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João Peres [1]
Victor Matioli [1]
Boyd Swindurn [2]

[1] *O Joio e o Trigo, São Paulo, Brasil.*
[2] *School of Population Health, University of Auckland, Auckland, New Zealand.*

Correspondence
J. Peres
O Joio e o Trigo.
Rua Rocha 238, São Paulo, SP
01330-000, Brasil.
joaomdperes@gmail.com

Boyd Swinburn understands that the evidences surrounding the NOVA classification are increasingly voluminous, and it is only a matter of time before some resistances are overcome. The professor at the School of Population Health at the University of Auckland, New Zealand, sees a clear connection between the division of food by extent and processing purpose, and the concept of the global syndemic, which analyzes the encounter between malnutrition, obesity and climate change. Swinburn coordinated the group of researchers brought together by *The Lancet* [1] to analyze the interactions between these three factors, which affect the majority of people in all countries and regions of the world. They constitute a syndemic, or synergy of epidemics, because they coexist in time and place, interact with each other to produce complex sequelae, and share common fundamental social factors.

In an interview to CSP, the researcher assesses that there is a clear role for ultra-processed foods in this syndemic. *"If you go beyond those visible manifestations of the global syndemic and you ask the question about 'what is it about the food system per se that is driving all these three things?', then you come down to 'what is driving the whole ultra-processed foods tidal wave is how the food system is set up'"*.

The professor claims that Brazil's leadership in the development of dietary guidelines is fundamental. He especially admires the holistic approach of the *Food Guide for the Brazilian Population*, published in 2014 by the Brazilian Ministry of Health. The connection of food with environmental issues and historical and cultural processes is seen as a strong point. For him, NOVA still has a "Latin American flavor", in the sense that it is slowly being incorporated by other research groups around the world.

Dr. Boyd Swinburn (photo: University of Auckland).

João How do you evaluate the NOVA classification? How do you evaluate it? What do you think are its advancements, and what are its weaknesses?

Boyd Well, its weakness is that it's novel, and that it takes some time for people to get used to. And people do react against something new. It poses a big threat to powerful food manufacturers, and so there's a lot of pushback from it in a kind of political sense. They don't want to see that what they do is fundamentally unhealthy, so there's an enormous pushback. As with any classification, and it's not particular to NOVA, it's true for any classification, there are challenges around the edges, where you add just this little bit of something for yogurt, and it goes from being a processed food which is good for you into an ultra-processed food which is bad for you. But that's common to everything, to *Health Star Ratings*, to whatever. And I think that to me those are the main weaknesses. It is a potential weakness that there is no clear mechanistic understanding of how it might have an impact on health. And that's a particular challenge for people who like to think in one-step linear processes. That salt raises blood pressure, that creates risk for stroke and so on, that kind of mechanism is relatively easy to understand. But even people in the scientific world are still seeing the mechanism as being intrinsic to the product itself. In other words, the components of the product, not the whole picture of ultra-processed food, which means its hyper-palatability, the fact that you eat it quicker, the fact that it's heavily marketed, that it's available everywhere, that it's high-profit, long shelf life, so it's always around. There's a whole package of potential, not only biological, but psychological, social, and economic reasons why it might lead to over-consumption and obesity and noncommunicable diseases So, I think people have a hard time getting their head around that.

I think the advantages of it are that it's got a fair amount of data behind it now [2]. And the data includes randomized clinical trials. So, the data also show that the impact of ultra-processed foods is above and beyond nutrient components that are easy to measure, like salt, sugar, saturated fats and so on. So, the randomized clinical trials tried to match for those nutrients. Epidemiological studies often try to adjust for those nutrients, to try and see whether that is where its effect lies. It's pretty clear to me anyway that the nutrients' part of the mechanisms is only part of it. There's a whole lot of stuff in there, a whole lot of effects that we don't really understand. So, you know, I think the evidence is really on its side, and the evidence is increasing enormously. I think the team has refined these definitions, so they're easy to understand, a little bit clearer.

