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D1.3 Scale to assess uptake of an HiAP approach in cities

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List of acronyms

ACRONYM	MEANING
CoP	Community of Practice
ECHI	European Health Indicators
HIA	Health Impact Assessment
HII	Health Impact indicators
HiAP	Health in All Policies
MM-HiAP	HiAP Maturity Model
UN-HABITAT	United Nations Human Settlements Programme
WHO	World health Organisation

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1. EXECUTIVE SUMMARY

The present document (Deliverable 1.3) defines the current plan adopted to carry out Task 1.7. This task will develop a comprehensive scale to measure the degree of acceptance and use of a Health in All Policies, (hereinafter, HiAP), approach in urban environments.

HiAP actions applied during the PULSE project will be focused on implementing a HiAP **Community of Practice** (CoP) within each urban site and a HiAP **Learning Platform** to integrate the CoPs across the five urban sites. Therefore, a result for this first task will establish the basis in which this future task will evolve by the time that it constitutes a valuable tool for measuring increase in acceptance and penetration of the HiAP approach in our urban test beds. This action will be followed by an increase in the level of dialogue and engagement via CoPs; new integrated policy measures addressing local needs and concerns; spread of knowledge and collaboration within the PULSE test bed ecosystem.

In section 2, we will discuss the concept of HiAP, its role in modern society and the lines of action that will be undertaken in the project.

In section 0, we will analyse existing models to establish the level of maturity of HiAP in cities. The scale presented will be an improvement on the HiAP Maturity Model (MM-HiAP), consequently, this section presents a deeper look into this model. From these studies, indicators and codes of best practices have been extracted that will be applied to the PULSE Maturity Scale-HiAP (PMS-HiAP).

Finally, we will present PMS-HiAP as an objective tool for the assessment of HiAP in cities, which is to be applied to the PULSE testbed cities. Using this tool, rankings could be generated to understand the development of HiAP policy-making across the domains of health, environment, transport and planning. A description of the procedures and guidelines for the correct implementation of the scale will be covered in this section.

2. INTRODUCTION

The concept of public health involves different fields of action. Far from its original concept, which was closely linked to the medical field, public health encompasses multiple actors and scenarios. A recent definition of modern public health could be taken from (Detels, Beaglehole, Lansang, & Gulliford, 2009):

“Public Health is the process of mobilising and engaging local, state, national and international resources to ensure the conditions in which people can be healthy. The actions that should be taken and determined by the nature and magnitude of the problems affecting the health of the community. What can be done will be determined by scientific knowledge and the resources available. What is done will be determined by the social and political situation existing at the particular time and place.”

Health is influenced by how and where people live, work, move or enjoy their leisure. The most significant factors that affect people's health are social, cultural, economic and environmental, which creates a complex scenario that implicates multiple actors. According to Urbanos (2010), health strategy in all policies requires structural changes in the organization of institutions. Written during the economic recession, Urbanos maintained that such a deep crisis offered excellent opportunities to push for the necessary changes. As the economy recovers, winds of change have mobilized institutions and agencies, but we are in need of useful tools to measure trends the level of maturity of these policies.

We can venture that the changes that have occurred since the last decade have followed a positive trend, but, we are in need of useful tools to measure the level of maturity of this policies (Hendriks et al., 2014). It is necessary to understand the phenomenon as a whole and be prepared to assess HiAP (World Health Organization, Finland, Sosiaali- ja terveystieteiden ministeriö, & Global Conference on Health Promotion, 2014) defined the following key tasks for assessing readiness to act and continually improve HiAP. Professionals and institution must be able to:

- Establish requirements for HiAP
- Understand the interest and issues of the parties
- Make use of the structures available for a sustainable dialog
- Analyse and aware of health impact of current actions
- Negotiate policy changes
- Engage community
- Reflect on processes, relationships and lessons learned.

Nowadays, evolving conversations around the health in modern cities have identified multiple risk factors and necessary improvements in the urban environment. The problem has been set out in different working groups, defined sustainable development objectives (WHO) and even declared a goal of social justice encompassed in human rights from the latest United Nations initiative, UN-HABITAT 3, after the last Agreement of Paris. But there is still too much uncertainty around the current impact of a poor urban environment in developed countries. As an example, a recent study estimated that near 20% of mortality may be premature because of the poor urban management and pollution in the city of Barcelona (Mueller et al., 2016).

The PULSE project presents a novel approach as it will make use of Big Data analysis technologies and a wide repertoire of sources of information of different nature to generate models and scales of measure of maturity of the implantation of sanitary policies at the same time that will serve for the diffusion and

characterization of local problems. Smart cities demand tools of this nature to ensure sustainable development while providing means in which interaction with citizens can provide a collective benefit.

