Review / Artículo de revisión

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The new United Nations approach to sustainable development post-2015: Findings from four overviews of systematic reviews on interventions for sustainable development and health

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ABSTRACT

Objective. *To identify reported interventions that facilitate sustainable development and have had a positive impact on health in four areas: sustainable food production; sustainable energy use; sustainable jobs ("decent work"); and prevention of toxic exposure to chemicals.*

Methods. *Systematic review methods were used to synthesize evidence from multiple systematic reviews and economic evaluations. A comprehensive search was conducted of at least 14 databases and 8 websites for each of the four overviews, using pre-defined protocols, including clear inclusion criteria. To qualify as "sustainable," interventions needed to aim (explicitly or implicitly) to positively impact at least two dimensions of the integrated framework for sustainable development and had to include measures of health impact.*

Results. *In total, 47 systematic reviews and 10 economic evaluations met the inclusion criteria. The most promising interventions, such as agricultural policies, were identified for each of the four topics. While the evidence for the interventions is not strong because of the limited number of studies, there is no evidence of a definite negative impact on health. The only possible exception is that of taxes and subsidies—though this intervention also has the potential to be pro-equity with higher relative impacts for lower income groups.*

Conclusions. *The evidence found for effective interventions is useful for guiding countries toward the best options for non-health sector interventions that can positively impact health. This overviews shows that intersectoral work benefits every sector involved.*

Key words Sustainable development; sustainable development goals; review, systematic; sustainable agriculture; environment and public health; equity in health; employment; United Nations.

Sustainable development is "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs" (1). It is supported by three pillars—economic, social, and environmental—with health as both an outcome and a precondition for all three (2). The principle of sustainable development was adopted at the United Nations (UN) Conference on Environment and Development held in

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1992 in Rio de Janeiro, Brazil (3), and has been used extensively since then, influencing many initiatives at different levels. At the global level, "Agenda 21"(4)—the comprehensive, multisectoral, and practical guide produced and adopted by this conference—may be the most well-known document on how to apply and implement sustainable development goals and principles.

Twenty years later, in 2012, the UN Conference on Sustainable Development, commonly referred to as "Rio+20," brought together leaders of governments, non-governmental organizations, the private sector, and civil society to advance sustainable development even further by producing an agreement with even more impact than the Agenda 21. The Rio+20 produced a focused, political outcome document, "The Future We Want," and reached a consensus for launching a process based on a set of Sustainable Development Goals that build on the Millennium Development Goals (MDG; 5) and converge with the post-2015 development agenda (2).

At the Rio+20, the UN System Task Team on the Post-2015 UN Development Agenda presented a new framework for "realizing the future we want for all"(2). The framework assumed three core values: human rights, equality, and sustainability; and four key dimensions that build upon them: inclusive social development, inclusive economic development, environmental sustainability, and peace and security. These reflected some of the UN Secretary-General's report, "In Large Freedom," (6) as an important element to realizing the future we want for all. There were also four broad areas of "enablers" in the framework, particular to each of the four dimensions, yet supportive of all (6). Policies for these "enablers" should be seen as not just effective towards achieving goals related to a single dimension, but rather to all dimensions, having been designed to bring cohesion among policies at all levels, e.g., national, regional, global (6).

From this framework, one can deduce that health is a key aspect of the "inclusive social development" dimension, but also an outcome of the other key dimensions—environmental sustainability, inclusive economic development, and peace and security.

LINKAGES BETWEEN SUSTAINABLE DEVELOPMENT AND HEALTH

The final declaration of the Rio+20 Conference, "The Future We Want," was endorsed by all UN Member States (2) and affirmed the intrinsic relationship between health and sustainable development. Health plays an integral role in the context of sustainable development—as a prerequisite, an outcome, and as an indicator (7).

Sustainable development and public health are linked by interactions between the physical environment (e.g., air pollution, chemical exposures, and climate change) and the social environment (8, 9), together with poverty reduction and confrontation of diseases related to poverty (10). The social and environmental determinants of health are closely related to sustainable development—they are the societal conditions in which people are born, grow, live, work, play, and age. They include early years' experiences, education, economic status, employment and decent work, housing and environment, and effective systems of preventing and treating ill health (6). Smart strategies for transportation, work, housing, energy, and agriculture can reduce disease and the diseases of poverty. For example, the use of clean fuels can have positive impacts on the environment and reduce respiratory symptoms and disease. However, health does not automatically result from sustainable development policies, so it is important to measure their health impact. This process has been named, "Health Impact Assessment," (www.who.int/hia/en/) and can be informed by systematic reviews of the literature.

The health sector has a key role to play in producing evidence on the health impacts of sustainable development strategies. It can define health-relevant goals, indicators, and tools for measuring and monitoring the results of sustainable development policies. It can also encourage intersectoral collaboration for health (7).

APPROACH

To better understand the significance and implications of the new UN proposed framework's four separate, but related dimensions, overviews of the existing evidence were conducted. The four topics chosen were: sustainable food production, representing the inclusive social development dimension; sustainable energy use, representing the environmental sustainability dimension; sustainable jobs ("decent work"), representing the inclusive economic dimension; and prevention of toxic exposure to chemicals, representing the peace and security dimension. These four areas also align, to some extent, with work done by WHO on health indicators for sustainable development (11) and on health in the green economy (www.who.int/hia/green_economy/en/).

