Leveraging macro-social marketing to achieve sustainable development goals: a city-wide intervention addressing obesity in Brazil

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Abstract

Purpose – The purpose of this paper is to demonstrate how macro-social marketing can contribute to the United Nations 2030 sustainable development's goal of reducing non-communicable diseases and promoting and well-being by addressing the wicked problem of obesity.

Design/methodology/approach – A comprehensive, population-based intervention developed as a call-to-action movement to address obesity city-wide in Brazil was conducted and analyzed according to a macro-social marketing perspective, combined with the total process planning model (TPP).

Findings – The intervention was successful in effecting systemic change by targeting multi-level audiences to trigger active participation and interaction of multiple sectors at the macro, meso and micro levels; fostering the related positive behaviors of physical activity and healthful eating; and using a complementary range of intervening tools including events, mass media and social digital media.

Originality/value – Using a holistic view that combines macro-social marketing with the TPP, this paper offers factual evidence on how to connect research and action meaningfully to address obesity by engaging, connecting and/or partnering with multiple stakeholders in an effort to promote a healthful lifestyle and well-being.

Keywords Obesity, Wicked problems, Macro-social marketing, UN SDGs, Healthful lifestyles

Paper type Research paper

Introduction

The United Nations 2030 Agenda for sustainable development "urgent call for action" and 17 sustainable development goals (SDGs) prioritize healthful lifestyles and well-being as

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essential to sustainable development. SDG3 seeks to "ensure healthy lives and promote well-being for all at all ages" and SDG3's target 3.4 highlights the need "to reduce by one-third premature mortality from non-communicable diseases (NCD) through prevention and treatment and promote mental health and well-being" by the year 2030 (United Nations [UN], 2015).

Obesity is both an NCD and a driver of other NCDs, such as Type 2 diabetes, cardiovascular disease and hypertension (Finkelstein *et al.*, 2005). The world faces an epidemic of obesity and other chronic NCDs, which are linked to an unhealthful lifestyle, so the call for decisive action to achieve target 3.4 and SDG3 is particularly timely and important for the foreseeable future. Recently, obesity and other NCDs have also been linked to an increased risk of complications from COVID-19 (Brocq *et al.*, 2020). In the context of the current global health crisis generated by COVID-19, which has affected every aspect of life around the world, the UN 2030 Agenda and the SDGs seem more relevant than ever. Pursuing UN target 3.4 and SDG3 through a national/global, concerted effort to address obesity with comprehensive population-based interventions that promote healthful lifestyles and prevent other NCDs can help to ensure our ability to cope better with current and future global health crises.

Having nearly tripled since 1975, obesity is among the world's greatest public health problems (World Health Organization [WHO], 2020), heading the list of the so-called "wicked problems" (Kemper and Ballantine, 2017; Kennedy, 2016; Parkinson *et al.*, 2017). A wicked problem is a social issue that is difficult to define, has a complex nature, has no clear source and involves stakeholders with varied and often contradictory views and perspectives (Kreuter and McClure, 2004; Rittel and Webber, 1973). According to Bennett (2012, p. 6), "a wicked problem requires a wicked solution that is a synergy of top-down and bottom-up solutions." A top-down approach emanates from government authorities who can implement public policy to create change, while a bottom-up design originates from the target audience (Bennett, 2012). Creating synergy between top-down and bottom-up designs requires macro levels of inter-sectoral interventions that consider multiple interests, priorities, valuations by target audiences, institutional complexities and the uncertainty that is inherent to these problems (Head and Alford, 2015; McGregor, 2012).

The foresight obesity systems map shows that obesity is a complex problem that results from the interaction of many factors. The map posits that seven factors and their interdependencies determine the level of obesity in an individual or a group, namely, food consumption, food production, physical activity, psychology, physical activity environment, physiology and social psychology (Vandenbroeck *et al.*, 2007). As individuals who are affected by obesity are ingrained in their social contexts, any attempt by social marketers to create individual change must consider the wider social and cultural environment (Kennedy, 2016; Truong *et al.*, 2019). Consequently, an effective intervention requires a holistic approach, such as macro-social marketing, with collaboration from multiple stakeholder groups at the micro (or downstream), meso (or midstream) and macro (or upstream) levels (Domegan, 2008; Kemper and Ballantine, 2017; Kennedy, 2016; Truong, 2017; Truong *et al.*, 2019).

In total, 75% of Brazil's population is overweight or obese (Brasil Ministério da Saúde, 2020), and the country is third in the world in terms of COVID-19 cases (Worldometer, 2021). Webber *et al.* (2012) found that disease-related deaths that are due to unhealthful lifestyles, such as those that lead to high rates of obesity and other NCDs across Latin America, have laid an increasing burden on health systems. Unfortunately, despite high levels of obesity in Latin America, population-based health interventions are scarce (Hoehner *et al.*, 2013) and there is limited use of social marketing by researchers in less developed countries (Truong, 2017; Truong *et al.*, 2015).

In response, a group of researchers and health experts recognized the public health problems related to poor eating choices and physical inactivity, the limited research in this area and the need to promote healthful lifestyles and well-being. In line with UN target 3.4 and SDG3, they developed, implemented and evaluated between late 2015 and early 2017 a comprehensive population-based intervention in Brazil called the life of health (LoH). Although healthful eating has a greater role to play than physical activity in addressing obesity (Malhotra *et al.*, 2015), physical activity is one of seven factors that determine the level of obesity in an individual or group (Vandenbroeck *et al.*, 2007), so LoH used a macro-social marketing approach to increase both healthful eating and physical activity among the population. This paper connects research and action to deliver meaningful societal change through a holistic view that acknowledges the important interconnection between social marketing and the UN 2030 Agenda. Accordingly, we seek to answer the following research question: how can social marketers engage, connect and/or engage in partnership with other stakeholders to improve health and well-being by addressing obesity, in line with UN target 3.4 and SDG3?

This paper makes four primary contributions to the extant literature. First, it provides factual evidence for how macro-social marketing can be leveraged to achieve UN SDG3 by addressing the wicked problem of obesity holistically through involving multiple stakeholders to achieve transformative change (Saunders and Truong, 2019; Truong *et al.*, 2019). Second, it combines macro-social marketing with the total process planning (TPP) model (Blair-Stevens and French, 2007) to contribute to the growing literature on macro-social marketing. This helps to establish a base of theoretically guided interventions that have achieved behavior change and can assist in designing and implementing interventions that have a wide impact (Lefebvre, 2013; Rundle-Thiele *et al.*, 2019). Third, it addresses obesity in an integrated manner by acting on two of the seven factors that determine obesity: unhealthful eating and lack of physical activity (Vandenbroeck *et al.*, 2007). Fourth, it contributes to closing a substantial gap in social marketing research, which has been concentrated primarily in developed countries (Truong, 2017; Truong *et al.*, 2015). In the remainder of this paper, we present LoH as a case study that addresses the wicked problem of obesity by leveraging macro-social marketing to achieve UN target 3.4 and SDG3.

