Plan of Action on Health in all Policies: Validation of Implementation Indicators

Draft document
25 March 2015

Contents

Executive Summary

The Plan of Action on Health in all Policies of the Pan American Health Organization (PAHO Regional HiAP Plan) was adopted by the Member States in September 2014 with a view to establishing clear steps for the implementation of the HiAP approach in the countries of the Region of the Americas. The Plan of Action corresponds to the World Health Organization (WHO) Health in all Policies Framework for Country Action (Global HiAP Framework), developed in January 2014 in a coordinated effort with the countries of the Americas.

The Regional HiAP Plan contains 12 indicators framed within the six strategic lines of action of the Global HiAP Framework for 2014-2019. These indicators were formulated in 2014 through an open, joint consultation process in the countries and at meetings with experts aimed at integrating the wealth of intersectoral perspectives and experiences that characterizes the Region.

This draft document analyzes the 12 indicators of the Regional HiAP Plan, with a view to increasing their validity and reliability by specifying their contents and identifying the aspects that should be present. These aspects were determined by reviewing the main concept papers and narratives on international and regional experiences involving HiAP and the intersectoral approach to health and health equity. We propose a framework for analyzing the set of indicators in terms of their contribution to advancing the HiAP approach, making it possible to differentiate and locate each indicator, and thereby strengthening the Plan's structural coherence.

The Regional HiAP Plan has process indicators that are formulated in terms of the number of countries in the Region that have implemented specific processes that meet the requirements of the strategic line of action to which they correspond. In general, calculations involve judging the level of compliance based on reports from the countries that document the requirements or key elements of the indicator.

Each indicator is explicitly defined in an explanatory file with an illustrative example and the rationale, method of calculation, data collection and information sources, baseline and proposed goal for 2019, as well as comments and limitations. The purpose of the file is to clarify the content of the indicators and the documentation requirements so as to facilitate country reports on advances in the implementation of policies with a HiAP approach. It is also useful for benchmarking by countries.

This analysis of the indicators of the Regional HiAP Plan is still under construction and some aspects are still under review. This document and the accompanying attachment, which contains the files that explain the indicators, are drafts to be discussed and enriched with specific recommendations from the Expert Consultation as to the best way to implement the Regional HiAP Plan, to be held at PAHO Headquarters 31 March–1 April 2015.

Introduction

Intersectoral action for health is not a new concept. It is inarguable that the health of the population and health inequities are determined by factors outside the operational sphere of the health sector. Neither is there any question that there is a need for sectors to work together to address the (intermediate) determinants of health and (structural) determinants of health inequities (1). Intersectoral action has been proposed as a key component to achieve health objectives, well-being, and equity—and strengthened over time with new conceptual and operational elements—in various important global instruments promoted by WHO:

- the Declaration of Alma-Ata (1978) (2)
- the Ottawa Charter for Health Promotion and the Healthy Cities programs (1986) (3)
- the Final Report of the Commission on Social Determinants of Health (2008) (4)
- the Adelaide Statement on Health in all Policies (2010) (5)
- the Rio Political Declaration on Social Determinants of Health (2011) (6)
- and the Helsinki Statement on Health in all Policies (2013) (7)

HiAP is seen as a new and innovative expression of intersectoral action, arising at the same time as health is becoming increasingly central to the political agenda. This is exemplified in the emerging agenda of post-2015 sustainable development, which further emphasizes the systemic nature of health, social welfare, social justice, economic development, and environmental protection, calling for more comprehensive and integrated responses, involving all sectors of government, civil society, and the private sector in the formulation, implementation, and evaluation of public policies (7,8).

Definition of HiAP: "*…an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts in order to improve population health and health equity*." Conceptually, it reflects the principles of legitimacy, responsibility, transparency and access to information, engagement, sustainability, and collaboration between sectors and levels of government (7). It is not an end in itself, but a means to seek health, well-being, and health equity (9).

An increasingly clear understanding of HiAP has been developing through concrete experiences in several countries, and through research and exchanges at international conferences and regional meetings, with significant contributions from the countries of the Americas (5, 7, 10). HiAP focuses on improving health and health equity with an emphasis on the impact of public policy on the determinants of health and well-being, including health systems. It is based on the recognition of rights related to health and well-being, and the obligations of governments to apply them.

