



Building Blocks for the Future  
PILAR III – HEALTH AND WELL BEING

# Translating Systems Thinking into Public Health Innovations

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everythink



## About this white paper

This document aims to compile and summarize the speeches, thoughts and bold ideas shared during the Open Sessions of the 2021 Annual Event of the Business and Innovation Network, recording, for future reference, the contribution of a group of impressive people from all over the world who gathered in Porto to share, evolve and create knowledge and visions for the future of Humanity. This was a collaboration between BIN@ Network and Everythink, a design company.

## About BIN@ Business and Innovation Network

Business & Innovation Network (BIN@) is an international network of academic and industry partners engaged in supporting open innovation and the creation of sustainable forum for sharing good practices and opportunities in innovation. BIN@ promotes a set of activities ranging from brokerage events to softlanding opportunities for startups. BIN@ has currently around 4500 delegates worldwide and so far has held 14 international events in Portugal, UK, Brazil, Romania, Poland and one fully digital event. You can see more about our activities on the official website: [www.businessandinnovation.net](http://www.businessandinnovation.net).

## About Everythink

EVERYTHINK is an award-winning studio for creativity, design and innovation, established in 2008 in Porto. Through design, they put creative methodologies and strategic thinking at the service of companies' innovation, to create new services, products and experiences, impacting people in a positive, easy and happy way. Everythink's approach with customers, users, and stakeholders is key to create new products, services and experiences, with a positive impact on people's lives. The team works on different areas and outputs, offering diversity and experience in an effect of cross-pollination offering innovative insights, efficiency and time-to-market. Find more at [www.everythink.com](http://www.everythink.com)

# Translating Systems Thinking into Public Health Innovations

A conversation with



**Terry Huang**

**CUNY, Firefly Innovation**

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**Public health and healthcare are one of the sectors most resistant to change, very slow at adopting new ways of thinking and doing things. The same set of strategies in public health have been tried for a long time but they're not making a big dent regarding many of the complex diseases that the world is dealing with. Obesity is a case in point. Although billions of dollars have been spent in addressing this, the problem is only getting bigger. Part of that is because siloed approaches still dominate in society, without our really being able to truly connect the dots or truly transform the system in a fundamental way that get individuals, organizations and corporations to all work in a different way. The academic endeavor to push towards systems change and develop and test innovative strategies is an important part of Terry's work, championing the integration of systems thinking and systems science into public health, and obesity and chronic disease prevention, in particular.**

## Systems thinking for system change

Everybody, naturally, defaults to a standard way of doing business, even if, nominally, they're interested in creating a better world, because the fundamental equation in our political, social and economic system hasn't really changed.

Public health people have been trained, over many years, to focus more on the problem so they have become really good at dissecting the problem in ever finer details and running very sophisticated statistical models to tease out cause and effect. But we've not been very good at coming up with solutions. Oftentimes knowing what causes a problem doesn't translate into what is needed to solve the problem.

To tackle a specific given problem, just knowing what the risk factors are, doesn't necessarily tell you what needs to be in the solution package. The public health way of thinking is, 'if I can identify what is on the right side of the equation -- these are the main effects -- and do something to intervene on these main effects, then I'm going to solve the problem'. But we know it's not that simple because these main effects rarely

work in isolation. They work in an interconnected system, they interact, and there are many other variables that you did not include in your equation. It is precisely the inability of traditional statistical models to fully capture this complexity that is fundamental to our existence that we begin to see the emergence of systems science.

Systems science is not new. It's been used in engineering, social sciences, ecology, and other fields. The approach seeks to capture the behaviors of multiple stakeholders at multiple levels, ranging from individuals to families, communities, organizations, sectors, etc. Within this approach, there are a lot of feedback loops and complex structures that underlie the emergence of a particular problem and its potential solutions.

## Why systems thinking approach?

In the mid 2000s, we realized that individually tailored approaches were not working. Health education is important, but it's not adequate. Policy and environmental interactions are important because they create the conditions in which people can potentially optimize their behavior. For example, just building a park

doesn't mean that people will come. Policy and environmental interventions alone are also not enough. To effectuate policy and environmental interventions, we need individuals (at different levels of society) to act. So, we still must deal with individual behavior at some level. There are interconnections lots of feedback loops, but how do we bring everything together? Computer scientists, engineers and ecologist have been using systems science techniques to manage this type of complexity. How can we incorporate these into public health?