Macro-social marketing

Social marketing seeks to create societal change by altering attitudes, beliefs and behaviors to enhance societal well-being (Dibb, 2014; Saunders *et al.*, 2015), often focusing on individual-level behavior changes (Kennedy, 2016). However, as we need systems thinking to understand the impact that wicked problems have on individuals, businesses and society, macro-social marketing is an ideal perspective, as it presents researchers with complex situations that benefit from such thinking (Truong *et al.*, 2019; Wooliscroft, 2019). The terms "system social marketing" and "macro-social marketing" have been used interchangeably, but Flaherty *et al.* (2020) argued that they are not the same, even though the two concepts both integrate social marketing and systems thinking to address complex and wicked problems. Macro-social marketing also integrates institutional theory (Duffy *et al.*, 2017; Kennedy, 2016) and other theoretical approaches, such as socio-technical transitions (Kemper and Ballantine, 2017) and socio-ecological models (Lindridge *et al.*, 2013). We adopt Flaherty *et al.*'s (2020, pp. 159–160) recent definition, which expands on previous definitions of macro-social marketing, as "an approach, which integrates social marketing, institutional theory, systems thinking and other theoretical contributions to seek system-wide change through altering the problem perpetuating institutional norms of all stakeholders in the system."

Macro-social marketing "seeks to generate societal change by influencing the marketing, social, cultural and policy systems" (Truong, 2017, p. 422). The marketing system –"a network of individuals, groups and/or entities linked directly or indirectly through sequential or shared participation in economic exchange" (Layton, 2007, p. 230) – is a result of social mechanisms that help to explain how interactions take place in a system and the interactions between individuals and the environment in which they are embedded (Domegan *et al.*, 2016; Duffy *et al.*, 2017; Kennedy, 2016; Layton, 2015). Macro-social marketing uses the actions of government and other upstream actors to restructure market systems by reducing the efficiency of the elements of the traditional marketing mix surrounding the sought behavior change (Truong, 2017). Examples include taxation to reduce the consumption of soft drinks that affect obesity. This view is consistent with Lefebvre's (2013) micro-to-macro perspective, which suggests a parallel between shifting from a focus on individuals to include entire markets and shifting from a focus on individual determinants of changing health behavior to a social-ecological approach. An ecological perspective is useful in addressing obesity, as that perspective focuses on the multiple and interacting determinants of health behavior, including intrapersonal, interpersonal, community, organizational, community, physical environmental and policy determinants (Sallis *et al.*, 2008).

Calls have been made to combine the socio-ecological model with social marketing on the grounds that considering those inter-related influences can support the delivery of more successful social marketing interventions (Lindridge *et al.*, 2013). Kemper and Ballantine (2017) applied a macro-social marketing perspective based on the social-ecological model in conceptualizing environmental factors into formal and informal institutions. While formal institutions include government legislation and policy, informal institutions refer to the culturally shared meanings and values that are expressed in habitual behavior. The two kinds of institutions complement each other. Similarly, Hamby *et al.* (2017) emphasized the importance of institutions and showed that the actions of midstream institutions can be successful when such institutions, which are close to the direct beneficiaries (e.g. non-governmental organizations), create change in their institutional norms to address the beneficiaries' problems, thus facilitating improvement at the macro level. Hamby *et al.* (2017) called for further research by suggesting that midstream institutions may serve as brokers in an ecosystem, thus increasing the effectiveness of government interventions.

Micro, meso and macro levels of macro-social marketing

Macro-social marketing follows the principles of the social-ecological model and presupposes three levels of social marketing coverage, namely, micro, meso and macro (Kennedy, 2016; Lefebvre, 2013; Truong *et al.*, 2019). The three levels are synergistically intertwined, and they must work simultaneously for social change to be effective (Dibb, 2014). While micro-social marketing focuses on creating behavior changes in individuals, macro-social marketing seeks to change the social institutions – the norms, beliefs, practices, codes, values and behaviors – that support them, so systemic change can take place (Kennedy, 2016; Truong *et al.*, 2019).

At the micro-level is the individual, who is at the center of a range of environmental influences that involve family, friends and peers. It is at this level that most social marketing actions operate by designating the responsibility for behavioral change exclusively to the individual (Wallack, 2002). However, social marketing has seen a shift from a downstream focus to a more holistic view (Truong *et al.*, 2019) that acknowledges that individuals are embedded in their environments and that putting the onus solely on the individual is unhelpful (Lefebvre, 2013). At the meso level are companies, non-profits and community

groups that can interconnect directly or indirectly to influence the adoption of desired behaviors (Wood, 2016). The macro-level includes actors such as policymakers, governments and the market – that is, social, political and economic forces that influence the individuals, groups and organizations that are in the socio-ecological system (Dibb *et al.*, 2013; Hoek and Jones, 2011).

While upstream social marketing seeks structural changes via policymakers, macro-social marketing seeks to change the institutional norms that surround a wicked problem in such a way that systemic change can occur (Kennedy, 2016). In this sense, the macro-level of a macro-social marketing approach refers to the scale of functioning of a system or a marketing problem that occurs on a societal level or at a large scale, as it affects such a proportion of consumers in a system that a system-wide intervention is necessary (Truong, 2017). In our case, LoH is a city-wide intervention implemented to address the wicked problem of obesity and promote healthful lifestyles.

To address the wicked problem of obesity and effect social change, macro-social marketing should not only target a broad range of stakeholders but also focus on the interconnections and feedback among these stakeholders and the systems of which they are part (Meadows, 2008; Truong *et al.*, 2019) so as to facilitate value co-creation activities among them (Parkinson *et al.*, 2017). LoH's holistic perspective systematically managed the micro, meso and macro challenges and opportunities that arose (Figure 1).

Methods

We used case study research – that is, "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 1994, p. 13) – to gain insight into how a city-wide intervention can address obesity. We defined LoH as our case study and looked into the main influences of physical activity and healthful eating decisions in the city's population. TPP is a useful framework to support the planning, development and delivery of interventions (Blair-Stevens and French, 2007), so it has been applied to social marketing campaigns (Blanchette *et al.*, 2016). To the best of our knowledge, the TPP has been applied only in micro-social marketing. However, we combine macro-social marketing with the TPP to help organize and manage the complexities involved in developing the

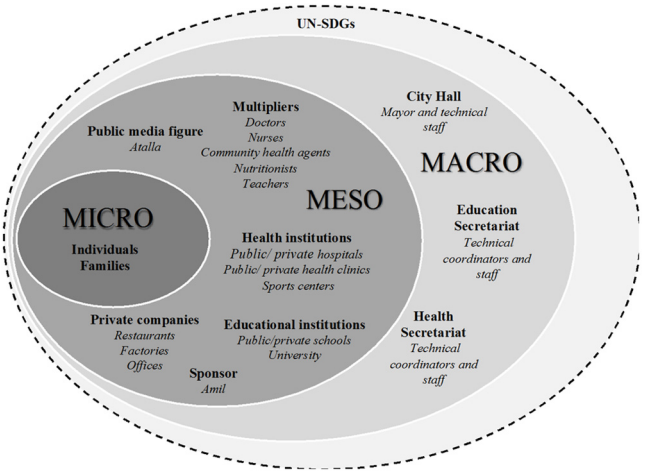

Figure 1.
The holistic perspective of the life of health intervention

city-wide intervention. We expect that using TPP to systematize the application of a macro-social marketing approach will make it possible to acquire evidence about how the micro, meso and macro levels of LoH interact in all stages of the intervention.