Although the term refers to “in all policies,” this does not mean the approach must be present in all initiatives. Rather, it refers to the objective of ensuring that concern and responsibility for health impacts and health equity are considered systematically in all sectors. For this reason, some prefer to refer to “action across sectors” (8). Despite increasing clarity regarding the purpose and focus of frameworks of action and precursor experiences, it continues to be a challenge in many countries to integrate sectors into public policy processes aimed at health and well-being.

After the Helsinki Conference and Statement, the WHO Health in all Policies Framework for Country Action (Global HiAP Framework) (11) was developed in a coordinated effort with the countries of the Americas to support national processes. The Framework sets out six key components (strategic lines) to put the HiAP approach into action:

1. Establish the need and priorities for HiAP
2. Frame planned action
3. Identify supportive structures and processes
4. Facilitate assessment and engagement
5. Ensure monitoring, evaluation, and reporting
6. Build capacities

Regional Plan of Action: Background

The Americas is the first WHO region to establish a Regional Plan of Action on Health in all Policies (Regional HiAP Plan), adopted in September 2014 by the Member States, with the general purpose of defining clear steps for implementation of the approach in countries of the Region (12). The Regional HiAP Plan corresponds to the WHO Global HiAP Framework (11).

The PAHO Regional HiAP Plan was formulated on the basis of the available solid evidence, including case studies of good practices in countries in the Region, global and regional analytical frameworks, and the recommendations of extensive consultations with actors inside and outside the health sector (12). It was drafted after a broad and extensive review aimed at ensuring collective and inclusive development, consistent with the uniqueness and values of the Region(10).

HiAP and the Intersectoral approach: Experiences in the Region

In the Region of the Americas, the HiAP concept is closely linked to the “intersectoral approach,” stemming from the 1978 Declaration of Alma-Ata on “Health for All,” which had a strong impact on Latin America and the Caribbean. Further significant contributions were made by the Ottawa Charter (1986) on health promotion and by the developments and debates involving SILOS (local health systems) (13,14). This was part of the health sector’s response to the democratization processes taking place in the Region. The emphasis was on the need to reorganize and reorient health systems

through decentralization and local development, and on strengthening and renewing the primary care strategy approved in Alma-Ata, while giving greater importance to seeking equity with solidarity and justice for the entire population.

According to the Declaration of Alma-Ata, this "involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors." (2)

There is a wealth of experience in the Region that should be gathered and shared with member countries, regarding the progress and discussions that have been enriching the HiAP approach (15,16).

There has been limited documentation and evaluation of the advances in the Region, which has restricted the dissemination of existing knowledge and lessons learned, both among member countries and with other regions. The Regional Plan, the document produced in the Region on the conceptual models for addressing HiAP (9), and this proposal on indicators (17) are all attempts to fill that gap.

In the countries of the Americas there is a diversity of experience not only at the central level, but especially at the subnational and local levels (18). It should be noted that several initiatives in the Region were initially linked to other governmental sectors, mainly in the social area. The health sector has been a collaborating actor in these initiatives, but not always in a leadership role. A diversity of approaches to equity and social determinants can also be found, and the opportunities for addressing the most structural aspects are closely linked to social changes in countries (9).

The types of relationships built around HiAP are closely related to the purpose of the joint effort, since *HiAP is not the main objective or an end in itself, but is a means to achieve health, well-being, and health equity.*

Finally, it should be noted that HiAP is a strategy that *not only has a technical basis, but also a solid policy basis*. In the technical area, there is a clear need for coordination between sectors, focusing on the search for efficient use of resources rather than duplication of effort, among other issues. At the policy level, there is a key role for the discussions of democratization and of the insufficiency of economic growth as a response to achieve well-being, equity, and social justice. The latter bears relation to policies and programs that address social protection and equity in the Region.(9)

Under this conceptual framework, an in-depth review of the varied experiences in the Region was conducted under the sponsorship of PAHO (9) in 2014. This helped identify the context of the experiences and their features and scope, emphasizing the development of factors that have characterized the origins and evolution of the intersectoral approach in the Region.

