

In Medias Res

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

Prof. Peter Sheridan Dodds | @peterdodds

Computational Story Lab | Vermont Complex Systems Center
Vermont Advanced Computing Core | University of Vermont



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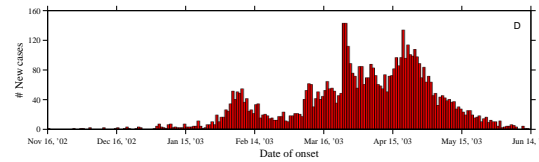
For novel diseases:

1. Can we predict the size of an epidemic?
2. How important is the reproduction number R_0 ?

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



- Epidemic slows... then an infective moves to a new context.
- Epidemic discovers new 'pools' of susceptibles: **Resurgence.**
- Importance of rare, stochastic events.



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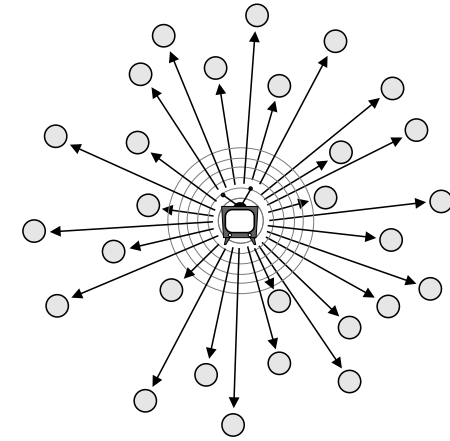
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Mistake 2:

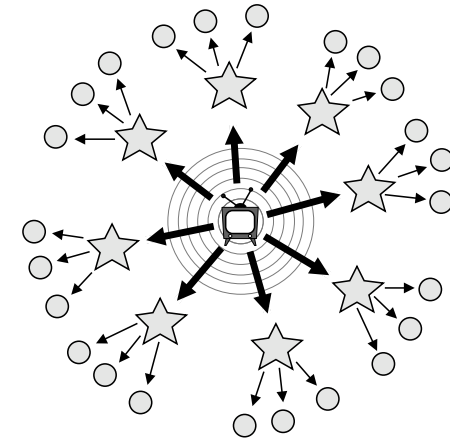
Seeing success is 'due to social' and wanting to say 'all your interactions are belong to us'



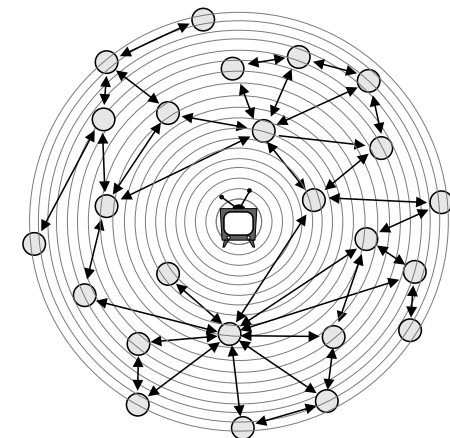
The hyperdermic model of influence:



The two step model of influence: [3]



The network model of influence:



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Contagion

A confusion of contagions:

- Did Harry Potter spread like a virus?
- Can disinformation be "infectious"?
- Suicide, Violence, Stupidity?
- Morality? Evil? Laziness? Stupidity? Happiness?
- Religion?
- Democracy ...?
- Language? The alphabet? [1]
- Stories?



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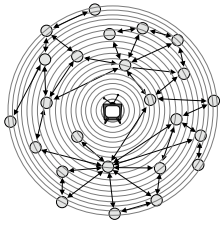
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The network model of influence:



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]



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And of course:



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



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100 days earlier in the PoCSverse ...



The dynamics of course reviews



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References I

- [1] J. Gleick. The Information: A History, A Theory, A Flood. Pantheon, 2011.
- [2] D. Harmon, R. Ridley, and J. Rolland. Look Who's Purging Now, 2015.
- [3] E. Katz and P. F. Lazarsfeld. Personal Influence. The Free Press, New York, 1955.
- [4] D. J. Watts and P. S. Dodds. Influentials, networks, and public opinion formation. Journal of Consumer Research, 34:441–458, 2007. pdf



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