TPP consists of five stages – scoping, development, implementation, evaluation and follow-up (French *et al.*, 2010) – each of which involves a range of tasks. *Scoping* involves understanding the main factors that influence the target audiences' lives and behaviors, the barriers to change and community contributions that can facilitate positive change. The scoping stage also ensures that the objectives are realistic, as target behaviors, target segments and the methods to be adopted in the intervention are examined, selected and agreed upon. *Development* consists of creating and developing a personalized product or service (e.g. an intervention), pre-testing it with the intended audience and refining the work through the participation of stakeholders and partners who are motivated to contribute. *Implementation* refers to initiating, implementing, managing and adjusting the intervention based on feedback, and monitoring relevant data. In the *evaluation* stage, the work's achievements and overall impact are evaluated in terms of process, impacts, results and effectiveness and recommendations for future action are made. Finally, the activities of the *follow-up* stage depend on the evaluation stage's findings and the learning that should be applied. Two of the authors were directly involved in LoH.

Findings

This section follows the stages of the TPP framework in reporting the analysis, interpretation and results of the case study.

Scoping stage

Public media figure. LoH was conceived by the physical educator Marcio Atalla, who specializes in training elite athletes and celebrities from the Brazilian sports scene. One of the first personal trainers in the country, Atalla built a successful career promoting lifestyle changes for sports figures such as former soccer player and Brazilian national team member Ronaldo Nazário. With the aim of helping to address the problem of obesity, Atalla launched LoH to mobilize the city to embrace a more healthful way of life. He led LoH from conception to conclusion and was responsible for negotiating partnerships, determining the feasibility of interventions and taking a proactive part in the delivery of the intervention itself. Atalla was both behind the scenes and on the stage of LoH.

Location: Jaguariúna, Brazil. The municipality of Jaguariúna was chosen to host LoH. Jaguariúna has an estimated population of 53,000 (Brazil: 207.7 million), an average life expectancy of 75.4 years (Brazil: 75.8), a literacy rate of 92.5% (Brazil: 96.6%) and a gross domestic product per capita of USD 42,500 (Brazil: US$8,600) (IBGE, 2016).

A key factor in choosing Jaguariúna was the Citizen Card, a unique online tool that has recorded real-time data (e.g. health markers) on the city's population since 2007. The card must be presented for a citizen to undergo any type of procedure in the public health clinics or municipal hospital and is requested whenever a citizen wishes to use services in the areas of education, sports, transportation or social assistance. In 2018, Jaguariúna won the SmartCity Business America prize in recognition of its use of the Citizen Card in the supply of medicines (SmartCity Business, 2018). Registration of the population in LoH was carried out using the identification numbers on the Citizen Card so ordinary citizens who participated in LoH could be monitored. Another factor that influenced the decision to use Jaguariúna was its infrastructure, as it contains 14 parks, more than 20 plazas (public squares) and 10 sports and recreation spaces, a level of facilitation that is not common in Brazilian cities.

Partnerships and financing. LoH established a partnership with the City Hall of Jaguariúna, which offered support in terms of physical and operational structure by, for example, providing transportation for the LoH team and making public spaces available for events. The ongoing dialogue was established with the mayor and senior officials of Secretariats in the year preceding the intervention. Partnerships were also established with 16 private companies and the local university, the latter of which made available students from health courses (e.g. nursing and nutrition) as volunteers in the LoH registration phase. LoH was financed by Amil, a private company that operates health care and dental plans and has 6.2 million beneficiaries and more than 30,000 service providers, including hospitals, clinics and laboratories throughout Brazil. To address obesity, Amil launched the "no child obese" movement in 2014, held a series of preventive health programs for chronic diseases and contributed funding of approximately US$1.4m to LoH.

Formative research. Formative research started with a critical literature review of publications on exercise and physical activity, nutrition and dietetics, including evidence from public health interventions that have been undertaken around the world such as the North Karelia Project in Finland. Global and national health and public policy guidelines such as the Food Guide of the Brazilian Population (edition 2015.2) (Brasil Ministério da Saúde, 2015), which classifies food by its level of processing, were also important benchmarks in planning the project.

Formative empirical research activities, including unstructured interviews (Lavrakas, 2008) and interpersonal observations used for exploratory research, were undertaken in Jaguariúna to identify the main influences in the population's decisions related to physical activity and healthful eating. The LoH team learned about people's behavior in parks, plazas, sports and recreation spaces and health clinics. The team also engaged with key informants such as community leaders, health professionals and teachers. Formative research focused on LoH's target audiences at the micro-level (e.g. individual ordinary citizens observed and interviewed in parks) and the meso level (e.g. doctors observed and interviewed in health clinics) and took place approximately eight months before the intervention was launched. This immersion in the city provided insights into distinct subgroups of the population and the social and cultural environments in which people undertook their daily activities.

Development stage

Target audience and segmentation. LoH adopted multiple influencing roles. At the micro-level, LoH targeted individuals and their families (i.e. adults, children and adolescents). LoH also sought to harness support from partners in the meso and macro environments. At the meso level, the intervention reached out to "multipliers," health professionals and educators, etc., who had the skills to pass the LoH's message along in the long term. The actions developed for the health team, which included physicians, nurses, nutritionists, physical educators and community health agents who work in health institutions such as public and private hospitals and health clinics and sports centers, were intended to unify the healthful-lifestyle discourse that was being conveyed to the city's population. The educational team consisted of principals, coordinators and teachers from the city's public and private schools and the university students who worked as volunteers on the project, and their educational institutions. The meso level also included the staff of private companies such as restaurants, factories and offices, which can also act as multipliers of LoH's message to their stakeholders (e.g. employees). At the macro level, LoH targeted local government and policymakers in the persons of the mayor and his technical team and the staff of both the

Education and the Health Secretariats, such as technical coordinators and staff who represent the educational and health social systems.

Preparing for pre- and post-intervention assessment. The data from the city's adults, children and adolescents were gathered on an electronic platform that facilitated monitoring the evolution of lifestyle indicators related to physical activity and dietary patterns. Two samples were collected, namely, one that provided data on adult lifestyle indicators, which were collected through the questionnaire on the Surveillance of Risk Factors and Protection against Chronic Diseases by Telephone Inquiry (Vigitel), a tool of the Brazilian Ministry of Health, and one that provided data on the lifestyle indicators of children and adolescents, which were collected in person at the local schools. All indicators were collected in two phases, namely, pre-intervention (Time 1: April–May 2016) and post-intervention (Time 2: December 2016–January 2017).