This deliverable aims at describing the consecution of a HiAP scale useful to assess the impact and level of maturity of this policies in PULSE pilot sites. The necessity of a maturity scale has been widely demanded by several studies (Duhl, Sanchez, Organization, & others, 1999; Hendriks et al., 2014; Kickbusch, Buckett, South Australia, Department of Health, & Health in All Policies Unit, 2010; Leppo, 2013; Mueller et al., 2016; Storm, den Hertog, Oers, & Schuit, 2016; Storm, Harting, Stronks, & Schuit, 2014; Taylor & Quigley, 2002; Urbanos, 2010; World Health Organization et al., 2014) .

3. HEALTH IN ALL POLICIES FRAMEWORK

HiAP was defined in the context of the 8th Global Conference on Health Promotion as “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. It improves accountability of policymakers for health impacts at all levels of policy-making. It includes an emphasis on the consequences of public policies on health systems, determinants of health and well-being.”

One of the objectives of PULSE project is the development of a Health in All Policies perspective, and a ‘whole-of-city’ model. To achieve this, the project plans to integrate and analyze data across sectors (e.g., health, environment, transportation) in each city

There are currently several approaches to adopt these strategies and our test beds cities have already adopted some of them.

In this deliverable, we present an analysis of the different HiAP approaches, together with the status of our test beds cities. Based on this, we have developed a scale (based on the existing HiAP Maturity Model) that will allow us to measure the degree of acceptance and use of a HiAP approach in urban environments at the end of the project.

Another important issue around HiAP is the proper definition of what does it mean inter-sectorial collaboration. Some authors have indicated the necessity of a concise definition of this concept (Storm et al., 2014). As mentioned in (Hernandez Aguado et al., 2010), the inter-sectoral actions initiated in some European governance areas has produced an efficient and sustainable action which enables the development of synergies and the achievement of inter-sectoral co-benefits that may enhance equity in health and the welfare of citizens.

The inter-sectoral collaboration is defined as (Rudolph, Caplan, Mitchell, Ben-Moshe, & Dillon, 2013):

“Incorporating health and health equity into decision making across sectors requires intersectoral collaboration as well as changes in government organization structures and processes, in order to clarify, support, and advance the achievement of the priority goals of diverse stakeholders in and out of government”.

4. HEALTH IN ALL POLICIES APPROACHES

Many strategies have been followed in order to implement HiAP approaches. In parallel with these approaches, a number of metrics have naturally emerged to evaluate the effectiveness of these actions. Some of the questions that these models tried to answer are:

- How can be extracted general trends in terms to evaluate in a long term the effectiveness of the approach?
- How can be measure the attitude and changes of the policy makers towards HiAP?
- Are these actions cost effective?

4.1. Health Impact Indicators

Impact indicators has been demonstrate useful unless further development and integration is required (Corburn & Cohen, 2012).

Health Impact indicators (HIIs) are a set of statistics-based indices that assess the extent to which health-oriented policies have been adopted in a given environment. This includes I and II stages of maturity, recognised and considered HiAP set up can be inferred from these indicators. Even though some authors manifest that these rosy looking effect of socio-economic inequality within urban areas can be over seen in health stats (Rydin et al., 2012). The effect of socio-economic inequality on health within urban areas can be captured by HIIs.

Within HIIs, Health Impact Assessment (HIA) is intended to produce a set of evidence-based recommendations to assist decision-makers in maximising the positive health impacts and minimising the negative health impacts of proposed policies, programs or projects (Taylor & Quigley, 2002).

The main objective of HIA is to apply existing knowledge and evidence about health impacts, to specific social and community contexts and to develop evidence-based recommendations that inform decision-making in order to protect and improve community health and wellbeing,('Health Impact Assessment').

The procedures of HIA are similar to those used in other forms of impact assessment, such as environmental impact assessment or social impact assessment.

As an example of HIA, the European Health Indicators (ECHI), formerly known as European Community Health Indicators, are the result of long-term cooperation between EU Member States and the European Commission. Three ECHI projects (1998-2001, 2001-2004, 2005-2008), funded by EU health programs, established the first ECHI indicator lists with the aim of creating a comparable health information and knowledge system to monitor Health at the EU level ('European Core Health Indicators (ECHI) - Public Health - European Commission').

In collaboration with the World Health Organization (WHO), the European Commission has selected a list of 88 ECHIs. These indicators are sets of data (tables, graphs, maps) on health status, determinants and care in some European countries. Within these indicators, there are 15 clearly defined HiAP indicators which have been included in our Development Key Indicator list, see section 6.