The four overviews used the best available evidence to answer the following two principle questions and related subquestions: (Q1) What are the interventions that facilitate sustainable development and have a positive impact on health? (Q1a) What is their impact on health inequalities? (Q1b) What evidence is there for their cost-effectiveness? (Q1c) Which dimensions of the integrated framework are affected by the intervention and how?; and (Q2) Given the interdisciplinary and inter-sectorial nature of sustainable development, which sectors should the health sector engage with to promote sustainable development?

The objective of this work was to identify reported interventions that facilitate sustainable development and have had a positive impact on health in four areas: (i) sustainable food production; (ii) sustainable energy use; (iii) sustainable jobs, i.e.,"decent work"; and (iv) prevention of toxic exposure to chemicals.

MATERIALS AND METHODS

Seeking to rapidly review and synthesize the broadest evidence-base possible, an overview of systematic studies was conducted rather than a single systematic review of primary studies (12–14). An overview also carries less risk of bias (15). A protocol was developed for each of the overviews and published in PROSPERO, the international prospective register of systematic reviews (16–19).

A summary of the protocols follows. For each of the four overviews, at least 14 databases and 8 websites were searched for systematic reviews and economic evaluations. One review author (MH) conducted the searches and screened the titles and abstract. The full text of any potentially relevant papers was retrieved

for closer examination. The pre-specified inclusion criteria were applied against these papers by two reviewers (MH, RC). Disagreements were resolved by discussion and consensus. One reviewer (MH) extracted all relevant data from included papers and a second reviewer verified the extracted data. While the use of two reviewers for study selection and data extraction requires additional time, it improves the quality and reproducibility of the overview. The methodological quality of the included systematic reviews was assessed by two reviewers (MH, RC) using AMSTAR: A MeaSurement Tool to Assess Reviews (20). Systematic reviews that achieved scores of 8–11 were considered high quality; scores of 4–7 medium quality; and scores of 0–3 low quality. Quality assessment was used to interpret the results of reviews synthesized in this overview and to form the study's conclusions. Preference was given to evidence from high and medium quality systematic reviews, with little weight given to those of low quality. This methodology closely follows that used in the Cochrane Collaboration systematic reviews and overviews (15).

Inclusion criteria for all four overviews

All four overviews shared certain inclusion criteria regardless of the topic in question.

Types of studies. All four reviews included systematic reviews of studies of effectiveness, including reviews of randomized controlled trials (individuals or clusters), quasi-randomized controlled trials, controlled before-and-after studies, interrupted time series, and analytic observational studies (cohort, case-control, or cross-sectional studies). Economic evaluations (cost-effectiveness, cost-utility, and/or cost-benefit) and systematic reviews of economic evaluations were also eligible for inclusion.

Types of participants. All four overviews include**d s**tudies of individuals, groups, communities, countries, and/or regions. Both developed and developing countries were included.

Types of interventions. All four overviews considered interventions, including programs, policies, strategies, legislation, regulation, and courses of action. To classify as "sustainable," interventions needed to aim (explicitly or implicitly) to positively impact at least two dimensions of the integrated framework for example, environmental sustainability *and* inclusive social development (which includes health), or environmental sustainability *and* inclusive economic development (where impact on health is also measured).

Types of comparisons. All four overviews considered scenarios with no intervention, another/new intervention, or current practice.

Types of outcome measures. For all four interviews, health was measured at the level of the individual, group, community, country, region, and/or globally, including: disease incidence, prevalence, burden; mortality; morbidity; symptoms and signs of disease; health service use; health-related costs; and health-inequalities, by gender, age, life stage, socioeconomic status, area of residence, etc.

Language and study period. Publications in English, Spanish, and Portuguese were eligible for inclusion. Studies published in the 17 years from January 1997 – January 2014 were considered. Both grey and peer-reviewed literature were sought and included. The searches for systematic reviews were conducted in November 2013 – July 2014 (21–24).

Inclusion criteria specific to an overview

In addition to the above criteria, each overview specified the types of interventions relevant to its topic.

Sustainable jobs. This overview was further focused on interventions conducted in or applicable to health services workplaces. Quality of care was also included as a primary outcome.

Prevention of toxic exposure to chemicals. The following primary outcomes were also included: measures of chemical incident severity or frequency, such as number of chemical incidents and of individuals affected by the incident; and measures that showed reduced risk of toxic exposure to chemicals.

RESULTS

In total, 47 systematic reviews and 10 economic evaluations met the inclusion criteria. The flow diagram showing full details of the number of records identified, included, and excluded in the search for systematic reviews and economic evaluations can be found in the complete reports (21–24), but is summarized in Table 1 (25–82).

The quantity and quality of the evidence varied for each of the four topics. The quality of the included systematic reviews was poorest in the area of prevention of toxic exposure to chemicals, with 7 of the 13 included systematic reviews being scored as "low" per the AMSTAR criteria. Due to the complex nature of many of the interventions/actions in this area, most of the included systematic reviews needed to rely on evidence from non-experimental study designs, e.g., cohort or cross-sectional studies.

High level findings

What are the interventions that facilitate sustainable development and have a positive impact on health (Q1)? The most promising interventions for each of the four topics are shown in Table 2. While the evidence for these interventions is not strong, there is no evidence of a definite negative impact on health, with the possible exception of taxes and subsidies in foods—though this intervention also has the potential to be pro-equity with higher relative impacts for lower income groups.