Now, 15 years since we first began to champion it, systems science is accepted as an important approach in the mainstream. Systems thinking is now one of the key competencies prescribed by the accrediting body of programmes and schools in public health. That's a huge leap. Not everybody understands what it is exactly and certainly not everybody practices it. But at least it is recognized as a valid approach. Systems science doesn't displace the traditional toolbox; it adds to it.

This systems approach is really about aligning multiple stakeholders. We have to work across sectors. The toolbox gives us several techniques, including qualitative, quantitative and computational methods, that we can leverage to get from point A to point B. I often talk about the heterogeneity in a complex system, across factors, actors and sectors.

Health really is everybody's business. Unfortunately, it does take everyone in. However, the biggest question is what is the role of each actor? And how do the different actors work in a way that is coordinated, so that they're not just duplicating each other's effort but actually working in a way that is mutually reinforcing? The whole has to be greater than the sum of its parts if we are to effectively intervene on the system.

### **Competition and cooperation for boosting innovation**

The key here is not just one top management. It's really about coordinated management at multiple levels, and we have to be able to delegate. Some of these system insights have become really crucial to public health. I can't say that we are really good at it yet. When it comes to collaboration and competition, traditionally, public health only talks about collaboration but dismisses competition. However, if we rely only on collaboration, that doesn't necessarily lead to innovation.

Competition is also a necessary ingredient for innovation. It turns out that if we set up collaboration and competition at two different scales, we can create a virtuous circle whereby competitive teams attract members that are collaborative, and more collaboration leads to teams being more competitive.

But, the reality is that we rarely do this. When was the last time you ever saw government agencies, for example, set up to compete with each other (in a friendly way) to come up with the most innovative idea to solve a particular problem? Never. Even in the private sector, there is great room for improvement.

### **Crowdsourcing ecosystem for public health innovation**

We need to leap outside our comfort zone. At Firefly Innovations, for example, we're creating a whole new ecosystem where we can crowdsource the most interesting ideas, not limiting only to people working in public health but also those from the broader community and with diverse expertise. There's a lot of untapped talent in communities that are disproportionately affected by health disparity problems. These talents are rarely discovered and are rarely ~~get~~ connected to the larger ecosystem for innovation.

Because CUNY has a very strong mission in serving students from underserved backgrounds – an aspect of our brand equity – it's very natural for us to use Firefly Innovation as a platform to uncover these hidden talents in the community.

Once community innovators are identified, we bring them into the tent, and we cultivate

them and provide them with resources, mentors, and education, so that they become more competitive-in accessing the broader ecosystem out there. As part of this effort, we are constantly leveraging both collaboration and competition to further promulgate innovation.

This type of approach just has never really been used in public health. We can also imagine doing this at the community level. We can create innovation containers, hubs or living labs.

I have a vision for how we could solve complex public health challenges such as obesity, without becoming like Cuba. We need to create a culture that promotes creativity and prizes failures. However, because there is a lot of inertia within any established field, I'm a firm believer of integrating other disciplines and sectors into public health research and practice, be them from the arts, humanities, design or engineers., If we only rely on people within public health, they're too resistant to change.

They're not going to be able to get there on their own. We need to bring in other viewpoints and expertise areas from a totally non-traditional public health arena to disrupt the system and status quo.

One of the challenges in public health is that we're not always in tune with people's real

needs. Public health tends to be quite top down, telling you what you're supposed to do or to eat, when to exercise or how much you're supposed to sleep. And on top of that, messages are not always consistent, they change depending on new information that becomes available, oftentimes, it's too late to, then people are confused. So, public health is one of the worst communicators ever. COVID situation has really shown that huge light on this deficiency. Part of creating systems change is to work with people who are really good at branding, marketing, PR, health communications, to come up with new ways of talking to, and engaging with, the people.

This is an area that we're really lacking. My school just introduced a new MS programme on health communications and social change.

We need to train more public health graduates who can become experts in communicating with people. I fear that we are still only scratching the surface because we're not really working with the real experts out there in the field. They're not in academia, they're in practice in different industries who really know how to frame things, because part of communicating is not just being open and being able to speak to people, but also knowing how to frame an issue in a way that is digestible and relatable, with small messages you need to be emotionally or actively engaging. You can't only speak to people's brains, you have to

speak to people's hearts.

That's really a real challenge for us. This is why I love working with designers. We work with a lot of designers on our various projects, because I recognise my own deficiencies and we need the input from people from other disciplines.