This review has also helped determine and elucidate when intersectoral action is successful. Although as we have already mentioned, the intersectoral approach is not

in itself a central objective, "*we believe that it is necessary to emphasize its success, associated first of all with the reduction in social and health inequities; secondly, with the inclusion—in the health sector—of the needs and priorities of other sectors; and finally, with the inclusion of health as a goal or target in the other sectoral policies.*" (9)

The Regional HiAP Plan and its indicators

The Regional HiAP Plan contains 12 indicators for the period 2014-2019, framed in six lines of action consistent with the Global HiAP Framework. With regard to these indicators, the Plan proposes goals to be achieved through 2014-2019 that are consistent with the objectives of the PAHO Strategic Plan (19). The indicators were formulated in consultation with experts and the countries, and were adopted during the 53rd Directing Council of PAHO, with a view to providing guidance and key recommendations for the implementation of the HiAP approach in the countries of the Region.

Specifically, the Plan seeks to facilitate the following activities:

- Generate and document evidence on HiAP for high-level advocacy to enhance collaboration between different sectors;
- Use case studies of HiAP to extend the approach throughout the Region;
- Build capacity in HiAP through the HiAP course developed by WHO, which two collaborating centers of PAHO and other national institutions will implement;
- Deploy the use of health impact assessment methodologies in monitoring the HiAP pilot initiative.
- Work with the Healthy Municipalities and Schools and Healthy Universities networks to extend the Regional HiAP Plan;
- Monitor the progress of the countries in the implementation of HiAP;
- Strengthen South-South collaboration, demonstrating the progress in HiAP, together with South-North collaboration—in particular the WHO/EURO office, which has made significant progress on this agenda.

In light of the above and at the request of PAHO, each indicator was analyzed within the HiAP conceptual framework in order to understand the diverse contributions made by each one.

Four major groups of HiAP indicators can be identified, forming *a matrix of indicators* to evaluate progress on the strategic lines of the Plan:

The **first group** searches countries for ***conditions that could be favorable for work on HiAP***. This implies that there are not necessarily any current HiAP initiatives in these countries, but that the development of conditions that could facilitate or trigger HiAP work should be monitored. There are four such indicators.

The first indicator is associated with possible entry points that could be focused on HiAP work:

> *Indicator 1.1.1. Number of countries with established national/regional networks of multisectoral working groups and stakeholders to evaluate the impact of government policies on health and health equity.*

This first group also includes a set of indicators associated with facilitating or triggering HiAP work, i.e. processes that would allow certain mechanisms or conditions to facilitate a reorientation toward HiAP work:

> *Indicator 2.1.2. Number of countries that formally exchange information and best practices at least once every two years on policies addressing health inequities and HiAP.*

> *Indicator 3.3.1. Number of countries with accountability mechanisms that support civil society engagement and open access to information.*

A fourth indicator that helps provide a better understanding of the context and conditions of equity with a view to HiAP work is:

> *Indicator 2.2.1. Number of countries and territories producing equity profiles that address at least two priority determinants of health at the national or subnational level.*

The **second group** of indicators attempt to ***identify and document HiAP initiatives currently in progress*** in the Region, and determine their various components and attributes, including: mechanisms used to influence other sectors, contents of the actions; the degree to which equity and the social determinants of health (SDHs) are addressed; the role of social engagement in the development and implementation of the initiative; and the regional and global scope of the initiative. There are five indicators in this group.

One set of indicators seeks to determine the mechanisms used for relations with other sectors in the countries, identifying types of influence, organization, and content of the work done with other sectors. Emphasis is on the type of relation with other sectors and whether equity and SDHs are addressed, especially in relation to development plans.

> *Indicator 3.1.1. Number of countries and territories with a specific mechanism, such as intersectoral committees or HIA, by which the health sector can engage within and beyond the public sector.*

> *Indicator 3.2.1. Number of countries that have identified supportive structures and processes in the implementation of HiAP, as appropriate, at the national and*

subnational governments through the inclusion of HiAP in development plans, as appropriate.

Other indicators in this group focus on the degree of engagement in HiAP work and the type of engagement (who participates and in what areas).

Indicator 4.1.1. Number of countries and territories with mechanisms to engage communities and civil society in the policy development process across sectors.

Indicator 4.1.2. Number of countries and territories with specific strategies to engage those experiencing inequities in policy discussions at the local, subnational, and national levels.

Another indicator attempts to identify the regional and global scope of HiAP work, so as to know which countries have effectively implemented the Global HiAP Framework, and the adaptations countries have made for their implementation

Indicator 1.1.2. Number of countries and territories implementing the Health in All Policies Framework for Country Action.

