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COVID-19

How will it end?



CORONAVIRUS

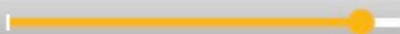
Source: UK Government

41,614

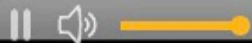
total UK deaths

Deaths for any reason within 28 days of a positive test

05:45



32:15



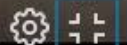


BBC NEWS

R number rises

00:48

32:15

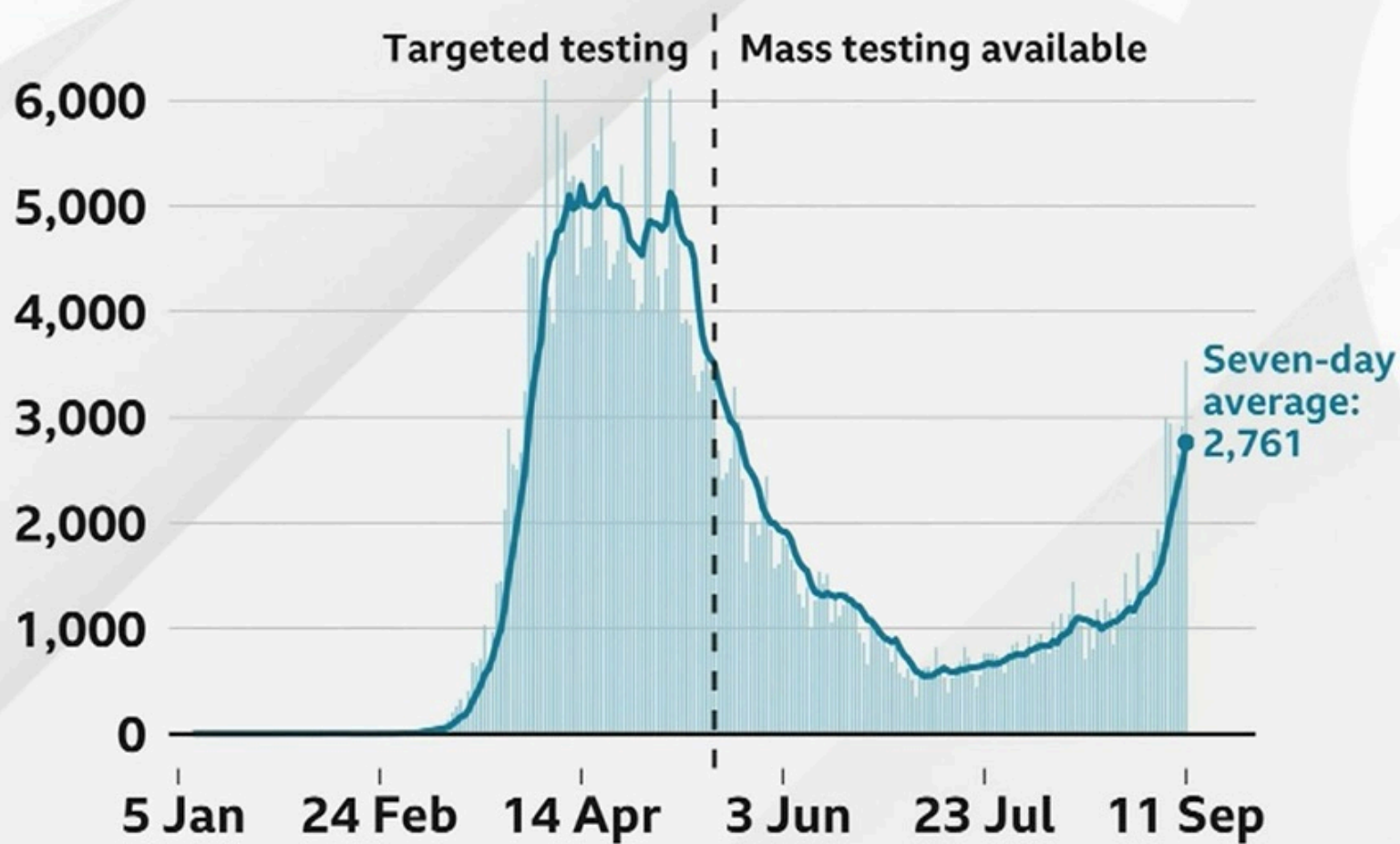




