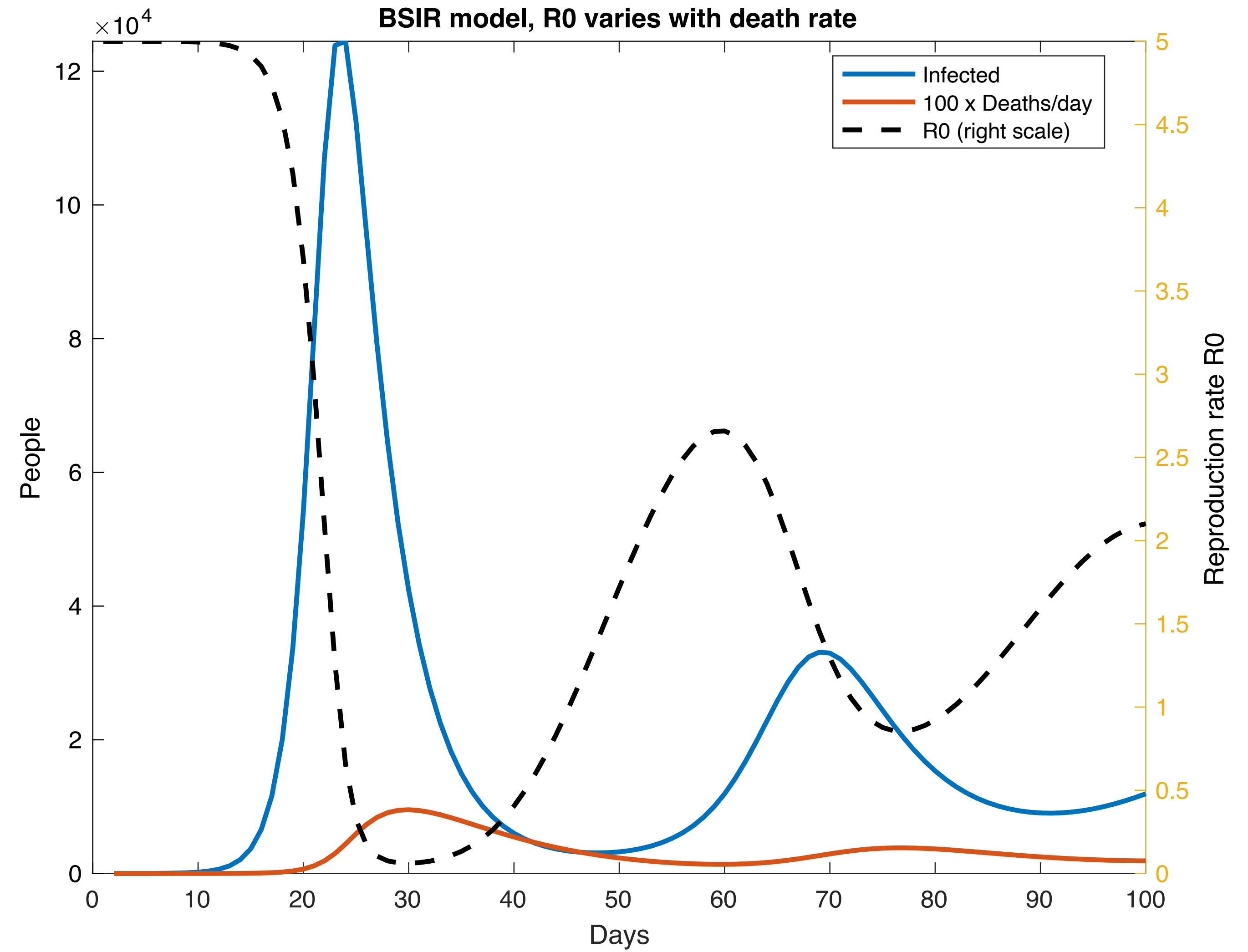
# Behavioral SIR models— a warning

$\Delta S_{t+1} = -\beta S_t I_t / N$	Susceptible
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- Current, accurate information on the current local infection rate, location and nature of hotspots is vital.
- Just a little random testing would be really cheap relative to \$5 trillion dollars.
- Don't try to lie.

