Complex Systems in Public Health

Further Resources

General complex systems reading

❑ Rutter H et al. The need for a complex systems model of evidence for public health. Lancet. 2017;390(10112):2602-4. https://spiral.imperial.ac.uk/handle/10044/1/52213.

❑ Stearman J. Learning from evidence in a complex world. Am J Public Health. 2006;96(3):505-14. https://dx.doi.org/10.2105%2FAJPH.2005.066043.

❑ UK HM Treasury. Magenta Book 2020. Handling complexity in policy evaluation. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879437/Magenta_Book_supplementary_guide._Handling_Complexity_in_policy_evaluation.pdf.

❑ Ladyman J, Wiesner K. What is a Complex System? New Haven: Yale University Press; 2020.

❑ Sterman J. Business Dynamics: Systems Thinking and Modeling for a Complex World. Boston: Irwin McGraw-Hill; 2000.

❑ Hovmand P. Community Based Systems Dynamics. New York: Springer; 2014.

❑ Meadows DH. Thinking in Systems. A Primer. 2008. https://research.fit.edu/media/site-specific/researchfitedu/coast-climate-adaptation-library/climate-communications/psychology-amp-behavior/Meadows-2008.-Thinking-in-Systems.pdf

❑ Hawe P, Shiell A, Riley T. Theorising interventions as events in systems. Am J Community Psychol. 2009 Jun;43(3-4):267-76. doi: 10.1007/s10464-009-9229-9. PMID: 19390961.

Social Network Analysis

Core texts for Social Network Analysis:

- Hanneman, Robert A. and Mark Riddle. 2005. Introduction to social network methods. Riverside, CA: University of California, Riverside (http://faculty.ucr.edu/~hanneman/)

- Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2013). *Analyzing social networks*. SAGE.

- Thomas W. Valente. Social Networks and Health. Models, Methods, and Applications

Social Network Analysis

Core texts for network interventions:

- Valente TW. Network interventions. Science. 2012 Jul 6;337(6090):49-53.

- Valente TW, Pitts SR. An Appraisal of Social Network Theory and Analysis as Applied to Public Health: Challenges and Opportunities. Annu Rev Public Health. 2017 Mar 20;38:103-118.

- Latkin CA, Knowlton AR. Social Network Assessments and Interventions for Health Behavior Change: A Critical Review. Behav Med. 2015;41(3):90-7.

Social Network Analysis

Societies:

INSNA: International Network for Social Network Analysis: http://www.insna.org/

EUSN: European Social Network:
http://www.esn-eu.org/home/index.html

Courses:

Methods@Manchester: http://www.methods.manchester.ac.uk/events/summer-school-2016/courses/social-network-analysis/

LINKS Centre for SNA, Kentucky: https://sites.google.com/site/uklinkscenter/

Duke Network Analysis Centre, Social networks and health workshop:
https://csde.washington.edu/news-events/social-networks-and-health-workshop/
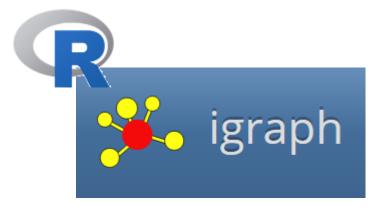
Social network analysis: software packages

Agent-based Modelling (ABM)

Core text books:

- Wilensky, U. and W. Rand (2015). An Introduction to Agent-Based Modeling: Modeling natural, social and engineered complex systems with NetLogo. Cambridge, MA: MIT Press.
- Railsback, S. F. and V. Grimm (2011). Agent-based and Individual-based Modeling: A Practical Introduction. New Jersey: Princeton University Press.
- Gilbert, N. (2008). Agent-Based Models. Quantitative Applications in the Social Sciences. Los Angeles: Sage Publications.
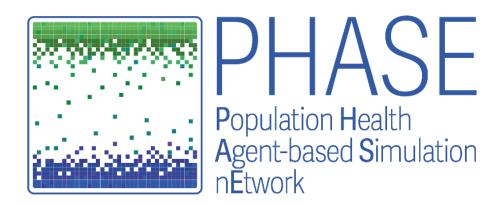
Training

- ABM for the self-learner (free resource): http://www.research.criticalconnections.com.au/ABMBook/
- Santa Fe Institute Complexity Explorer: https://www.complexityexplorer.org/courses/101-introduction-to-agent-based-modeling-spring-2020
- Santa Fe Institute Fundamentals of Netlogo: https://www.complexityexplorer.org/courses/84-fundamentals-of-netlogo

Support networks:

❑ UKPRP PHASE network

❑ A range of useful reading material on ABMs:
http://phasenetwork.org/abm-resources/

www.phasenetwork.org   **@phase_network**

Systems Dynamics

❑ Sterman J. Business Dynamics: Systems Thinking and Modeling for a Complex World. Boston: Irwin McGraw-Hill; 2000.
❑ Bala B, Arshad F, Noh K. System dynamics: modelling and simulation. Singapore: Springer Nature; 2017.
❑ Hovmand P. Community Based Systems Dynamics. New York: Springer; 2014
❑ Scott R. Group Model Building: Using Systems Dynamics to Achieve Enduring Agreement. Singapore: Springer; 2018.

Support networks:
❑ Systems Dynamics Society (SDS): https://systemdynamics.org/what-is-system-dynamics/

Courses:
❑ SDS online course catalog: https://systemdynamics.org/online-course-catalog/#online-course-list