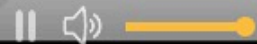
CORONAVIRUS

UK daily cases

Source: UK Government

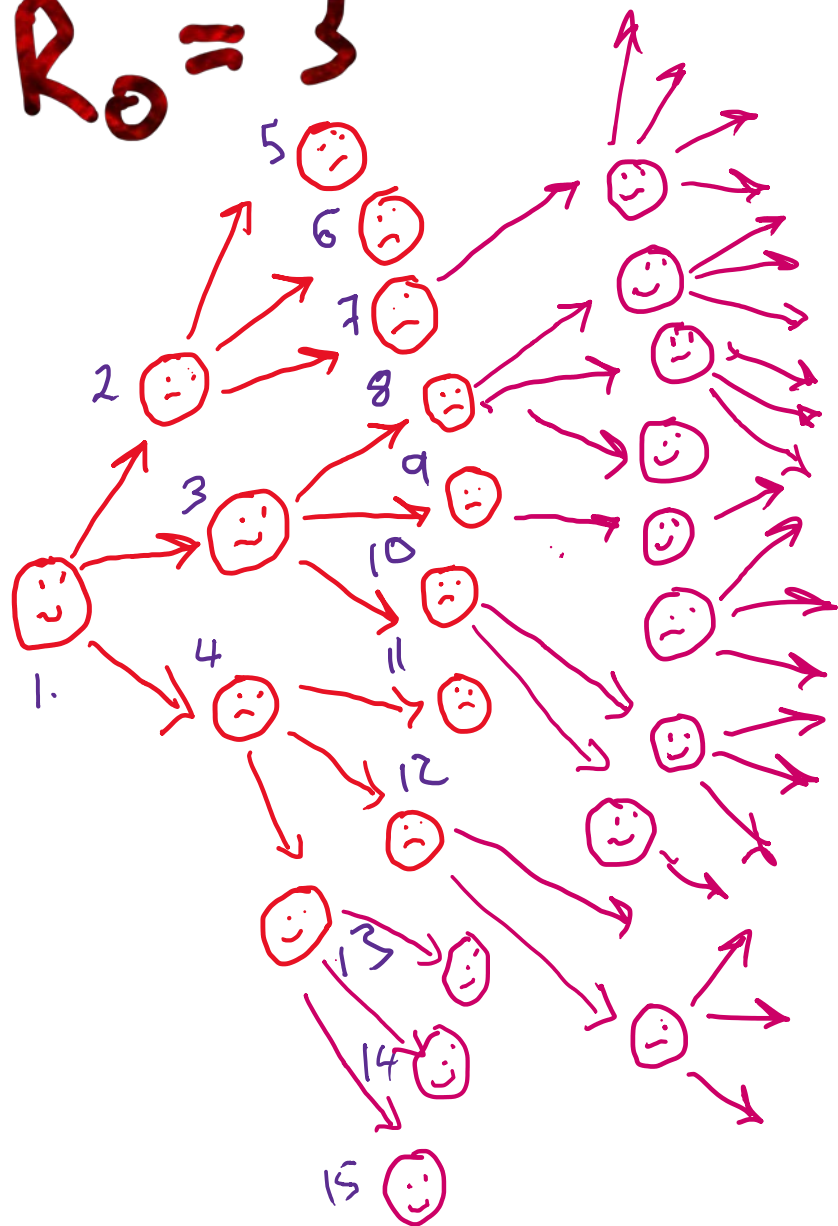


05:25

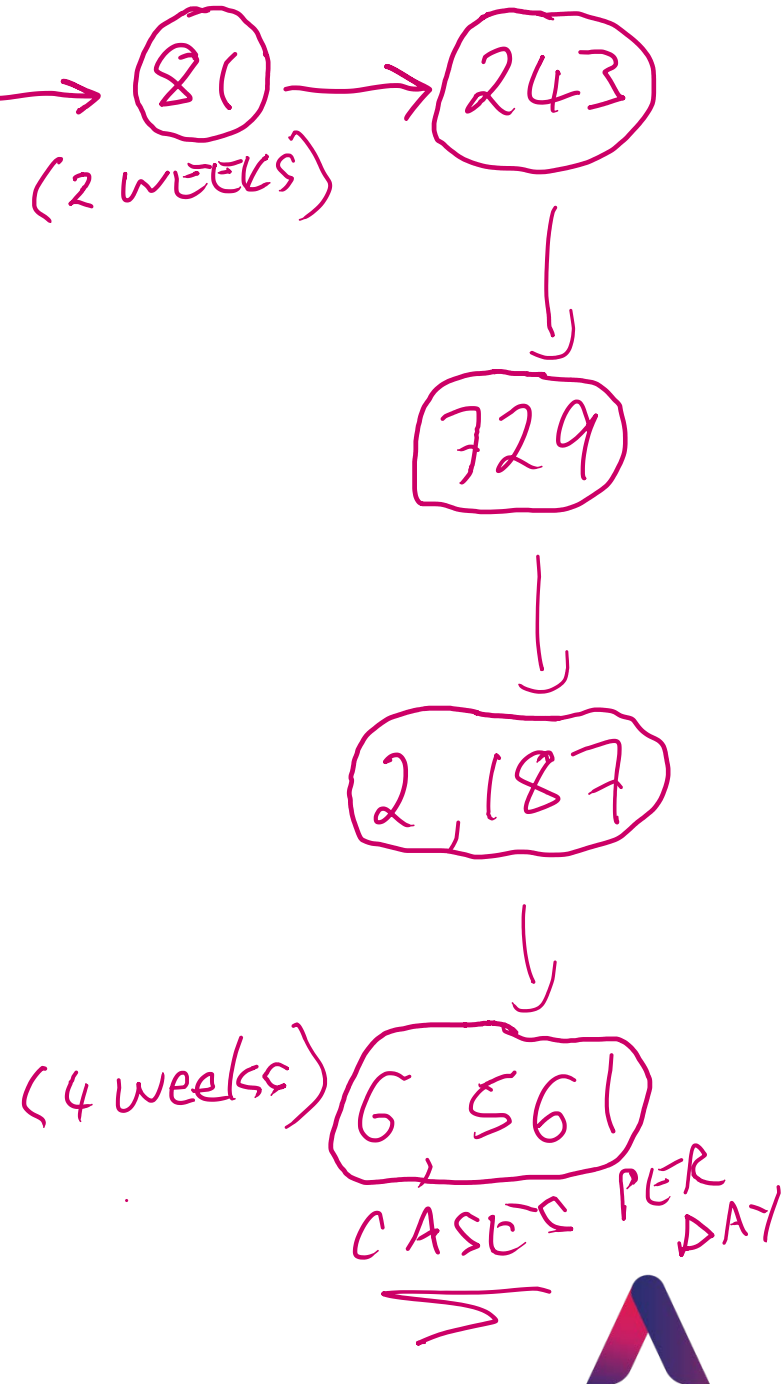


3,539
new confirmed cases