Adult lifestyle indicators. During Time 1, a probabilistic sample of 1,424 citizens aged 18 or older who had access to a telephone was randomly selected from the Citizen Card database, so any person (whether enrolled in LoH or not) had an equal opportunity to be asked to answer the questionnaire. The Vigitel questionnaire inquired about respondents' physical activity (during leisure time, at work, during travel to and from work and while performing domestic activities), sedentary behavior (watching television) and eating habits (consumption of fruits and vegetables, sweetened soft drinks, sugary foods and fatty meat and swapping main meals for snacks or junk food). The same questionnaire was fielded to the same sample again during Time 2, with an added yes/no question regarding whether the respondent had changed his or her health-related lifestyle in the preceding seven months. At Time 2, the questionnaire was answered by 1,400 respondents, and chi-squared comparisons identified no drop-out bias. The data were assessed using the generalized estimating equations (GEE) method (Hardin, 2005). A thorough methodological description and analysis of these data were published elsewhere (Atalla *et al.*, 2019).

Child and adolescent lifestyle indicators. Schoolchildren aged 10 to 18 were invited to enroll in LoH via an explanatory document on the intervention that had been sent to their parents or guardians for consent. During Time 1, those who had the approval to take part in the project answered a questionnaire about their physical activity and sedentary behavior (time spent watching television (TV), playing video games and using the computer) and had their anthropometric data (body weight and height) collected at school. The same questionnaire and anthropometric data were collected during Time 2. In Time 1, 3,592 children and adolescents participated and 3,214 individuals participated in Time 2. As in the adult sample, chi-squared comparisons showed no drop-out bias, the data were assessed using the GEE method. A thorough methodological description and analysis of these data were published elsewhere (Atalla *et al.*, 2018).

Implementation stage

The intervention lasted seven months, from April to November 2016. Tables 1 and 2 summarize the events, communication and media actions undertaken to promote capacity-building and health awareness. Adults, children and adolescents were encouraged to engage in both structured (e.g. swimming, running and cycling) and non-structured (e.g. avoiding prolonged sedentary time, increasing walking time and taking the stairs instead of the elevator) physical activity and food and nutrition education. For example, adult residents could use the app Oi, Atalla! (Hi, Atalla!) to monitor their daily structured and non-structured physical activities and food intake. Both multipliers and policymakers received training sessions and policymakers such as the mayor and senior officials of the Health and the Education Secretariats took part in several meetings with Atalla and his technical team.

Timeline	Intervention components	Description	Target behavior	Target audience	Scope
April to May 2016	Walks	Two walks, one is the inaugural walk, in which life of health was launched (attended by 3,000 people)	PA	ADU, CHI, ADO	D
	Atalla Laboratory	A stylized laboratory that unraveled myths and truths about physical activity and food	PA, HE	ADU, ADO	D
	Challenge Day	An event that launched several challenges that were sent to participants via SMS to schools and universities, public institutions and companies	PA, HE	ADU, ADO	D
	Workshops	An exercise workshop that approached topics related to physical activity with simulations of exercises that can be done at home, and a healthful eating workshop that addressed (with the help of nutritionists) topics such as signs of hunger and satiety, effects of ultra-processed foods and food labels	PA, HE	ADU, CHI, ADO	D
June to September 2016	June festival	A traditional Brazilian party held in June that involved music, dance, games and challenges (although the food stands were the main attraction)	PA, HE	ADU, CHI, ADO	D
	Picnic	A picnic held at the city park that gathered around 600 people and in which the importance of engaging in physical activity and more healthful eating was discussed	PA, HE	ADU, CHI, ADO	D
	Life of health clinic	An office where the participants could have blood tests and discuss the results of their laboratory examinations with doctors and nurses	PA, HE	ADU	D
	Biking event	A six-kilometer cycling tour to celebrate the 62nd anniversary of the city of Jaguariúna	PA, HE	ADU, CHI, ADO	D
April to November 2016	Training sessions in schools	Periodic training in every school in Jaguariúna (three private and 15 public schools) that involved directors, coordinators, teachers and students to encourage movement and good nutrition in the school environment	PA, HE	CHI, ADO, MUL	M
	Training sessions in restaurants	Visits to six restaurants in which the team suggested the menu include balanced, healthful meal options consisting of vegetables, grains and lean meat	HE	MUL	M
	Training sessions in private companies	Training in 16 private companies that involved activities such as physical exercise sessions in the workplace, visits to the canteens that proposed new dining options and challenges	PA, HE	MUL	M
	Training sessions in public institutions	Team visits to 15 public institutions (e.g. the municipal hospital, public health clinics, the Health and Education Secretariats, education and sports centers) for talks with doctors, nurses, nutritionists, community health agents and health professionals to empower them to bring information about healthful lifestyles to the population	PA, HE	MUL, PM	M, U
	Meetings with politicians	Meetings with the mayor and the Health and the Education Secretariats high boards	PA, HE	PM	U

Notes: PA: physical activity; HE: healthful eating; ADU: adults; CHI: children; ADO: adolescents; MUL: multipliers; PM: policymakers; D: downstream; M: midstream; U: upstream

Table 1. Life of health implementation: events

Timeline	Intervention components	Description	Target behavior	Target audience	Scope
April to November 2016	Billboards and street ads	Four continually updated billboards and 12 street ads were on display in places where citizens circulated en masse, such as at the entrance to the city, in the railway station, at tourist points (e.g. museums) and at bus stops	PA, HE	ADU	M
	Short text messages	SMS of up to 150 characters (including spaces) were sent weekly to the cell phones of those enrolled in the project with recommendations about healthful eating and physical activity	PA, HE	ADU	D
	Radio	Local radio stations covered the events live. Radio station CBN transmitted a weekly show called "life of health" nationally	PA, HE	ADU	M
	Television	More than 20 reports were shown on local television shows and one report was shown on a Brazilian primetime news program	PA, HE	ADU	M
	Newspapers and magazines	Three local newspapers published weekly reports in both printed and online formats, while the newspaper with the largest circulation in Brazil published a special report on the project. More than 10 magazines published content on life of health	PA, HE	ADU	M
	Illustrated booklet	More than 5,000 illustrated booklets were distributed to the population at events that took place in parks and public recreational spaces, businesses, schools, restaurants and public institutions	PA, HE	ADU, CHI, ADO, MUL	M
	Instagram, Facebook, YouTube and the website	The Instagram profile reached more than 2,000 followers and the Facebook page was "liked" by more than 6,000 people. The YouTube channel included 42 short videos and hit around 8,000 views. The website (www.vidadeesaude.com.br) featured content on the project description, event programming and links to Instagram, Facebook and YouTube	PA, HE	ADU	M
	Mobile app	The Oi, Atalla! (Hi, Atalla!) application was a platform available at Google Play and Apple Stores for guiding and monitoring structured and non-structured physical activities and registering food choices	PA, HE	ADU	D

Table 2.
Life of health implementation: communication and media

Notes: PA: physical activity; HE: healthful eating; ADU: adults; CHI: children; ADO: adolescents; MUL: multipliers; D: downstream; M: midstream; U: upstream

In total, 10 professional and amateur-led cycling and running clubs emerged spontaneously during the intervention.

