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Monitoring Health Inequalities

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Abbreviations

CA	Country assessment
HEA	Health equity audit
HI	Health inequalities
HIMS	Health inequality monitoring system
HMS	Health monitoring systems
PFA	Policy framework for action
WP	Work package

Executive summary

The Joint Action Health Equity Europe (JAHEE) is a Joint Action financed by the Third Health Programme 2014-2020 of the European Union. It represents an important opportunity for countries to work jointly to address health inequalities. One of the aims with JAHEE and the specific focus of work package five (WP5) is to advance member states ability to monitor national health inequalities.

More specifically, the objective of WP5 is to support partner countries to develop monitoring systems on health inequalities well adapted to the national contexts, suited to policy requirements and sustainable over time. As WP5 partner, you are expected to put into practice the commitment to these objectives through implementation of concrete actions aimed at strengthening the national health inequality monitoring system.

This Policy Framework for action (PFA) contains an outline of the core components in an “ideal” health inequality monitoring system. The framework is based on current empirical knowledge on health inequality monitoring and on theories on health inequalities and the mechanisms behind such inequalities. The PFA serves as a “golden standard” to which each country can compare its existing health inequality monitoring system. The underlying idea is that such a comparison could guide and facilitate an understanding of each country’s development potential.

In line with recent literature on health inequality monitoring the PFA suggest that what should be strived for in terms of national health inequality monitoring is a broad and cyclic system that is sustainable over time. The health inequality monitoring system should comprise a broad set of data, and mirror the most relevant health outcomes and underlying social determinants in subgroups of the population, thus facilitating evaluation of health policies and supporting prioritisation. Participating countries are however encouraged to start on a small scale and to concentrate on getting well-functioning and regular health inequality monitoring of a few health indicators in place before successively adding on indicators based on experiences learned, identified needs, or priorities in the public agenda of monitoring

1 Introduction

The Joint Action Health Equity Europe project (JAHEE) is a Joint Action financed by the Third Health Programme 2014-2020 of the European Union. The general objective of JAHEE is to contribute to achieve greater equity in health outcomes across all groups in society in all participating countries and in Europe at large and to reduce the inter-country heterogeneity in tackling health inequalities. The project is a collaboration between 25 countries contributing with different background, expertise and know-how to the project goals. The overall project is coordinated by Istituto Superiore di Sanità (Italy). For a more thorough description of the explanatory framework underlying the design of the JAHEE project, please see appendix 1.

JAHEE consists of nine work packages (WPs), four mandatory (WP1-WP4) and five thematic (WP5-WP9). The work in the five thematic work packages follows a three-step approach. In the first step, based on the best available knowledge, the five thematic WPs will develop a specific domain policy framework. At participating country level, an individual country profile template and five specific country assessments (for each thematic WP) will be elaborated. In the second step, the participating countries will implement a selection of actions to tackle health inequalities. In the last step, recommendations based on the best results achieved will be produced and disseminated (Figure 1).

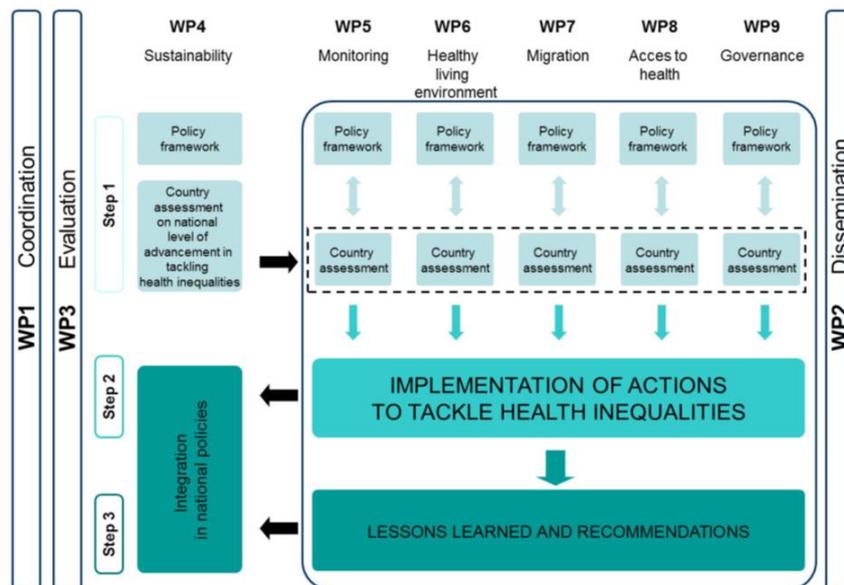


Figure 1. JAHEE project design

1.1 The purpose and work process of work package five

One of the thematic WPs is devoted to monitoring. In this WP institutions from 12 countries are collaborating to attract attention to and improve countries' capacity to monitor health disparities. The project, offers an unique opportunity for participating countries to work together in a structured work process that allow partner countries to share, build and transform available knowledge into concrete actions aimed at strengthening national health inequality monitoring systems in Europe. The overall objective of WP5 is to support countries to develop health inequality monitoring systems well adapted to the national contexts, suited to policy requirements and sustainable over time.

Much of the current health inequality monitoring is based on aggregate descriptions at national levels where averages or proportions are compared between geographical entities. However, inequalities between nations evolve from systematic differences in living conditions, circumstances, and opportunities between population groups within geographical entities. To be able to follow such trends in health, to detect less favourable trends at an early stage, and to reveal the determinants of trends in the population and in subgroups of the population, it is essential to have a national monitoring system in place. In addition, a strong national health inequalities monitoring system (HIMS) is fundamental for countries to assure that no one, in line with the aspirations of The United Nations 2030 Agenda, is left behind. Ultimately, the ambition of WP5 is to in a “do something, do more, do better manner” contribute to the development of participating countries' HIMS.

In short, the work process in WP5 on monitoring health inequalities comprises three phases. The first is the assessment phase where participating countries assess their own HIMS against an “ideal” (state-of-the-art) HIMS in order to identify possible areas/actions for improvements. Depending on the current structure of the national health monitoring system (HMS) and the availability of data, these actions will differ. In some cases, the appropriate objective for a specific country might be to do something – e.g. to identify a couple of relevant indicators for monitoring health inequalities (HI). In other cases, the appropriate objective might be to do more – e.g. to extend the existing HMS to include data disaggregated to socioeconomic groups – and in still other cases an appropriate objective might be to do better – e.g. to add indicators based on measures that are more sophisticated. During the second phase, the countries develop and implement at least one of the actions identified during the first phase. The third phase concludes the project by gathering reports on experiences and conclusions from the second phase in order to elaborate final recommendations for progress in HI monitoring in each country at the end of the JAHEE.

1.2 Aim and scope of the Policy Framework for Action

In this Policy Framework for Action (PFA), an outline of the core components in an “ideal” HIMS is presented and actions to build such a system are suggested. The framework is based on current empirical knowledge and theories on HI and the mechanisms behind such inequalities. The framework will serve as a “golden standard” to which each country can compare its existing HIMS. The underlying idea is that such a comparison could guide and facilitate an understanding of each country’s development potential.

The PFA is divided into three sections. The first is a theoretical section that aims to provide a common understanding of what HI are and how these evolve. To have a common understanding of the concept is necessary not only to develop adequate measures, but also to shape actions and select appropriate interventions.

In the second section, drawing on the structure of the theoretical model and a review of earlier work on HI monitoring, is a suggestion of components that should be included in an ideal HIMS. The peer-reviewed papers and reports are briefly accounted for in appendix 2.

In the third section, a model for choosing actions for implementation and for assessing the current state of participating countries national HIMS is described.

1.3 Intended users

This guide is mainly intended for the members of WP5 in the JAHEE project.

2 Theoretical framework

The socioeconomic circumstances in which people live their lives are closely related to their health. Typically, the lower one's position in the social hierarchy the worse one's health. This association has been found in relation to most major causes of ill health and irrespective of which measure of social position is used.

A couple of things are important to highlight. First, we are talking about differences between social groups rather than between individuals. This has theoretical as well as measurement implications. When analysing HI between social groups, the uneven distributions of resources, opportunities, and scope for action that are coupled with position in the social structure are stressed, not variation between individuals. Second, the pathways at work are many and complex. The unequal distributions of resources, opportunities, and scopes for action coupled with positions in the social hierarchy operate in different areas of life, across the life course, and on different aggregate levels along causal chains of mediating factors that tend to cluster. A monitoring system on HI should relate to this inherent complexity by not only reflecting inequalities in health outcomes, but also the processes that give rise to them across the life course and at different levels of aggregation.