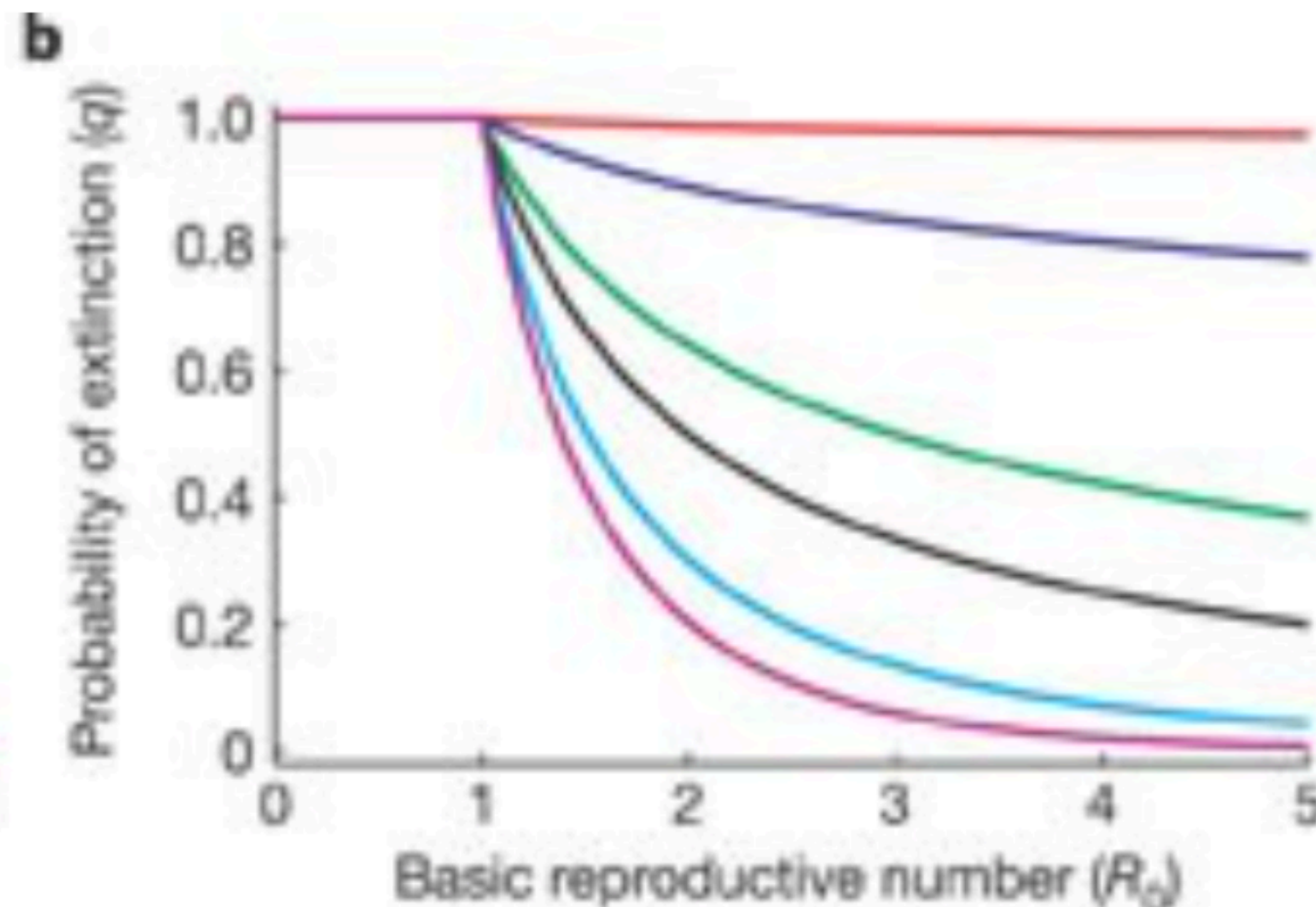