in hospital treatment

$$R_0 = 3$$

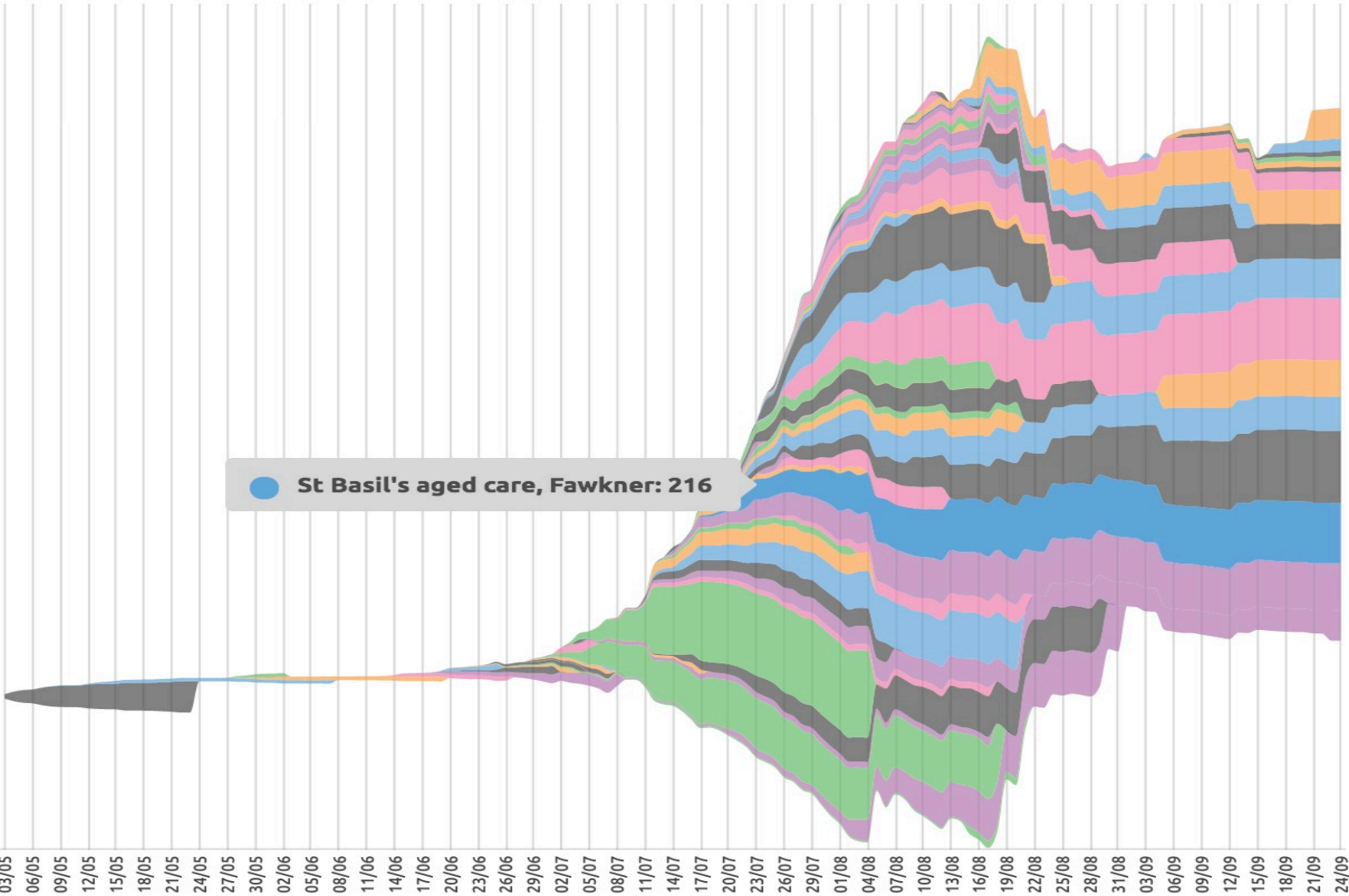


$$R_0 \text{ COVID-19} = 3$$

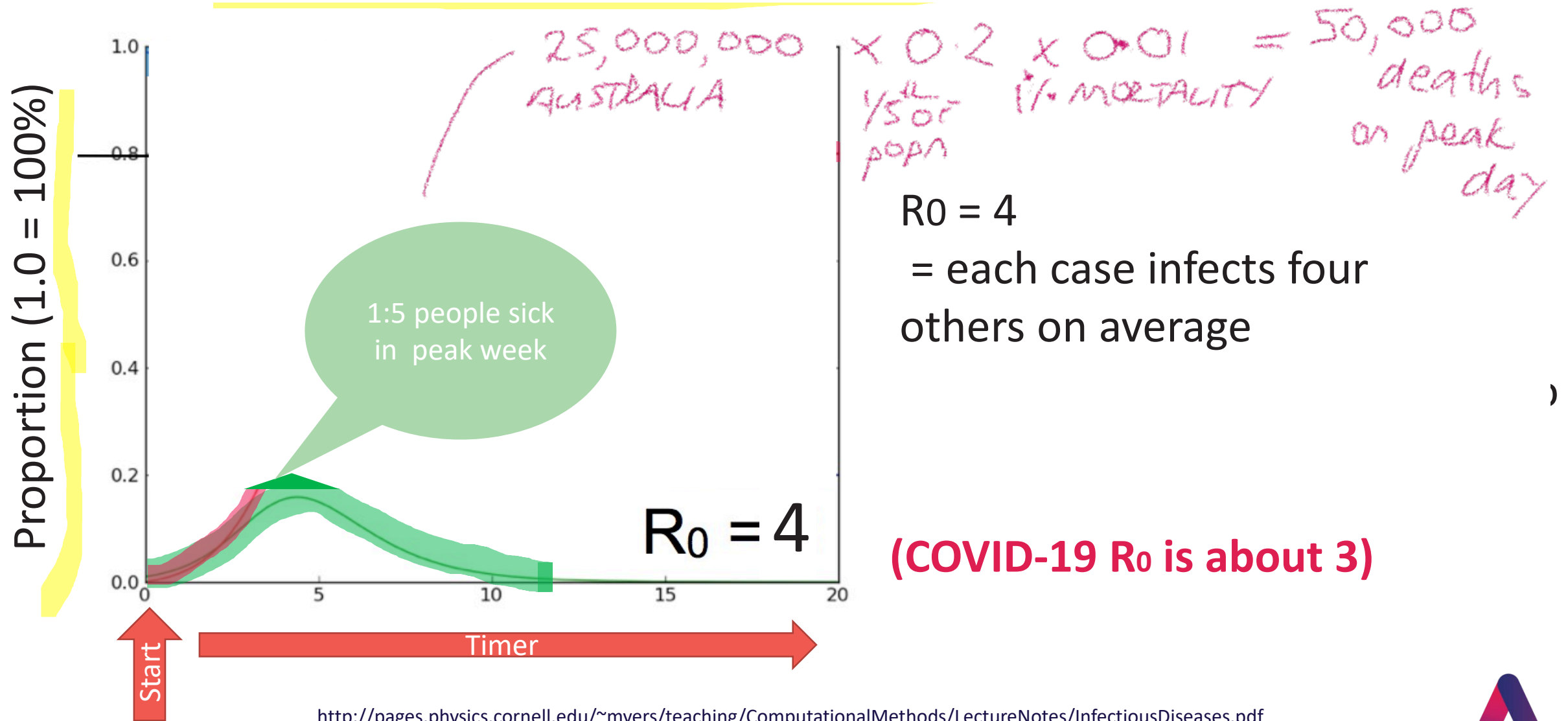


Progression of Victoria's largest clusters and outbreaks (tap...