#### A public health-related ecosystem

COVID has really accelerated the effort to create a much more interconnected and virtual ecosystem. Firefly Innovation, launched at the end of 2019, has been operating completely online. This has worked to our advantage. We're taking this as an opportunity, not as a challenge. Even though we're housed in a university, there's no reason why our platform can't serve the global community. We're about to launch a new campaign called Firefly Collective, where we're going to invite public health entrepreneurs from around the world to self-identify and engage with us and join this network. Echoing back to what I said earlier about health being everyone's business, we need to be able to draw on the strengths, the goodwill and resources from a much more diverse group of people from around the world to solve complex challenges.

And, in fact, we can do a lot with very little money. If people are committed to the cause

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and they're interested in doing something different, their time and talent are even more valuable than the money that might be crowdsourced. I really believe in the power of converging diverse people and minds.

**A glimpse about**  
**+ Health And Wellbeing**  
**+ Circularity**  
**+ Society**

In fact, this brings out how health really intersects with the other two pillars of the summit programme, circularity and society, because at the end of the day, **we're not going to really be able to address most of the top health conditions that affect morbidity and mortality if we don't fundamentally rethink what is the sustainable system that we all need to shape and construct in order to basically alter and realign the incentives and disincentives in our system.**

Until we do that, we're just going to be playing on the edges and we're not going to get to the core of the issue. In public health, there's already a lot of interest, for example, in more sustainable food systems. For example, how should we tackle food waste at the same time as improving population nutrition? Again, here's a perfect intersection of circularity and health.

### Example 1 | Firefly Innovation

At Firefly Innovations, there is an action pillar that includes a lot of the usual innovation activities, such as hackathons and accelerator programmes. Because we're housed in a university, there is also a really strong education pillar, targeting both the public health audience as well as audiences outside public health and academic settings. We have both for-credit courses as well as not-for-credit programmatic activities, lectures and workshops throughout the year that seek to bring people with different backgrounds and interests together. Every year, we try to introduce new topics, new ideas, and new people to stimulate all of our minds. And no one ever knows when that little magic spark might emerge.

In addition to these two pillars, there is a third pillar ~~is~~ focused on strategic science. As the platform matures, Firefly Innovations can be in a position to assume leadership in conducting research on the entrepreneurship process, to be able to demonstrate that public health entrepreneurship leads to improved public health outcomes.

In the meantime, the R&D we are engaged in now is more tailored to the startups in our ecosystem. We help ventures with community-based research, validating their ideas in the community and thinking through



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public health metrics so that the public health impact is baked into the business model for startups. Last but not least, we're also interested in the health and well being of the entrepreneurs themselves, which is an area that's just beginning to get attention. In the long run, as we work with more and more ventures, we want to be able to answer the question,

**Does adding  
entrepreneurship to  
the public health  
toolbox make a  
difference?**

Firefly Innovations is a passion project, but it's also an effort I believe can really lead to true transformations for public health and for society.

**Example 2 | Healthy Cities Movement**

We can glean a lot of lessons from the success of the Healthy Cities Movement (HCM) that started in Europe but has now spread around the world. Looking at European cities versus American cities, for example, there are very different approaches to health and well being. The notion of social or policy entrepreneurship is very strong in the HCM and a lot of that has to do with building the capacity of individual actors to become champions and agents of change - people that work in public health but also in related sectors. It's about really cultivating an army of change agents. In addition to involving the public sector, increasingly, the private sector is being looped in. This gradually shifts the paradigm of public health being a purely public-sector business to one that emphasizes health being everyone's business.

This movement illustrates the need to have health in all policies and in all places and the need to involve a lot of different sectors and actors in order to create a culture change.

The HCM is less about showing obesity or diabetes reduction by X percent but more about creating a social climate that-favors health and well being.

**EXAMPLE 3 | MEXICO'S ALLIANCE FOR  
DIETARY HEALTH**

In developing countries, a recent example of a systems approach to public health that comes to mind relates to Mexico. Mexico suffers greatly from a very high prevalence of obesity, in both adults and children. This has been a major contributor to the growing problem of diabetes. A few years ago, the Conservative government in Mexico agreed to a legislation that would place a tax on sugar sweetened beverages. I personally don't think that sugar taxes are the panacea to the obesity problem, but it can be one strategy of many. What's most important about this one strategy is not only the effect of pricing on consumption, but what you do with the extra revenue that is generated. If you can channel that revenue and put into ~~words~~ other strategies in public health, then you really get more bang for your buck. What's unique about the Mexican story is that there was a highly effective coordination of policy leaders and civil society, with tremendous expertise around advocacy, marketing, and public mobilization under a new NGO called Alliance for Dietary Health. In the end, the legislation was passed in a Conservative Congress, which is amazing.



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