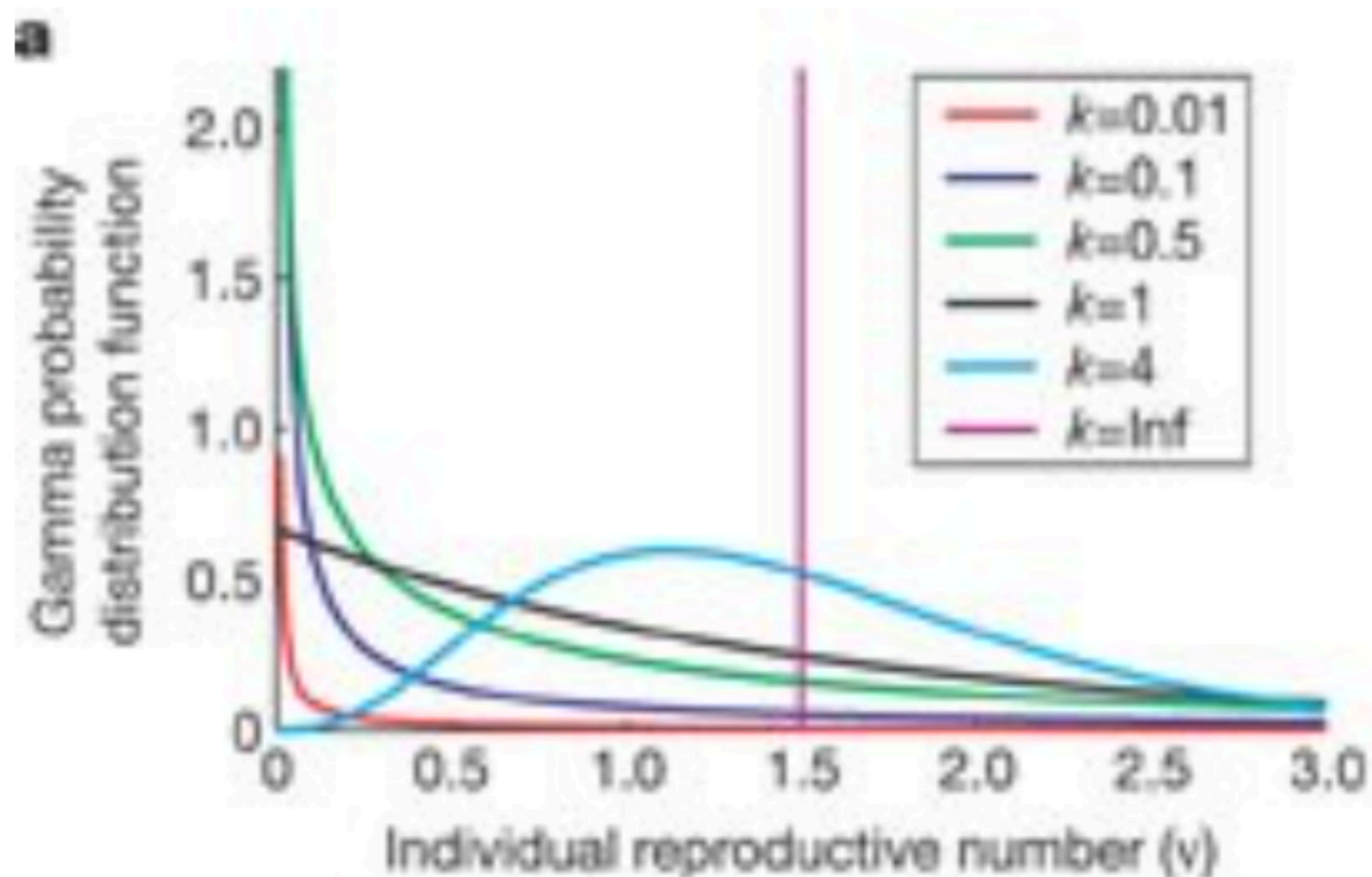
People respond to current *death* rate