HIAs do not generally involve new research or the generation of original scientific knowledge due to financial and time constraints. On the other hand, it is important to highlight that applying HIAs outcomes,

as a result from monitor and evaluate policies and trends in HiAs can influence other HiAs in contexts that are similar. An HiAs' recommendations may focus on both design and operational aspects of a proposal.('Health Impact Assessment')

HiAs has also been seen as a mechanism by which potential health inequalities can be identified and addressed prior to the implementation of proposed policy, program or project (Acheson & Great Britain, 1998).

4.2. HiAP Maturity Model (MM-HiAP).

PULSE will work to bring the HiAP approach into alignment with complex, multidimensional analysis of the socio-geographic distribution of risk and resilience (as defined above) in our test bed cities.

MM-HiAP was proposed by Storm et al. as a feasible method for measuring stages of HiAP (Storm et al., 2014). The process described will be followed in the PULSE project approach which will extend the methodology and throughputs to include other actors involved in the complex reality of HiAP.

The methodology described 14 key indicators, already included in Development Key Indicators(DKIs) presented in section 6. The original model has been focused on the different policy sectors and focuses mainly on determining the level of inter-sectoral collaboration. The methodology is based on classical data collection via interviews, bibliographic review and questionnaires as shown in annex I. From this evaluation it can be determine 5 stages of maturity:

- **Stage I, unrecognised;** no attention to a particular problem (within HiAP). The problem is not recognised.
- **Stage II, recognised;** policy makers recognise the problematic and have identify which activities could alleviate it.
- **Stage III, considered;** first actions has been taken and initial contact between health and non-health collaborators has been established.
- **Stage IV, implemented;** there exist collaboration agreements with non-health sectors and HiAP investments in several areas (not only in isolated problems).
- **Stage V, integrated;** the HiAP have introduced visible milestones and a quality control process to assess those goals.
- **Stage VI, institutionalised;** if exist a systematic improvement of the HiAP quality control.

Even this model has been selected as a good approach for determining the maturity status of HiAP. There exists some few withdraws recognised by the authors, which PULSE approach will try to overcome. The methodology relies on the interpretation of the key characteristics or strategies, even when the authors trusted in a second opinion strategy to reach and objective grade, there exist the possibility that some of these key characteristics were interpreted differently by policy makers, some white notes to unify terminologies and frameworks regarding HiAP could help in that end since some terms such as "collaboration" can be freely interpreted. Some other withdraws of the methodology are: the requirement of a more extensive data collection, better identification of the policy makers, apply the methodology to other wicked problems (apart from health inequities) and a more precise definition of the stages.

Based on these considerations PULSE HiAP scale has been defined.

5. PULSE HiAP SCALE

The main improvement of the proposed model is that it incorporates data collected directly from citizens, which allows us to define not only the level of intra-class maturity but also interclass divergences that are indicative of societies **perceived Information** as a result of integration of local policies and citizen participation.

Indicators have been proof effective and necessary for capturing the social determinants of health and promote greater urban health equity, but universal set of indicators may be less useful than context specific to capture the social reality of a city (Corburn & Cohen, 2012). For that reason it has been developed an identified an adaptive methodology that will be applied individually within each pilot site.

Methodology

As commented, the PULSE HiAP Scale will be based on previous maturity models and will mainly follow a hybrid architecture similar to the schema for Maturity Models proposed by (Domingues, Sampaio, & Arezes, 2016), the advantages from a hybrid strategy leads in a wider view of a complex phenomena and allows individual and multi factorial comparative analysis.

