

Science and the challenges of complexity in health problems

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doi: 10.1590/0102-311X00139319

We stated in an Editorial published in 2013 ¹ (p. 2142) that “*in science we cannot content ourselves with well-established approaches*”. As researchers in the collective health field, we must use science to search for paths to confront the major challenges facing the health of populations. We must deepen the debate on advancing a “consequentialist” science ², whether in the field of epidemiology, the human sciences, or health policy. It is not enough to identify causal mechanisms, to understand the limits of the care provided by the Brazilian Unified National Health System (SUS), and to acknowledge the importance of individual discourse in diagnosing health problems and access to health services. All of this is extremely important, but we must take a step further and identify approaches for dealing with the complexity of these problems.

Complex is not synonymous with complicated. We see complex problems as those whose shape involves multiple relations and feedback loops that balance and guarantee the system’s dynamic stability. The question here is not to identify the cause of the growing prevalence of obesity in the world as a consequence of forces in the food industry, agribusiness, and food deserts, but how to deal with the problem ³. We would all like the *Guia Alimentar para a População Brasileira* ⁴ to have a major impact on obesity prevalence. And if this impact fails to materialize, it is due precisely to the stability of a complex system.

How do we address problems that do not display a linear causal chain, in which A causes B with C as the outcome? Even the notion of “outcome” restricts our understanding in this case. The problem requires considering the whole set, with the different actors and points of view. And to confront the problem, simplification is necessary, always coherently and without losing sight of the whole, explicitly bringing to the surface the assumptions and mental models, and creating a shared vision ⁵. The only criterion that allows combining such different and multidisciplinary points of view, from economics to nutritional science, from epidemiology to administration of the SUS, from policy to the quality of the food available in poor communities, is action, the perspective of a coordinated intervention in an identified problem.

Various methods coexist (and even contradict each other) in this approach. Some of these methods are qualitative, described as “soft system approaches”, while others are more quantitative ⁵. What they all share is the need to leave our comfort zone, to simplify while

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ensuring that the view of the whole is lost. As researchers in the collective health field, we need to change our mental model, maintaining a stance of permanent learning ⁶.

There are several problem-situations in the collective health field. When we are faced with a problem (thus justifying the term “problem-situation”), what often comes to mind immediately is that a relatively simple measure “would suffice”. It would suffice to control the vector population, although “*there’s no evidence that any recent vector-control interventions, including massive spraying of insecticides, have had any significant effect on...*” ⁷ (p. 1802). Or that it would be possible to control hypertension by prescribing properly indicated drugs. It “would suffice” for hypertensive individuals to follow the prescription correctly, which is not always true even for persons with a university education ⁸. Why do vaccination coverage rates drop, when they are such a successful strategy for controlling numerous diseases? Are vaccines the victims of their own success? ⁹.

In Brazil’s current context of setbacks in social policies, when the rejection of science is being constructed deliberately ¹⁰, it is indispensable to adopt ways to address the challenges in collective health that contribute to multidisciplinary action, combining researchers, policymakers, and the population, integrating culture, knowledge, and science. CSP hopes that the collective health community will rise to this challenge.

Additional information

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