

# Examining Multilevel System Dynamics Affecting HIV Community Viral Load

## Project Steering Committee

### RESEARCH TEAM:

*Maryann Abbott, MA<sup>1</sup>*

*H. Danielle Green, Ph.D.<sup>1</sup>*

*Rosey Gonzalez<sup>1</sup>*

*Jianghong Li, MD, M.Sc.<sup>1</sup>*

*David Lounsbury, Ph.D.<sup>2</sup>*

*Heather Mosher, Ph.D.<sup>1</sup>*

*Lucy Rohena<sup>1</sup>*

*Peg Weeks, Ph.D. (PI)<sup>1</sup>*

<sup>1</sup> *Institute for Community  
Research*

<sup>2</sup> *Albert Einstein College of  
Medicine*

### COMMUNITY RESEARCH PARTNERS:

*Christina Cipriani, Hartford Dispensary*

*Linda Estabrook, Hartford Gay & Lesbian  
Health Collective*

*Robin Deutsch, MD, Hartford Hospital  
Brownstone Clinic*

*Heidi Jenkins, CT Dept. of Public Health*

*John Merz, AIDS CT*

*Mauricio Montezuma, MD, Community Health  
Services*

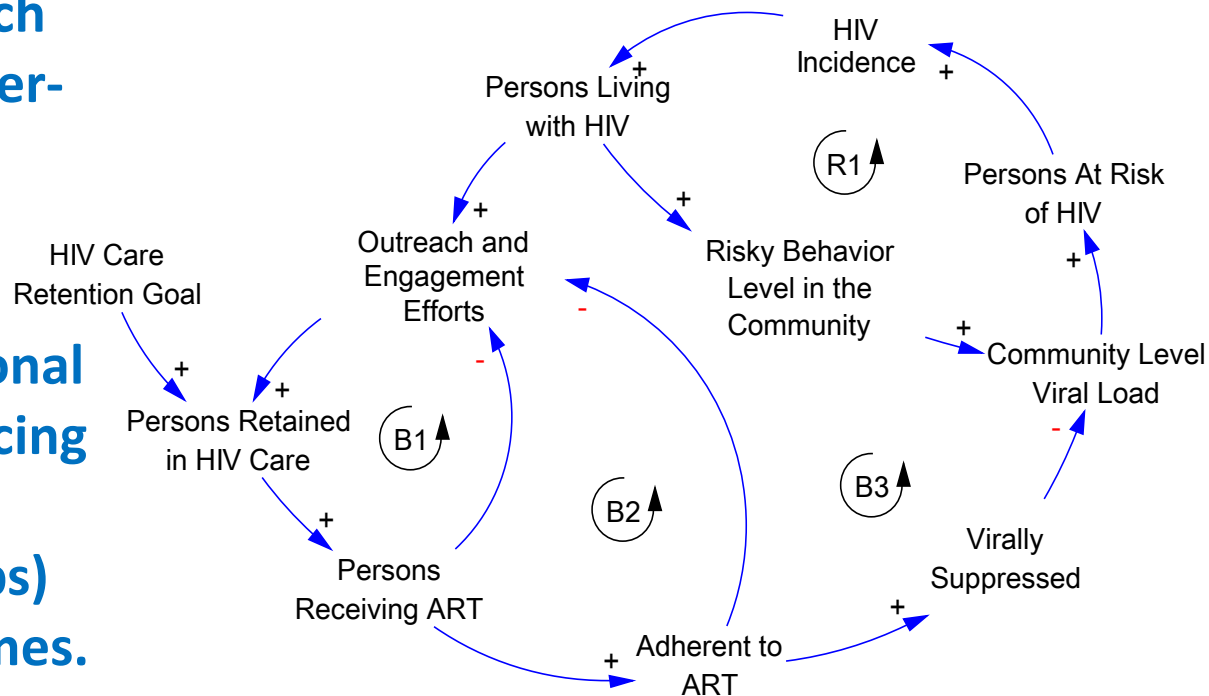
*Fernando Morales, Latino Community Services*

*Gary Rhule, MD, Hartford Dept. of Health &  
Human Services*

# Purpose

- This 3-year study of the HIV Test & Treat (T&T) continuum of services in Greater Hartford examines contributors to the treatment cascade and community viral load (CVL).
- The study engages community stakeholders (providers and people-with-HIV/at-risk) to develop a comprehensive system dynamics (SD) model of the HIV T&T continuum that can inform systems strategies to reduce CVL and the HIV epidemic.
- The SD modeling approach recognizes the role of inter-organizational service networks and the many interacting social, organizational, and personal factors that create balancing and reinforcing dynamic processes (feedback loops) affecting HIV T&T outcomes.

Causal Loop System Dynamics (SD) Model Depicting Some of the Dynamics of Community Viral Load

