

The Basics of Program Science

PROGRAM SCIENCE

Program Science is the systematic application of theoretical & empirical scientific knowledge to improve the design, implementation, & evaluation of public health programs.

An iterative, multi-phase approach for developing, refining, and improving public health programs.



HOW IT WORKS

Research is embedded within programs & programmatic questions drive scientific inquiry and learning.



Program and research goals are aligned to achieve population-level health impact and equity.



Engagement between community, government, and program partners is sustained over long periods.



Collaborations between researchers, communities, program implementers, and policymakers support program optimization.

SPHERES OF PRACTICE & CRITICAL STEPS

Programmatic learning & scientific evidence is used to inform public health policy and is incorporated into program planning & implementation to accommodate the evolving needs of a program.

STRATEGIC PLANNING

- Outline program priorities & develop resource allocation strategy
- Understand local epidemiological context to identify priority geographies & populations through:
 - Mapping and population size estimation
 - Qualitative & quantitative assessments
 - Mathematical modelling

PROGRAM IMPLEMENTATION

- Identify appropriate intervention mix
- Identify optimal delivery platforms and support implementation
- Meaningfully engage, support, & partner with local community to facilitate contextualized programmatic responses
- Refine interventions using embedded research

LEARNING & RESEARCH AGENDA

PROGRAM MANAGEMENT & MONITORING

- Ongoing program monitoring, including process documentation
- Continuous analyses of monitoring data to identify "opportunity gaps"
- Indicator quality & validity
Trends in program outputs, outcomes

WHAT ELSE SHOULD I KNOW?

Program Science aims to optimize program implementation, but also focuses on optimizing population-level impact.

Achieving population-level impact depends upon many factors, including a program's focus population(s); the selection of program components/interventions & delivery platforms, including those at the community, facility, and health systems levels; and interactions between program components/interventions.



Program Science emphasizes getting research out of practice, formulating new hypotheses, then getting new research back into practice.*

It focuses on multiple interventions operating within a program simultaneously, and their interfaces with at the population level.

*Parkhurst J, et al. Lancet 2010; 375(9724): 1414-5.



Program Science is concerned with the totality of a program and its context.

This includes understanding local epidemiology (e.g. priority populations and geographies, transmission dynamics, inequities in outcomes of interest), setting appropriate programmatic priorities, selecting and combining appropriate interventions, and allocating program resources accordingly.

It also encompasses monitoring and evaluation strategies, and explicitly considers the role of advocacy in developing support for programs within local policy arenas and communities.



Using a Program Science approach yields good program management and provides insights into program operations. It generates knowledge that can be used to adjust existing program strategies and inform future program design and implementation.

New program knowledge could emerge in areas such as:

Improving approaches to appraise & understand dynamics of local epidemics

Developing novel strategies for evaluating/assessing program impact

Expanding public health sciences into new fields that address complexity (e.g. understanding inequities in health outcomes; interfaces between individual, pathogens, their environment; optimizing health service coverage)



WHY USE PROGRAM SCIENCE?



INTEGRATION OF RESEARCH & PROGRAMS

Ensures that a program's key knowledge gaps are driving an embedded research and learning agenda, which then generates evidence to inform and optimize program operations.



ENHANCED PROGRAM RESPONSIVENESS

Allows programs to be flexible, nimble, and adaptable to identify, evaluate, and respond to programmatic complexities as they emerge.



SYNERGISTIC COLLABORATION

Centres multidisciplinary teams working together to build upon their diverse strengths to create synergies.



LONG-TERM PARTNERSHIPS

Builds inter-sectoral partnerships that last beyond single projects and periods of funding turnover, creating a sustainable foundation for further work to improve population-level outcomes.

ADDITIONAL PROGRAM SCIENCE READING

- ⌚ Aral SO, Blanchard JF. The Program Science initiative: improving the planning, implementation and evaluation of HIV/STI prevention programs. *Sex Transm Infect* 2012; 88(3): 157-9.
- ⌚ Blanchard JF, Aral SO. Program Science: an initiative to improve the planning, implementation and evaluation of HIV/sexually transmitted infection prevention programmes. *Sex Transm Infect* 2011; 87(1): 2-3.
- ⌚ Becker M, Haworth-Brockman M, Keynan Y. The value of program science to optimize knowledge brokering on infectious diseases for public health. *BMC Public Health* 2018; 18(1): 567.
- ⌚ Becker M, Mishra S, Aral S, et al. The contributions and future direction of Program Science in HIV/STI prevention. *Emerg Themes Epidemiol* 2018; 15: 7.
- ⌚ Crockett M, Avery L, Blanchard J. Program science--a framework for improving global maternal, newborn, and child health. *JAMA pediatrics* 2015; 169(4): 305-6.
- ⌚ McClarty LM, Bhattacharjee P, Isac S, et al. Key Programme Science lessons from an HIV prevention 'Learning Site' for sex workers in Mombasa, Kenya. *Sex Transm Infect* 2018; 94(5): 346-52.