I think it also makes it relatively easy to, in some ways, communicate this to people. That ultra-processed food is stuff that you wouldn't cook in your kitchen. If you look at the ingredients and there's something you don't recognize, it's probably ultra-processed. So, in some ways, it is quite good public communication system for getting the information across. And I think it is kind of refining and validating what a lot of people think already, which is that processed foods are a problem. And this is just defining more tightly what people think in their heads about processed foods. It's kind of adding scientific value and specificity to an idea that people kind of already have. Also, in measuring and monitoring, we were doing some work on monitoring shops and things in Peru, so "*bodegas*" and other food retail outlets. It's pretty easy to count the proportion of ultra-processed foods in a shop. You just stick your head in and look around, and you just see that 90% of this is all fancy-packaged, and it's most likely they will be ultra-processed foods. You don't have to go and look at all the sodium content, and the fat and sugar content and so on. So, for monitoring it adds some ease. I think there's a lot of pluses to it. It's still seen as a bit South American, not international, so the fact that Pan-American Health Organization (PAHO) has kind of picked it up and used it, whereas other World Health Organization (WHO) regional offices haven't, still gives it a Latin American flavor. But there are champions internationally, and all these studies are coming out internationally, so I think that'll change over time.

Victor I would like to know if NOVA fit somehow in your research agenda. And how about the term "ultra-processed food"? Is it normally used by your research community?

Boyd Have I done research on ultra-processed foods? Yeah, we did one study looking at the ultra-processed food around the world using a Euromonitor and the changes over time over about 30 years, 20 or 30 years or something, and compared it to the trajectories in obesity [3]. We've done these kinds of ecological studies, as they're called. We do quite a bit of stuff on labelling and food composition and marketing to kids and things, so, when we're classifying foods, we'll classify them in different ways. We'll classify them according to the New Zealand Nutrient Profile System, and the WHO one, and the NOVA one, type of thing, so we'll compare different, you know, classification systems. Outside of Latin America, I'd say the term ultra-processed as a category is having difficulty getting hold. I reviewed, in the middle of some global reviews of the moment on food and food systems at a relatively high level, and some of them will acknowledge the issue around highly processed foods. But they don't use the term "ultra-processed", I think because of the controversy and the reaction that it sparks. And that it hasn't in many countries, particularly the United States, probably, but also Europe, hasn't taken hold yet. And so, they're a bit wary of doing that, but I encourage them to use the term "ultra-processed" because it's more precisely defined than the term "highly processed" or "processed foods", that people, just referring back to that idea that people have in their heads, that's not well-defined. I think it's getting there in international documents, but it's still got some distance to go.

João Talking a little bit about the reaction against NOVA. We have talked about weaknesses, but how do you evaluate the criticism against NOVA?

Boyd Well, some of it is coming from a purely commercial criticism. This is big companies with huge vested interests in processed foods. And to have a blanket, an unhealthy blanket put across all of their foods is something they don't like very much. And they will respond in a fairly predictable, stereotypical approach. That's kind of natural. People within the industry also use some of those weaknesses. They'll say, "*Well, this product here, you're saying, 'This is okay, but this is not', just with this little change*". So, they dive down into the nuance. They talk about the lack of mechanisms, that it makes no real sense, it's not logical, and they use those kinds of arguments, playing on those kinds of uncertainties, and some of the weaknesses, I guess, of the NOVA system. I haven't seen any major companies acknowledge the literature. They say it's all epidemiological evidence. And that's another way of people dismissing the evidence, by saying, "*it's just epidemiological*". So they'll put cross-sectional studies, they'll put ecological studies, they'll put cohort studies, they'll put longitudinal ecological studies all in the same basket, and say, "*This is just epidemiology, this is highly fraught and highly prone to bias*". And yes, every epidemiological study has its biases. As any studies do. But when you put these different types of studies together, with different biases, then if a consistent pattern emerges, to me that's telling something about the question you're asking. And that's what I'm seeing from the epidemiological literature, so, often by flicking it away by saying "this is just epidemiology" is another way

of dismissing it. They will push hard, and push hard for long against this. Which is probably a good sign that you're on the right track.

Victor I would like to ask you about the Brazilian dietary guidelines. When you look at the guidelines as a whole, which aspects, beyond the adoption of NOVA, do you think it contributes to this paradigm shift for this type of document?