Each of the indicators mentioned above helps characterize the progress made in HiAP work in four priority areas that are related to the success of HiAP:

- *reduction of social inequities*: a set of indicators characterize the approach taken to equity;
- *inclusion—in the health sector—of the needs and priorities of other sectors;*
- *inclusion of health as a goal or target in other sectoral policies*: with the above set of indicators it is possible to determine the levels of implementation, influence, and impact of HiAP on health and other sectors.
- *quality of the HiAP approach*: a key aspect not only associated with equity outcomes, but also with the sectors engaging in this process, calling for deeper work with other sectors, beyond the usual collaborators.

The **third group** of indicators focuses on determining the degree to which the countries have moved forward in the ***monitoring and evaluation of strategies, policies, and programs that include the HiAP approach***. The Plan identifies an indicator associated mainly with the group of countries that already have initiatives HiAP underway:

Indicator 5.1.1. Number of countries and territories that monitor, evaluate, and report on progress towards introducing health and health equity in the development and implementation of government policies.

A **fourth group** of indicators seeks to determine the degree to which countries address the ***need for training and knowledge development*** in the HiAP area. This aspect can act as facilitator of HiAP processes in countries that have not yet implemented them. In countries that have already implemented or are currently implementing HiAP initiatives, this can constitute an aspect of sustainability in HiAP work. An indicator of this kind is identified in the Plan:

> *Indicator 6.1.1. Number of countries and territories with recognized institutes such as national public health institutes, universities and collaborating centers offering training courses on the implementation and monitoring of HiAP and related concepts.*

In short, the indicators of the Regional Plan seek to identify the most significant characteristics of the HiAP implementation process in order to measure the advances in HiAP implementation in the countries of the Region (20).

The next step in the analysis of the indicators of the Regional HiAP Plan within the HiAP conceptual framework is to review every indicator through a content validation process using documentary analysis to strengthen the indicator's usefulness and facilitate its implementation by the countries.

Validation of the indicators of the Plan

There are different types of indicators. Typical quantitative health indicators measure the frequency of occurrence of an event (disease, care, or activities) in a population group, locality, or establishment. Other indicators refer to measurable elements of performance for which there is evidence or consensus that can be used to evaluate complex processes, such as quality. Sets of indicators of this type are the building blocks of evaluation, each one making a statement about structure, processes, or outcomes (20).

The indicators of the Regional HiAP Plan are of the latter kind, mutually linked in a matrix of aspects related to the HiAP implementation processes, i.e. they measure advances and quality in terms of conditions, priorities, design, formulation, implementation, and evaluation of public policies in sectors that take this approach. All the indicators in this matrix are formulated in terms of the number of countries in the Region carrying out processes that meet the requirements of the specific aspects measured in terms of the corresponding strategic line of action for HiAP implementation. In general, calculations involve judging the level of compliance based on reports from the countries that document the requirements or key elements of the indicator, resulting in a "yes" or "no" answer.

As was mentioned above, the indicators of the Regional Plan are the result of consensus forged during extensive consultations with country actors and experts, held

in 2014 and approved by the PAHO Directing Council in September of same year (10, 12).

Two main criteria for the analysis of any indicator are:

1. Whether it measures what it is attempting to measure, i.e. its validity.
2. Whether the same measurement process produces consistent results, i.e. its reliability (21).

These concepts are related. An ambiguous indicator is unlikely to measure what it wants to measure does not produce consistent results.

With regard to validity, we can distinguish between:

- face validity, which determines whether the measurement appears to be a good way to operationalize the construct (This tends to be the type of validity that is underpinned by consensus.);
- content validity (whether the indicator contains all the relevant aspects within the scope of the construct, for the purposes of its use, based on evidence). (20)

Validation method: Explanatory notes for each indicator

This analysis attempts to increase the content validity of the indicators of the Regional Plan by reviewing the available information on the HiAP construct in concept papers and in narrative sections of technical documents and case studies. The identified aspects reveal the coherence of the indicators and determine whether they are evidence-based and whether they provide information on the reality of the situation (22).

The analysis of each indicator is presented in an "explanatory file" that defines what is being measured, the rationale for measuring it, the method of computation, documentation requirements and information sources, baseline and goal, periodicity, comments and limitations, type of HiAP indicator, and comparability. The contents of the file are meant to reveal the key aspects of any "good indicator" (see table below).

