

Special article

Commentary: Reducing inequalities in child obesity in developed nations: What do we know? What can we do?

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ABSTRACT

Inequalities in child obesity within and among nations result from unequal distribution of resources and environments that prevent unhealthy weight gain—healthy food, opportunities for physical activity, primary and preventive health care, and protection from stressors. While some developed nations have recently slowed the increase in child obesity, none has successfully reversed the growing concentration of child obesity among the poor and disadvantaged. This commentary reviews the evidence on patterns and causes of unequal distribution of child obesity in developed nations and analyzes the implications for the development of interventions to reduce these inequalities.

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Comentário: Reduzir desigualdades na obesidade da criança em países desenvolvidos. O que conhecemos? O que podemos fazer?

RESUMO

As desigualdades na obesidade infantil dentro de cada e entre os diversos países resultam da distribuição desigual dos recursos e de ambientes que previnem o ganho não saudável de peso: alimentos saudáveis, oportunidades para a prática de atividade física, cuidados de saúde primários e preventivos e proteção dos fatores de stress. Apesar de alguns países mais desenvolvidos terem recentemente conseguido diminuir o aumento da obesidade nas crianças, nenhum inverteu com sucesso a concentração crescente da obesidade infantil entre os mais pobres e desfavorecidos. Este comentário pretende rever a evidência existente quer ao nível dos padrões, quer das causas da distribuição desigual da obesidade nas crianças em países desenvolvidos, e analisa as implicações para o desenvolvimento das intervenções com vista à redução dessas desigualdades.

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Palavras-chave:

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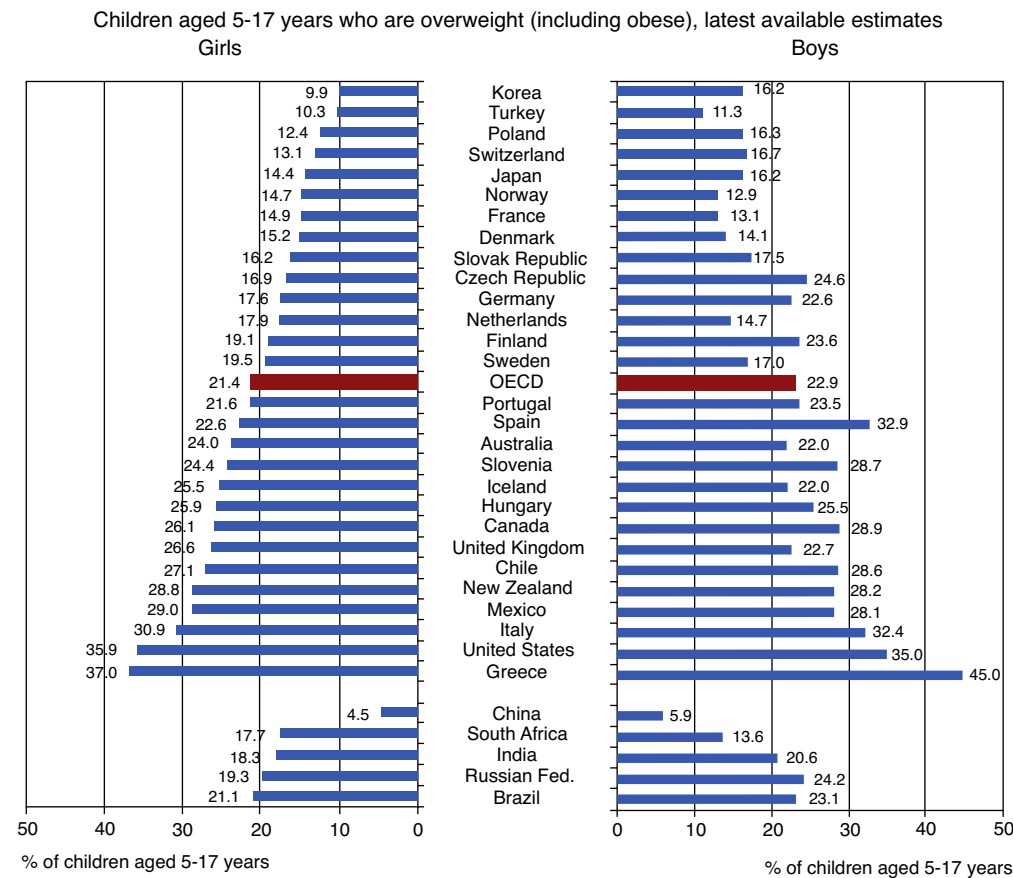
Desigualdades em saúde