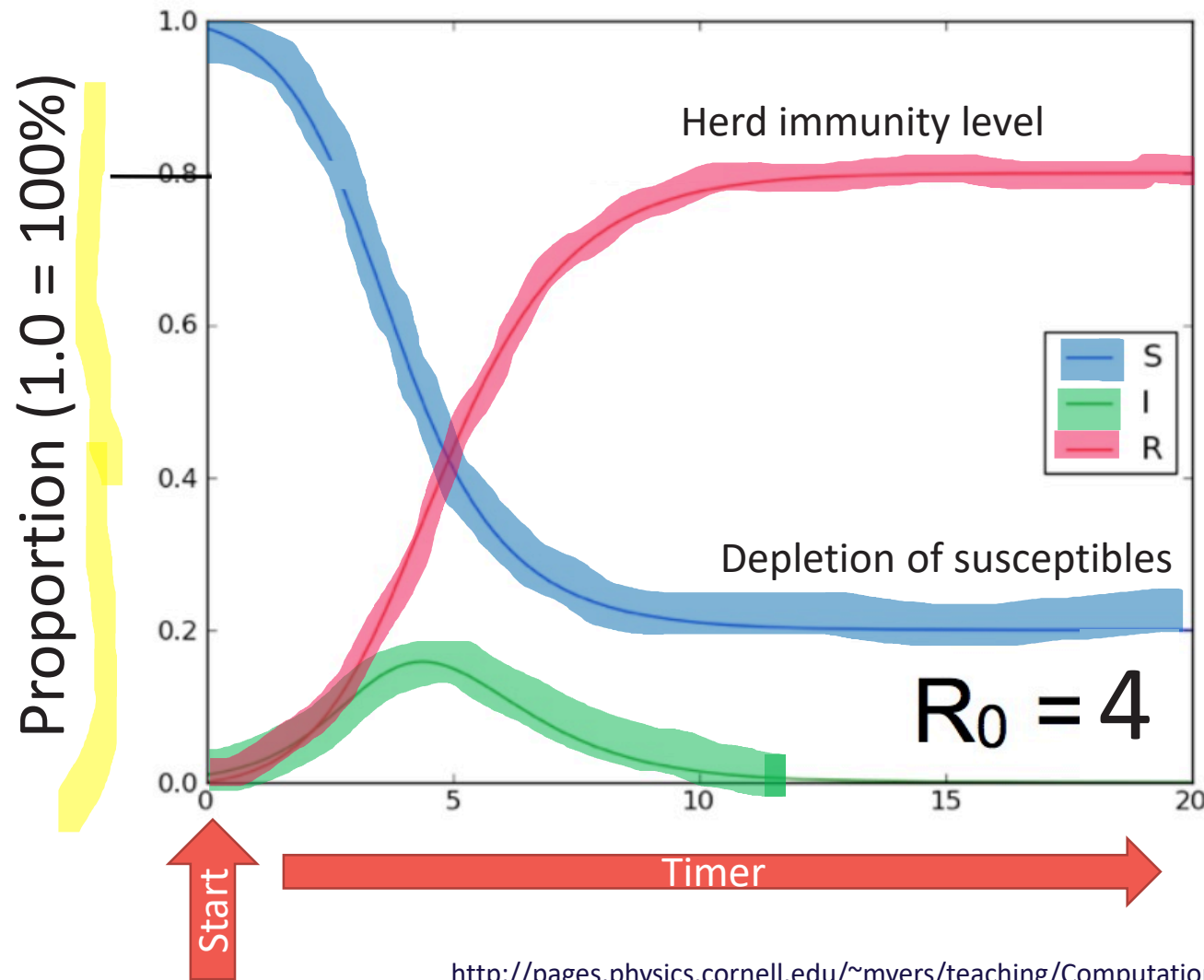
rollover for details)



How does a pandemic eventually stop?



Dynamics of an $R_0 = 4$ infection



There will always be some
 SUSCEPTIBLES (eg 20% in this
 infection
 For UK currently about 8% of
 population is seropositive
 fizzle out

COVID-19 R_0 is about 3



How do we change R?

$$\mathcal{R}_0 = \tau \cdot \bar{c} \cdot d$$

τ = transmissibility

\bar{c} = average rate of contacts between cases and susceptible people

d = duration of infectiousness



How do we change R?

$$R_0 = \tau \cdot \bar{c} \cdot d$$

τ = transmissibility

wash hands
social distance
wear a mask

\bar{c} = average rate of contacts between cases and susceptible people

d = duration of infectiousness

stay home
→ find, isolate all cases



Norman Swan

7/30

Wash hands



Social distance



Wear masks



Get tested with even the mildest symptoms...