The model of Diderichsen, Evans, Whitehead, et al.¹ is often used to illustrate the complex processes by which social conditions are linked to HI (Figure 2). In brief, the model illustrates how HI are created through effects of social stratification. The sorting of individuals into groups with different relative social positions is based on characteristics such as education, income, labour market position, ethnicity/immigration, or gender. The uneven distributions of resources, opportunities, and scope for action associated with these social positions are in turn associated with systematic differences in living conditions (specific exposures) and to differential vulnerability to such conditions. In addition, the effect of such exposures might be stronger (differential vulnerability) among people in lower social positions because they have fewer resources in terms of knowledge, networks, time, and/or money to counteract the exposures. People in lower social positions also tend to be exposed simultaneously to many risk factors more often than people in more advantaged social positions. In other words, the specific exposures tend to cluster and interact, and the strength of the effect is dependent on the co-existence of other risk factors. In addition, it is not only the strength of this effect on health that is dependent on the social position, but also the social and economic consequences of ill health. The impact of ill health on people's lives and socioeconomic

circumstances is likely to be more severe among more disadvantaged social groups and thus to further contribute to processes of social stratification.

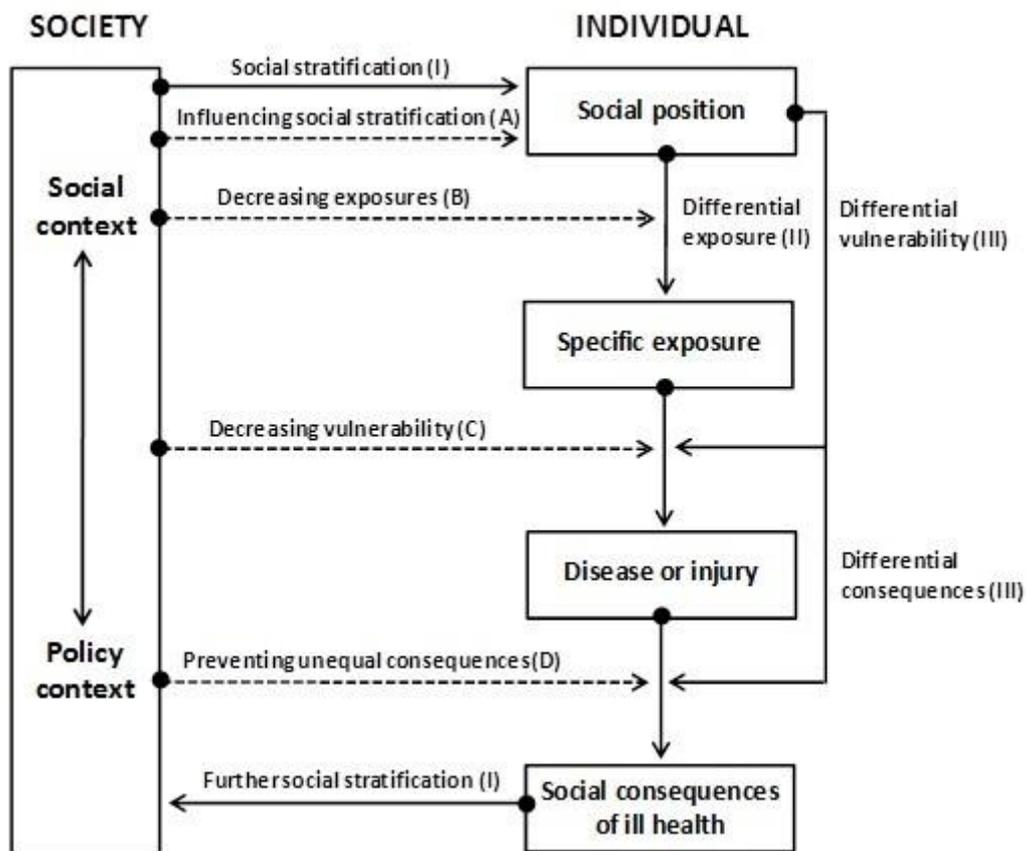


Figure 2. Diderichsen et al. model¹ illustrating the pathways from social context to health outcomes. A-D illustrating entry points for action. I-III illustrating active mechanisms.

Following from the model, a HIMS with the ambition to reflect the processes linking social circumstances to social inequalities in health requires information on a) social positions and their distribution, b) specific exposures (living conditions and health behaviours) and their social distributions, and c) health outcomes and their social distributions.

3 Health inequality monitoring: the ideal system

In this section, an outline of the core components of an “ideal” HIMS is suggested drawing on the structure of the Diderichsen et al. model¹ and earlier attempts in the literature to develop monitoring frameworks for HI. The reviewed literature is briefly accounted for in Appendix 2.

3.1 Health inequality monitoring

HI monitoring identifies where inequalities exist and where subgroups of the population stand in terms of health. When health inequalities are determined to be unjust, unfair and avoidable, they are referred to as health inequities. In more recent literature, HI monitoring is understood as a broad surveillance system in which the importance of the technical infrastructure of the systems, quality issues of the data and methods, and consistency and comparability over time and geographical areas is acknowledged. It is also often suggested that HIMS should reflect policy objectives and mirror the implementation and outcomes of actions.

HI monitoring can be described as a cyclical process divided into a number of reoccurring steps².

- Defining the objectives of the system.
- Identifying health topics and dimensions of inequality that are relevant in the population under consideration. A conceptual framework of social determinants and inequalities in health is useful to guide the identification and selection of relevant health topics, inequality dimensions and determinants. This step might also be political because it can entail consultations with diverse stakeholders that are involved with matters related to health and health determinants.
- Obtaining data about relevant health indicators and inequality dimensions from one or more data sources.
- Analysing the data. The process of analysing health data includes calculating health estimates by population subgroups and/or summary measures of inequality and analysing trends across time.
- Reporting and disseminating results so that they can be used to inform policy, the public, and stakeholders.
- Evaluating the results. Based on the results, changes might be implemented that will impact and improve health. In order to monitor the effects of these changes, more data must be

collected that describe the on-going state of health; thus, the cycle of monitoring is continual.

- Evaluating the whole system periodically to ensure that problems of public health importance are monitored efficiently and effectively and that that the system meets its purposes and objectives.

Navigating the complexities of the monitoring cycle requires a range of different skills and resources. Technical knowledge and resources to perform analyses, capacity to interpret results and communicate them effectively as well as capacity to advocate for and implement change. To meet these requirements, the HIMS ideally needs to be supported politically, legally, financially and by adequate human resources. In addition, the monitoring should be situated in robust systems and infrastructures that are run by strong national institutions. Developing this infrastructure and these resources may be a long-term ambition for some countries, while for others, existing resources may be strengthened and fine-tuned³. Yet, regardless of the current state of HI monitoring or the capacity and the resources available, each component of the monitoring cycle can be strengthened and improved². Any effort dedicated to build and maintain the knowledge, skills and capacity to conduct HIM will be beneficial for the country and for combating inequalities in health.

3.2 Data sources and data collection

A central aspect of a well-functioning HIMS is the availability of data. No data often means no recognition of the problem⁴. Simply put, monitoring HI requires two types of data: data about health and data about dimensions of inequality³. Such data can be derived from different sources, all of which have advantages and disadvantages (see Table 1 for an overview). It is important to understand the strengths and limitations of the available sources to ensure that the best available data are used. Ideally, the used data sources should be reasonably accessible, they should be regularly updated, and they should measure the same thing over time to enable time series. This is facilitated if indicators are derived from existing data registers or from data that are collected regularly⁵. The monitoring system should also provide a basis for decisions and efforts at local, regional, and national levels, hence in an ideal system data on different levels of aggregation should be available. This PFA focuses on HIM at the national level, the approach and the suggestions may however also be applied to monitor inequalities within any defined population.

The access to data differs significantly between countries, often due to differences in the existence or absence of personal identifiers and to differences in their legislative frameworks⁶. In some

countries data from different registers can be linked through the use of personal identification numbers. The Nordic countries are for instance well known for their long-term health and welfare registers and their ability to interlink all these different registers. In other countries, legal restrictions prohibit the linkage of health data. Data protection legislation is a delicate balance between protecting the right of the individuals to privacy and the interests and needs of society⁶. In some countries this balance tips more towards protecting the right of privacy than in other countries (in Germany for instance)⁶. In these types of countries, survey data might be the solution. In yet other countries there are no legal barriers that restrict the linkage of data, but time and resources to do so have not been sufficient.