Políticas de saúde

Introduction and background

Child obesity is a problem in itself and a harbinger of serious health, social, and economic problems for many of today's

overweight and obese children. Absent transformative interventions to reduce child obesity, we risk leaving our children and grandchildren a world in which their life spans and quality of life are worse than for the current generation, a terrible legacy. While increases in child obesity in recent decades



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Fig. 1 – Children aged 5–17 years who are overweight (including obese), latest available estimates.

have affected all social classes, countries and cultures, the burden of obesity and its lifetime adverse consequences are not equally distributed. Health officials, health professionals, researchers and policy makers in many countries have called for comprehensive action to reduce the rates of child obesity but less attention has been focused on acting to reduce the wide and growing inequalities in child obesity.

Given the rising rates of diet-related non-communicable diseases in low, middle and high income nations, any failure to make inequality reduction a priority will widen the already large socioeconomic and racial/ethnic gaps in overall premature mortality and preventable illnesses. Thus, taking action to reduce inequalities in rates of child obesity is an essential component of achieving national and global goals of achieving health equality.

In this commentary, I review what is known about the scope, magnitude and distribution of child obesity with a focus on developed nations; summarize the current literature on its causes; and then analyze the options for interventions to reduce inequalities in child obesity. The broader goal is to inform the development of more effective interventions to reducing inequalities in child obesity. Given rising rates of child obesity in middle income and emerging nations, the experiences in of the United States, Europe and other wealthy countries may provide insights that can help other countries avoid some of the growing burden of child obesity.

The scope, magnitude and distribution of inequalities in child obesity

In the last few years, several reviews have summarized what is known about the distribution of child obesity within and between nations. An update from the Organization for Economic Development, as shown in Fig. 1, reports that for 5–17 years old girls, the latest data available show that rates of overweight (including obesity) range from 4.5 percent in China to 37 percent in Greece; for boys aged 5–17 the range is 5.9 percent also in China, to 45 percent in Greece.¹ Of the 33 countries for which data are reported, 15 nations report rates of overweight of more than 20 percent for girls and 20 nations report rates of overweight of more than 20 percent for boys. In most countries, the OECD report shows, boys aged 5–17 have higher rates of overweight than girls. In England, France and the United States but not in Korea, children show social inequalities in overweight rates. The report concludes that for child obesity as well as adult obesity, “there is no clear sign of retrenchment of the epidemic, despite major policy efforts focused on children in some of the countries concerned.”¹(p.1)

In a study analyzing the relationship between income inequality and obesity in 19 European and North American countries, Wilkinson and Pickett found that that for

13–15 year olds, developed nations with higher levels of income inequality have higher rates of obesity among 13–15 years.^{2(p.93)} At the high end of the income inequality/teen obesity association were the USA, Portugal and the UK; at the low end were Sweden, Finland and Norway. Similar relationships were found for adult women and men.³

These national rates mask substantial differences within nations. In China, for example, cities such as Shanghai and Beijing report dramatically higher rates of child obesity than do inland cities or rural areas.⁴ To date, the social gradient in child obesity in China does not follow patterns in observed in most higher income nations.

Several studies have examined demographic correlates of child overweight in Europe. For example, one study of preschool children aged 4–7 in six nations (Germany, Belgium, Bulgaria Greece, Poland, and Spain) found that children of parents with high body mass index (BMI) or low socioeconomic status were at higher risk of overweight and obesity than their respective counterparts.⁵ Parental influences can be genetic, metabolic (e.g., overweight mothers are less likely to breast feed), behavioral, or environmental (e.g., low income parents are more likely to live in more obesogenic communities). Another review of European studies on differences in overweight among children from migrant and native origin found that migrant children, especially non-European migrants, were at higher risk for overweight and obesity than their native counterparts.⁶

In the United States, a recent review found “persistent and highly variable disparities in childhood overweight and obesity within and among states, associated with socioeconomic status, school outcomes, neighborhoods, type of health insurance, and quality of care”.^{7(p.347)} According to the National Survey of Children’s Health, Black, Hispanic and Pacific Islander children aged 10–17 years old have rates of overweight and obesity substantially higher than white and Asian children.⁸ These differences in obesity rates also track differences in household income and educational achievement by race/ethnicity, showing the clustering of different forms of inequality. Obesity and overweight are also correlated with parental education with children of parents with less education having higher rates than children of more educated parents. From 2003 to 2007, obesity prevalence for all 10–17 year olds increased by 10 percent but for children in low-education, income or unemployment households by 23–33 percent.⁹ Children with public insurance, single mothers, living in Hispanic Spanish-language household, and in neighborhoods with no park or recreation center have higher rates of obesity/overweight than their respective counterparts.⁷ Another review reported that several studies found substantial differences in the distribution of early life risk factors for child obesity such as infant feeding practices, sleep duration, child’s diet, and patterns of physical and sedentary activities.¹⁰