$$\log(\beta_t) = \log \beta_0 - \alpha_D \Delta D_t / N.$$





# Superspreading



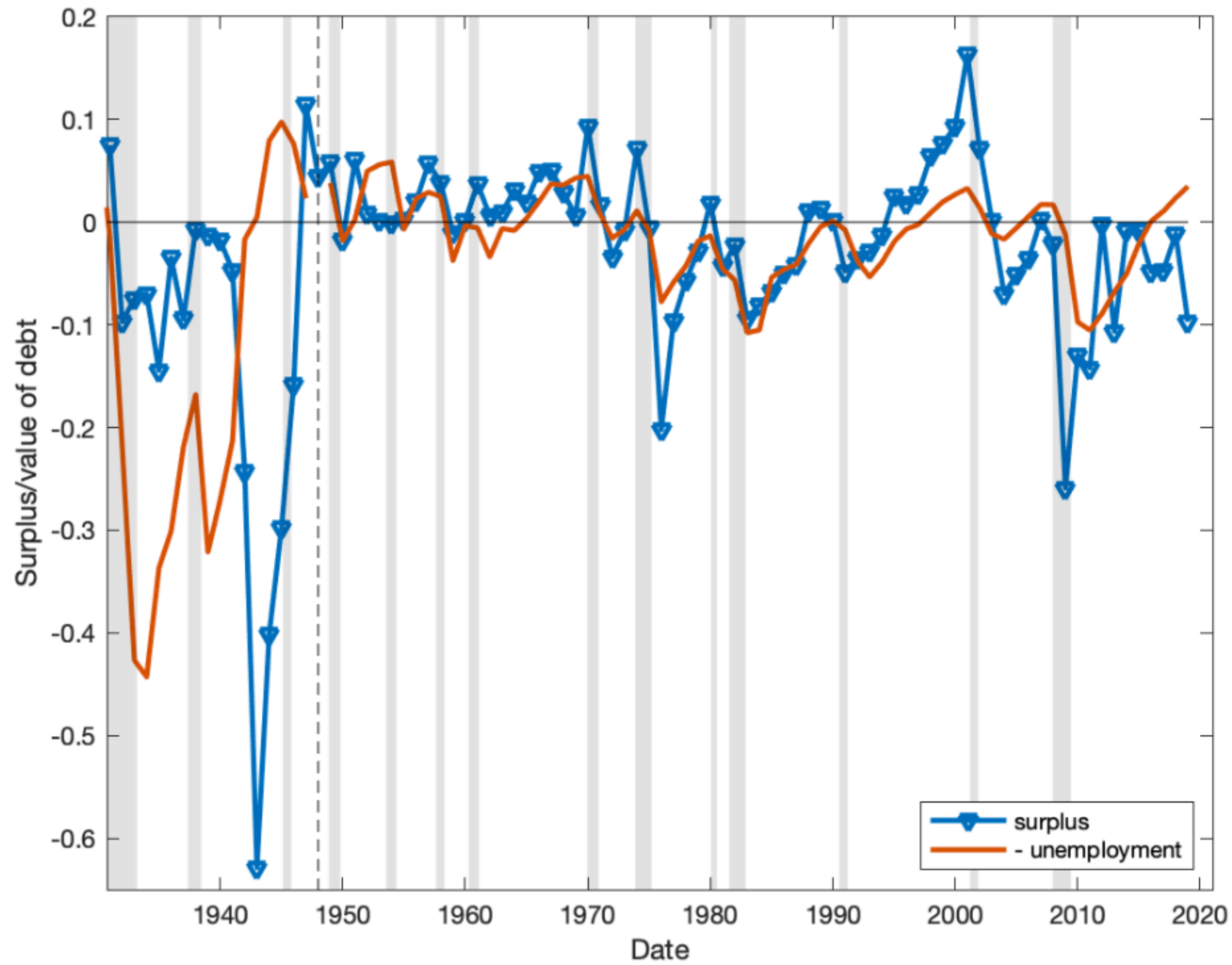
Key: Not just *there are* superspreading events. But most people who get it got it directly or one step from a super spreader

“Of the 349 local cases.....196 were linked to just six superspreading events. One person alone appears to have infected 73 individuals after frequenting several bars in late March. Weddings, temples, hot-pot dinners, work parties and karaoke venues...just 20 percent of cases, *all of them involving social gatherings*, accounted for an astonishing 80 percent of transmissions. ...Another 10 percent of cases accounted for the remaining 20 percent of transmissions — with each of these infected people on average spreading the virus to only one other person, maybe two people. This mostly occurred within households.”

Forget about maintaining — or, if infections resurge, resuming — sweeping measures designed to stem the virus’s spread in all forms. Just focus on stopping the superspreading.” (And all of these are cheap to stop)

Dillon C. Adam and Benjamin J. Cowling, New York Times.

- Heterogeneity.
  - *Superspreading* activities and places. Mechanism: aerosols, indoors, talking loudly, long exposure.
  - Public vs. private health:  $R < 1$  is enough.
- Behavior. Information: How does (and doesn't) this spread? What are local rates?
- Testing. Savior or panacea?
  - One of many ways to reduce the cost of lowering contact rate.
  - Massive failure of / lack of low-level bureaucratic public health capacity.
  - Test, track, trace, coercive isolation? Not in US.
- Summer/fall. Productivity and reallocation shock. (Demand/precautionary saving too)
- Long term reallocations? Cities?
- Policy.
  - From insurance to disincentives. Unemployment. Rent. Mortgage payments?
  - Regulation.
- Macro / Finance policy.
  - Why not great vacation? Debt.
  - Fed & cares support, lending predicated on V shaped recession.
  - Fed: no creditor may lose money, no price may fall.
  - Forecast *much* more money financed payout, Fed market support.
- Legacy.
  - Moral hazard. Over and over again is not an expedient, it's a regime.
  - Debt (short term!) and reserves.
  - Does debt not matter? *Wisdom* of spending not amount of spending. Stimulus checks.
  - Just put Summers (secular stagnation) Blanchard ( $r > g$ , no matter how you expand debt) Kelton (MMT) vs 1000 years of history to test.



- WWII / UK 1800s were paid by steady primary surpluses, strong supply side (productivity) growth in a much less regulated economy.
- Any other success story for 150% D/GDP?