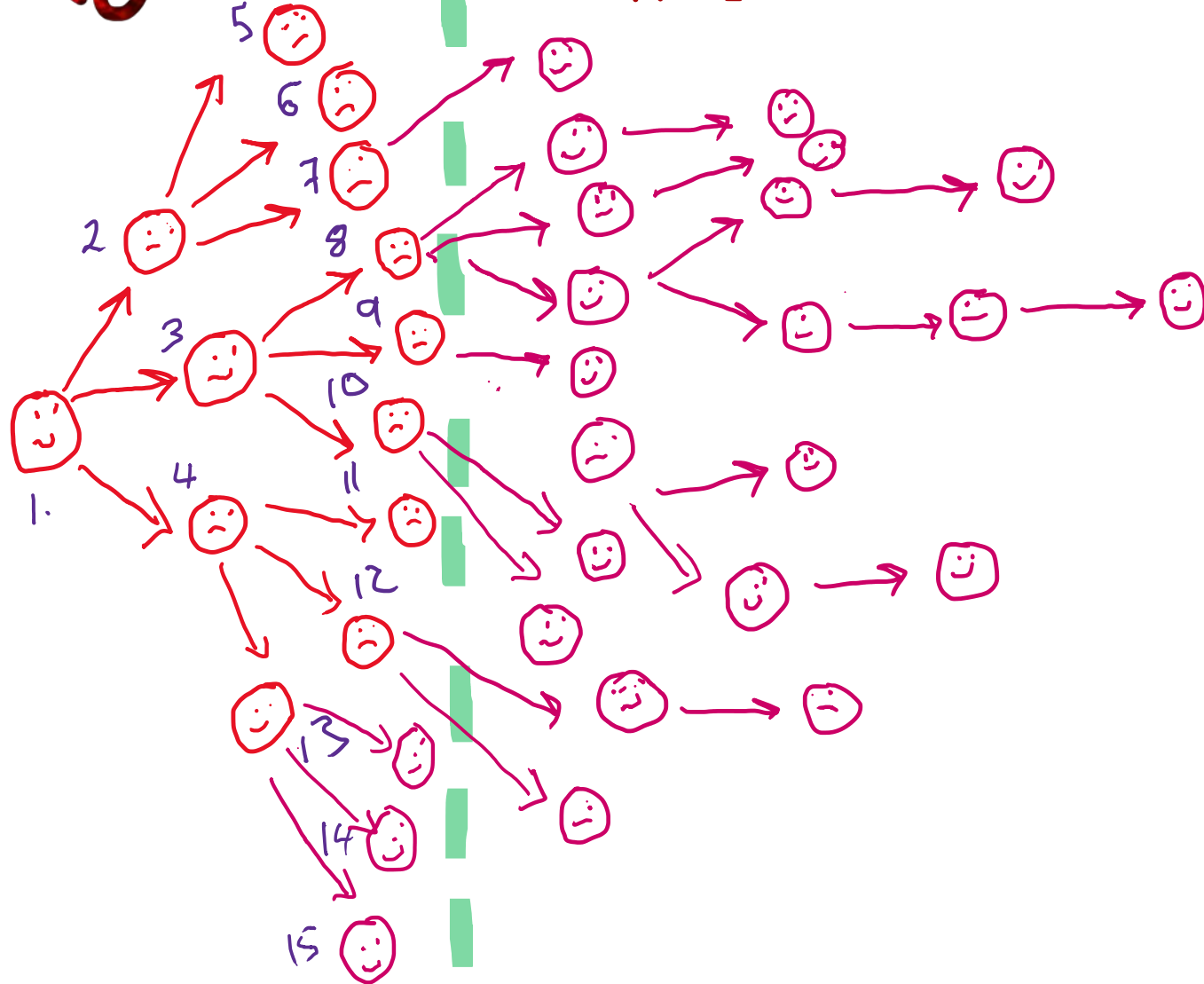


$R_0 = 3$

← we change R.... →

$R < 1$

end of restrictions



(No more virus)