10 key questions for a "good indicator"

1. What is being measured?
2. Why is it being measured?
3. How is it defined?
4. Who or what does it measure?
5. When does it measure it?
6. Does it measure numbers or proportions?
7. Where does the data come from?
8. How accurate and complete are the data?
9. Are there any caveats or warnings for interpretation?

10. Is statistical process control necessary?

Source: NHS. The Good Indicators Guide. (23)

Preparing the explanatory file for each indicator involved establishing terminology and the key aspects being measured in relation to the relevant aspects of the line of action being addressed. It was also possible to introduce nuances to differentiate better among the aspects covered by each indicator. The analysis therefore helped increase both the content validity and the reliability of the set of indicators by specifying which aspects the countries should document. Nevertheless, it is necessary to go beyond the validation of the design and results of the indicators, and consider the validation of their end use and application by the countries, in terms of how they support national and regional decision-making.

The set of explanatory files for the 12 indicators are included in the enclosed document accompanying this report.

The challenge: Implementation using the indicators

Implementation of the set of the indicators requires the countries of the Region to make a major commitment to monitoring and, especially, documentation, since each indicator will become a source of knowledge about the experiences and learning in the countries, to be shared and exchanged at the regional and global levels.

While a detailed understanding of the mechanisms and organization of current HiAP experiences is important, it is equally important to know that the countries that have not yet developed a HiAP agenda are analyzing the conditions that can facilitate the development of an agenda. Thus, all countries are called upon to use this matrix, since it reflects the diversity of realities and advances in the Region.

It is important to stress that the set of indicators is not an instrument to compare or establish a hierarchy among countries, but instead is a tool that supports the process of implementing HiAP in the Region.

The usefulness of the matrix of indicators resides in the rigor with which it should be used by the countries in the process of self-assessment and documentation. Thus, transparent data collection and documentation are key aspects for the Plan's success at the regional level.

The indicators should be understood as part of a dynamic matrix that should serve the needs of the Plan. The inclusion of new indicators or the elimination of some of those that have been proposed should be considered in the implementation process.

The countries should take care not to limit the monitoring of HiAP interventions, programs, and actions to those that are linked to or generated by the health sector. Countries should be able to document—and include in the system—initiatives in other sectors in which the health sector participates, but does not play the leading role.

Finally, a fundamental challenge is ensure that the matrix dynamically supports regional processes and—together with the collection and systematization of plans and indicators at the regional level—to ensure that the capacity exists to regularly share these results at the regional level through brief information notes or reports, so that the countries receive real feedback that is both timely and constructive.

Recommendations going forward

It is recommended to hold a series of on-line sessions with the countries to ensure proper understanding of the set of indicators and the requested documentation.

It is recommended to carry out prior testing of the proposed matrix, applying it in two or three countries of the Region, thereby completing the proposed validation process. It is also recommended that this testing be done at different administrative levels (national, subnational, and local experiences).

It is recommended that implementation be accompanied by a training process for all countries so as to improve the quality of data registries and, in particular, for the evaluation and monitoring of the experiences in progress.

It is recommended that the matrix of indicators be constructed on a virtual platform in order to ensure and facilitate data entry by countries and monitoring at the regional level.

It is recommended to produce brief reports or information notes, as well as discussion forums on the progress of the Regional Plan, by monitoring the indicators regularly, for example every 3-6 months, thereby promoting country engagement in the generation of information and forums where this topic can be discussed.

References

1. Kickbusch I. Health governance in the 21st Century: A commentary. Public Heal Bull SA [Internet]. 2010;7(2):9–12. Available from: http://www.health.sa.gov.au/pehs/publications/publichealthbulletin-pehs-sahealth-1007.pdf

2. World Health Organization. Declaration of Alma-Ata. In: Primary Health Care. Report of the International Conference on Primary Health Care. Geneva: WHO; 1978.