Table 1. Data sources

Type of data	Examples	Advantages	Disadvantages	Improvements
Census	National population and household censuses	Data cover the entire population (or nearly so), providing accurate denominator counts for population subgroups	Contains only limited information on health. Timing of data collection is not consistent	Include individual or small-area identifiers
Vital registration system (civil registration and vital statistics system)	National birth, death, or marriage registries	Can be used to generate reliable estimates for mortality rate, life expectancy, and sometimes cause-of-death statistics. Often linked to information on sex, geographical region, occupation, and education	Incomplete in most low- and middle-income countries. Do not regularly include information on equity stratifiers other than sex	Expand coverage. Include at least one socioeconomic indicator. Include cause of death, birth weight, and gestational age (when not included)
Medical registries	Registries of cancers, dental health, asthma, diabetes, congenital defects, cardiovascular diseases, etc.	Contains information about people who have a specific disease or condition	Only covers people that have been in hospital care	Include individual or small-area identifier
Household survey	Demographic and Health Survey, World Health Survey, Study on Global Ageing and Adult Health, Living Standards Measurement Study	Data are representative for a specific population (often national). Have rich data on a specific health topic as well as living standards and other complementary variables. Often repeated over time, allowing for measurement of time trends. Conducted in multiple countries, allowing for benchmarking	Sampling and non-sampling errors can be important. Survey might not be representative of small subpopulations of interest (so cannot be used to assess cross-district inequalities)	Repeat surveys on a regular basis. Enhance comparability over time and between countries by harmonising survey questions. Increase sample sizes
Institution-based records (administrative data)	Resource records (e.g. number of hospitals, health workers). Service records (e.g. number of immunisations given). Individual records (e.g. medical charts labour and retirement registries)	Data are readily and quickly available. Can be used at lower administrative levels (e.g. district level)	Data may be fragmented or of poor quality. Often data cannot be linked to other sources. Data might not be representative of the whole population	Include individual or small-area identifiers. Create standardisation of electronic records across institutions
Surveillance system	Outbreak disease surveillance, Sentinel surveillance, Risk factor surveillance, Demographic surveillance	Can provide detailed data on a single condition or from selected sites. Sentinel surveillance site data are useful for correction of over reporting or under reporting	Not always representative of a population. Some systems might collect little information relevant to equity stratifiers	Include individual or small-area identifiers. Integrate surveillance functionality into larger health information systems with full coverage

Adapted from O'Donnell O et al. Analysing health equity using household survey data. Washington, DC, World Bank, 2008⁷

3.3 Levels of aggregation

Social stratification not only occurs between individuals, but also between geographic entities such as nations, regions, and/or local areas such as neighbourhoods, and thus data on different levels should be considered. Choosing an appropriate level of aggregation for assessing HI is crucial to the validity of the measurement but is limited by the availability of data, which are often restricted to administrative areas that might or might not be relevant for specific HI outcomes. Every effort should be made to access individual-level data as the basis of HIMS because such data give the greatest flexibility for aggregating output on an appropriate level.

There are several issues to consider when deciding which is the appropriate level of aggregation:

- The level of aggregation depends on the objectives of the HIMS – if the purpose is to monitor and compare countries, the country level is enough; if the purpose is to analyse inequalities within countries, then other area levels are necessary (such as states or provinces).
- The level of aggregation should reflect knowledge about the mechanisms driving HI. The problem then is that such mechanisms might well be operating at different levels simultaneously, e.g. ischemic heart disease might be associated with individual-level living conditions, which in turn might be influenced by residential area characteristics that are the results of decisions made at the city, state/district, or even governmental levels.
- The relevant level of aggregation is the one where political decisions are made that can impact on the distribution of the relevant specific exposures associated with the health outcomes of interest. This might well lead to different levels of aggregation depending on which exposure or health outcome is being considered.

3.4 Indicators

An indicator is a variable, or a combination of variables, selected to represent a certain wider issue or characteristic of interest. The indicator is used to measure and monitor performance of a system. Indicators of health inequalities can, for instance, be useful for comparing health outcomes and risk factors across population groups or geographic areas and for determining policy priorities. Every indicator is made up of metadata and data. The metadata contain the background information of an indicator and refer to the title, the rationale, and information about how the indicator is actually constructed (Figure 3). Publishing the metadata is essential for proper documentation and transparency in the calculation of the indicator. The metadata are different from the information that is fed into the indicator, the actual figures, which is called the data⁸.

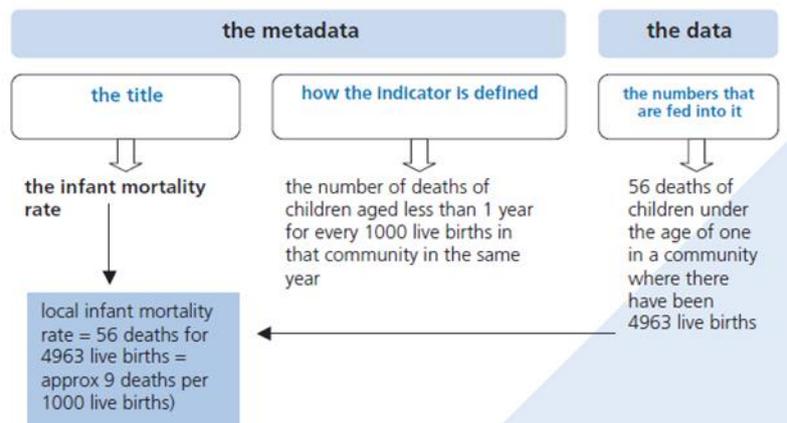


Figure 3. The structure of an indicator. Adapted from *The Good Indicator Guide*⁸.

To be able to select the most appropriate indicators and distinguish between good and bad indicators, it is essential to understand the structures of the indicators and to systematically and critically assess them. A number of quality criteria that might be helpful in this process are listed in Table 2.

Table 2. Proposed selection criteria.

Criteria	Description
Validity	The indicator measures what it is supposed to measure and measures the same thing over time.
Relevance	The indicator is relevant and addresses important dimensions of health and HI.
Sensitivity	The indicator is sensitive to changes so that it is possible, to a certain extent, to evaluate the effect of interventions.
Measurable	The indicator can be populated with meaningful data that are collected regularly.
Understandable	The indicator is easy to understand and easy to interpret.
Dimension of inequality	The indicator can be disaggregated into socioeconomic groups (i.e. education, income, gender, age, ethnicity, etc.).

No indicator will perfectly fit all criteria, but it is important that they have been considered and assessed systemically and that any compromises have been judged acceptable and made explicit⁸.

3.4.1 Health indicators

The indicators used to monitor health outcomes should reflect both general health within the population and more specific health outcomes. More general measures of health such as all-cause mortality, life expectancy, and mental wellbeing are often the result of complex causal mechanisms that are usually difficult to disentangle but nevertheless say something important about people's health and wellbeing in the population. Indicators on more specific health outcomes, in contrast, are more specific and linked to known causal mechanisms, e.g. mortality from ischemic heart disease, incidence of pulmonary cancer, low birth weight, and alcohol-related diagnoses. Again, the guiding principle should be that the chosen indicators are relevant and deemed to be important in the monitored context. The leading causes of death in the specific country could, for instance, be relevant specific health outcomes to focus upon. In addition, it might be useful to distinguish some indicators that could be also used for international reporting.

3.4.2 Indicators of social position

Ideally, the health outcomes should be possible to stratify along the most frequently used dimensions of stratification – education, income, occupational status, ethnicity, age, and gender – and at the most appropriate levels (individual, national, regional, and/or local) considering that stratification not only occurs between individuals, but also between geographical contexts. The guiding principle should be that the social indicator that is most readily available and most reliable should be chosen first. Preferably, though, education should serve as a primary stratifier because this minimizes the risk for reverse causality. To allow for international comparability, the ISCED classification of educational levels (or the ISEI index of occupational status) could be used. For children, information about parental education, income, and/or occupation should be used. For individuals out of the workforce, stay at home parents for instance; the dominant social position in the household should be used. To define social position in relation to ethnicity/migrant status or similar concepts might be especially challenging as accurate and comparable data that is collected frequently is limited and in some countries none existing. In addition, the way data is collected and the definitions that are used varies considerably between countries which creates issues regarding comparability and harmonization of data. Yet, more and better disaggregated data on ethnicity/migrant status and similar concepts has been called for as it is essential to better understand how migration affects individuals' wellbeing. At the most basic level information on whether or not a person is a migrant, i.e. foreign-born should be strived for. It is also useful to identify native-born children of migrants (often called the 'second generation', though they are not

migrants themselves). The usual criterion is that one or both of their parents were born in a foreign country. Additional data that may be useful is date of arrival of a migrant, reason for entry (type of permit, e.g. work, study or family reasons; asylum seeker; date granted asylum) and if they are European/ European Free Trade Association nationals, or 'third country nationals'.

In the literature there are usually two types of indicators of social position: those that identify certain “vulnerable groups” (e.g. the unemployed, the population at risk of poverty) and those that identify social position, often operationalised as level of education, income and/or occupational status. The former often reflect groups with a low position on the “social ladder” and thereby reflect just one end of the socioeconomic gradient. The latter group consider the spectrum, e.g. from low to high income or from low to high education. The collected indicators should ideally allow for the examination of both vulnerable groups and the gradient.

Interactions between the indicators of social position should be considered by adjusting for or stratifying along multiple dimensions simultaneously. It is well known that different dimensions of social position intersect⁹, yet they often tend to be considered separately. For instance, work on ethnicity and health and work on social determinants of health has in the past often been carried out within different frameworks. To get a thorough picture of the complexity of HI multiple effects need to be considered simultaneously. The success of such adjustments and stratifications depends on data availability, but the ambition should be to consider how age, gender, ethnicity, and/or geographical area might jointly influence the effect on health of the other indicators of social position. This could be particularly important from the policy point of view because the effect of, for instance, education on health might differ between men and women or between individuals with different ethnic backgrounds.

