

In Medias Res

Last updated: 2021/10/07, 17:44:59 EDT

Principles of Complex Systems, Vols. 1 & 2
CSYS/MATH 300 and 303, 2021-2022 | @pocsvox

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Vermont Advanced Computing Core | University of Vermont



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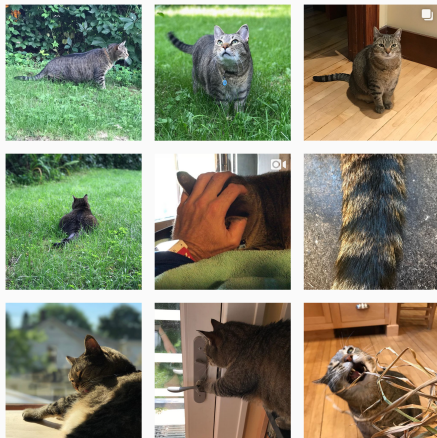
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 On Instagram at [pratchett_the_cat](https://www.instagram.com/pratchett_the_cat) 



Outline

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Contagion

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A confusion of contagions:



A confusion of contagions:

📦 Did Harry Potter spread like a virus?



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- 📦 Can disinformation be “infectious”?



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- 🧱 Can disinformation be “infectious”?
- 🧱 Suicide, Violence, Stupidity?



A confusion of contagions:

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- ☒ Can disinformation be “infectious”?
- ☒ Suicide, Violence, Stupidity?
- ☒ Morality? Evil? Laziness? Stupidity? Happiness?



A confusion of contagions:

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- Religion?



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- Democracy ...?



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- Democracy ...?
- Language? The alphabet?^[1]



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- ☒ Religion?
- ☒ Democracy ...?
- ☒ Language? The alphabet?^[1]
- ☒ Stories?



For novel diseases:



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1. Can we predict the size of an epidemic?



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-  1918-19 "Spanish Flu" ~ 75,000,000 world-wide, 500,000 deaths in US.
-  1957-58 "Asian Flu" ~ 2,000,000 world-wide, 70,000 deaths in US.



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-  1918-19 "Spanish Flu" ~ 75,000,000 world-wide, 500,000 deaths in US.
-  1957-58 "Asian Flu" ~ 2,000,000 world-wide, 70,000 deaths in US.
-  1968-69 "Hong Kong Flu" ~ 1,000,000 world-wide, 34,000 deaths in US.



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R_0 approximately same for all of the following:

-  1918-19 "Spanish Flu" ~ 75,000,000 world-wide, 500,000 deaths in US.
-  1957-58 "Asian Flu" ~ 2,000,000 world-wide, 70,000 deaths in US.
-  1968-69 "Hong Kong Flu" ~ 1,000,000 world-wide, 34,000 deaths in US.
-  2003 "SARS Epidemic" ~ 800 deaths world-wide.

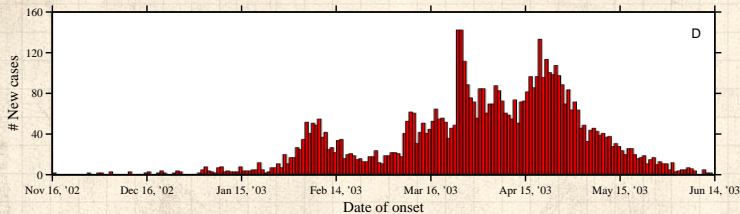


Resurgence—example of SARS

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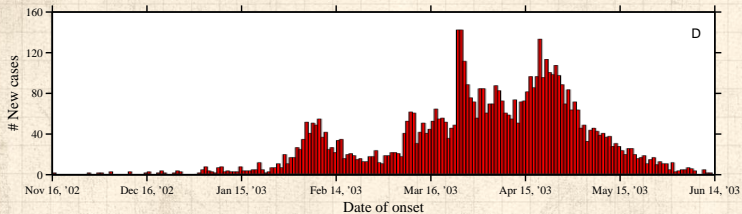


Resurgence—example of SARS

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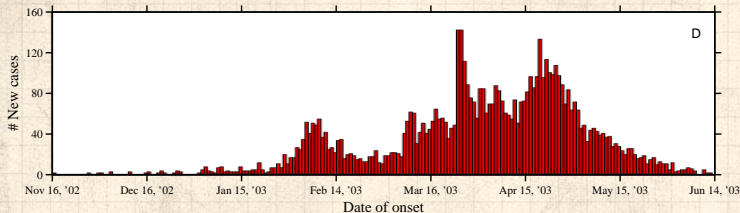
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Epidemic slows...



Resurgence—example of SARS

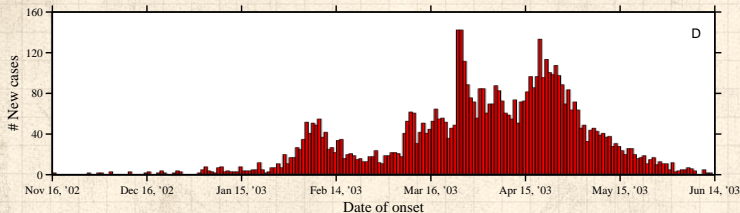


Epidemic slows...

then an infective moves to a new context.