In addition, for the prevention of toxic exposure to chemicals overview, two interventions were promising in terms of their *potential impact on health* due to a reduction in exposure to toxic chemicals (pesticides) or health risk factors (arsenic levels in urine):

- Drinking water tested for contamination with arsenic and results disseminated to households (25).
- Organic farming/diet to reduce exposure to pesticides (26).

Organic farming/diet was also included in the sustainable food production overview. While no impact on health was found, the evidence suggested that it might reduce exposure to pesticide residues and antibiotic-resistant bacteria (26, 27).

TABLE 1. Search results and quality of systematic reviews on interventions for sustainable development and health, 1997–2014

	Food	Energy	Jobs	Chemicals
Systematic reviews (SRs)				
Number of references found	2 603	153	1749	5 799
Full text articles assessed for eligibility	59	15	25	54
Number of SRs included	15	5	14	13
References of included studies	(26, 27, 34, 38–49)	(50–54)	(28–31, 35, 55–63)	(25, 26, 32, 33, 64–72)
Economic evaluations (EEs)				
Number of references found	250+	79+	80	73
Full text articles assessed for eligibility	10	3	4	6
Number of EEs included	7	1	0	2
References of included studies	(73–79)	(80)		(79, 80)
Quality[a] of included systematic reviews	3 high 8 medium 4 low	2 high 2 medium 1 low	5 high 6 medium 3 low	4 high 2 medium 7 low

Source: Prepared by the authors from the study data.

[a] Systematic reviews with AMSTAR scores of 8–11 were assessed as high quality, 4–7 as medium quality, and 0–3 as low quality.

Note: The exact number of references found in the search for economic evaluations for the food and energy overviews is not known because keywords needed to be searched one at a time in one database.

TABLE 2. Interventions that facilitate sustainable development and have a positive impact on health from an overview of systematic reviews, 1997–2014

Intervention
Sustainable food production
Agriculture interventions that aim to increase household food production (home gardens, livestock, dairy, cash cropping) (38, 40, 46)[a]
Reduction in meat production and consumption (47)[b]
Bio-fortification of maize, rice, or wheat (38, 40)[a]
Agriculture policies – output price policies[b] and public distribution system policies (39, 43)[a]
Taxes and subsidies[c] (34, 41, 42, 43, 45, 47)[b]
Sustainable jobs ("decent work")
Enforcement of occupational health and safety regulations (58, 60)[b]
Workers' compensation feature – degree of experience rating[d] (60)[b]
Flexible working interventions that increase worker control and choice (such as self-scheduling of shifts or gradual/partial retirement) (57)[b]
Organizational changes to shift work schedule – positive for switching to slow to fast rotation, changing from backward to forward rotation, and self-scheduling of shifts (56)[b]
Some employee participation interventions (such as employee committees and giving employees more control over their working hours), though these may not protect employees from generally poor working conditions (such as during downsizing) (35)[b]
Sustainable energy use
Introduction of electricity for lighting and other uses (50)[a]
Improved stoves for cooking and health and/or cleaner fuels for cooking (50, 52)[a]
Household energy efficiency measures (51,53)[b]
Prevention of toxic exposure to chemicals
Legislation to ban Endosulfan pesticide to prevent fatal poisonings (70)[a]

Source: Prepared by the authors from the study data.

[a] Research conducted in developing countries.

[b] Research conducted in developed countries.

[c] While the included systematic reviews suggest largely positive impacts on health, some of the higher quality studies suggested unintended compensatory purchasing may result in negative impacts on health. Thus, care needs to be taken with this intervention and any potential negative outcomes also need to be balanced with the possible pro-equity effects of the intervention.

[d] This is where insurance providers (public or private) attempt to encourage prevention efforts by tying a firm's insurance premiums to its claims activity, e.g., lower premiums for lower claims.

For the sustainable jobs overview, some interventions were shown to have a negative impact on health, including in health services workplaces:

- Precarious employment (except in Scandinavian welfare state regimes), including downsizing/restructuring, temporary workers, and outsourcing/home-based work (28–30); however, these three reviews were of low quality.
- Task restructuring – autonomous groups (31).

For the prevention of toxic exposure to chemicals overview, two interventions were found to be ineffective:

- Education combined with cleaning equipment or supplies to reduce lead in houses with children (32, 33).
- Dust control performed by cleaning professionals to reduce lead in houses with children (32, 33).

What is their impact on health inequalities (Q1a)? The impact of most of these interventions on health inequalities is largely unknown. Many of the systematic reviews did not include health inequalities as an explicit outcome. Where impact on health inequalities was assessed in systematic reviews, it was done in few included primary studies, and the findings were mostly inconclusive. Exceptions include:

Sustainable food production. For taxes and subsidies, the high quality systematic review included found that food-pricing strategies have the potential to reduce health inequalities (34).

Sustainable jobs. A study in one of the included systematic reviews found that participation interventions might benefit lower grade workers and employees belonging to ethnic minorities (35). For precarious employment, in one included systematic review, 5 of the 8 studies that examined gender found that women

were especially vulnerable to adverse health effects (29), while another systematic review on the same topic found more nuanced results (28). However, the fact that precarious employment can lead to poorer health is in itself evidence of employment-related health inequalities (28–30).