Events. The implementation of LoH featured a series of events that Atalla attended. The events were designed around two strategic axes, namely, citizen engagement in activities, most of which were held in parks and at recreational sites, and group training sessions for

multipliers and policymakers, most of which were held in their workplaces. Three events that focused on citizen engagement deserve particular attention because each had many attendees – up to 5,000 people, namely, the inaugural walk, which kicked off the intervention (Figure 2); the LoH clinic, where a team of doctors provided free medical feedback on test results to participants who requested them when they enrolled at the registration centers; and exercise and healthful eating workshops, which showed examples of exercises that could be included in one's daily routine using common objects (e.g. a broom or a chair) and encouraged reconnection with signs of hunger and satiety, meal-planning and taking the time to cook.

Communication and media. LoH used both mass media (billboards and street ads, short message service, radio, television, newspapers and magazines and illustrated booklets) and digital social media (Instagram, Facebook, YouTube, LoH website and a mobile app) to encourage the citizens of Jaguariúna to enroll in LoH, inform them about the events that were taking place during the intervention, and promote the project to local and national press.

The communication campaign was structured around the idea that small lifestyle changes can make a big difference to health. The campaign messages emphasized the individual's role in taking care of his or her own health (e.g. "preventive medicine is our daily routine – how we move and how we eat – so the magic pill of health is within each of us. We produce it every day"). For the visual identity of LoH, a logo showing a person with open arms closing in a circle and emphasis on the word *vida* (life) symbolized the sense of urgency and the impact that the practice of physical activity and good nutrition can have on reducing obesity and improving health.

Evaluation stage

Intervention reach. Everyone in the city was exposed to the intervention in some way through mass communication media, and approximately 9,000 people or 17% of the city population, took part in it either by officially enrolling in the project at registration centers

Note: The walk began in the Cultural Center and passed through streets and avenues of the central region of Jaguariúna, finishing in Park of the Lakes

Source: Advertising Agency ACT10N

Figure 2.
The inaugural walk event, which kicked off the intervention

(n = 3,984) and schools (n = 3,592) or participating in the Vigitel research (n = 1,424). The intervention directly reached 100% of schools (n = 18), 100% of public health clinics (n = 7) and around 43% of all schoolchildren and adolescents in the municipality and trained 63% of all health professionals who were registered to work in the city. LoH reached the macro level by ensuring that the mayor and the staff who were responsible for health, education and sports at the municipal level attended the training sessions and by meeting with them repeatedly to manage the delivery of the intervention.

Pre- and post-intervention lifestyle indicators. The adult group revealed significant changes in lifestyle indicators after the intervention, as 37% had increased their physical activity during their leisure time, 17% increased it at work and 14% did so while performing domestic activities. In total, 13% reduced the habit of watching television for more than 3 h a day. Food standards improved, as 18% of respondents reported increased fruit and vegetable consumption, 35% reduced their consumption of sweetened soft drinks, 16% reduced their consumption of sugary foods and 34% stopped swapping main meals for snacks or junk food. The results were statistically non-significant for consumption of fatty meat. On the downside, 25% reduced their physical activity while traveling to and from work. Details of these results have been published elsewhere (Atalla *et al.*, 2019).

Similarly, in the children and adolescent groups, lifestyle indicators showed significant positive changes, as obese and overweight children and adolescents reduced their body mass index (BMI) z-scores (−0.15 for obese and −0.08 for overweight). A significant positive change took place with regard to sedentary behavior, as time spent on video games and watching television on weekdays declined by 21 and 8.5 min per day, respectively. However, television time during the weekend remained unchanged, and these two groups showed an increase of 1 h per day spent on computers. In addition, the intervention did not change the amount of time they spent in physical activity at school, as the results were statistically non-significant. Details of these results have been published elsewhere (Atalla *et al.*, 2018).

Evidence of institutional changes and policymaking. LoH was successful in recognizing the important role of midstream institutions in influencing not only individual-level behavior but also upstream decisions. In contrast with micro-social marketing that aims at changing individual-level behavior, macro-social marketing seeks to institutionalize long-term societal behavioral change (Kennedy, 2016). Training sessions were effective in changing multipliers' attitudes about a healthy lifestyle, thus paving a way for positive changes in individual behavior. For example, after taking part in the LoH training sessions, the management board of a factory decided to change its restaurant's menu to increase the nutritional value of the meals served to employees, and the chief executive officer of a company established small breaks during work time for employees to stretch and move. Therefore, the influence of multipliers went beyond telling people what to do (e.g. a doctor instructing patients about the importance of exercising) to offering opportunities to put healthful behavior into action. Our findings support Hamby *et al.*'s (2017) proposition that the power of macro-social marketing does not solely come down from large entities' institutional changes, as creating change in many smaller institutions can produce macro changes in societal norms.

In terms of government-related actors, the Education Secretariat disseminated recommendations to every school in the city to enrich the school environment and encourage physical activity during students' breaks. A local policy was established so that school playgrounds and sport spaces could remain open to the local community outside school hours to encourage physical activity.

Follow-up stage

Given the successful behavioral changes achieved during the intervention, more than 80 multipliers, including health professionals and the educational team, continued to apply the lessons learned from LoH. Since 2017, the population of Jaguariúna has assessed the city's public health services positively, which received 696, 683 and 668 points in 2017–2019, respectively, well above the average points (522, 549 and 473) achieved by 14 neighboring cities (INDSAT, 2020). LoH also served as an inspiration for nearby cities to institute their own healthful lifestyle programs. For example, Holambra developed the Healthy Holambra Program.

Three independent programs coordinated by the municipality of Jaguariúna emerged based on LoH, namely, the sports for all program in 2017, which offers free classes in various sports to 7–15-year-old children in one park in the city, the Champions project in 2019, which provides sports training to more than 3,500 residents (children, adults and the elderly) in public spaces located in various neighborhoods and the sport at home program in 2020, which offers online sports classes to residents in response to COVID-19. These results demonstrate the significant long-term impact of LoH on the community and Brazil in general.

Discussion

Our findings show that LoH met the three requirements that, according to Sjöström and Stockley (2001), the effective interventions should meet: it worked at the policy, environmental, community and individual levels (i.e. macro, meso and micro); it adopted an integrated, holistic approach by focusing on physical activity and healthful eating and on multiple target audiences and it involved a complementary range of intervening actions (events, mass media and social digital media).