Boyd Well, I certainly do, and certainly moving to sustainable dietary guidelines is an extremely concrete, doable step for trying to shift the paradigm to healthy and sustainable food systems. Healthy and sustainable food systems is this big, nebulous idea, very complex, very detailed, and all that sort of stuff. And people say, "*Well, what are you going to do tomorrow?*". Okay, sustainable food-based dietary guidelines are a very concrete step to take, and while on the one hand you can say that people don't pay any attention, you know, the general public doesn't pay attention to the dietary guidelines when they're making their food choices, nevertheless, it's a very powerful platform, a policy platform for other things to spring from. So, school food, or purchasing and procurement, or labelling, there's a whole lot of things that stem from that. I think sustainable dietary guidelines are a fundamentally concrete valuable step that countries need to go through, and I think that if every country went through those steps, then this debate would be out in the open. Everybody would be talking about it in multiple countries with good sustainable dietary guidelines over the line. At the moment, for example, the United States is reviewing its dietary guidelines, and sustainability is completely off the table. Nobody's allowed to talk about it. And so, in the future that is going to be totally unacceptable. But we're not there yet.

When I was in Australia several years ago, they did the same thing, and sustainability got chucked off the table by pressure from the industry. So, we're having to shift to a new normal about what's appropriate for dietary guidelines, and these days, especially for Western countries anyway, as dietary guidelines come up for review, it's difficult to see how sustainability would not be raised and put on the table [4]. Whether it's allowed to stay on the table, and whether, you know, the pressure from the food industry will kick it off the table is another thing, but if a country like, I don't know, Belgium or Germany or something was going to revisit their dietary guidelines, it would be difficult to see how that wouldn't include sustainability.

So, Brazil's leadership in this has been absolutely fundamental. It's not just sustainability that was new about the Brazilian guidelines, they're much more holistic, they take into account all of the social and historical and cultural aspects of food which most dietary guidelines don't. So, Brazil is way ahead of the curve. There are a few other smaller countries that brought it in. But it needs big countries like that. Canada did it, in a not quite as explicit and strong way as Brazil, but when it comes big countries like Canada that people take notice of, having a few more of those countries would really set the global ball rolling. But make no mistake, Brazil's leadership in this was just absolutely fundamental.

Victor Do you think that sustainability is the main aspect of the Brazilian guidelines?

Boyd It's not the main aspect, but there is currently a big wave of pressure for sustainable things, for sustainability, climate change, food environments, and if any country, if there's any wave that a country is going to ride to bring in and revise its dietary guidelines under some different paradigm, it's going to be sustainability that is going to put it on the table. Whether they adopt a NOVA classification or whatever for their definitions, I suspect that's a bit further away, but having sustainability on the table is critical.

João Let's talk a little about reformulation. Some sectors of the industry have adopted concise ingredient lists, by trying to eliminate additives and even having incorporated the term "minimally processed foods". How do you analyse this movement? Is it a real change towards a profile of healthier products?

Boyd I think that a lot of emphasis is put on reformulation that isn't warranted. There are some aspects about food composition which are very clear and do warrant a lot of effort and... trans fats, getting trans fats out of the system is a classic example of that. You know, there's no need for trans fats. Lots of countries have done it. Getting trans fats out of the system, out of food, is unequivocally good, simple, and important. Salt is probably the next reformulation. One with more history. And I think there is considerable value in a concerted approach. But it is a big job. It is a big concerted effort to reduce salt in ultra-processed foods. It's multiple years. The only really good example we've got is the UK, and that was many years of concerted effort, but I think if governments picked it up and you

had more government involvement than they had in the UK, that could potentially have good value. So, reformulation for trans fats, yes, definitely. Salt, yes, I think that's really of value. Particularly sugar is much more problematic. Much more problematic. We've got Public Health England's experience [5] of a structured reformulation, where the government is trying to, in a voluntary way, trying to cajole the food industry to reduce sugar content. And they aimed to get 20% reduction by 2020, and they've got 2%. It's not going to meet the target, and it's actually turning out to be very hard. Now, a lot of the companies when they do reformulate sugar, they'll put in non-nutritive sweeteners, so as to keep the same kind of sweet taste. You're losing some sweet, some sugar calories, but it's not really much of a great advance. It still has high sweetness and so on. And then, beyond that, in terms of all the other additives, adding fibre, and reducing colourings and flavourings and so on. Yeah, I think that's all kind of good stuff, but I don't see it as a heavyweight strategy that's going to really shift the healthiness of the food supply and of the diet, with the exception of trans fats and salt. Whereas with sugar, I think there are other strategies to achieve its reformulation, like taxes are probably a much more potent way to get companies to respond.