What evidence is there for their cost-effectiveness (Q1b)? For three of the overviews, economic evaluations were found. Interventions that were found to be cost-effective are shown in Table 3.

Which dimensions of the integrated framework are affected by the intervention and how (Q1c)? By definition, all interventions aimed to impact on "inclusive social development" include health. Health (or a risk factor for health) was also measured as an outcome in all included systematic reviews since it was specified as an inclusion criterion. In general, outcomes related to the other dimensions of the integrated framework—inclusive economic development, environmental sustainability, peace and security—were not reported in the included systematic reviews. This does not mean that outcomes related to these dimensions have not been measured at all. Neither does it mean that there is no evidence that the included interventions influence the other dimensions of the integrated framework. It is more a reflection of the inclusion criteria for the overviews that gave priority to health outcomes.

In relation to the other dimensions of the integrated framework, for "inclusive economic development," all of the sustainable jobs interventions sought to impact this dimension, as did the majority of sustainable food production interventions. Regarding "environmental sustainability," all of the sustainable energy interventions aimed to impact on this dimension, as did the majority of the sustainable food production interventions. In terms of "peace and security," only the prevention of toxic exposure to chemicals interventions aimed to impact this dimension.

Given the interdisciplinary and intersectoral nature of sustainable development, with which sectors should the health sector engage in order to promote sustainable development (Q2)? In general, the sectors involved in the intervention were not specified in the included systematic reviews. The sectors involved were deduced by the authors of the overviews, thus these finding should be taken as indicative, not definitive.

Sustainable food production. Sectors that were, or would need to be, involved in the implementation of the interventions include the agriculture, health, environment, economic, and international development sectors, depending on the particular intervention.

Sustainable jobs. Given that this overview was focused on interventions conducted in or applicable to health services workplaces, the health sector was the most relevant sector.

Sustainable energy. Sectors that were, or may need to be, involved in the implementation of the interventions include the energy, health, environment, economic, housing, transport, local government, and international development sectors, depending on the particular intervention.

Prevention of toxic exposure to chemicals. The relevant sectors vary according to the intervention, but most commonly include the health and environment sectors.

TABLE 3. Interventions that facilitate sustainable development and are cost-effective, from an overview of systematic reviews, 1997–2014

Intervention	Cost-effectiveness
Sustainable food production	
Bio-fortification of maize, rice, or wheat (77, 78)[a]	Very cost-effective
Taxes and subsidies (73, 74, 76)[b]	Potentially cost-saving
Strategies to combat acidification and ozone (73)[b]	Net benefits
Aflatoxin control strategies in maize and groundnuts (77)[a]	Very cost-effective
Prevention of toxic exposure to chemicals	
A strict enforcement strategy for interventions to reduce lead in houses with children (79)[b]	Cost-beneficial

Source: Prepared by the authors from the study data.
[a] Research conducted in developing countries.
[b] Research conducted in developed countries.

DISCUSSION

The most promising interventions included in the overviews, in terms of impact on health are shown in Table 2. These interventions also have potential environmental, peace and security, and/or economic impacts. Interventions for which there is evidence of cost-effectiveness are shown in Table 3.

These overviews have utilized systematic review methodology. Systematic reviews are important because they represent the highest level of evidence available. These overviews are further evidence that it is possible to conduct systematic reviews for complex health, environmental, and social policy interventions (34, 35) and that these can inform policymaking at all levels.

Implications for policy

What is needed now is vigilant implementation of interventions whose impact on health is likely to be positive, taking care not to broaden inequalities in health. Along with evidence of effectiveness, it is important to consider broader aspects that impact on real world decisionmaking, including local context, feasibility of implementation, acceptability to stakeholders, sustainability of effect, impact on equity and cost, and potential impact (both positive and negative) on other dimensions of sustainability.

Implementation of any intervention must be evaluated and should:

- Leverage partnerships with funders, implementers, and researchers.
- Be multidisciplinary to benefit from the expertise of all relevant sectors.
- Be rigorous and well designed, including credible control groups. The establishment of agreed quality standards to guide researchers is advisable.
- Establish a baseline measurement in order to compare outcomes.
- Measure, where possible and relevant, outcomes across the dimensions of social development (including health), environmental sustainability, peace and security, and economic development.

- Measure impact on health inequalities.
- Include a concurrent process evaluation to ensure that the intervention is implemented as intended and without unintended consequences.
- Include long-term measures (12 months or more) so that the sustainability of the results can be measured.
- Assess the cost-effectiveness of the interventions.

If evaluation of an implemented intervention or a pilot study is done well, it will contribute to the research evidence and inform future action.

Implications for research

For all four overviews, the measurement and reporting of possible impacts on health inequalities in both primary studies and systematic reviews revealed a clear research gap that needs to be addressed. In addition, no studies reported on possible impact on human rights.

The quality and quantity of systematic reviews varied for each of the overviews. The area most in need of attention is prevention of toxic exposure to chemicals. For the sustainable jobs overview, a gap was seen in research from developing countries and in the informal sector. There was also a range of pre-specified interventions where no systematic reviews were found, and interventions where the systematic review evidence was insufficient to draw conclusions about the effectiveness of the intervention. These are detailed in each of the four overviews (21–24).