In addition, information on the distribution of the population across social and regional groups should be included in the HIMS because the size of the groups and changes in this distribution are important to consider when determining the impact on HI.

3.4.3 Indicators of specific exposures

The indicators of specific exposures should reflect health-relevant living conditions and behaviours. In countries with a less developed HIMS, the choice of specific exposure indicators might be empirically based either in the sense that they are data driven i.e. that it is data availability that decides which indicators can be focused on, or in the sense that the choice is based on detected needs. For the latter, the underlying idea is that when HI are detected these findings should be

scrutinized with appropriate equity lenses or preferably with health equity audit (HEA) tools¹⁰ in order to identify possible causes for the HI and possible counteractions. A HEA is a tool that allows professionals to, in a systematic way, review the detected inequalities in order to identify actions needed to reduce these. Hence, it is not until this point that “causality” issues are elaborated on and a relevant exposure indicator is decided on. Such an alarm system does not require a sophisticated infrastructure of indicators of specific exposures, and the only relevant requirement is that outcome data can be disaggregated along (to start with) one of the recognised dimension of stratification.

Alternatively, in a more developed HIMS the choice of specific exposure indicators could draw from scientific knowledge about mechanisms linking social position to health. The World Health Organization Commission on Social Determinants of Health (CSDOH) framework adapted for the European context might be useful in this process¹¹. The model is similar to the Diderichsen model¹ but illustrates more clearly specific exposures (in Figure 3 referred to as intermediary determinants) that might link social position to health. As illustrated in Figure 4 four main pathways are distinguished between, exposures related to material resources, psychosocial factors, behavioural and biological factors, and health care services.

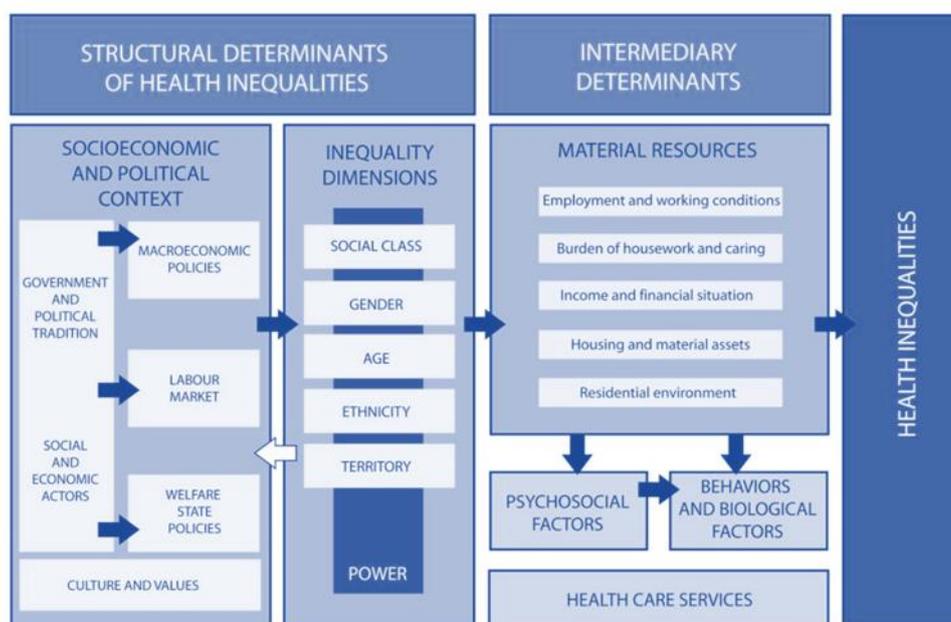


Figure 4. CSDOH framework for Europe adapted from Borrell for the Spanish Commission to Tackle Social Inequalities in Health, 2017¹¹.

The choice of indicators could also depart from policy entry points. The Swedish Commission for Equity in Health¹² lists eight such entry points over the life course, which are very similar to those suggested in British Equality and Human Rights Commission¹³ :

- Exposures associated with early life development
- Exposures associated with the educational system and school
- Exposures associated with work, working conditions, and working environment
- Exposures associated with income/economic resources
- Exposures reflecting the quality of housing and neighbourhood conditions
- Exposures associated with possibilities to practice healthy living habits
- Exposures reflecting the degree of control over life circumstances and the degree of influence and participation in society
- Exposures associated with access to and utilisation of health care, e.g. unmet needs of health care and inequalities in treatment and rehabilitation

These points could of course vary between countries, but the guiding idea is that the choice of indicators should depart from the most central entry points for actions in the specific context.

In appendix 3 are some *examples* of indicators gathered from existing international databases, structured according to the above mentioned policy entry points^{12,13}. The suggested indicators have been developed to monitor health between countries. As such, the indicators does not currently measure inequalities within countries, only in exceptional cases are they available by social position other than gender and age. Yet, given that the indicators rely on data from most European countries they might be, provided that there are data available to break them down by social position, good candidates for being integrated in nation-specific HIMS reporting routines and in existing European or global HIMS.

3.5 Data Analysis

The general recommendation from the literature is that monitoring HI requires a combination of methods because no single method will provide a thorough picture of the degree of HI. Ideally, therefore, several measures should be used in combination. It is advisable to include both a measure of relative and a measure of absolute health inequity because these types of measure are complementary and findings can depend on which type is used. Simple measures of health inequity – such as the rate ratio and rate difference – can be complemented with more complex measures

of health inequity⁴. However, rather than different ad hoc solutions, one should try to decide on a number of measures to be used to be able to illustrate short and long-term changes in HI⁵ (Table 3 for an overview). By necessity, the choice of method should be based on the data that are available.

Table 3. Measures of health inequalities

Range – how big is the gap?	Absolute and relative difference between two contrasting groups
Steepness – how steep is the gradient?	Regression-based indices that consider all groups separately, e.g. relative index of inequality or slope index of inequality
Scale – how big is the problem?	An account for the numbers involved and current trends; possibly also “total impact” indices, e.g. Population attributable fraction (PAR) and index of dissimilarity
Trends – what happens over time and in space?	Whether indicators imply a reduction or increase in HI is often a foundation for policymaking, e.g. visualized in line graphs

Adapted from the Scottish Long-term Monitoring of Health Inequalities 2017¹⁴

In addition, given that socioeconomic groups can vary considerably in their age structure it is essential, whenever possible, to use HI measures that are age-standardised or adjusted for age.

3.6 Dissemination and communication

The HIMS should be developed so that regular reporting on HI and its determinants is possible. The results should be published periodically in a communicative format that helps policy-makers and other stakeholders (including the public) understand the results of the inequality analyses². Ideally, a dissemination plan should be designed to define the dissemination objectives, the activities, the targets, and the tools to be used. In addition to the traditional means of disseminating, such as reports, seminars, and leaflets, other formats such as websites, social media, slideshows, and videos should also be considered to facilitate the communication and understanding of the results (see Marin-Gonzales et al., 2017¹⁵ for more examples). Without investment in communication skills and appropriate reporting channels the results of monitoring may not reach the target audience.

3.6.1 Stakeholders

Stakeholders might include staff from ministries of health and statistical officers, policy-makers, researchers, health-care professionals, civil society groups, nongovernmental organisations, regional officers, local governments, and the public.

3.7 Evaluation

Appropriate evaluation of the HIM is central. Policy-makers are increasingly looking to quantitative evidence in order to identify priority areas for action and to inform decision-making processes. These data serve as an important basis for identifying where inequalities exist and – when monitoring is done over time – how they change over time¹⁶. It is therefore essential that the system and its results are evaluated and that changes are implemented, indicators developed and more data collected to enable an ongoing and accurate monitoring of the state of HI¹⁷ and of outcomes of implemented actions.

4 A model for choosing actions for implementation

This chapter is supposed to provide an overview of the envisaged project process.

The aim of WP5 is to identify, attract attention to, and improve the within-country capacity to monitor HI, and the participating countries will have to put into practice their commitment to this aim through concrete activities. The choice of activities has to be based on reliable information about the current state of the HIMS, and such information will be collected as part of specific country assessments (CA). Building on the structure of the HI monitoring process (as described on page 8) information about the scope of monitoring, data availability, data analysis, reporting, evaluation and HI indicators will be collected. The results of the CAs will serve as a “baseline” for the countries from which feasible activities to improve the HIMS will be identified, comparing the current system with the “ideal” monitoring system. To ensure comparability and consistency across countries, templates will be developed and used to summarise and structure the results of the CAs.

4.1 Criteria for the selection of activities

The choice of actions will depend on the results of the mapping of the current HIMS (summarised in the CA) and the particular gaps, promising entry points, and priorities that have been identified in each country when comparing their system with the ideal system. The WP coordinator will support the partners in this process, facilitate exchange of experiences, and suggest clusters of countries with similar approaches to allow for common discussions that can help overcome difficulties that could arise. Complex actions requiring a long-term approach are out of the scope. However, some preliminary activities facilitating such complex actions can be eligible as actions implemented within the WP.