The greatest potential for solving wicked problems occurs when learning takes place collaboratively, between the community and stakeholders (Roberts, 2000). At the micro-level, the LoH intervention included individuals and their families. For example, events were organized so that family members could attend and learn together. At the meso level, LoH sought to have an impact on a wide range of stakeholders (e.g. private and public-school students, employees of private companies and health clinics' patients) that act as network structures surrounding the individual. To effect a systemic change, LoH sought to change the social systems (e.g. family, work and school) in which individuals are embedded (Kennedy, 2016; Truong *et al.*, 2019) and to establish a new normative framework for conceptualizing a healthful lifestyle. For example, at the micro-level, LoH reduced the excessive consumption of unhealthful goods such as soft drinks and junk food and at the meso level, it sought to change social institutions to change interrelated systems. A major finding in our study was the achievement of significant community involvement in initiating and sustaining motivation for social change (Hamby *et al.*, 2017) through the multipliers. The education and training that the multipliers received during the intervention period, along with the events and media communications, created a solid basis for extending multipliers' ability to encourage the desired behavioral changes among the city's population. The improvement of obese and overweight children's and adolescents' BMIs that resulted from the intervention illustrates the effectiveness of these joint actions that targeted the micro-level (children) via the meso level (teachers in schools).

At the macro level, LoH addressed the upstream level by going beyond attempts to influence the attitude of policymakers to set up a strong partnership with Jaguariúna's City Hall and Health and Educational Secretariats, which was central to the ability to implement a number of events that fostered the desired behaviors of physical activity and a healthful

diet. The systematic alignment of LoH with policymakers was key to the intervention's success, as these leaders influence citizens' lives through public policies and educational guidelines.

Implications for theory and practice

This study answered the question concerning how social marketers engage, connect and/or create partnerships with other stakeholder groups to pursue health and well-being by addressing obesity, in line with UN target 3.4 and SDG3. In answering the research question, we combined macro-social marketing with the TPP to address holistically the wicked problem of obesity. This approach contributes to the literature by extending the application of the TPP, which has been widely used at the micro-level in social marketing (Blair-Stevens and French, 2007). It also contributes to the limited but growing macro-social marketing literature by providing evidence of implementation of interventions that have a wide impact (Domegan, 2008; Kemper and Ballantine, 2017; Kennedy, 2016; Lefebvre, 2013; Rundle-Thiele *et al.*, 2019; Truong, 2017; Truong *et al.*, 2019). The study also contributes to the limited social marketing research in emerging or developing economies (Truong, 2017; Truong *et al.*, 2015).

By combining a macro-social perspective with the TPP, LoH involved multiple stakeholders in producing transformative societal change by influencing the broad marketing, social and cultural policy systems that surround the desired behavior changes (Saunders and Truong, 2019; Truong, 2017; Truong *et al.*, 2019). LoH recognized the power of collaboration in effecting societal change by involving a wide range of inter-connected stakeholders in the educational, health and business communities that are part of the individual's social network, thus connecting the upstream, midstream and downstream elements of the intervention (Dibb, 2014). This broad view of social marketing can shift the focus on individual behavior change to a more holistic, multilevel collaboration perspective like the one used by LoH, which is appropriate for addressing wicked problems such as obesity.

The study also makes several practical contributions. LoH addressed obesity in an integrated manner by acting on two of seven factors that determine obesity: unhealthful eating and lack of physical activity (Vandenbroeck *et al.*, 2007). It also shows how the intervention addressed how to make everyday life more active and improve nutrition. As Tables 1 and 2 show, all but two of the 21 actions from the intervention combined both physical activity and healthful eating. Integrating both behaviors was accomplished in simple, creative ways, such as through question-and-answer games at a picnic event that promoted the benefits of fresh food and water consumption, combined with stimuli to move (e.g. jumping in and out of hula-hoops when questions were answered correctly).

Another of the study's practical implications is its finding through LoH that following simple daily rules can have significant positive health results. Simple, highly feasible tips were suggested at the events and in the communication materials, such as how to read food labels to avoid ultra-processed food and how to exercise at home in only 7 min per day. Research shows that people are more likely to increase and maintain physical activity when they do not have to move to certain locations, such as gyms (Hillsdon and Thorogood, 1996). The LoH billboard at the entrance to the city, which stated, "get off the sofa, spend two more hours on foot per day, and lose five kilos per year!" showed that it does not take much effort to be healthy. LoH targeted families in tackling the complex problem of obesity because entire families can join in the intervention together. Based on previous studies (Sleddens *et al.*, 2017) and LoH's results, we conclude that one family member can influence another, who influences another in a continuous loop that builds LoH's desired behaviors.

In addition, LoH demonstrated the value of developing public-private partnerships and involving a public media figure to influence individual behavior changes (Wong *et al.*, 2015). Amil and Atalla were important meso influences of LoH, as the intervention would have not been possible without Amil's funding and Atalla played a leading role in channeling stakeholders' efforts at the micro, meso and macro levels to create a united system. Participation of key actors in the marketing system is in line with Meadows' (2008) and Truong *et al.*'s (2019) claim that macro-social marketing should consider the broad marketing network to address wicked problems such as obesity. As an opinion leader, Atalla could alter behavior because of his expert and referent social power (French and Raven, 1959), thus influencing society's values and belief systems so that societal change can take place (Kennedy, 2016; Truong *et al.*, 2019). Through his massive media presence, Atalla inspired the target audience to take action and mobilized the community by being present at more than 50 events offered by the public-private partnerships. Comprehensive stakeholder involvement allowed people to find the locations (e.g. parks equipped for the workshops) and support (e.g. meetings with health professionals at public places) they needed to change their lifestyles for the better.

Finally, the study suggests that social events, mass media and digital social media can play complementary roles in achieving the objectives of an intervention such as LoH. In line with McNamara *et al.* (2010), using events instead of relying only on mass media supports the view that population-based health interventions must go beyond unidirectional communication to include substantial citizen engagement. As a multidirectional communication tool, social media has emerged as a channel for citizen engagement, so interventions can blend strategies that tie the popularity of public media figures with the desire of ordinary people who use social media to post their own experiences with the project (e.g. photos of the events).

Limitations of life of health and future research

Our study has several limitations that lead to avenues for future research. LoH could have worked the upstream dimension with activities beyond the meetings with and training of policymakers, such as by involving the mayor and his technical team and the Health and Education Secretariats' senior officials, to including the councilors who create local laws. For instance, LoH did not attempt to change the curricula or the menus of municipal public schools. Although such actions are useful in terms of public policy, they are complex to execute, as they involve changing laws. Another shortcoming is that LoH was not designed to make it possible to analyze its long-term impact on the local health industry. Future research could calculate how much money this population-based health intervention saved in terms of medical bills (i.e. spending on hospital and medical procedures) by comparing the cost of preventive- versus primary-care approaches. In addition, LoH did not take any particular action that was targeted at the disadvantaged, marginalized or low-income segments of the population. Future research could focus on this group.

Conclusion

This paper demonstrates that social marketers can leverage macro-social marketing through a comprehensive city-wide intervention that addresses obesity by engaging, connecting and/or creating partnerships with multiple stakeholders to promote a healthful lifestyle, in line with UN target 3.4 and SDG3. The TPP was useful in systematizing the complexities associated with LoH's planning, organizing and management so the people and stakeholders involved could engage, collaborate and contribute effectively and holistically.