Limitations. This study was designed to evaluate the existing evidence related to the UN Framework for Sustainable Development, which was the basis for the Agenda 2030 (4) for Sustainable Development designed to orient the whole UN System, including its Member States, for the next 15 years. A limitation of the study was that it did not compare or elaborate on other existing models for health and development.

Conclusions

These four separate, but related, overviews have shown that there is already systematic review-level evidence in the literature that demonstrates the relationship between health and the key dimensions of the proposed UN sustainable development framework. The evidence found for effective interventions will be useful in guiding countries on their best options for non-health sector interventions that can positively impact health. Importantly, the overviews show the benefits of intersectoral work for all relevant sectors.

Based on this overview's general conclusions, it is safe to say that focused action and alliances between the health sector and the sectors involved in safe food production and distribution, decent work in the health industry, and clean energy and safe chemicals can be a win-win situation. Such actions can benefit both sustainable development and public health.

It is likely that, after the approval of the new integrated framework for sustainable development by the UN General Assembly, many Member States will be eager to implement concrete actions, particularly in the health sector. It would be timely and helpful, therefore, to develop tools and instruments *now* that build capacity among Member States to implement projects that leverage existing knowledge on interventions that positively impact both health and sustainable development.

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REFERENCES

1. World Commission on Environment and Development. Our common future (Brundtland Report). Oxford, New York: Oxford University Press; 1987.
2. United Nations. The future we want. Outcome document of the United Nations Conference on Sustainable Development. New York: UN; 2012.
3. United Nations. Report of the United-Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992. New York: UN; 1993. Available from: www.un.org/ga/search/view_doc.asp?symbol=A/CONF.151/26/Rev.1%20(Vol.%20I)&Lang=E Accessed on 25 March 2016.
4. United Nations. Agenda 21. Proceedings of the United Nations Conference on Environment and Development, Rio de Janerio 3 to 14 June 1992. New York: UN; 1993. Available from: https://sustainabledevelopment.un.org/milestones/unced/agenda21 Accessed on 25 March 2016.
5. United Nations. Road map towards the implementation of the United Nations Millennium Declaration Report of the Secretary-General. New York: UN; 2001. Available from: www.unmillenniumproject.org/documents/a56326.pdf Accessed on 25 March 2016.
6. United Nations System Task Team. Realizing the future we want for all. Report to the Secretary-General. New York: UN; 2012.
7. Pan American Health Organization. Health, environment and sustainable development: towards the future we want. Washington, DC: PAHO; 2013.
8. World Health Organization. The Ottawa charter for health promotion: first international conference on health promotion; 21 November 1986. Geneva: WHO; 1986.
9. World Health Organization. Rio political declaration on social determinants of health. Rio de Janeiro, Brazil: WHO; 2011.
10. Haines A, Alleyne G, Kickbusch I, Dora C. From the Earth Summit to Rio+20: integration of health and sustainable development. Lancet. 2012;379:2189-97.
11. World Health Organization. Measuring health gains from sustainable development. Sustainable cities, food, jobs, water, energy, disaster management. Initial findings from a WHO Expert Consultation; 17-18 May 2012. Geneva: WHO; 2012.
12. Becker LA, Oxman AD. Overviews of reviews. In: Higgins JPT, Green S, eds. Cochrane handbook for systematic reviews of interventions version 5.1.0 (updated March 2011). The Cochrane Collaboration; 2011. Available from: http://handbook.cochrane.org/ Accessed on 25 March 2016.