Given the diversity of existing HIMSs and access to data among participating countries, a major objective of WP5 is to reduce the gap between the current HMS and an “ideal” system. This should be done in steps. Depending on the status of the current health information system and the availability of data, a stepwise approach can entail

- conducting the mapping of the current HIMS and taking steps to promote the construction of an evidence base for the current status of the HIMS
- establishing at least one meaningful indicator of HI, possibly prioritizing HI indicators that also could be integrated in existing European or global HIMS.

- strengthening the equity perspective in current health monitoring by introducing equity stratifiers
- developing more sophisticated measures that could be used to guide policy and decision makers
- developing a system of HI information revealing trends in health outcomes and the associated risk factors and social determinants along the causal pathways

The ultimate goal should be a national monitoring of HI that comprises a broad set of data, mirroring the most relevant health outcomes in subgroups of the population and their associated risk factors and underlying social determinants, thus facilitating evaluation of health policies and supporting prioritisation. Participating countries are however encouraged to start on a small scale and to concentrate on getting well-functioning and regular HIM of a few health indicators in place before successively adding on indicators based on experiences learned, identified needs, or priorities in the public agenda of monitoring. In some countries, performing the CA and taking steps to promote the construction of an evidence base for the current status of the HIMS might be the most useful contribution JAHEE can make.

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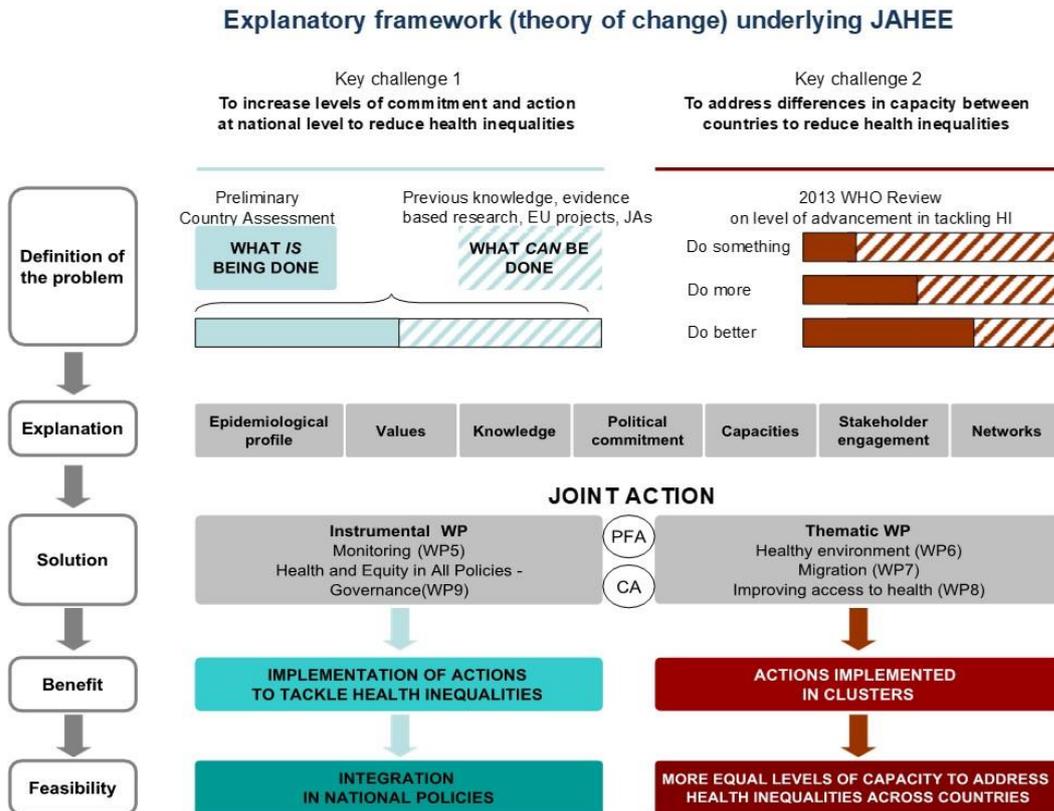
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Appendices

Appendix 1: JAHEE explanatory framework



For any further information on JAHEE <https://jahee.iss.it/>

Appendix 2: Literature review

This appendix provides a brief review of some often cited papers and reports from the beginning of 1990s and onward, accounting for the discussion on how to measure health inequalities. As such, it is limited to the more technical aspects of monitoring and is not a systematic literature review. Rather, it aims at providing the “big picture” of the discussion on the many methodological aspects of measuring HI, framing basic issues relevant within the WP5 partnership.

Wagstaff, Paci and Doorslaer (1991): On the measurement of inequalities in health

In this often cited paper the authors provide a critical review of six inequality measures often used and suggest which measures are best suited to measure inequalities in health. They discuss to what extent the following six measures meet what they argue were the minimal requirements of an inequality measure:

1. It should reflect the socioeconomic dimension to inequalities in health
2. It should reflect the experiences of the entire population rather than e.g. social class I and V
3. It should be sensitive in changes in the distribution of the population across socioeconomic groups

The six measures scrutinized were

- The range
- Gini coefficient
- Pseudo-Gini coefficient
- Index of dissimilarity
- Slope index of inequality
- Concentration index and curve

The authors conclude that only the slope index of inequality and the concentration index meet all three requirements.

Mackenbach and Kunst, 1997: Measuring the magnitude of socio-economic inequalities in health

The authors define socioeconomic inequalities in health as "differences in the occurrence of health problems between individuals of higher and lower SES" most often operationalized as level of education, occupation and/or income. Based on earlier work they suggest that a strategy to implement a successful monitoring system could include:

1. assessment of data availability;
2. collection of additional data, if necessary;
3. analysis, interpretation and presentation of the data;
4. formulating a policy response to the results, and identifying new data needs.

In their review they identify twelve different measures that might be useful:

Basic measurement technique	
<i>Index</i>	<i>Interpretation</i>
Ratio of low vs high	
<i>Extreme groups</i>	<i>Morbidity rate of lowest socio-economic group as ratio of the highest group</i>
<i>Broad groups</i>	<i>Morbidity rate of the lower broad group as ratio of the higher broad group</i>
<i>Percentile approach</i>	<i>Morbidity rate of the lowest quintile as ratio of the highest quintile</i>
Correlation and regression	
<i>Product-moment correlation</i>	<i>Correlation between morbidity rate and socio-economic status</i>
<i>Regression on SES</i>	<i>Increase in morbidity rate per one unit increase in SES</i>
<i>Regression on cumulative percentiles (Relative Index of Inequality; Slope Index of Inequality)</i>	<i>Morbidity rate ratio (RII) or differences (SII) between the least and most advantaged person</i>
<i>Regression on z-values</i>	<i>Morbidity rate difference between group with lower and higher-than-average morbidity rates (times 0.5)</i>
Gini-like coefficients	
<i>Pseudo-Gini coefficient</i>	<i>0 = no morbidity differences between groups; 1 = all ill-health is in the hands of one person</i>
<i>Concentration index</i>	<i>0 = no morbidity differences associated with SES; -1 / + 1 = all ill-health is in the hands of the least/most advantaged person</i>
Other	
<i>Population Attributable Risk (PAR)</i>	<i>% reduction in overall morbidity if all persons would have the morbidity rate of the upper group</i>
<i>Index of Dissimilarity</i>	<i>% of overall morbidity that has to be redistributed in order to yield the same rate in each group</i>

The authors conclude that the final choice should be based on technical considerations but also the specific perspective with which health disparities are to be measured. They suggest that in practice, several indicators should be used in combination.

Kunst et al. (2001): The Health Monitoring System

A task force coordinated from the Erasmus University in Rotterdam was commissioned by the EUC to suggest how socioeconomic factors could be integrated in the Health Monitoring System. In their final report, they suggested guidelines to follow socioeconomic inequalities in health between member states as well as an application of suggested measures on the EU area from 1980 and forward. They underlined the importance of a systematic approach comprising a) identification of relevant variables and data sources; b) compilation of data stratified by socioeconomic status; c) statistical elaboration and d) presentation of results.