By using a macro-social marketing perspective, LoH sought to effect systemic change by changing the institutional norms that perpetuate obesity at the micro, meso and macro levels. By combining macro-social marketing with the TPP, we were able to build bridges between the micro, meso and macro levels in every stage of the TPP. For example, the TPP scoping stage highlights the role of local government institutions, as LoH developed valuable partnerships with the city hall (macro) and the formative research with ordinary citizens (micro) and multipliers (meso). The TPP development stage presents the target audiences of LoH, including downstream, midstream and upstream audiences. Details of the actions delivered in each of the three levels are explained in the implementation stage (Tables 1 and 2). Finally, the TPP evaluation and follow-up stages highlight the direct and indirect results of the intervention, such as the improvement in the lifestyle indicators of adults and children (micro), the capacity building of multipliers (meso) and the attitudinal changes of policymakers that then became public policy and guidelines (macro). We hope that LoH can offer valuable insights into how to address the wicked problem of obesity by bringing together the micro, meso and macro levels of macro-social marketing in future interventions.

References

Atalla, M., Pinto, A.J., Mielke, G.I., Benatti, F.B. and Gualano, B. (2019), "Impact of a real-world lifestyle intervention in an entire Latin American city with more than 50,000 people", *Obesity*, Vol. 27 No. 12, pp. 1967-1974.

Atalla, M., Pinto, A.J., Mielke, G.I., Baciuk, E.P., Benatti, F.B. and Gualano, B. (2018), "Tackling youth inactivity and sedentary behavior in an entire Latin America city", *Frontiers in Pediatrics*, Vol. 6 No. 298, pp. 1-5.

Bennett, A.G. (2012), "Introduction: a wicked solution to the global food problem", *Iridescent*, Vol. 2 No. 3, pp. 2-10.

Blair-Stevens, C. and French, J. (2007), *Social Marketing: Big Pocket Guide*, 2nd ed., National Social Marketing Centre (NSMC), The National Consumer Council, London.

Blanchette, L., Gaar, V.M., Raat, H., French, J. and Jansen, W. (2016), "The development of the 'water campaign': combining social marketing and intervention mapping", *Journal of Social Marketing*, Vol. 6 No. 4, pp. 318-334.

Brasil Ministério da Saúde (2015), "Guia alimentar Para a população brasileira", available at: https://bvsms.saude.gov.br/bvs/publicacoes/guia_alimentar_populacao_brasileira_2ed.pdf (accessed 1 July 2020).

Brasil Ministério da Saúde (2020), "Vigitel brasil 2019: vigilância de fatores de risco e proteção Para doenças crônicas por inquérito telefônico", available at: www.saude.gov.br/images/pdf/2020/April/27/vigitel-brasil-2019-vigilancia-fatores-risco.pdf (accessed 1 June 2020).

Brocq, S.L., Bryant, M., Roberts, K. and Tahrani, A.A. (2020), "Obesity and COVID-19: a call for action from people living with obesity", *The Lancet*, Vol. 8 No. 8, pp. 652-654.

Dibb, S. (2014), "Up, up and away: social marketing breaks free", *Journal of Marketing Management*, Vol. 30 Nos 11/12, pp. 1159-1185.

Dibb, S., Carrigan, M. and Gordon, R. (2013), "Unlocking the potential of upstream social marketing", *European Journal of Marketing*, Vol. 47 No. 9, pp. 1525-1547.

Domegan, C.T. (2008), "Social marketing: implications for contemporary marketing practices classification scheme", *Journal of Business and Industrial Marketing*, Vol. 23 No. 2, pp. 135-141.

Domegan, C., McHugh, P., Devaney, M., Duane, S., Hogan, M., Broome, B.J., Layton, R.A., Joyce, J., Mazzonetto, M. and Piwowarczyk, J. (2016), "Systems-thinking social marketing: conceptual

extensions and empirical investigations", *Journal of Marketing Management*, Vol. 32 Nos 11/12, pp. 1123-1144.

Duffy, S.M., Northey, G. and van Esch, P. (2017), "Iceland: how social mechanisms drove the financial collapse and why it's a wicked problem", *Journal of Social Marketing*, Vol. 7 No. 3, pp. 330-346.

Finkelstein, E.A., Ruhm, C.J. and Kosa, K.M. (2005), "Economic causes and consequences of obesity", *Annual Review of Public Health*, Vol. 26 No. 1, pp. 239-257.

Flaherty, T., Domegan, C., Duane, S., Brychkov, D. and Anand, M. (2020), "Systems social marketing and macro-social marketing: a systematic review", *Social Marketing Quarterly*, Vol. 26 No. 2, pp. 146-166.

French, J.R.P., Jr. and Raven, B.H. (1959), "The bases of social power", in Cartwright, D.P. (Ed.), *Studies in Social Power*, Institute for Social Research, University of MI, Ann Arbor, MI, pp. 150-167.

French, J., Blair-Stevens, C., McVey, D. and Merritt, R. (2010), *Social Marketing and Public Health: Theory and Practice*, Oxford University Press, New York, NY.

Hamby, A., Pierce, M. and Brinberg, D. (2017), "Solving complex problems: enduring solutions through social entrepreneurship, community action, and social marketing", *Journal of Macromarketing*, Vol. 37 No. 4, pp. 369-380.

Hardin, J.W. (2005), *Generalized Estimating Equations (GEE), Encyclopedia of Statistics in Behavioral Science*, John Wiley and Sons, Hoboken, NJ.

Head, B.W. and Alford, J. (2015), "Wicked problems: implications for public policy and management", *Administration and Society*, Vol. 47 No. 6, pp. 711-739.

Hillsdon, M. and Thorogood, M. (1996), "A systematic review of physical activity promotion strategies", *British Journal of Sports Medicine*, Vol. 30 No. 2, pp. 84-89.

Hoehner, C.M., Ribeiro, I.C., Parra, D.C., Reis, R.S., Azevedo, M.R., Hino, A.A., Soares, J., Hallal, P.C., Simões, E.J. and Brownson, R.C. (2013), "Physical activity interventions in Latin America: a systematic review", *American Journal of Preventive Medicine*, Vol. 34 No. 3, pp. 224-233.

Hoek, J. and Jones, S.C. (2011), "Regulation, public health and social marketing: a behaviour change Trinity", *Journal of Social Marketing*, Vol. 1 No. 1, pp. 32-44.

IBGE (2016), "Panorama cidade", available at: https://cidades.ibge.gov.br/brasil/sp/jaguariuna/panorama (accessed 2 December 2018).

INDSAT (2020), "Relatório de indicadores de satisfação dos serviços de saúde pública", available at: www.indsat.com.br (accessed 11 August 2020).

Kemper, J.A. and Ballantine, P.W. (2017), "Socio-technical transitions and institutional change: addressing obesity through macro-social marketing", *Journal of Macromarketing*, Vol. 37 No. 4, pp. 381-392.