13. The Joanna Briggs Institute. Joanna Briggs Institute reviewers' manual. Adelaide: The Joanna Briggs Institute; 2014.
14. Bambra C, Gibson M, Sowden A, Wright K, Whitehead M, Petticrew M. Tackling the wider social determinants of health and health inequalities: evidence from systematic reviews. J Epidemiol Commun Health. 2010;64:284-91.
15. Higgins JPT, Green S, eds. Cochrane handbook for systematic reviews of interventions version 5.1.0 (updated March 2011). The Cochrane Collaboration; 2011. Available from: http://handbook.cochrane.org/Accessed on 25 March 2016.
16. Haby M, Chapman E, Clark R, Galvão L. Agriculture, food and nutrition security interventions that facilitate sustainable development and have a positive impact on health: an overview of systematic reviews (Protocol). PROSPERO [Internet]. 2014: [CRD42014008780 p.]. Available from: www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014008780.
17. Haby M, Chapman E, Clark R, Galvão L. Energy interventions that facilitate sustainable development and have a positive impact on health: an overview of systematic reviews (Protocol). PROSPERO database; 2014. Available from: www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014008940 Accessed on 20 March 2016.
18. Haby M, Chapman E, Clark R, Galvão L. Interventions that have a positive impact on worker's health and facilitate sustainable development: an overview of systematic reviews (Protocol). PROSPERO database; 2014. Available from: www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014008944 Accessed on 20 March 2016.
19. Haby M, Soares A, Chapman E, Clark R, Korc M, Galvão L. Interventions that facilitate sustainable development by preventing toxic exposure to chemicals: an overview of systematic reviews (Protocol). PROSPERO database; 2014. Available from: www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42014010457 Accessed on 20 March 2016.
20. Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol. 2007;7:10.
21. Haby MM, Chapman E, Clark R, Galvão L. Agriculture, food, and nutrition interventions that facilitate sustainable food production and impact health: an overview of systematic reviews. Rev Panam Salud Publica; 2016. [In press]
22. Haby MM, Chapman E, Clark R, Galvão L. Interventions that facilitate sustainable jobs and positively impact worker's health: an overview of systematic reviews. Rev Panam Salud Publica; 2016. [In press]
23. Haby MM, Chapman E, Clark R, Galvão L. Energy interventions that facilitate sustainable development and impact health: an overview of systematic reviews. Rev Panam Salud Publica; 2016. [In press].
24. Haby MM, Soares da Silva A, Chapman E, Clark R, Korc M, Galvão L. Interventions that facilitate sustainable development by preventing toxic exposure to chemicals: an overview of systematic reviews. Rev Panam Salud Publica; 2016. [In press]
25. Lucas PJ, Cabral C, Colford JM, Jr. Dissemination of drinking water contamination data to consumers: a systematic review of impact on consumer behaviors. PLoS One. 2011;6:e21098.
26. Smith-Spangler C, Brandeau ML, Hunter GE, Bavinger JC, Pearson M, Eschbach PJ, et al. Are organic foods safer or healthier than conventional alternatives?: a systematic review. Ann Intern Med. 2012;157: 348-66.
27. Dangour AD, Lock K, Hayter A, Aikenhead A, Allen E, Uauy R. Nutrition-related health effects of organic foods: a systematic review. Am J Clin Nutr. 2010;92:203-10.
28. Kim IH, Muntaner C, Vahid Shahidi F, Vives A, Vanroelen C, Benach J. Welfare states, flexible employment, and health: a critical review. Health Policy. 2012; 104:99-127.
29. Quinlan M, Mayhew C, Bohle P. The global expansion of precarious employment, work disorganization, and consequences for occupational health: a review of recent research. Int J Health Serv. 2001;31(2):335-414.
30. Westgaard RH, Winkel J. Occupational musculoskeletal and mental health: significance of rationalization and opportunities to create sustainable production systems, a systematic review. Appl Ergon. 2011; 42(2):261-96.
31. Bambra C, Egan M, Thomas S, Petticrew M, Whitehead M. The psychosocial and health effects of workplace reorganisation. 2. A systematic review of task restructuring interventions. J Epidemiol Community Health. 2007;61(12):1028-37.
32. Haynes E, Lanphear BP, Tohn E, Farr N, Rhoads GG. The effect of interior lead hazard controls on children's blood lead concentrations: A systematic evaluation. Environ Health Perspect. 2002;110(1): 103-7.
33. Yeoh B, Woolfenden S, Lanphear B, Ridley GF, Livingstone N. Household interventions for preventing domestic lead exposure in children. Cochrane Database Syst Rev. 2012;4:CD006047.
34. Eyles H, Ni Mhurchu C, Nghiem N, Blakely T. Food pricing strategies, population diets, and non-communicable disease: a systematic review of simulation studies. PLoS Med. 2012;9:e1001353.
35. Egan M, Bambra C, Thomas S, Petticrew M, Whitehead M, Thomson H. The psychosocial and health effects of workplace reorganisation. 1. A systematic review of organizational-level interventions that aim to increase employee control. Epidemiol Community Health. 2007;61(11): 945-54.
36. Berti PR, Krasevec J, FitzGerald S. A review of the effectiveness of agriculture interventions in improving nutrition outcomes. Public Health Nutr. 2004;7(5):599-609.
37. Dangour AD, Hawkesworth S, Shankar B, Watson L, Srinivasan CS, Morgan EH, et al. Can nutrition be promoted through agriculture-led food price policies? A systematic review. BMJ Open. 2013;3(6): e002937
38. Gunaratna NS, Groote HD, Nestel P, Pixley KV, McCabe GP. A meta-analysis of community-based studies on quality protein maize. Food Policy. 2010;35(3): 202-10.
39. Loevinsohn M, Sumberg J, Diagne A, Whitfield S. Under what circumstances and conditions does adoption of technology result in increased agricultural productivity? A systematic review prepared for the Department for International Development. Brighton, UK: Institute of Development Studies; 2013.
40. Masset E, Haddad L, Cornelius A, Isaza-Castro J. Effectiveness of agricultural interventions that aim to improve nutritional status of children: systematic review. BMJ. 2012;344:d8222
41. McCorriston S, Hemming DJ, Lamontagne-Godwin JD, Parr MJ, Osborn J, Roberts PD. What is the evidence of the impact of agricultural trade liberalisation on food security in developing countries? A systematic review. London: EPPI Centre, University of London; 2013.
42. Powell LM, Chaloupka FJ. Food prices and obesity: Evidence and policy implications for taxes and subsidies. Milbank Q. 2009;87(1):229-57.
43. Powell LM, Chriqui JF, Khan T, Wada R, Chaloupka FJ. Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: a systematic review of prices, demand and body weight outcomes. Obes Rev. 2013;14(2):110-28.
44. Solari L, Donaires LF, Hijar Guerra G, Mendoza A, Pachas P, Suárez C. Evaluación de los efectos adversos de los alimentos genéticamente modificados en la salud humana: revisión de la literatura científica. Lima: INS-UNAGESP; 2011.
45. Thow AM, Jan S, Leeder S, Swinburn B. The effect of fiscal policy on diet, obesity and chronic disease: a systematic review. Bull World Health Organ. 2010;88(8): 609-14.
46. Webb Girard A, Self JL, McAuliffe C, Olude O. The effects of household food production strategies on the health and nutrition outcomes of women and young children: a systematic review. Paediatr Perinat Epidemiol. 2012;26(suppl 1):205-22.
47. Yip CS, Crane G, Karnon J. Systematic review of reducing population meat consumption to reduce greenhouse gas emissions and obtain health benefits: effectiveness and models assessments. Int J Public Health. 2013;58(5):683-93.
48. Policy and Operations Evaluation Department (IOB), Ministry of Foreign Affairs of the Netherlands. Renewable energy: access and impact. A systematic literature review of the impact on livelihoods of interventions providing access to renewable energy in developing countries. The Hague: IOB; 2013.
49. Maidment CD, Jones CR, Webb TL, Hathway EA, Gilbertson JM. The impact of household energy efficiency measures on health: A meta-analysis. Energy Policy. 2014;65:583-93.
50. Rehfuess E, Pope D, Bruce N, Dherani M, Jagoe K, Naeher L, et al. Review 6: Impacts