Victor Let's talk a little bit about the relations between the global syndemic and NOVA. Do you see that there's a dialogue between the obesogenic environments theory [6], the global syndemic concept, and the NOVA classification?

Boyd Yeah, they do, they dialogue at quite a deep level. At the visible manifestation level, where you've got obesity, undernutrition, and climate change. It's very easy to see how it dialogues with obesity. That's dead clear, and the evidence is getting stronger. How it dialogues with undernutrition, I think there is a story, and there is some evidence there about how these products are coming in and they're very attractive, and they're very palatable, and that does take the food transition that many countries are going into, from basic staples type of diet, into transitioning not into a wide variety of healthy products, but into a variety of unhealthy products. So, in other words, they're starting to dominate so that countries, so that populations that are coming out of that more subsistence-based and very basic low variety of foods can shift into a diet of wider variety, which is actually better for your health. Unfortunately, that variety is being steered into ultra-processed foods just because of this dominance of the market. I think it is having an effect on undernutrition, but the narrative is a little bit more nuanced. And in terms of the climate change part, I think at the manifestation point, let's say, what is the contribution of ultra-processed foods to the greenhouse gas contribution of the food system. And actually, it's quite small. It's really the production, and particularly with beef and dairy, as well as food waste, because now ultra-processed foods stay around for a hell of a long time. They're not wasted. The packaging might be, but the food itself isn't. So, ultra-processed foods don't figure hugely in the food-climate change nexus. It's more of a minor part.

But if you go beyond those visible manifestations of the global syndemic and you ask the question "what is it about the food system per se that is driving all these three things", then you come down to "what is driving the whole ultra-processed foods' tidal wave is how the food system is set up". How we incentivize and disincentivize the food industry, what rules we put around or what caveats. How we warn the public and so on. All the policies and the economics and the kind of expectations, I guess, around norms and expectations around food and food systems, which are set up at a deep level, are creating ultra-processed foods, which is giving people diabetes and heart disease and obesity, which is unaccounted for by that food system. And the same kind of set of mechanisms is allowing cow production to be unrestrained and so on. So, yeah, at the visible manifestation points, you can see the story, that's stronger for some than for others. But at a deeper level, it's very fundamental in there, with how we construct the food system in the first place.

João About the *Global Syndemic Report*, could you identify movements and reactions from governments, the private sector, civil society, or academia that have incorporated and have tried to dialogue and establish new proposals from what's proposed and detected in the *Global Syndemic Report*?

Boyd The place is heading down very quickly into sustainable food systems, so, within the *Global Syndemic Report*, we identified food systems, transport systems, land use, and urban design, and out of those four, the one that's got the biggest momentum is the food system, and sustainable food systems. And I think that's where it's going to have its biggest impact. So, it is there in the mix of the international dialogue. This *Global Syndemic Report* came out about the same time as the *EAT-Lancet Report* [7]. The *EAT-Lancet Report* got a lot of pushback, especially from the meat industry and the dairy industry,

and from people who, you know, the "Paleo diet" people, who are like the high-carb, high-fat brigade. And so, they got quite a lot of pushback from that, whereas the *Global Syndemic Report* didn't get that pushback. I think we've presented it in multiple countries and it seems that it helps people hang these things together and see through these visible manifestations into the deeper structures of the food system that we need to change. So, I don't see international pushback from that. And it might be a little bit more of a unifying concept than the *EAT-Lancet Report*, which tended to be a bit divisive. But they're both on the table, they're both speaking in the same direction, and yeah, I think both points of view are valid, and people are certainly getting the idea that these things are deeply connected.

Contributors

J. Peres and V. Matioli participated in the drafting of the text and revision of the final version to be published. B. Swinburn revised the final version to be published.

Additional informations

ORCID: João Peres (0000-0002-4767-2811); Victor Matioli (0000-0002-8961-5540); Boyd Swindurn (0000-0002-2131-045X).

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