The suggested indicators overlap the indicators suggested by Mackenbach et al as well as by Waagstaf & Doorslaer above:

		Summary index (with example of an interpretation)	
		On the 'absolute' occurrence of health problems	On the 'relative' occurrence of health problems
Indices that compare two contrasting groups	Compare extreme groups	Rate Difference e.g. the absolute difference in mortality between professionals unskilled manual workers	Rate Ratio idem, but the <i>proportional</i> mortality difference
	Compare broad groups	Rate Difference e.g. the absolute difference in mortality between non-manual and manual classes	Rate Ratio idem, but the <i>proportional</i> mortality difference
Regression-based indices that take into account all groups separately	Based on 'absolute' SES	'Absolute effect index' e.g. the absolute increase in health associated with an income increase of 1000 Euro	'Relative effect index' idem, but the <i>proportional</i> increase in health
	Based on 'relative' SES	'Slope Index of Inequality' (SII) e.g. the health difference between the top and bottom of the income hierarchy	'Relative Index of Inequality' (RII) idem, but the <i>proportional</i> health difference
"Total impact" indices that explicitly take into account population distributions	The PAR perspective (equality by levelling up)	Population Attributable Risk (PAR) e.g. the total number of cases that would be avoided in the hypothetical situation that all people would have (the rate of those with) tertiary education	PAR (%) idem, but as a <i>proportion</i> of all cases (of death, disease, etc) in the total population
	The ID perspective (equality by redistribution)	Index of Dissimilarity (ID) e.g. the total number of cases to be redistributed between groups in order to obtain the same average rate for all groups	ID (%) idem, but as a <i>proportion</i> of all cases (of death, disease, etc) in the total population

The authors conclude that, given the objectives in EU health policies, it is possible and desirable to perform a systematic compilation of data to describe the degree of HI between member states. They also recommend adding data on the social determinants stratified by socioeconomic status. They also discuss pros and cons with socioeconomic classifications and health outcomes as collected from surveys vs. registers.

World Health Report 2000

In their WHR 2000 WHO suggested an index to measure performance of health systems. The index had five components of which HI was one. The measure of HI differed in that it assessed the inequalities between individuals rather than between groups of individuals. The rationale was that by measuring inequalities between e.g. socioeconomic groups presupposes some idea a priori of what are the causes to HI and thereby expresses a normative assumption which, according to the authors, should be avoided. The advantages with inter-individual measurement are

- Individuals with worst health can be identified without having access to data on e.g. socioeconomic conditions
- Comparisons of inequalities between nations or over time is straightforward since there is no need to consider socioeconomic or demographic changes within populations.
- By separating the definition and measurement of inequalities from a priori decided causal pathways or normative positions, the inequalities per se could be researched.

This approach provoked heavy criticism. The critics meant that just measure the inter-individual differences will mask significant knowledge on possible points of action and if one wish to reduce inequalities it will be necessary to analyse and identify factors and causal pathways behind HI. The authors defended their suggestion by pointing at the lack of relevant data at the global level and stated that the lack of data will make it difficult to develop the research on HI. They said that the univariate analysis they suggested aimed at comparing HI at the global level.

Regidor 2004: Methods for measuring health inequalities

Regidor take this controversy as a starting point in his contribution and suggested that the WHO-approach makes sense when one is interested in the magnitude of inequalities within populations but if the interest is about inequalities between groups within nations it is necessary to apply a stratifying variable to the data. He therefore suggests four principally diverse types of inequality measures:

- An inequality measure “in a strict sense” – the Gini coefficient,
- Measure of association – e.g. frequencies, rates
- Measures of potential impact – e.g. population attributable risk, concentration index
- Measures based on rankings of the socioeconomic stratifier – slope index of inequality, relative index of inequality

The overlap is considerable between Regidor, Mackenbach and Kunst.

Long – Term Monitoring of Health Inequalities (Scotland).

The Scottish Government decided in 2008 to develop set of indicators together with appropriate methods to compile the data. The taskforce suggested to pick out a small number of relevant and major indicators on health inequalities, headline indicators:

- Healthy Life Expectancy (HLE)
- Premature Mortality (under 75 years)
- Mental Wellbeing of Adults (aged 16+)

The taskforce also suggests indicators on morbidity and mortality from specific causes:

- Coronary Heart Disease - first ever hospital admission for heart attack aged under 75 years
- Coronary Heart Disease (CHD) Mortality - deaths aged 45-74 years
- Cancer - incidence rate aged under 75 years
- Cancer- deaths aged 45-74 years
- Alcohol - first hospital admission aged under 75 years
- Alcohol - deaths aged 45-74 years
- Premature Mortality (aged 15-44 years)
- Low Birthweight
- Healthy Birthweight

The taskforce also recommended to apply a combination of methods for the compilation of data. Since there was no information at individual level an area-based index was used (SIMD Scottish Index of Multiple Deprivation) as the unit of analysis. The suggested methods were

- Relative index of inequality – answers the question “How steep is the inequality gradient?”.
- Absolute difference – answers the question “How large is the distance?”.
- Scale – answers the question “How big is the problem?”

WHO Commission on the Social Determinants for Health

In their final report the WHO Commission on the Social Determinants for Health suggest that HI monitoring would present data stratified by social groups within countries and include measures of inequity in health and determinants between these groups. The commission suggests a thorough list of indicators but that such a surveillance system can be built progressively. However, the commission suggest ensuring at least the availability of basic mortality and morbidity data stratified by socioeconomic group and by regions within countries, a “minimum health equity surveillance system”, including:

- Improve routine health statistics to follow health and mortality trends separately for men and women and for different social strata, using nationally representative data;
- Where reliant on surveys, improve representativeness while also addressing the problem of missing data for vulnerable groups
 - Statistical power – sufficient to disaggregate the majority of health outcomes and determinants for relevant social strata and to monitor time trends in health inequality;
 - Data quality and methods – reliability, validity, sample and estimation methods, statistical techniques;
 - Consistency/comparability of data collection – to allow for comparisons over time and across geographical areas
 - Geo-referencing – to facilitate data linking;
 - Frequency with which surveys are conducted – ideally at least every five years;

The commission suggests that data on the most important social determinants of health should be collected and analysed together with health data and that the surveillance system should comprise data on a range of social determinants along the causal pathway, from daily living conditions to more structural drivers of HI, allowing for time-trends on SDH.

The methods suggested by the commission comprise relative and absolute measures since these are complementary. It also recommends using both simple measures and more complex while being aware that the latter might be difficult to communicate to a lay target group.

BOX 16.3: TOWARDS A COMPREHENSIVE NATIONAL HEALTH EQUITY SURVEILLANCE FRAMEWORK

HEALTH INEQUITIES

Include information on:

health outcomes stratified by:

- sex
- at least two socioeconomic stratifiers (education, income/wealth, occupational class);
- ethnic group/race/indigeneity;
- other contextually relevant social stratifiers;
- place of residence (rural/urban and province or other relevant geographical unit);

the distribution of the population across the sub-groups;

a summary measure of relative health inequity: measures include the rate ratio, the relative index of inequality, the relative version of the population attributable risk, and the concentration index;

a summary measure of absolute health inequity: measures include the rate difference, the slope index of inequality, and the population attributable risk.

HEALTH OUTCOMES

mortality (all cause, cause specific, age specific);

ECD;

mental health;

morbidity and disability;

self-assessed physical and mental health;

cause-specific outcomes.

DETERMINANTS, WHERE APPLICABLE INCLUDING STRATIFIED DATA

Daily living conditions

health behaviours:

- smoking;
- alcohol;
- physical activity;
- diet and nutrition;

physical and social environment:

- water and sanitation;
- housing conditions;
- infrastructure, transport, and urban design;
- air quality;
- social capital;

working conditions:

- material working hazards;
- stress;

health care:

- coverage;
- health-care system infrastructure;

social protection:

- coverage;
- generosity.

Structural drivers of health inequity:

gender:

- norms and values;
- economic participation;
- sexual and reproductive health;

social inequities:

- social exclusion;
- income and wealth distribution;
- education;

sociopolitical context:

- civil rights;
- employment conditions;
- governance and public spending priorities;
- macroeconomic conditions.

CONSEQUENCES OF ILL-HEALTH

economic consequences;

social consequences.

Expert review and proposals for measurement of health inequalities in the European Union

In a review published by DG SANCO 2011 the authors compiled and analysed data on how HI was distributed between MS and NUTS2 regions. They analysed both inter-individual inequalities and between-group inequalities.

The analysis comprised two parts: one with “objective” outcomes, i.e. measures related to mortality statistics, and one based on “subjective” data, i.e. measures related to self-reported information.

They grouped results in three groups: “simple” indicators, which are easy to understand and communicate, “regression based” indicators, and “more advanced” indicators.

The simple indicators

- Absolute and relative frequency measures,
- The odds ratio
- The range
- The range ratio, the rate between the highest decile (e.g. income) and the lowest; cf inter quintile ratios etc.
- Index of dissimilarity

The regression based indicators

These measures relate health outcomes to socioeconomic position categorised along an ordinal scale

- Slope index of inequality
- Relative index of inequality

More advanced indicators

- Departure from the mean and variance measures
- The coefficient of variation – the standard deviation divided by the mean of the distribution
- The log variance
- The Gini coefficient
- The Robin Hood-index – the maximum vertical departure from the “line of equality” to the Lorenz-curve; measures how much of the distribution that need to be redistributed to achieve perfect equality.
- The concentration curve

The authors also account for several measures that involve some aspect of ethical considerations of societal distribution, such as Atkinson’s index.

This review thus contains a few indicators but hardly any new as compared to earlier reviews, apart from those which contain ethical considerations.

Fair Society Healthy Lives

The English review of HI underlined the importance of measuring both the scale of inequalities and the change over time. Chosen indicators should be integrated in routine statistics, be comparable between different parts of UK and internationally, especially between high income countries.