Do these socioeconomic, racial/ethnic and gender disparities in rates of child obesity constitute an injustice? The theories of philosophers Amartya Sen, Martha Nussbaum and others suggest they do.^{11,12} In this view, social conditions that deprive one sector of the population of the opportunity to achieve their full potential for well-being and full participation in society are unjust. Clearly, the health,

social and economic consequences of child obesity burden individuals, families and communities for life. Thus, the differential distribution of the conditions that contributes to obesity serve to maintain or exacerbate the social and health inequalities within and among low, middle and high income nations.¹³

Drivers of inequality of child obesity

Public policy discussions about obesity often fail to distinguish between drivers of obesity (i.e., prevalence) and drivers of inequalities in obesity (i.e., disparities or inequalities). Most basically, the prevalence of obesity will increase when growing proportions of the population increase consumption of high calorie, low nutrient foods and decrease the physical activity needed to burn these calories. This describes the situation in most of the world today.

However, inequalities in health – and obesity – are produced when healthy and unhealthy living conditions and opportunity structures are differentially distributed among the populations of different nations, regions or localities, leading to differences in the rates of increase in obesity and therefore inequalities in its distribution. Thus it is possible to reduce the prevalence of obesity without addressing the distribution.

Many national and municipal governments are taking action to address the main drivers of elevated BMIs but few are acting aggressively to change the distribution. The result of such policies can be that the better off benefit more from interventions than the poor, thus actually widening the gap. For those seeking to reduce the health burden of child obesity, finding ways to change the distribution of obesogenic environments is as important as reducing the prevalence in the population as a whole.

In both the United States and Europe, child obesity is becoming concentrated in low income communities. Given its role in the etiology of non-communicable diseases, this suggests a vicious circle of increasing concentration of child obesity, early onset of non-communicable diseases and widening socioeconomic inequalities in premature mortality and preventable illness.

Differential distribution of three resources – food, physical activity opportunities, and health care – has been identified as main drivers of inequalities in child obesity.¹⁴ These factors operate at the global, national, regional, community and individual levels to produce differing rates of obesity among different social groups. To summarize, market forces, public policies and social factors interact to differentially distribute access to affordable healthy and unhealthy food, opportunities for safe physical activity, and access to the primary and preventive health services that can reduce the risk of obesity. This differential distribution of what Swinburn et al.¹⁵ and others have labeled “obesogenic environments” creates inequalities in child obesity.

Wilkinson and Pickett² propose a fourth driver for inequalities in obesity: social stressors associated with the social gradient and income inequality. They argue that “the psychosocial effects of inequality may be particularly important because they can influence all other pathways: sedentarism,

caloric intake, food choice and the physiological effects of stress.”^{3(p 673)} They fault the more behavioral explanations of obesity for their failure to address “the reasons why people continue to live a sedentary lifestyle and to eat an unhealthy diet, and how these behaviors provide comfort.”

Drivers of inequalities in child obesity can be considered the “cause of the causes”,¹⁶ the underlying determinants of the multiple social and behavioral correlates of higher BMIs. Understanding the precise mechanisms by which each of these drivers operates at each level of organization at a particular time and place is a critical first step in eliminating inequalities in child obesity. Ranking the causal importance and the feasibility of change at each level for each driver is a second critical step. This analysis can lead to priorities for action. Based on such analyses, health officials and political leaders can give the most attention to the most effective and feasible policies, programs and services. This approach has the potential to make meaningful changes in the most powerful causal pathways.

