HIV/AIDS in the Developing World: The Brazil Story

Excerpt from: "Complicated and Complex Systems: What Would Successful Reform of Medicare Look Like?" By Brenda Zimmerman and Sholum Globerman, York University, Toronto, Canada

SIMPLE **Following a Recipe**	**COMPLICATED** **Sending a Rocket to the Moon**	**COMPLEX** **Raising a Child**
The recipe is essential	Formulae are critical and necessary	Formulae have a limited application
Recipes are tested to assure easy replication of success	Sending one rocket increases assurance of future success	Raising one child provides experience but no assurance of future success
No particular expertise is required (cooking skill can improve the success rate)	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success
Recipes produce standardized, predictable results every time	Rockets are similar and there is a high degree of outcome predictability	Every child is a unique individual with unpredictable "outcomes"

In this section of the paper, we explore the story of a complex health issue: HIV/AIDS in the developing world. We argue that when HIV/AIDS is considered as a complex rather than a complicated problem, radically different options emerge for intervention and policy. We show how a complicated approach to the problem determines the types of questions posed and logically leads to a conclusion that the situation is intractable. We follow this by looking at Brazil's success in beating the odds and argue that their approach embraced the underlying principles of complex adaptive systems. This dramatically changed the nature of questions asked, the solutions found and the interventions taken. *(The Brazilian HIV/AIDS case and analysis are adapted from Begun, et al. in press 2002).*

Despite the fact that Brazil's annual per capita income is less than $5000 (Downie 2001), it has managed to falsify the World Bank prediction that it did not have the resources to resist HIV infection and would have 1.2 million cases of HIV/AIDS by 2000 (World Bank 1997). Instead, it had 0.5 million (UNAIDS/WHO 2000 Update, Revised). Brazil has been far more successful than South Africa in combating AIDS, In the 1980s Brazil had one of the worst infection rates in the world (Darlington 2000), far surpassing South Africa. Today, South Africa's HIV infection rate is 25% of the population whereas Brazil's is 0.6% (UNAIDS/WHO 2000 Update, Revised). Brazil challenged all of the prevailing complicated assumptions about how to deal with the HIV/AIDS epidemic.

I. HIV/AIDS in Developing Countries – Underlying Assumptions of a Complicated View

In 1997, the World Bank reported that an estimated 30 million people have contracted the human immunodeficiency virus (HIV) and 90% of those are in developing countries (World Bank 1997). HIV/AIDS in developing countries is often assumed to be an intractable problem. Why? Here are the assumptions underlying the diagnosis:

- *Cost of drugs*

The anti-retroviral drug cocktails have transformed AIDS into a controllable, chronic disease for those who can afford the drugs in the developed world. However, their cost is out of reach for poor countries.

Antiretroviral therapy, which has achieved dramatic improvements in the health of some individuals in high-income countries, is currently unaffordable and too demanding of clinical services to offer realistic hope in the near term for the millions of poor people infected in developing countries. (World Bank 1997)

- *Prevention versus treatment*

In developing countries with limited resources and high rates of HIV infection, choices need to be made as to how to spend the limited health care dollars to fight the disease. Countries frequently decide that prevention of the spread of the disease is the best they can do. Treatment is a luxury they can't afford. So they opt to focus almost exclusively on prevention.

- *Uneducated, illiterate patients cannot manage their own therapies*

The drug treatment regime to control AIDS is a complicated routine. Different drugs need to be taken at specific times of the day. How can illiterate, uneducated people be expected to comply with such a sophisticated routine? In addition, sometimes a drug needs to be taken with food, which adds another challenge in poor countries where food is a scarce and unpredictable resource for the poor.

- *Prevention needs to focus on the fear and severity of the problem*

One of the tactics taken in prevention is to inform the public of the incredible dangers involved in unsafe sex. The fear of disease and death will change people's behaviours to limit the spread of AIDS.

- *Making a dent in the HIV/AIDS problem in developing countries will take a generation or two*

An almost exclusive focus on prevention, even if it is successful, will result in devastating losses in the current adult generation and perhaps the next if they were born with HIV/AIDS. The impact of today's prevention tactics will really be seen by the 2nd or 3rd generation. In the meantime, many millions will die of the disease.

- *Integration requires a sophisticated health care system across a country*

In developing countries, health care systems and public health infrastructures are frequently not consistent across the country. A national system of prevention and treatment requires a well-developed integrated health care system and infrastructure.

II. Brazil's Approach to HIV/AIDS as a Complex Problem

Brazil did not accept the analysis of the HIV/AIDS problem presented by the World Bank. It implicitly recognized that it was a complex problem that lent itself to different questions and hence led to less intractable conclusions. The tables below contrast the questions and answers in the two perspectives.

Table 11: Brazil Questions

Questions that Assume a Complicated Problem	**Questions that Assume a Complex Problem**
What will drug costs be for our infected population? Or whom can we afford to treat?	How can we reduce costs so that we can provide treatment for all who need it?
Since illiterate poor people cannot be expected to comply with a complicated regime of therapy, what resources are needed to assure compliance for those treated? (i.e. assumption of need for professionals to manage patients' regime)	What methods of communication will work to convey drug therapy routine to a patient – even a homeless, illiterate patient? If food is an issue, how can we use existing charities to provide food so that patients can get food at the right time for their drug regime?
With our limited resources, should we focus more on prevention or treatment? Or what are the resources for an effective prevention treatment?	How can we achieve our prevention goals while treating all of those currently infected?
What infrastructure do we need to implement our plans? What will this cost? What are the trade-offs? From what program/service will we take the money to afford this infrastructure?	Where are the informal and formal networks/relationships that exist that are consistent with our overall approach/values? How can we help to strengthen these connections? What skills or resources exist already in our country and how can we help make them more visible and hence useful?