The suggested measures were

- The range
- Relative difference
- Slope Index of Inequality (SII)

- Relative index of Inequality (RII)
- Concentration Index
- Population Attributable Risk

These are much the same as in earlier reports and reviews. The report also discussed appropriate levels of aggregation to meet problems of heterogeneity within areas. The authors suggested to use information from smaller geographical areas assuming larger socioeconomic homogeneity within those but also noted that this approach also run the risk of the small N problem.

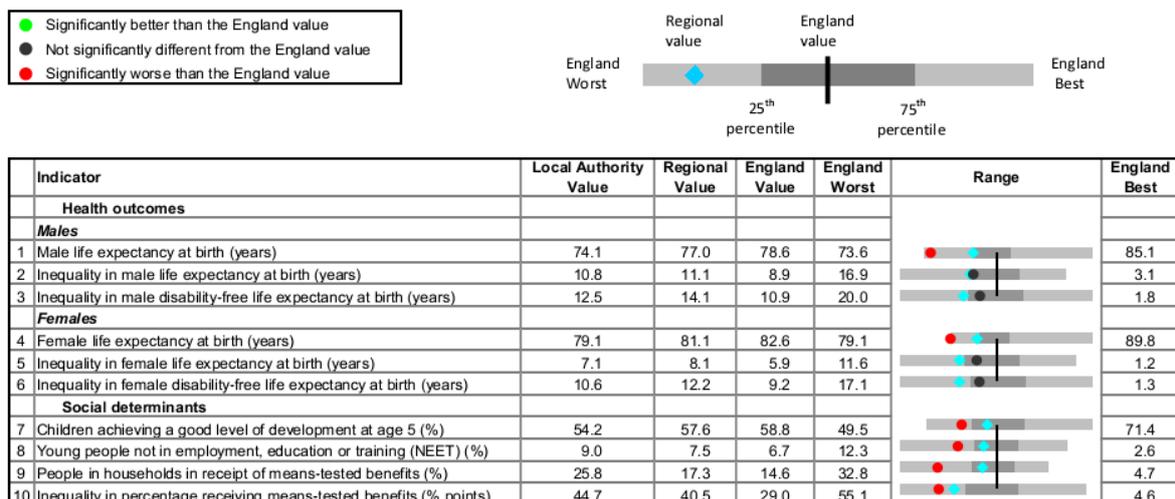
Following these ideas, the London Health Observatory and the UCL presented a number of indicators reflecting major social determinants for health. In 2012 the following indicators were included in a monitoring system:

- Life expectancy for men and women
- Slope Index of Inequality for life expectancy for men and women
- Slope Index of Inequality for disability free life expectancy (healthy life years)
- Children with good development at age 5
- Young adults not in education, employment nor training
- Individuals in households receiving social allowances
- Slope index of Inequality for individuals receiving social allowances

The results were presented per Local Authority, thus giving a cross sectional view on how a specific area compared to the regional and English results, see below.

Marmot Indicators for Local Authorities in England, 2012 - Manchester

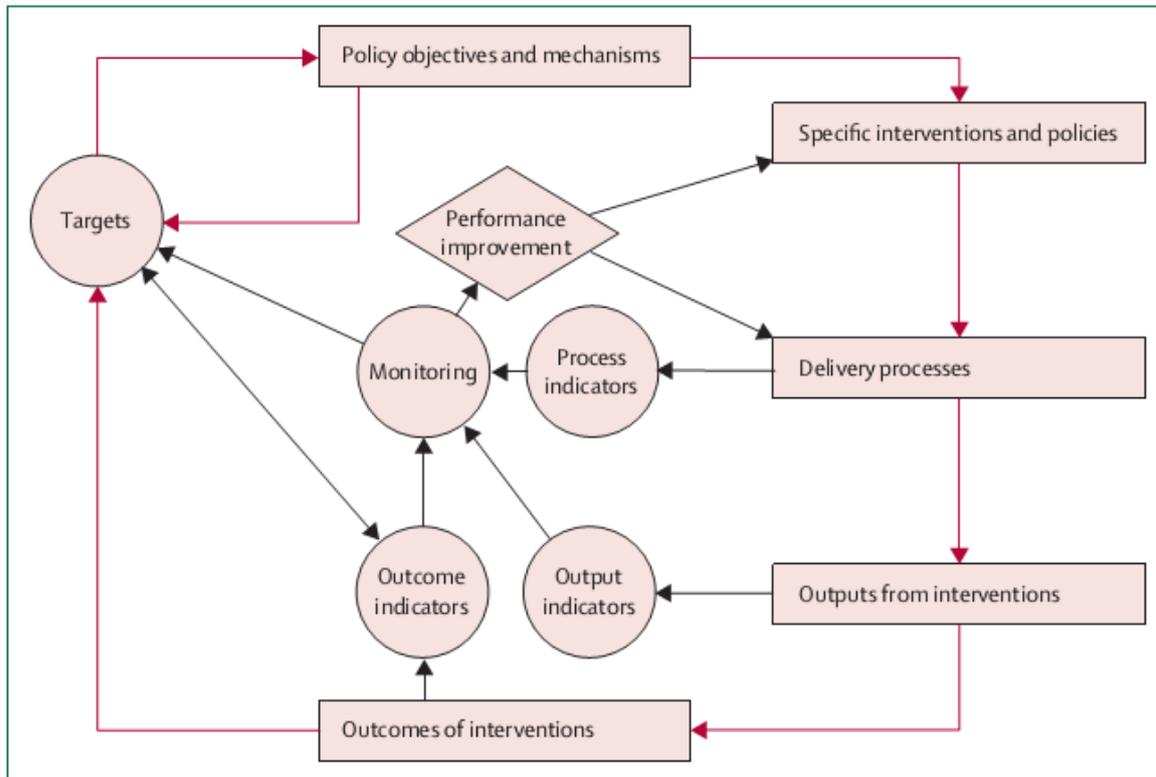
The chart below shows key indicators of the social determinants of health, health outcomes and social inequality that correspond, as closely as is currently possible, to the indicators proposed in Fair Society, Healthy Lives. Results for each indicator for this local authority are shown below. On the chart, the value for this local authority is shown as a circle, against the range of results for England, shown as a bar.



WHO European review of social determinants of health and the health divide

In the WHO European review from 2013 the authors recommended to design a HI monitoring system to support policymakers in their defining health policies and support to evaluations of such policies. It is important that the HI monitoring system measure the distribution of health outcomes and the social determinants in the entire population to reflect the social gradient.

The report did not identify specific indicators but focused on central components in such a system.



The authors suggest that the HI monitoring system should reflect objectives and to what degree they are achieved. It should also mirror the implementation and outcomes from actions taken to achieve the objectives (to the right in the figure).

This approach implies that the HI monitoring system is a system to help *evaluate* interventions to reduce HI and include also process and output/outcome indicators.

World health statistics 2016

One cornerstone of this Joint Action on Health Inequalities is the link to Agenda 2030. The Agenda has major implications for health monitoring. In the report WHO brings together the health-related SDG-indicators. There is one comprehensive health goal – SDG 3: Ensure healthy lives and promote well-being for all at all ages. SDG 3 includes 13 targets and 26 proposed indicators covering major health priorities.

The report also discusses issues with data availability and the need for access to disaggregated data to enable measuring HI.

Table 6.6
Summary of the availability and degree of disaggregation of country data on proposed health and selected health-related SDG indicators^a

Indicator topic	Country data availability	Disaggregation	Comparable estimates	Source estimates	
3.1.1	Maternal mortality	Fair	Poor	Annual	UN MMEIG
3.1.2	Skilled birth attendance	Good	Fair	In preparation	UNICEF, WHO
3.2.1	Under-five mortality rate	Good	Fair	Annual	UN IGME
3.2.2	Neonatal mortality rate	Good	Fair	Annual	UN IGME
3.3.1	HIV incidence	Fair	Fair	Annual	UNAIDS, WHO
3.3.2	Tuberculosis incidence	Fair	Poor	Annual	WHO
3.3.3	Malaria incidence	Fair	Fair	Annual	WHO
3.3.4	Hepatitis B incidence	Poor	Poor	In preparation	WHO
3.3.5	People requiring interventions against NTDs	Good	Poor	Annual	WHO
3.4.1	Mortality due to NCDs	Fair	Poor	Every 2–3 years	WHO
3.4.2	Suicide mortality rate	Fair	Poor	Every 2–3 years	WHO
3.5.1	Treatment substance use disorders	Poor	Poor	Not available	UNODC, WHO
3.5.2	Harmful use of alcohol	Good	Fair	Annual	WHO
3.6.1	Road traffic injury deaths	Good	Poor	Every 2–3 years	WHO
3.7.1	Family planning	Fair	Fair	Annual	UN Population Division
3.7.2	Adolescent birth rate	Good	Fair	Annual	UN Population Division
3.8.1	Coverage index UHC	Fair	Poor	In preparation	WHO, World Bank
3.8.2	Financial protection	Poor	Poor	In preparation	WHO, World Bank
3.9.1	Mortality due to air pollution	Fair	Poor	Every 2–3 years	WHO
3.9.2	Mortality due to WASH	Fair	Poor	Every 2–3 years	WHO
3.9.3	Mortality due unintentional poisoning	Fair	Poor	Every 2–3 years	WHO
3.a.1	Tobacco use	Good	Fair	Every 2–3 years	WHO
3.b.1	Access to medicines and vaccines	Poor	Poor	Not available	WHO
3.b.2	ODA for medical research	Good	Not applicable	In preparation	OECD, WHO
3.c.1	Health workers	Fair	Poor	Not available	WHO
3.d.1	IHR capacity and emergency preparedness	Good	Not applicable	Not applicable	WHO
2.2.1	Stunting among children	Good	Good	Annual	UNICEF, WHO, World Bank
2.2.2	Wasting and overweight among children	Fair	Fair	Annual	UNICEF, WHO, World Bank
6.1.1	Drinking-water services	Good	Good	Every 2–3 years	UNICEF, WHO
6.2.1	Sanitation services	Good	Good	Every 2–3 years	UNICEF, WHO
7.1.1	Clean household energy	Good	Good	Every 2–3 years	WHO
11.6.1	Air pollution	Good	Good	Annual	WHO
13.1.1	Mortality due to disasters	Good	Poor	Every 2–3 years	UNISDR, WHO
16.1.1	Homicide	Fair	Poor	Every 2–3 years	UNODC, WHO
16.1.2	Mortality due to conflicts	Fair	Poor	Every 2–3 years	OCHCR, WHO