Health inequalities intersect with and are produced by other forms of inequality such as income, education, and transportation inequalities, creating a cascade of inequalities that operate across generations. For example, inadequate schooling deprives parents of the knowledge and skills to protect their children against obesity and the income to afford healthier food and more opportunities for physical activity. Low-income neighborhoods may lack healthier food choices and also the transportation systems that would make it easy for residents to travel to super markets outside the neighborhood that do offer healthier food. Higher rates of crime in low-income neighborhoods may dissuade parents from encouraging their children to play outside, thus further exposing them to longer hours of television time, itself associated with sedentarism and unhealthy diets. Moreover, the cumulative burdens of poverty and inequality create stressors that cascade down the social gradient, concentrating among the poorest. As previously described, these accumulating stressors can increase behaviors associated with obesity. To reduce inequalities in child obesity, we’ll need to find new ways to interrupt this cascade at various levels of organization. Thus, intersectoral approaches that include food, education, criminal justice, and transportation sectors are a key element of effective responses.¹⁷

Interventions to reduce child inequalities

Given the complexity of the pathways and mechanisms that shape the prevalence and distribution of child obesity no single intervention can reverse the trends of the last two or three decades. Rather, health authorities at all levels of government, in partnership with other government, civil society and business sectors, will need to create a portfolio of policy, programmatic and educational interventions. Mapping the systems that contribute to inequalities in child obesity and the relative contributions of single and multiple determinants will help to set priorities for action.

Several recent reviews summarize the available evidence on interventions to reduce child obesity.^{14,18,19} Several have

focused specifically on policy interventions and dissemination and sustainability issues.²⁰⁻²⁴ The interventions shown to be effective constitute the building blocks for the multi-level, multi-sector portfolios of interventions that will be needed to reduce child obesity. Two key points should inform the creation of these more comprehensive responses. First, reducing the unequal distribution of child obesity among population groups requires understanding and addressing the previously described drivers of inequalities, not simply its individual level determinants. Second, a portfolio of interventions, like an investment portfolio, must be balanced among sectors and between long and short term and high risk, high payoff and lower risk but lower payoff approaches. New methodologies like portfolio review^{25,26} and systems science,²⁷⁻²⁹ both still in early stages of development, will need to be applied to this task.

The literature on child obesity and more broadly on health inequalities suggests several intervention dimensions that portfolio planners should consider. These overlapping but conceptually distinct dimensions are best conceived as continua rather than dichotomies. The five I will briefly consider here are: upstream vs. downstream; targeted vs. universal; local vs. national; education vs. regulation; and voluntary vs. mandatory. The task for planners is to select a portfolio of interventions that include an appropriate balance of these characteristics.

Upstream vs. downstream: Change drivers of inequalities

Upstream interventions to reduce child obesity tackle the social forces that push some populations into social circumstances that elevate the risk for obesity and that create obesogenic environments. Downstream ones seek to mitigate the consequences of these environments. Upstream interventions to shrink inequalities in child obesity within or among nations seek to modify the social forces that inequitably distribute poverty, marginalization, cumulative exposure to stressors, access to healthy food, exposure to unhealthy food marketing, opportunities for physical activity and access to the primary and preventive health services that can reduce child obesity.

Examples of upstream interventions include tax, work and social benefits policies to reduce income inequality, poverty, and social marginalization, all factors repeatedly associated with inequalities in child obesity. They also include trade agreements and regulations that limit the rights of the food industry to produce and market unhealthy food to children, often targeting low income populations.^{30,31} Downstream interventions to reduce inequalities provide populations experiencing higher rates of obesity with enhanced access to services and programs designed to reduce obesity at the individual level. More broadly, Paul Farmer has labeled this strategy the “preferential option for the poor”, basing it in part on Christian theology.³² By giving populations of children most exposed to the social factors that cause obesity first options for healthier food, more opportunities for physical activity and enhanced access to preventive and primary health care, health authorities can begin to whittle away the handicaps imposed by living in a more risky environment.

Targeted vs. universal

Targeted interventions to reduce child obesity focus on populations at highest risk while universal ones provide benefits to the entire population. To illustrate, some nations and municipalities provide free, healthy school meals to all children while others limit this offer only to those living in poverty. The first approach has the advantage of normalizing the benefit and reducing any stigma associated with free school food. In practice, it often benefits the poor most, because they have less access to healthy food outside schools. Universal programs also win political support from all sectors of the population, making them less subject to cutbacks in times of economic decline, precisely when they are most needed.

Targeted approaches are less expensive and focus resources on those most in need but are especially vulnerable during periods of austerity. Targeted approaches may also magnify discrimination or social isolation.³³ Other examples of targeted approaches are distributing healthy food in poor communities, zoning restrictions on fast food in high obesity or high poverty neighborhoods, nutrition education in low income communities, and new parks in high crime areas. Universal approaches include limits on food advertising to children, calorie labeling in restaurants and fast food outlets, mandated and enforced physical activity in all schools or progressive taxes to reverse income inequality. Both universal and targeted approaches can contribute to reductions in inequalities in child obesity.