of interventions on household air pollution concentrations and personal exposure. WHO indoor air quality guidelines: household fuel combustion. Geneva: World Health Organization; 2014.
51. Thomson H, Petticrew M, Thomas S, Sellstrom E. Housing improvements for health and associated socio-economic outcomes: A systematic review. Cochrane Database Syst Rev. 2013;2:CD008657.
52. Turley R, Saith R, Bhan N, Rehfuess E, Carter B. Slum upgrading strategies involving physical environment and infrastructure interventions and their effects on health and socio-economic outcomes. Cochrane Database Syst Rev. 2013;1:CD010067.
53. Bambra C, Whitehead M, Sowden A, Akers J, Petticrew M. 'A hard day's night?' The effects of compressed working week interventions on the health and worklife balance of shift workers: A systematic review. J Epidemiol Community Health. 2008;62(9):764-77.
54. Bambra CL, Whitehead MM, Sowden AJ, Akers J, Petticrew MP. Shifting schedules. The health effects of reorganizing shift work. Am J Prev Med. 2008;34(5):427-34.
55. Joyce K, Pabayo R, Critchley JA, Bambra C. Flexible working conditions and their effects on employee health and well-being. Cochrane Database Syst Rev. 2010;2: CD008009.
56. Mischke C, Verbeek Jos H, Job J, Morata Thais C, Alvesalo-Kuusi A, Neuvonen K, et al. Occupational safety and health enforcement tools for preventing occupational diseases and injuries. Cochrane Database Syst Rev. 2013;8:CD010183.
57. Pearson A, Porritt K, Doran D, Vincent L, Craig D, Tucker D, et al. A systematic review of evidence on the professional practice of the nurse and developing and sustaining a healthy work environment in healthcare. Int J Evid Based Healthc. 2006;4(3):221-61.
58. Pega F, Carter K, Blakely T, Lucas Patricia J. In-work tax credits for families and their impact on health status in adults. Cochrane Database Syst Rev. 2013;8:CD009963.
59. Robson LS, Clarke JA, Cullen K, Bielecky A, Severin C, Bigelow PL, et al. The effectiveness of occupational health and safety management system interventions: a systematic review. Safety Science. 2007;45: 329-53.
60. Tompa E, Trevithick S, McLeod C. Systematic review of the prevention incentives of insurance and regulatory mechanisms for occupational health and safety. Scand J Work Environ Health 2007;33(2): 85-95.
61. Witter S, Fretheim A, Kessy FL, Lindahl AK. Paying for performance to improve the delivery of health interventions in low- and middle-income countries. Cochrane Database Syst Rev. 2012;2:CD007899.
62. Jacobs DE, Brown MJ, Baeder A, Sucosky MS, Margolis S, Hershovitz J, et al. A systematic review of housing interventions and health: introduction, methods, and summary findings. J Public Health Manag Pract. 2010;16(5 suppl):S5-10.
63. James M, Nazar M, Sanchez-Sweatman O. Effectiveness of public health in organized response to non-natural environmental disasters. Hamilton, ON (Canada): Effective Public Health Practice Project; 1999.
64. Keifer MC. Effectiveness of interventions in reducing pesticide overexposure and poisonings. Am J Prev Med. 2000;18(suppl 4):80-9.
65. Lum C, Kennedy LW, Sherley AJ. The effectiveness of counter-terrorism strategies: a systematic review. Campbell Syst Rev. 2006:2. doi: 10.4073/csr.2006.2
66. Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, et al. Suicide prevention strategies: a systematic review. JAMA. 2005;294(16):2064-74.
67. Rabinowitz P, Wiley J, Odofin L, Wilcox M, Dein FJ. Animals as sentinels of chemical terrorism agents: an evidence-based review. Clin Toxicol (Phila). 2008;46(2): 93-100.
68. Rautiainen RH, Lehtola MM, Day LM, Schonstein E, Suutarinen J, Salminen S, et al. Interventions for preventing injuries in the agricultural industry. Cochrane Database Syst Rev. 2008;1:CD006398.
69. Saegert SC, Klitzman S, Freudenberg N, Cooperman-Mroczek J, Nassar S. Healthy housing: A structured review of published evaluations of US interventions to improve health by modifying housing in the United States, 1990-2001. Am J Public Health. 2003;93(9):1471-7.
70. Sarchiapone M, Mandelli L, Iosue M, Andrisano C, Roy A. Controlling access to suicide means. Int J Environ Res Public Health. 2011;8:4550-62.
71. Cecchini M, Sassi F, Lauer JA, Lee YY, Guajardo-Barron V, Chisholm D. Tackling of unhealthy diets, physical inactivity, and obesity: health effects and cost-effectiveness. Lancet. 2010;376:1775-84.
72. Dallongeville J, Dauchet L, Mouzon O, Requillart V, Soler LG. Increasing fruit and vegetable consumption: a cost-effectiveness analysis of public policies. Eur J Public Health. 2011;21(1):69-73.
73. Krewitt W, Holland M, Trukenmüller A, Heck T, Friedrich R. Comparing costs and environmental benefits of strategies to combat acidification and ozone in Europe. Environmental Economics and Policy Studies. 1999;2(4):249-66.
74. Sacks G, Veerman L, Moodie M, Swinburn B. Traffic-light nutrition labelling and junk-food tax: a modelled comparison of cost-effectiveness for obesity prevention. Int J Obes (Lond). 2011;35(7): 1001-9.
75. Stein AJ, Nestel P, Meenakshi JV, Qaim M, Sachdev HP, Bhutta ZA. Plant breeding to control zinc deficiency in India: how cost-effective is biofortification? Public Health Nutr. 2007;10(5):492-501.
76. Steur H, Gellynck X, Blancquaert D, Lambert W, Straeten D, Qaim M. Potential impact and cost-effectiveness of multi-biofortified rice in China. N Biotechnol. 2012;29(3):432-42.
77. Wu F, Khlangwiset P. Health economic impacts and cost-effectiveness of aflatoxin-reduction strategies in Africa: case studies in biocontrol and post-harvest interventions. Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2010;27(4):496-509.
78. Krutilla K, Graham JD. Are green vehicles worth the extra cost? The case of diesel-electric hybrid technology for urban delivery vehicles. J Policy Anal Manage. 2012;31:501-32.
79. Brown MJ. Costs and benefits of enforcing housing policies to prevent childhood lead poisoning. Med Decis Making. 2002;22: 482-92.
80. Macauley M, Palmer K, Shih J-S, Cline S, Holsinger H. Modeling the costs and environmental benefits of disposal options for end-of-life electronic equipment: the case of used computer monitors. Discussion Paper 01–27. Washington, DC: Resources for the Future; 2001.
81. Baker PR, Costello JT, Dobbins M, Waters EB. The benefits and challenges of conducting an overview of systematic reviews in public health: a focus on physical activity. J Public Health (Oxf). 2014;36(3): 517-21.
82. Rehfuess EA, Bartram J. Beyond direct impact: evidence synthesis towards a better understanding of effectiveness of environmental health interventions. Int J Hyg Environ Health. 2014;217(2-3):155-9.