Resurgence—example of SARS



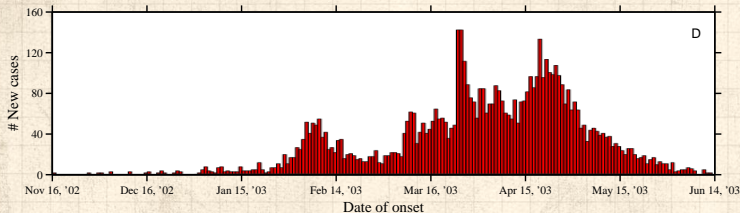
Epidemic slows...
then an infective moves to a new context.



Epidemic discovers new 'pools' of susceptibles:
Resurgence.



Resurgence—example of SARS



Epidemic slows...
then an infective moves to a new context.



Epidemic discovers new 'pools' of susceptibles:
Resurgence.



Importance of rare, stochastic events.



Mistake 2:

Seeing success is 'due to social' and wanting to say 'all your interactions are belong to us'

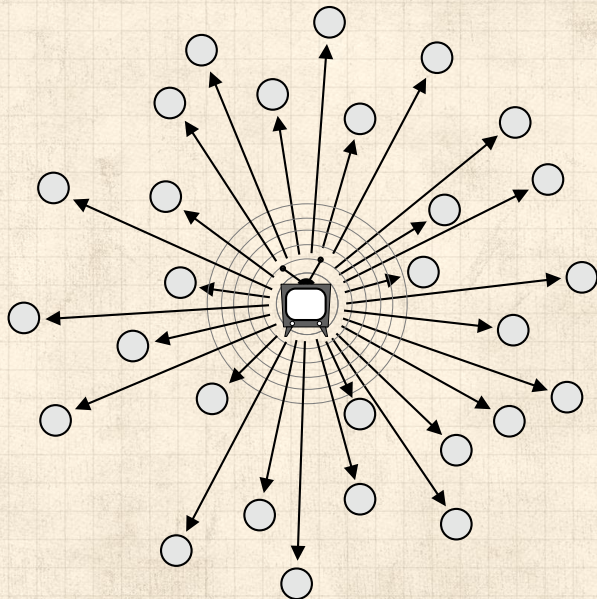


The hypodermic model of influence:

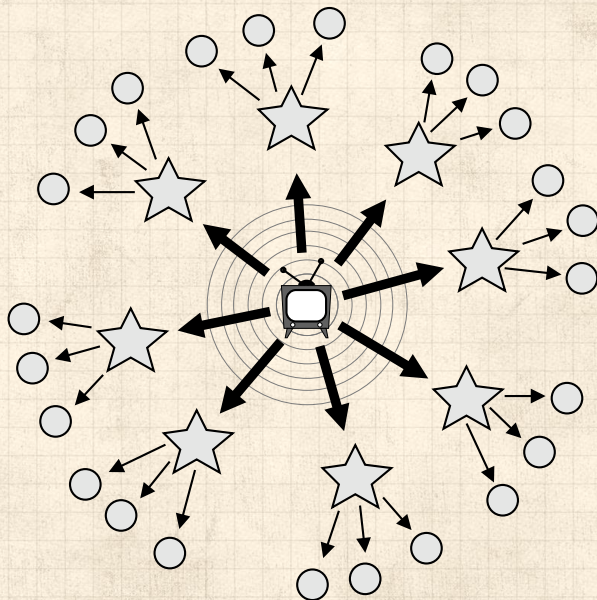
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The two step model of influence: [3]

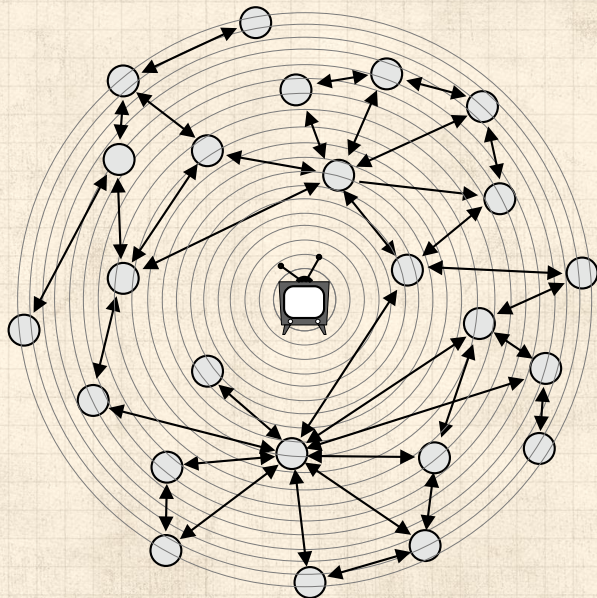


The network model of influence:

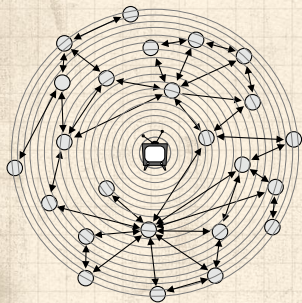
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The network model of influence:



How superspreading works:

Many interconnected, average, trusting people must benefit from both **receiving** and **sharing** a message far from its source.



[“Influentials, Networks, and Public Opinion Formation”](#)

Watts and Dodds,

J. Consum. Res., **34**, 441–458, 2007. [4]




And of course:



How we got here: It's going to be tropes all the way down¹



¹Three weeks earlier ... [↗](#)

100 days earlier in the
PoCSverse ... 



The complex dynamics of course reviews:

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References



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