Education vs. regulation

A third dimension of interventions is the balance between education and regulation. Educational interventions are based on the diagnosis that individuals lack information, knowledge or skills to avoid obesity; the prescription is to provide learners with the missing ingredient. Regulations, on the other hand, diagnose the problems within institutions and organizations and prescribe state-mandated organizational change as the remedy.

In practice, the two approaches can be combined. Interventions to offer calorie posting and nutrition labels on food, for example, mandate commercial outlets to provide these services to individuals, who will presumably make more informed choices based on this information. In addition, studies show that calorie labeling may lead organizations to reformulate products, an organizational change.³⁴ Campaigns to educate women about the benefits of breast feeding and the risks of infant formula and to improve nutrition education in the schools are educational approaches. Ending the distribution of free infant formula in health settings, banning the promotion of obesogenic foods to children, and setting standards on food portion size and nutrient density illustrate a regulatory approach. In general, regulatory approaches are more efficient than education because they bypass the difficult task of changing many individuals. However, regulations also elicit more political opposition from interest groups who may lose profits as a result. Regulatory approaches may be more effective in reaching vulnerable populations, who may lack the time, resources or prior educational background to take full advantage of educational interventions.

Local vs. national

A fourth dilemma facing planners seeking to reduce child obesity is how to find the right balance between works at the local versus the regional or national levels. Drivers of prevalence and unequal distribution operate at all three levels and jurisdictions vary in how responsibilities for food, physical activity and health care policies are allocated. In general, operating at higher levels of organization is more efficient, as a single policy change can benefit the country as a whole. In large countries, however, national governments may have difficulty in implementing policies nationwide and local or regional governments may resist national mandates, especially if they are not given adequate resources to fulfill these obligations. National policies may also generate higher level opposition from special interest groups, e.g., the food industry, making policy change more difficult.

In some cases, local changes can set the stage for national ones. In the United States, for example, several cities and states required calorie labeling in fast food chain restaurants, a policy that then became part of the national Affordable Care Act.³⁵ Some local policies that may contribute to reductions in inequalities in obesity are efforts to subsidize super markets and other stores that sell healthy foods in poor area; improved access to bicycling, walking and mass transit, rather than automobile travel; local initiatives to support urban agriculture; and municipal taxes on sugary beverages or other unhealthy products. National policies may be more appropriate for functions that usually operate only at the national level: rules for food advertising to children, national standards on sugar and fat for food formulation, and health care reimbursement for nutrition counseling.

Both local and national interventions can contribute to reductions in inequalities in child obesity. Perhaps the greatest risk for local approaches is to fall into the "local trap"³⁶ in which local authorities assume that factors driving inequalities in child obesity can be fully addressed at the local level when in fact they are generated and operate at all levels.

Voluntary vs. mandatory

A fifth dimension to consider is voluntary approaches, in which companies and other organizations are encouraged to change obesogenic practices versus mandatory ones (usually government regulation) that have the power of the state behind them.

The rationale for voluntary approaches is that they tap into the expertise of the organizations that need to make the changes (e.g., the food industry in formulation of food products for children); do not require an extensive enforcement apparatus; and do not unnecessarily extend the power of government. The proponents of regulatory approaches respond that empirical investigations of voluntary standards often show limited effectiveness, adherence is difficult to establish, and that they cede a vital public role in protecting health. In practice, as shown recently in the United States, despite lip service to voluntary approaches to limiting marketing of unhealthy food to children, the food industry often opposes even voluntary standards.³⁷

A related debate is to determine the appropriate role for special interests in setting obesity policy. The food industry has called for public private partnerships to set policy while some advocates and researchers have argued that this presents inherent conflicts of interest since food companies are legally required to maximize profits, not protect child health.³⁸ These advocates suggest public health professionals and food companies can negotiate agreements but need to acknowledge their sometimes conflicting interests, not pretend that all share a common goal.

Toward transformative policies and programs

Beyond these five dimensions of interventions to reduce inequalities in child obesity is a broader clash between those who advocate incremental and transformative changes in our approach to child obesity. In the real world, argue the incrementalists, only modest change is politically feasible; reducing food intake by a 50–100 calories a day or increasing daily physical activity by 10 min is sufficient, if sustained to bring about measurable declines in obesity. Adopting the language of harm reduction, proponents of incremental change argue it is better to make small changes than none at all. They also claim that incremental changes can lead to a “tipping point” in which little changes snowball into more meaningful ones.