last
person
recovers

Shutdown 1.0

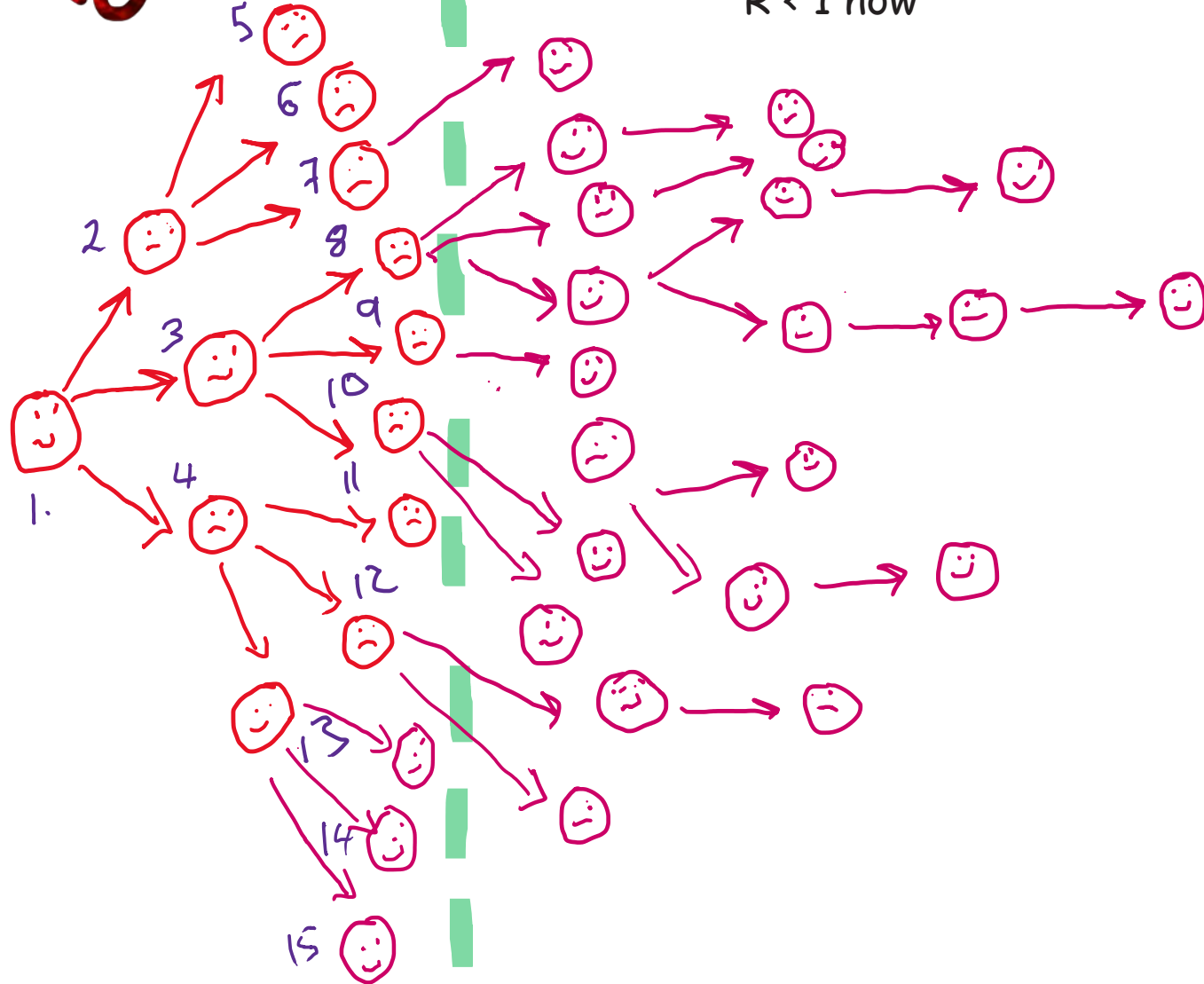
End of shutdown



$R_0 = 3$

← we change R.... →

$R < 1$ now

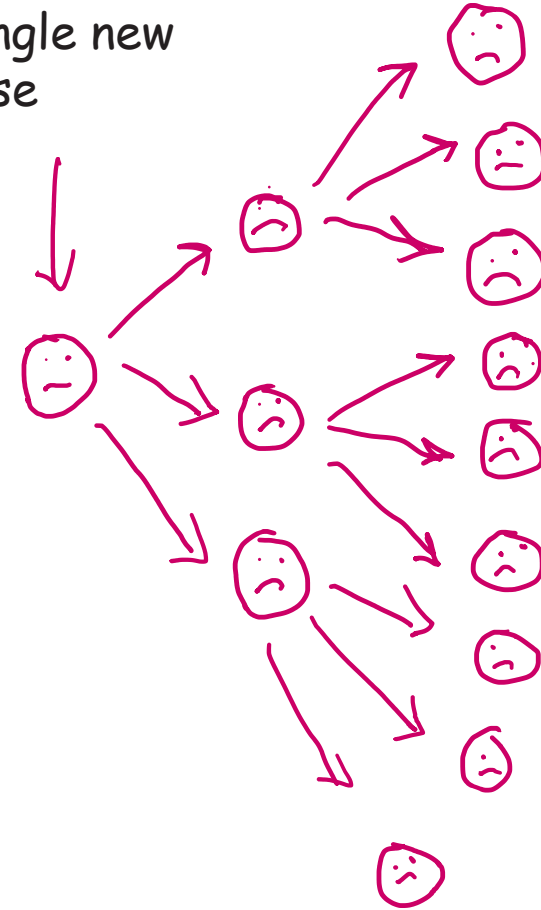


Shutdown 1.0

End of shutdown

end of restrictions

Single new case



Human and virus biology the same, back to $R = 3$



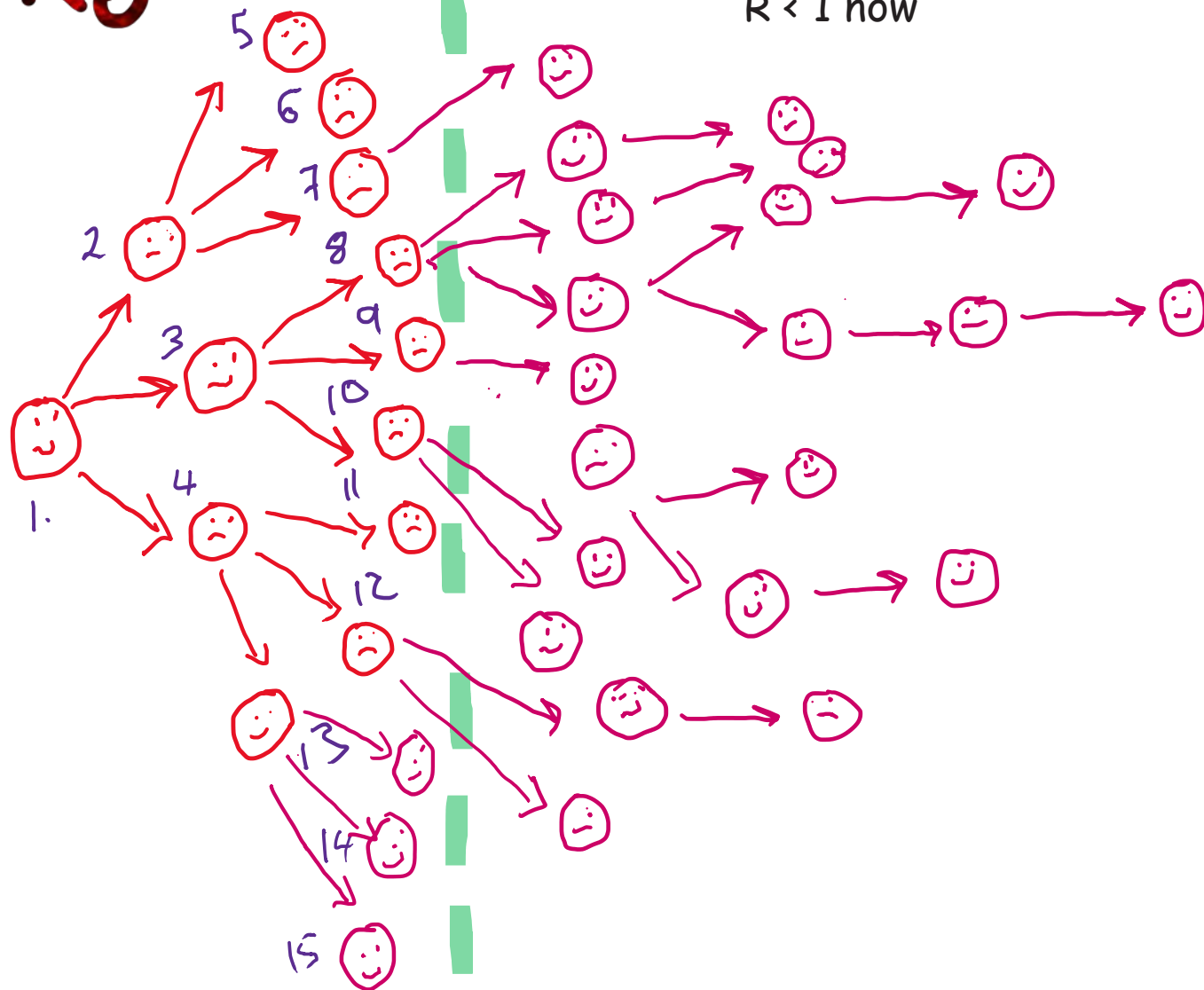
$R_0 = 3$

← we change R.... →

$R < 1$ now

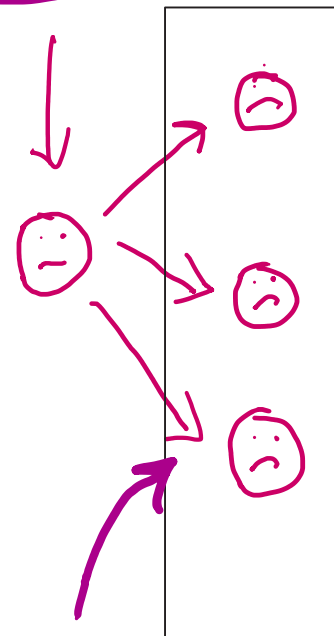
end of restrictions