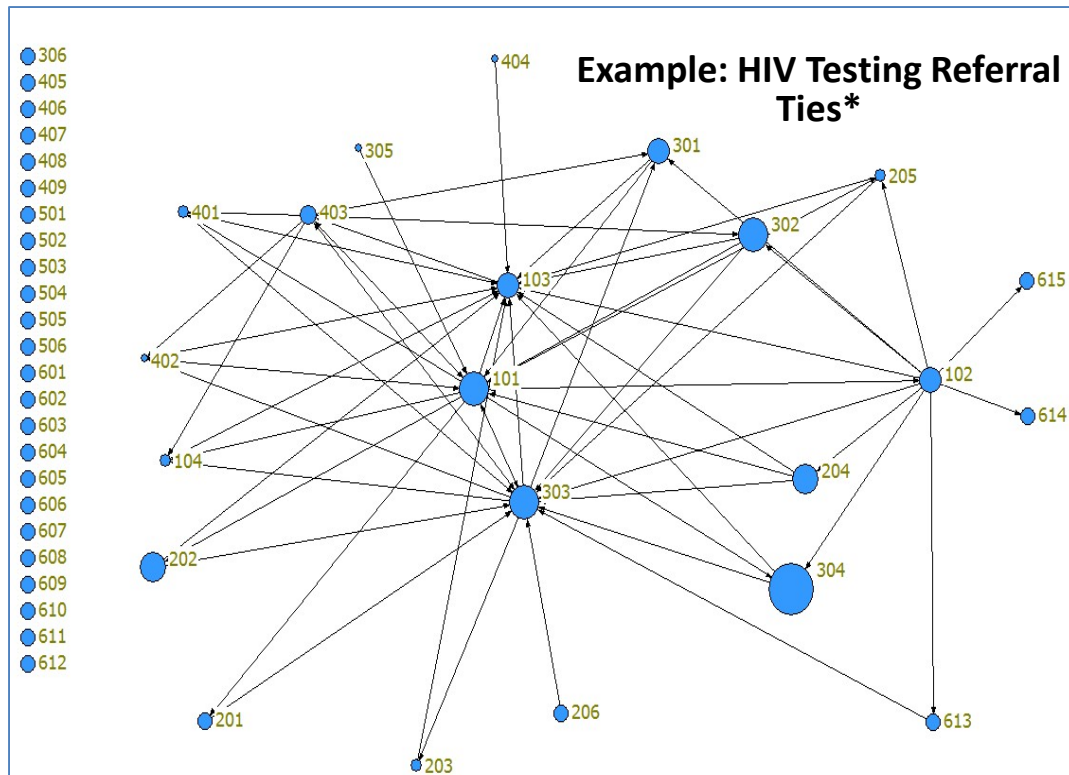


# Aims and Methods

1. Identify inter-organizational network factors that facilitate people with HIV (PWH) moving efficiently and effectively across the T&T continuum.
  - A network survey of providers & consumers measures inter-organizational referral ties in order to construct a whole (macro) network map of local area T&T service organizations.
2. Use mixed methods to examine the personal, inter-organizational, and community level factors that interact to generate system dynamics affecting the movement of PWH through the T&T continuum. Methods include:
  - Group interviews and organizational network surveys with 80-90 providers and PWH/at-risk
  - Repeated (BL/6mo/12mo) surveys with 300 PWH/at-risk
  - In-depth, longitudinal case tracking (5 interviews every 3mo) of 40 PWH
3. Using a participatory process with stakeholders and the project Steering Committee, develop a conceptual “system dynamics model” (a visual representation) of HIV T&T and CVL.
  - The model will integrate organizational network and systems structural factors and processes that generate positive and negative feedback loops which accelerate or impede progress toward reducing overall CVL.

# Progress to Date

- Group interviews/Network surveys: 5 provider groups (N=31 staff) and 9 PWH/ high-risk groups (N=58) generated a comprehensive list of factors affecting HIV T&T and identified inter-organizational network ties and qualities.
- Baseline cohort surveys with 164 PWH/high-risk and 11 case tracking baseline in-depth interviews have been completed to date.
- Inter-organizational network maps of multiple T&T services (HIV testing, linkage to care; treatment management, support services) have been constructed.
- A system dynamics (SD) 'scoping' modeling of the Greater Hartford HIV epidemic and treatment cascade and CVL has been designed using CT DPH epidemiological profile data.



\* Size of node refers to frequency of use of the organization reported by consumers in group interviews.

# How did you build this collaboration

- 28-year collaboration between ICR and HIV service and drug-treatment organizations in Greater Hartford for community research on HIV prevention with high-risk populations laid the foundation for the project Steering Committee.
- The Steering Committee was expanded by inviting additional community clinics that provide HIV medical care to engage them in an examination of systems factors affecting the HIV care continuum.
- Recognition of the need to compensate collaborating community organizations for their contribution to the research and model development meant developing contracts with each partner organization to pay them for:
  - Ongoing (bi-monthly) participation of the Director/Program Director on the Steering Committee
  - Assistance hosting group interviews (providers, consumers) and referring participants for research participation

# Lessons for the Network

- **Group interviews generated a list of numerous barriers and delays that affect PWH's entry into the T&T care continuum and their rapid and sustained achievement of viral suppression. Multiple stakeholder perspectives ensured fullness of the list of factors and identified hypothetical relationships among them.**
- **Organizational network maps and network analysis suggest ways to identify bottlenecks related to resources and inter-organizational connections to improve network efficiency.**
- **Development of the initial "scoping" SD model revealed challenges with specifying some of the model parameters that require additional and ongoing stakeholder input.**
- **The project Steering Committee has been essential for the development and implementation of the study and ongoing interpretation of findings.**

# Next steps & plans for growth

- Further analysis of the HIV T&T inter-organizational network will focus on structural properties, quality of ties, and possible governance structure that lead to efficiency of moving people through the system and keeping them in it.
- Further development of the SD model will focus on integrating qualitative data from group interviews on barriers/facilitators/ delays as well as resources (T&T staff, programs, supports) available in the system. Through this process we will identify feedback loops that create or can solve problems in system effectiveness.
- The final product will be a SD modeling tool that communities can use to understand system dynamics and identify potential opportunities to improve HIV T&T system effectiveness to reduce CVL.