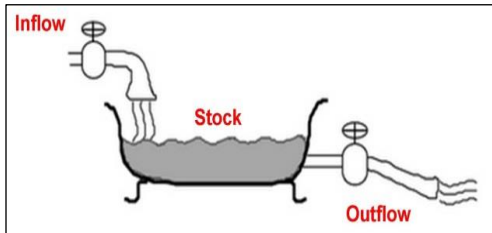
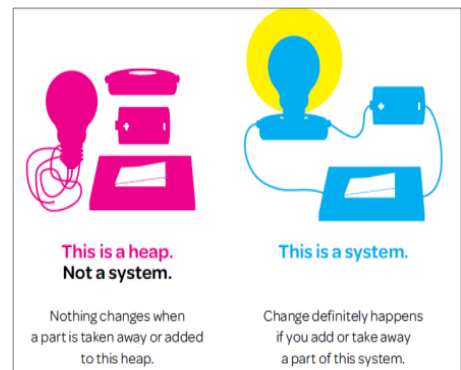


Definition of Words Commonly Used in System Dynamics (SD) Modeling*

System: A set of parts that is organized and interconnected in a pattern, or a “structure,” that produces a characteristic set of behaviors (for example, the HIV continuum of services is a system).

Dynamics: Change or movement, positive and/or negative, and interactions among things that create, increase/decrease, delay, or stop change and movement.

Modeling: Creating a visual diagram of a system and its dynamics. This visual diagram of a system can also be simulated with a computer.



Stocks: An accumulation of units (for example, water in a tub, people infected with HIV).

Flows: The movement of units into, out of, or between stocks.

Inflow: Units moving into the stock (like water coming from the faucet).

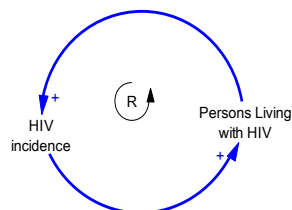
Outflow: Units moving out of the stock (water flowing down the drain.)

Variables are elements, features, factors or components of a system that are likely to vary or change.

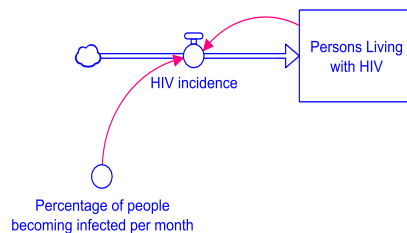
Feedback loops are created by 2 or more variables interacting with each other in a system. Feedback loops can be represented in several ways, including a causal loop diagram, stock-flow diagram, and graphs over time diagram (also called reference modes).

Positive or “reinforcing” feedback loops magnify or amplify change. Usually that means slow change becomes extremely rapid, sometimes called exponential change. These can be “vicious” or “virtuous” cycles.

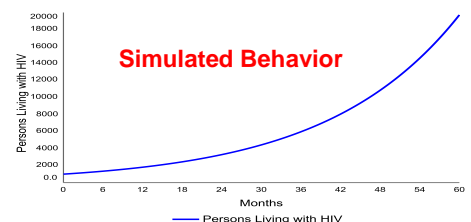
Causal Loop Diagram



Stock-Flow Diagram

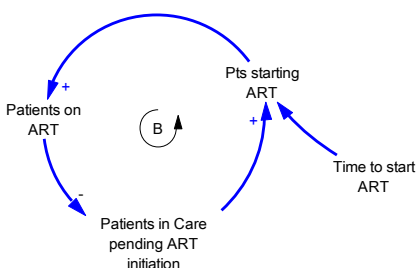


Reference Mode, or Graph-Over-Time Diagram

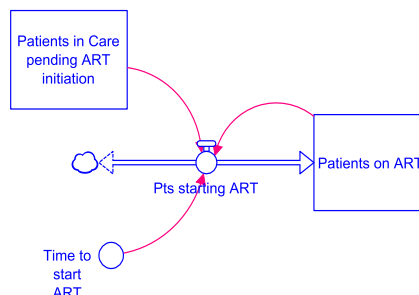


Negative or “balancing” feedback loops tend to create a balance. In these loops, one or more forces oppose or reverse the direction of change of one or more other forces. When two competing forces in a negative feedback loop interact, the resulting change can take many forms.

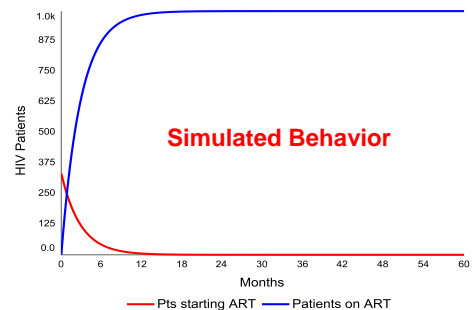
Causal Loop Diagram



Stock-Flow Diagram



Reference Mode, or Graph-Over-Time Diagram



Time delays refer to a temporary interruption in the flow or movement of units in a system.

These and additional system dynamics (SD) definitions of terms can be found in:

Meadows DH. Thinking in Systems: A Primer. White River Junction, VT: Chelsea Green Publishing; 2008



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* This document was developed by the Institute for Community Research in Hartford, CT. For more information, contact Margaret R. Weeks, Ph.D., Executive Director and Senior Scientist, mweeks@icrweb.org.