Transformative reformers respond that to date the modest changes in policies and programs related to child obesity have not led to reversals of the prevalence or distribution of child obesity, even in places with more comprehensive programs. They also worry that incremental changes may co-opt the demand for more meaningful change.

Windows of opportunity: Trapdoors of risk

In the last decade, the problem of child obesity has attracted growing attention from policy makers, the media, health officials and others. International organizations, national and municipal governments and civil society groups have made the reduction of child obesity a much higher priority than in the past. Some recent evidence suggests that the rate of increase has slowed or perhaps stabilized in some countries, a positive development. But as yet reductions in inequalities in child obesity have not been documented, and in fact in some places continue to widen. To change this distressing reality will require identifying new windows of opportunity for change as well as emerging trapdoors that can jeopardize possible successes. By seizing the former and avoiding the latter, it may be possible to create policies that can shrink current inequalities in child obesity.

Windows of opportunity

As the economic crisis of 2008 has further widened already high levels of income inequality in developed nations, a growing chorus of critics has pointed out its adverse moral, political, social and economic consequences.^{2,39,40} This wider awareness of inequality presents public officials and health authorities with an opportunity to propose structural and policy solutions and to contest the austerity alternative, described

in the next section. In the United States, Europe and around the world, elected leaders, social movements, and grass roots mobilizations are demanding that policy makers take action to reduce inequalities. Specifying the obesity and health-related costs induced by rising inequality can quantify the opportunity costs of not acting to reduce inequality.

Similarly, child obesity and especially the adult obesity and chronic diseases that inevitably follow it contribute to the rising cost of health care. The United States, the United Kingdom and other nations are struggling to re-organize their health care systems to maintain quality while lowering costs. In this climate, shrinking the flow of diet-related diseases into health care system is a promising strategy for lowering costs. Reducing obesity prevalence by developing strategies that most benefit low-income children has several economic benefits: compared to adult strategies, it maximizes opportunities for cost-saving prevention; it improves the health of the low-income populations most likely to depend on public funding for their health care, even in health systems that have a strong public sector; and it benefits most the disadvantaged populations most likely to have a high burden of other costly health problems.

Another opportunity for linking efforts to reduce inequalities in child obesity with other public efforts is the growing global movement to control non-communicable diseases.⁴¹ Child obesity is a key driver of rising rates of NCDs in low, middle and high income nations; reducing its incidence and its unequal distribution is a prime strategy for achieving the global goal of reducing the burden of NCDs. A recent WHO report for Europe recognizes the importance of reducing inequalities in child obesity as part of a European strategy for the prevention and control of NCDs.⁴²

Finally, the growth of a food justice movement, initially in developed nations but now around the world, can become an important ally for the policy changes needed to reduce the prevalence and unequal distribution of child obesity.^{43,44,45} A food justice movement that understands and can explain the links between obesity, food insecurity, noncommunicable disease epidemics, climate change and unsustainable food systems can be a powerful force for change, a catalyst for mobilization at the community, regional, national and global levels.

Trapdoors of risk

The current moment also presents challenges that can undermine any progress in reducing inequalities in the distribution of child obesity. Most dramatically, the austerity ideology that has emerged in response to the 2008 global economic crisis threatens to deprive governments of the funding and mandate to act aggressively against child obesity.^{46,47} As restoring economic growth and freeing market forces become higher priorities than reducing inequality or improving health, many government supported programs created in order to reduce child obesity or its fundamental drivers are at risk of cutbacks or elimination. At the same time, multinational corporations and their allies argue for deregulation and privatization, depriving governments of the regulatory tools needed to protect children from aggressive marketing of unhealthy food. In the US and the UK, food corporations and some political

leaders are proposing to turn over more responsibility for standards for healthy food to the food industry itself, a move that promises more, not less child obesity.^{37,38}

Conclusion

Continuing increases in child obesity and the persistent inequalities in its distribution threaten population health and social justice in low, middle and high income nations. While more research is needed on the causes and consequences of inequalities in child obesity, for the most part, we know what needs to be done. The economic and political forces that create more obesogenic environments for all people, but especially those living at lower levels of the social gradient, need to be confronted. No single intervention will achieve these results. But by developing a portfolio of policies, programs and services that can transform the food, physical activity and health care environments that contribute to the increasing prevalence and unequal distribution of child obesity, we can begin to reverse the alarming trends of the last three decades.