Find case



Shutdown 1.0

End of shutdown



prevent 9

QUARANTINE
3

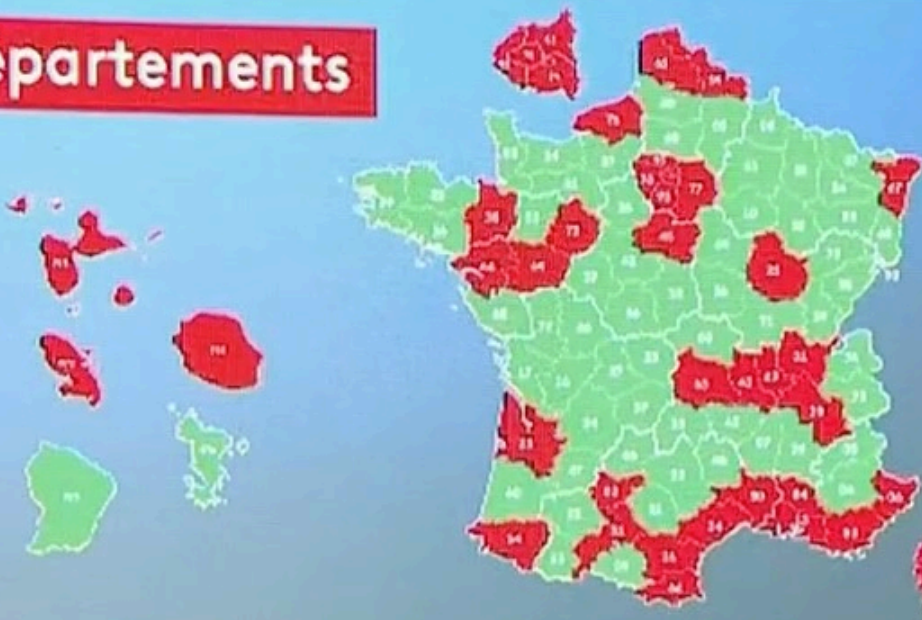
TIME
3 10
DAYS



Zones de circulation active du virus

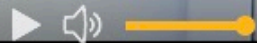
2

←
42 départements



07:37

54:29





Mortalité en réanimation

2

SOURCE : SANTÉ PUBLIQUE FRANCE / REVA



Mars-avril

35 à 40 %

Aujourd'hui

25 à 30 %

20h

13:07

Week-end

Covid-19 Une meilleure prise en charge en réanimation

54:36