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El nuevo enfoque de las Naciones Unidas sobre el desarrollo sostenible después del 2015: Resultados de cuatro sinopsis de revisiones sistemáticas de intervenciones relacionadas con el desarrollo sostenible y la salud

RESUMEN

Objetivo. Identificar las intervenciones notificadas que facilitan el desarrollo sostenible y han tenido un impacto positivo en la salud en cuatro áreas: producción sostenible de alimentos, uso sostenible de la energía, trabajo sostenible ("trabajo digno"), y prevención de la exposición a productos químicos tóxicos.

Métodos. Se usaron métodos de revisión sistemática para sintetizar la evidencia de múltiples revisiones sistemáticas y evaluaciones económicas. Sobre la base de protocolos predefinidos, incluidos criterios de inclusión claros, se realizó una búsqueda en al menos 14 bases de datos y ocho sitios web para cada una de las cuatro sinopsis de revisiones sistemáticas. Para ser consideradas "sostenibles," las intervenciones debían estar dirigidas (explícita o implícitamente) a lograr efectos positivos en al menos dos dimensiones del marco integrado para el desarrollo sostenible e incluir mediciones de la repercusión en la salud.

Resultados. En total, 47 revisiones sistemáticas y 10 evaluaciones económicas cumplieron con los criterios de inclusión. Se identificaron las intervenciones más prometedoras, como las políticas agrícolas, para cada uno de los cuatro temas. Si bien la evidencia sobre las intervenciones no es sólida debido al número limitado de estudios, no hay indicios de un impacto negativo concreto en la salud. La única posible excepción se relaciona con los impuestos y subsidios, aunque esta intervención también tiene el potencial de favorecer la equidad con una repercusión relativa mayor en los grupos de menores ingresos.

Conclusiones. La evidencia sobre intervenciones eficaces es útil para guiar a los países hacia las mejores opciones de intervención en sectores que no son de salud pero cuya repercusión también será positiva en el de la salud. Estas sinopsis indican que el trabajo intersectorial beneficia a todos los sectores implicados.

Palabras clave Desarrollo sostenible; objetivos de desarrollo sostenible; revisión; agricultura sostenible; medio ambiente y salud pública; equidad en salud; empleo; Naciones Unidas.