^a Country data availability and disaggregation were assessed based on the data available to WHO or other international agencies producing estimates for global monitoring. An indicator is classified as having "good" data availability/disaggregation if data were available for more than 75% of countries where the indicator is relevant (2010 or later); "fair" if data were available for 40–74% of countries; and "poor" if data were available for less than 40% of countries.

The Danish review 2012

Diderichsen et al presented 2012 a national review of HI in Denmark which included a thorough discussion on theories on health inequalities, mechanisms and links between structural and proximal SDH and health outcomes.

Based on the review the authors identified 12 determinants for health and suggested an extensive and detailed list on indicators linked to the determinants.

The Swedish commission 2017

The final report from the Swedish Commission for Equity in Health (SOU 2017:47, [summary report in English](#)) identifies the steps necessary to ensure that long-term and sustainable efforts for good and equitable health can continue.

One of the issues related to governance and follow-up is about how to strengthen knowledge-based efforts to follow-up, evaluate, stimulate research, on measures taken to reduce HI, one of which is to develop monitoring systems. One of the background reports to the commission (available only in Swedish), written by prof. Denny Vågerö, discusses HI monitoring and suggests some core characteristics of appropriate indicators. It underlines the importance of the system to inform policy making on international, national and subnational levels. It also points to the potential of a HI-monitoring system to contribute to a democratic development by providing an evidence base to the civic society and other agents aiming to reduce unfairness.

The report underline that it is important to agree on a common way of measuring HI and suggests a measure that is established and summarize differences between all relevant groups rather than the extremes. The example suggested in the report is Shkolnikov's index (Shkolnikov et al (2012). Increasing absolute mortality disparities by education in Finland, Norway and Sweden, 1971–2000. *Journal of Epidemiology and Community Health*, 66(4), 372–378).

Appendix 3: Indicator list

Domain	Abbreviated indicator name	Indicator name	Source ¹
A. Indicators which reflect general health within the population			
	Adult mortality rate between 15 and 60 years of age	Adult mortality rate (probability of dying between 15 and 60 years of age per 1000 population)	WHO page 22
	Premature mortality	Age-standardized premature mortality rate in people aged 30–69 years for four major noncommunicable diseases: cardiovascular diseases, cancer, diabetes mellitus and chronic respiratory diseases	H2020_34+35
	Life expectancy	life expectancy from birth and from age 30	WHO page 20
	Infant mortality	Under-five mortality rate (probability of dying by age 5 per 1000 live births)	WHO page 23
	Healthy life years	Number of years that a person is expected to continue to live in a healthy condition as derived from birth	ECHI 40
	Depression: self-reported prevalence	The proportion of people aged 15+ who reported having had depression in the past 12 months.	ECHI 23
	Self-reported general health	Proportion of persons who assess their health to be (very) good	ECHI 33
B. Indicators on health outcomes which are more specific and linked to known causal mechanisms			
	CHD - incidence of myocardial infarction	Coronary Heart Disease: incidence of first ever hospital admission for heart attack (aged under 75 years)	ECHI 24
	CHD - mortality	Coronary Heart Disease: deaths due to coronary heart disease per 100 000 persons (aged 0-64 years)	HFA-DB
	Cancer - incidence	Cancer incidence rate, by type of cancer (per 100 000 population)	WHO page 53
	Alcohol related mortality	Alcohol-related deaths per 100 000 persons (aged 45-74 years)	ECHI 16
	Suicide rate [SDG 3.4.2]	Suicide rate (per 100 000 population)	WHO page 35
	Injuries	Frequency of admission for injuries involving children, traffic injuries and falls per 100 000 persons	ECHI 29-31

Domain	Abbreviated indicator name	Indicator name	Source ¹
C. Specific exposures - Social determinants for health			
<i>Exposures associated with early life development</i>	Low birthweight	Incidence of low birthweight per 1000 newborn	WHO page 58, ECHI 28
	NEETS	Young people neither in employment nor in education and training (15-24 years) - % of the total population in the same age group (tipslm90)	Eurostat
	Childhood obesity	Children aged under 5 years who are overweight	WHO page 61 (barn < 5 år)
<i>Exposures associated with the educational system and school</i>	Early leavers from education	Early leavers from education and training by sex and labour status [edat_lfse_14]	Eurostat
<i>Exposures associated with income/economic resources</i>	Poverty	People at risk of poverty or social exclusion (t2020_50)	Eurostat
	Children at risk of poverty	At risk of poverty rate among 0-17 years of age.	Eurostat
<i>Exposures reflecting the degree of control over life circumstances and the degree of influence and participation in society</i>	Unemployment	Unemployment by sex and age - annual average	Eurostat
	Overall perceived social support	Persons who have someone to ask for help by sex, age and educational attainment level (ilc_scp15)	Eurostat
	Participation in volunteer activities	Participation in formal or informal voluntary activities or active citizenship by sex, age and educational attainment level (ilc_scp19)	Eurostat
	Trust (in people, in system)	Average rating of trust by domain, sex, age and educational attainment level (ilc_pw03)	Eurostat
	Family contact	Frequency of contacts with family and relatives or friends by sex, age and educational attainment level (ilc_scp11)	Eurostat
	Democratic participation	Proportion of voters in general elections among those eligible to vote	?
<i>Exposures reflecting the quality of housing and neighbourhood conditions</i>	Air quality	Pollution, grime or other environmental problems	Eurostat

Domain	Abbreviated indicator name	Indicator name	Source ¹
<i>Exposures associated with work, working conditions, and working environment</i>	Work related health risks	Percentage of employees who think that their health or safety is at risk because of their work	ECHI 53
	Accidents at work	Frequency of fatal and non-fatal occupational injuries	Eurostat
<i>Exposures associated with possibilities to practice healthy living habits</i>	Tobacco use among persons aged 15+ years (SDG 3.a.1)	Age-standardized prevalence of current tobacco use among persons aged 15+ years. Including smoked tobacco, "smokeless" tobacco and other tobacco products consumed by sniffing or chewing. "Current use" means use at the time of the survey, whether daily use or occasional use.	WHO page 70
	Total alcohol per capita (age 15+ years) consumption [SDG 3.5.2]	Total alcohol per capita (age 15+ years) consumption	WHO page 69
	Insufficient physical activity in adults (Also: adolescents)	Age-standardized prevalence of insufficiently physically active persons aged 18+ years	WHO page 75

Domain	Abbreviated indicator name	Indicator name	Source ¹
<i>Exposures associated with access to and utilisation of health care, e.g. unmet needs of health care and inequalities in treatment and rehabilitation</i>	Unmet needs for medical examination	Self-reported unmet needs for health care by sex, age, specific reasons and educational attainment level (hlth_ehis_un1e)	Eurostat
	Outpatient service utilization (Also: inpatient admissions and surgical volume)	Outpatient service utilization	WHO page 123

¹ Information on datasources

Abbreviation	Title	Website
Eurostat	European Core Health Indicators	https://ec.europa.eu/eurostat/data/database
H2020	Health 2020 indicators	https://gateway.euro.who.int/en/datasets/health-2020-indicators/
HFA-DB	European Health for All database	https://gateway.euro.who.int/en/datasets/european-health-for-all-database/
WHO	2018 Global Reference List of 100 Core Health Indicators (plus health-related SDGs)	http://apps.who.int/iris/bitstream/handle/10665/259951/WHO-HIS-IER-GPM-2018.1-eng.pdf;jsessionid=AFBD7AD1724FF93C7263946E47295BD4?sequence=1