At the same time, by mitigating the social stressors that accumulate among those living lower on the social gradient and that also increase their risk for obesity, we can accelerate that reversal. What is needed is not more evidence but the political will and the mobilization that will be needed to make that change. Fortunately, this type of challenge is one that public health and its allies have met many times before. What remains to be done is to translate the lessons learned from our past successes to the task at hand.

Conflicts of interest

The author has no conflicts of interest to declare.

REFERENCES

1. Organization for Economic Development. Obesity update 2012 [Internet]. Paris: OECD; 2012 [cited 2012 Apr 12]. Available at: <http://www.oecd.org/els/healthpoliciesanddata/49716427.pdf>
2. Wilkinson R, Pickett K. The spirit level: why more equal societies almost always do better. London, UK: Allan Lane; 2009.
3. Pickett KE, Kelly S, Brunner E, Lobstein T, Wilkinson RG. Wider income gaps, wider waistbands?: an ecological study of obesity and income inequality. *J Epidemiol Community Health.* 2005;59:670-4.
4. Chen CM. Overview of obesity in Mainland China. *Obes Rev.* 2008-2009; Suppl. 1:14-21.
5. Van Stralen MM, te Velde SJ, van Nassau F, Brug J, Grammatikaki E, Maes L, et al. Weight status of European preschool children and associations with family demographics and energy balance-related behaviors: a pooled analysis of six European studies. *Obes Rev.* 2012;13 Suppl. 1:29-41.
6. Labree LJ, van de Mheen H, Rutten FF, Foets M. Differences in overweight and obesity among children from migrant and native origin: a systematic review of the European literature. *Obes Rev.* 2011;12:e535-47.
7. Bethell C, Simpson L, Stumbo S, Carle AC, Gombojav N. National, state, and local disparities in childhood obesity. *Health Aff (Millwood).* 2010;29:347-56.
8. US Department of Health, Human Services, Health Resources, Services Administration, Maternal, Child Health Bureau. The National Survey of Children's Health 2007. Rockville, MD: U.S. Department of Health and Human Services; 2009.
9. Singh GK, Siahpush M, Kogan MD. Rising social inequalities in US childhood obesity, 2003-2007. *Ann Epidemiol.* 2010;20:20:40-52 [Erratum in: *Ann Epidemiol.* 2010; 20:250].
10. Dixon B, Peña MM, Taveras EM. Lifecourse approach to racial/ethnic disparities in childhood obesity. *Adv Nutr.* 2012;3:73-82.
11. Sen A. Why health equality? In: Anand S, Peter F, Sen A, editors. *Public health, ethics and equity.* Oxford, UK: Oxford University Press; 2004. p. 21-33.
12. Nussbaum MC. *Women and human development: the capabilities approach.* Cambridge, UK: Cambridge University Press; 2000.
13. Blacksher E. Children's health inequalities: ethical and political challenges to seeking social justice. *Hastings Cent Rep.* 2008;38:28-35.
14. Kulpers YM. Focusing on obesity through a health equity lens. *Obes Rev.* 2012;13 Suppl. 1:29-41.
15. Swinburn B, Eggar G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med.* 1999;29:563-70.
16. Marmot M. Social determinants of health inequalities. *Lancet.* 2005;365:1099-104.
17. Loureiro MI, Freudenberg N. Engaging municipalities in community capacity building for childhood obesity control in urban settings. *Fam Pract.* 2012;29 Suppl. 1:i24-30.
18. Summerbell CD, Moore HJ, Vögele C, Kreichauf S, Wildgruber A, Manios Y, et al. Evidence-based recommendations for the development of obesity prevention programs targeted at preschool children. *Obes Rev.* 2012;13 Suppl. 1:129-32.
19. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al. Interventions for preventing obesity in children. *Cochrane Database Syst Rev.* 2011:CD001871.
20. Brennan L, Castro S, Brownson RC, Claus J, Orleans CT. Accelerating evidence reviews and broadening evidence standards to identify effective, promising, and emerging policy and environmental strategies for prevention of childhood obesity. *Annu Rev Public Health.* 2011;32:199-223.
21. Capacci S, Mazzocchi M, Shankar B, Macias JB, Verbeke W, Pérez-Cueto FJ, et al. Policies to promote healthy eating in Europe: a structured review of policies and their effectiveness. *Nutr Rev.* 2012;70:188-200.
22. Dreisinger ML, Boland EM, Filler CD, Baker EA, Hessel AS, Brownson RC. Contextual factors influencing readiness for dissemination of obesity prevention programs and policies. *Health Educ Res.* 2012;27:292-306.
23. Farley TA, Van Wye G. Reversing the obesity epidemic: the importance of policy and policy research. *Am J Prev Med.* 2012;43:S93-4.
24. McPherson ME, Homer CJ. Policies to support obesity prevention for children: a focus on of early childhood policies. *Pediatr Clin North Am.* 2011;58:1521-41, xii.
25. Sendi P, Al MJ, Gafni A, Birch S. Portfolio theory and the alternative decision rule of cost-effectiveness analysis: theoretical and practical considerations. *Soc Sci Med.* 2004;58:1853-5.
26. Sendi P, Al MJ, Gafni A, Birch S. Optimizing a portfolio of health care programs in the presence of uncertainty and constrained resources. *Soc Sci Med.* 2003;57:2207-15.
27. Chan C, Deave T, Greenhalgh T. Childhood obesity in transition zones: an analysis using structuration theory. *Social Health Illn.* 2010;32:711-29.
28. Hammond RA. Complex systems modeling for obesity research. *Prev Chronic Dis.* 2009;6:A97.