3. WHO. Ottawa Charter for Health Promotion, World Health Organization. Geneva; 1986. Available from: http://www.paho.org/saludyuniversidades/index.php?option=com_content&view=article&id=5:health-promotion-ottawa-charter&Itemid=12&lang=en

4. Resolution WHA 62.14 of the World Health Assembly. Reducing health inequities through action on the social determinants of health. 2009. Available from: http://apps.who.int/gb/ebwha/pdf_files/A62/A62_R14-en.pdf

5. World Health Organization. Adelaide Statement on Health in all Policies: moving towards a shared governance for health and well-being. International meeting on Health in All Policies, Adelaide 2010; Adelaide (Australia). Geneva: WHO; 2010. Available from: http://www.who.int/social_determinants/hiap_statement_who_sa_final.pdf

6. World Health Organization. World Conference on Social Determinants of Health. All for Equity Meeting Report. Rio +20. World Conference on Social Determinants of Health [Internet]. Rio de Janeiro; 2011 [cited 2015 Mar 15]. p. 79. Available from: http://www.who.int/sdhconference/resources/Conference_Report.pdf?ua=1

7. World Health Organization. The Helsinki Statement on Health in All Policies. 8th Global Conference on Health Promotion, 2013 June 10-14; Helsinki (Finland). Gineva: WHO; 2013.

8. World Health Organization. First Draft of the Framework for Country Action Across Sectors for Health and Health Equity. 2015.

9. Solar O, Cunill-Grau N. Intersectorialidad y equidad en materia de salud en América Latina: una aproximación analítica. 2015.

10. Pan American Health Organization/World Health Organization—Regional Office for the Americas. Report: Regional Consultations on Plan of Action on Health in All Policies. 2014.

11. World Health Organization. Health in all Policies (HiAP): Framework for Country Action. Geneva: WHO; 2014.

12. Pan American Health Organization. Plan of Action on Health in All Policies. 53rd Directing Council; 66th Session of the Regional Committee of WHO for the Americas. 2014.

13. World Health Organization. Declaration of the International Conference on Health Promotion. Health Promotion in Latin America [Internet]. International Conference on Health Promotion. Health Promotion: November 1992; Santa Fé de Bogotá (Colombia). Geneva: WHO; 1992. Available from: http://www.bvsde.ops-oms.org/bvsdeps/fulltext/declarationBogota.pdf

14. Healthy Caribbean Coalition. Caribbean Charter for Health Promotion. First Caribbean Conference of Health Promotion; 1993 Jun 1-4; Port-of-Spain (Trinidad and Tobago). St. Michael (Barbados): HCC; 1993. Available from: http://www.healthycaribbean.org/publications/documents/cchp.pdf

15. Etienne CF. Social determinants of health in the Americas. Pan Am J Public Health / Rev Panam Salud Pública. 2013; 34(6):377–8.

16. Pan American Health Organization. Summary of Experiences from the Americas. The 8th Global Conference on Health Promotion; 2013 June 10-14; Helsinki (Finland). Washington, D.C.: PAHO; 2013.

17. Pan American Health Organization/ World Health Organization, Regional Office for the Americas. Concept paper. Implementation of the Plan of Action on Helath in All Policies (HiAP).

18. Pan American Health Organization/ World Health Organization, Regional Office for the Americas. Health in All Policies: Case Studies from the Region of the Americas. Washington; 2014. 46 p.

19. Pan American Health Organization. Strategic Plan of the Pan American Health Organization 2014-2019. 52nd Directing Council of PAHO, 65th Session of the Regional Committee; 30 September–4 October 2013; Washington D.C., U.S.A. Washington (D.C.), U.S.A.: PAHO; 2013.

20. Campbell SM, Braspenning J, Hutchinson A, Marshall M. Research methods used in developing and applying quality indicators in primary care. Qual Saf Health Care [Internet]. 2002 Dec [cited 2015 Jan 28];11(4):358–64. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1758017&tool=pmcentrez&rendertype=abstract

21. Carmines EG, Zeller RA. Reliability and Validity Assessment. Thousand Oaks, CA, US: Sage Publications Inc.; 1979.

22. Bockstaller C, Girardin P. How to validate environmental indicators. Agric Syst [Internet]. 2003 [cited 2015 Mar 22];76:639–53. Available from: http://observatorioambiental.iff.edu.br/publicacoes/publicacoes-cientificas/indicador_validacao.pdf

23. Pencheon D. NHS. The Good Indicators Guide: Understanding how to use and choose indicators [Internet]. Available from: file:///C:/Users/Patricia/Downloads/TheGoodIndicatorsGuideUnderstandinghowtouseandch (2).pdf