Table 12: Brazil Answers

Conclusions that Assume a Complicated Problem	**Conclusions that Assume a Complex Problem**
Meaningful solutions require sophisticated, integrated national health care systems	We will find ways to use the resources we have to respond to the problem
We cannot provide treatment to all when the costs are so high. Choices must be made.	We will find a way to provide treatment to all who need it by dramatically reducing costs.
We cannot afford resources to manage treatment compliance.	We will use our informal system to train people to care for themselves.
With our limited resources, we should focus more on prevention than treatment.	Prevention will be part of treatment and treatment will allow us "access" to population for prevention strategies.

A more detailed account of how Brazil dealt with the problem is presented below.

- *Cost of drugs*
  The government gives the drugs away for free to HIV/AIDS patients. Since 1994, Brazil has been manufacturing generic versions of the drugs in the anti-retroviral drug cocktail. Brazil uses the controversial clause of the World Trade Organization, which allows countries to violate patent laws in cases of national emergency (American Medical Association 2001). Brazil argued that the HIV/AIDS epidemic is and could become a national emergency. Although both the WTO and the US challenged Brazil on their use of this approach, Brazil has continued and in 2001, the US dropped the lawsuit against Brazil.

  Each year, more of the drugs were produced in Brazil in a generic form. By 2000, eight of the twelve necessary drugs were produced in generic form, at enormous cost reductions (Darlington 2000). Estimates of the cost reduction vary, and are being further reduced as more and more of the drugs are produced in generic form. At a minimum, the costs of the drug therapy per patient per year are 65% lower than the $12,000 cost in the US. Some estimate that it could be further lowered to be 90% less than the US cost.

- *Prevention versus treatment*
  Brazil chose to use treatment as part of the prevention strategy. When people know they can get treatment, they are more willing to come in to hospitals, clinics or certain NGOs for tests (Rosenberg 2001). The situation isn't deemed to be hopeless. While they are there for treatments or tests, they also get information and spread the prevention ideas. Today the bulk of the spending is on treatment, yet the prevention goals are being met.

- *Uneducated, illiterate patients*
  Nurses and other health care workers teach patients how to take the drugs. They use whatever methods they can to communicate the drug routine to the patients. They will draw pictures of the sun or the moon to denote different times of day. They will draw pictures of food on the labels of the pill bottles for those that need to be consumed with food (Rosenberg 2001, page 30). In addition, they will help the poorest patients link up with NGOs, churches and other organizations, which offer free food. In spite of the high illiteracy rate in Sao Paolo, the adherence rate for the drug regime is at the same level as in San Diego. In both cities, 70% achieve an 80% adherence rate (Rosenberg 2001, p. 30).

- *Prevention needs to focus on fear and the severity of the problem*
  Brazilian organizations have used a variety of playful approaches to sell the concept of condom use. The approaches include celebrating life and humour. Bright coloured costumes on musicians playing music are used as an opportunity to share information and make the use of condoms acceptable among the high-risk groups. Pre-school children are taught about HIV/AIDS prevention in some parts of Brazil (Lehman 1999). Ads depict condoms as props. One ad shows three women sitting around a table, which has a condom for a tabletop. All the women are saying, "Yes". The caption is "With a condom, they'll say 'yes, yes, yes'" (Walbran 1998).

- *Making a dent in the HIV/AIDS problem in developing countries will take a generation or two*
  Brazil's efforts really began in earnest in the early 1990s. By 1994, they were producing their first generic anti-retroviral drugs. Within five years, they had made a major impact on reducing the spread of the HIV virus. In the 1980s, they were held out as an example of one of the worst hit countries for HIV/AIDS. Today, they are touted as a model for developing countries fighting HIV/AIDS.

- *Integration requires a sophisticated health care system across a country*
  Brazil is not among the poorest countries in the world; it had an established infrastructure of hospitals, clinics and public health services but it was hardly of the caliber of first world systems (Rosenberg 2001). There were huge differences

in the services available across the country and to different segments of the population. Their HIV/AIDS efforts have, to quite an extent, strengthened the health infrastructure, or web of connections, to do the treatment and prevention work necessary to grapple with HIV/AIDS. They used over 600 existing NGOs and community level care organizations to reach the country's poor (Center for Disease Control 2000). The country now has 133 testing and counseling centers. Health care clinicians worked along side NGOs and other organizations to provide the full range of services needed. "It is a well-organized, well-formulated program that works because the government has managed to integrate the whole society – especially NGOs" (Rosenberg 2001).

The questions posed were of the kind "who has the current resources, skills needed to provide the treatment services or complementary needs for HIV/AIDS patients?" In other words, they looked for the hidden resources and existing informal relationships in the country, which wouldn't show up on a Ministry of Health organization chart. They looked at what existed in reality rather than in theory. They didn't assume away the messy and complex nature of the "system" but rather accepted it and embraced an emergent system and structure holding on to a very few key principles.

III. Changing the Nature of the Questions in Brazil

There are some key differences between a hypothetical set of questions that assume the Brazil case to pose a complicated problem and ones that assume its complexity. Both kinds of questions are based on a coherent set of assumptions about reality and change. Complicated problems are machine like and complex problems more life like. Each set of assumptions both illuminates and distorts certain aspects of reality. The machine metaphor of the complicated approach suggests external managers – or mechanics – need to fix the system or its parts. The life metaphor suggests that solutions (and new problems) have the potential to emerge from within. The external role becomes more facilitative than mechanical.