29. Luke DA, Stamatakis KA. Systems science methods in public health: dynamics, networks, and agents. *Annu Rev Public Health*. 2012;33:357-76.
30. Cairns G, Angus K, Hastings G, Caraher M. Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. *Appetite*. 2012. <http://dx.doi.org/10.1016/j.appet.2012.04.017>
31. Kraak VI, Story M, Wartella EA. Government and school progress to promote a healthful diet to American children and adolescents: a comprehensive review of the available evidence. *Am J Prev Med*. 2012;42:250-62.
32. Farmer P. *Pathologies of power: health, human rights, and the new war on the poor*. Berkeley: University of California Press; 2003.
33. McKee M, Stuckler D. The assault on universalism: how to destroy the welfare state. *BMJ*. 2011;343:d7973.
34. Swartz JJ, Braxton D, Viera AJ. Calorie menu labeling on quick-service restaurant menus: an updated systematic review of the literature. *Int J Behav Nutr Phys Act*. 2011; 8:135.
35. Farley TA, Caffarelli A, Bassett MT, Silver L, Frieden TR. New York City's fight over calorie labeling. *Health Aff (Millwood)*. 2009;28:w1098-109.
36. Born B, Purcell M. Avoiding the local trap: scale and food systems in planning research. *J Plann Educ Res*. 2006;26:195-207.
37. Wilson D, Roberts J. Special report: how Washington went soft on childhood obesity. *Reuters*; 2012, April 27. Available at: <http://www.reuters.com/article/2012/04/27/us-usa-foodlobby-idUSBRE83QOED20120427>
38. Brownell KD. Thinking forward: the quicksand of appeasing the food industry. *PLoS Med*. 2012;9:e1001254 <http://www.ploscollections.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001254;jsessionid=415D7371022EF9730DDBC7204F-BAC5AC>
39. Stiglitz J. *The price of inequality*. New York: Norton; 2012.
40. Organization for Economic Development. *Growing unequal? Income distribution and poverty in OECD countries*. Paris: OECD; 2008.
41. Beaglehole R, Bonita R, Alleyne G, Horton R, Li L, Lincoln P, et al. UN high-level meeting on non-communicable diseases: addressing four questions. *Lancet*. 2011;378:449-55.
42. WHO Regional Office for Europe. *Action plan for implementation of the European strategy for the prevention and control of noncommunicable diseases 2012-2016*. Copenhagen, Denmark: WHO Europe; 2012.
43. Gimenez EH, Shattuck A. Food crises, food regimes and food movements: rumblings of reform or tides of transformation? *J Peasant Stud*. 2011;38:109-44.
44. Gottlieb R, Joshi A. *Food justice*. Cambridge, MA: MIT Press; 2010.
45. Graff SK, Kappagoda M, Wooten HM, McGowan AK, Ashe M. Policies for healthier communities: historical, legal, and practical elements of the obesity prevention movement. *Annu Rev Public Health*. 2012;33:307-24.
46. McKee M, Karanikolos M, Belcher P, Stuckler D. Austerity: a failed experiment on the people of Europe. *Clin Med*. 2012;12:346-50.
47. Hunter DJ. Meeting the public health challenge in the age of austerity. *J Public Health (Oxf)*. 2010;32:309.