Kennedy, A.M. (2016), "Macro-social marketing", *Journal of Macromarketing*, Vol. 36 No. 3, pp. 354-365.

Kreuter, M.W. and McClure, S.M. (2004), "The role of culture in health communication", *Annual Review of Public Health*, Vol. 25 No. 1, pp. 439-455.

Lavrakas, P.J. (2008), *Encyclopedia of Survey Research Methods*, Sage Publications, Thousand Oaks, CA.

Layton, R.A. (2007), "Marketing systems: a core macromarketing concept", *Journal of Macromarketing*, Vol. 27 No. 3, pp. 227-242.

Layton, R.A. (2015), "Formation, growth, and adaptive change in marketing systems", *Journal of Macromarketing*, Vol. 35 No. 3, pp. 302-319.

Lefebvre, R.C. (2013), *Social Marketing and Social Change: Strategies and Tools for Improving Health, Well-Being, and the Environment*, Jossey-Bass, San Francisco, CA.

Lindridge, A., MacAskill, S., Gnich, W., Eadie, D. and Holme, I. (2013), "Applying an ecological model to social marketing communications", *European Journal of Marketing*, Vol. 47 No. 9, pp. 1399-1420.

Malhotra, A., Noakes, T. and Phinney, S. (2015), "It is time to bust the myth of physical inactivity and obesity: you cannot outrun a bad diet", *British Journal of Sports Medicine*, Vol. 49 No. 15, pp. 967-968.

McGregor, S.L.T. (2012), "Complexity economics, wicked problems and consumer education", *International Journal of Consumer Studies*, Vol. 36 No. 1, pp. 61-69.

McNamara, M.W., Leavitt, W.M. and Morris, J.C. (2010), "Multiple-sector partnerships and the engagement of citizens in social marketing campaigns: the case of lynnhaven river now", *Virginia Social Science Journal*, Vol. 45, pp. 1-20.

Meadows, D.H. (2008), *Thinking in Systems*, Earthscan, London.

Parkinson, J., Dubelaar, C., Carins, J., Holden, S., Newton, F. and Pescud, M. (2017), "Approaching the wicked problem of obesity: an introduction to the food system compass", *Journal of Social Marketing*, Vol. 7 No. 4, pp. 387-404.

Rittel, H.W.J. and Webber, M.M. (1973), "Dilemmas in a general theory of planning", *Policy Sciences*, Vol. 4 No. 2, pp. 155-169.

Roberts, N. (2000), "Wicked problems and network approaches to resolution", *International Public Management Review*, Vol. 1 No. 1, pp. 1-19.

Rundle-Thiele, S., David, P., Willmott, T., Pang, B., Eagle, L. and Hay, R. (2019), "Social marketing theory development goals: an agenda to drive change", *Journal of Marketing Management*, Vol. 35 Nos 1/2, pp. 160-181.

Sallis, J.F., Owen, N. and Fisher, E. (2008), "Ecological models of health behavior", in Glanz, K., Rimer, B.K. and Viswanath, K. (Eds), *Health Behavior and Health Education: Theory, Research, and Practice*, John Wiley and Sons, San Francisco, CA, pp. 465-486.

Saunders, S.G. and Truong, V.D. (2019), "Social marketing interventions: in-sights from a system dynamics simulation model", *Journal of Social Marketing*, Vol. 9 No. 3, pp. 329-342.

Saunders, S.G., Barrington, D.I. and Sridharan, S. (2015), "Redefining social marketing: beyond behaviour change", *Journal of Social Marketing*, Vol. 5 No. 2, pp. 160-168.

Sjöström, M. and Stockley, L. (2001), "Toward public health nutrition strategies in the European union to implement food based dietary guidelines and to enhance healthier lifestyles", *Public Health Nutrition*, Vol. 4 No. 2, pp. 307-324.

Sleddens, E.F., Gubbels, J.S., Kremers, S.P., van der Plas, E. and Thijs, C. (2017), "Bidirectional associations between activity-related parenting practices, and child physical activity, sedentary screen-based behavior and body mass index: a longitudinal analysis", *International Journal of Behavioral Nutrition and Physical Activity*, Vol. 14 No. 1, p. 89.

SmartCity Business (2018), "Prêmio inovaCidade", available at: http://smartcitybusiness.com.br/2018/premio-inova-2018/#1522692608985-1c9661b4-dae9 (accessed 2 December 2018).

Truong, V.D. (2017), "Government-led macro-social marketing programs in vietnam: outcomes, challenges, and implications", *Journal of Macromarketing*, Vol. 37 No. 4, pp. 409-425.

Truong, V.D., Dang, N.V.H., Hall, C.M. and Dong, X.D. (2015), "The internationalisation of social marketing research", *Journal of Social Marketing*, Vol. 5 No. 4, pp. 357-376.

Truong, V.D., Saunders, S.G. and Dong, X.D. (2019), "Systems social marketing: a critical appraisal", *Journal of Social Marketing*, Vol. 9 No. 2, pp. 180-203.

United Nations (UN) (2015), "Resolution adopted by the general assembly on 25 September 2015", available at: www.un.org/sustainabledevelopment/ (accessed 12 December 2020).

Vandenbroeck, P., Goossens, J. and Clemens, M. (2007), "Foresight tackling obesities: future choices – obesity system atlas", UK Government Office for Science, available at: www.foresight.gov.u/besit/1.pdf (accessed 2 December 2020).

Wallack, L. (2002), "Public health, social change, and media advocacy", *Social Marketing Quarterly*, Vol. 8 No. 2, pp. 25-31.

Webber, L., Kilpi, F., Marsh, T., Rtveladze, K., Brown, M. and McPherson, K. (2012), "High rates of obesity and non-communicable diseases predicted across Latin America", *PloS One*, Vol. 7 No. 8, p. 39589.

Wong, E.L., Yeoh, E.K., Chau, P.Y., Yam, C.H., Cheung, A.W. and Fung, H. (2015), "How shall we examine and learn about public-private partnerships (PPPs) in the health sector? Realist evaluation of PPPs in Hong Kong", *Social Science and Medicine*, Vol. 147, pp. 261-269.

Wood, M. (2016), "Social marketing for social change", *Social Marketing Quarterly*, Vol. 22 No. 2, pp. 107-118.

Wooliscroft, B. (2019), "Systems and macro-social marketing: researching wicked problems", in Kennedy, A. (Ed.), *Macro-Social Marketing Insights: Systems Thinking for Wicked Problems*, Routledge, New York, NY, pp. 12-26.

World Health Organization (WHO) (2020), "Obesity and overweight", available at: www.who.int/news-room/fact-sheets/detail/obesity-and-overweight (accessed 1 July 2020).

Worldometer (2021), "Covid-19 coronavirus pandemic", available at: www.worldometers.info/coronavirus/#countries (accessed 14 January 2021).

Yin, R.K. (1994), *Case Study Research*, Sage, Thousand Oaks, CA.

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