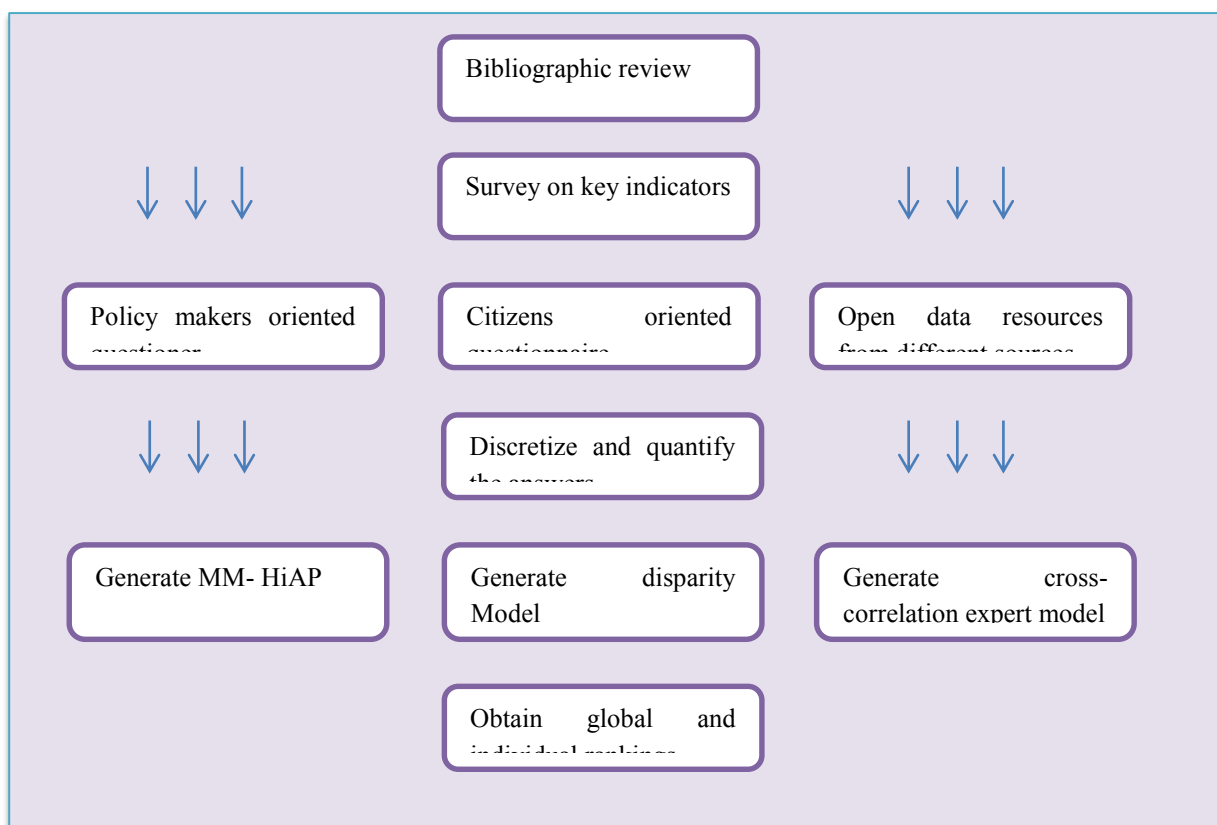


Figure 1. Methodology schema.

The PULSE test bed cities ecosystem is composed by 5 cities with underserved neighbourhoods. Test beds could be categorised by population in three different categories: 1 metacity (population over 20M people),

1 megacity (population between 10M and 20M people) and, 3 cities (population between 10K and 10M), according to the most recent UN estimations and city censuses, see Table 1.

Table 1. Population in test bed cities

City	Inhabitants (UN, 2015)	Inhabitants last Census (year)
New York	21.900.000	19.556.440 (2010)
Paris	11.210.000	9.290.263 (2010)
Barcelona	5.258.000	1.611.013 (2011)
Birmingham	2.512.000	2.697.168 (2017)
Singapore	7.312.000	5.719.644 (2010)

In the first stage, a bibliographic study will be undertaken in order to produce individual reports on the HiAP related documents, memberships or awareness of change initiatives, success histories reported in media and self-initiatives at local level. The bibliographic study will be focused also in how effective are the assessing effects of HiAP applications:

- Analyse case studies where HiAP has influenced in public policies.
- Detect cases where HiAP could be applied and it has not been considered.
- Identify positive or negative trends and actors or interests involved in these trends.

The second stage will be to identify the most relevant HIAs of each test bed city, to that end each pilot must follow the following steps taking into account PULSE Development Key Indicators (DKIs) from section 6.

- Screening:
Determine existing and required HIAs in the city.
- Scoping :
Select PULSE DKIs from next section or indicate if new indicators must be included, according to the pilot screening phase.
- Identification and assessment of impacts:
Try to determine the magnitude of the DKI according to the multiple data sources available
- Decision-making and recommendations:
Making explicit the trade-offs to be made in decision-making and formulating evidence-informed recommendations for later modelling.
- Evaluation, monitoring and follow-up:
Process and impact evaluation of the HIA and the monitoring and management of health impacts based on generated models. This last point will be covered through the methodology proposed in (World Health Organization et al., 2014). The framework implementation on their 5th point establishes that the key activities for ensure monitoring, evaluation and reporting are:

- a. Start monitoring at earlier stages
- b. Identify possible opportunities for collaboration in and out of the government
- c. Identify specific focus areas, within the PULSE project scope framework, and establish the baseline, targets and objective indicators from section 6.
- d. Carry out monitoring activities, this action will involve agreed monitoring of multiple actors from policy makers to citizens.
- e. Disseminate results to ensure future policy planners can take lessons from the activity reported.

From this second stage, information can be extracted to perform the questionnaires and information collectors targeted to each study group.

The third stage will collect information from the different actors involved. As previously commented, within the PULSE Project it will be covered multiple roles from the main actors involved. The PULSE ecosystem will gather information from open data repositories and inquiring directly the involved participants via questionnaires and inner tools. This will enrich an information exchange beneficial to the actors involved directly or indirectly, and relative to the CoPs and learning platform following this evaluation, as shown in the following figure.

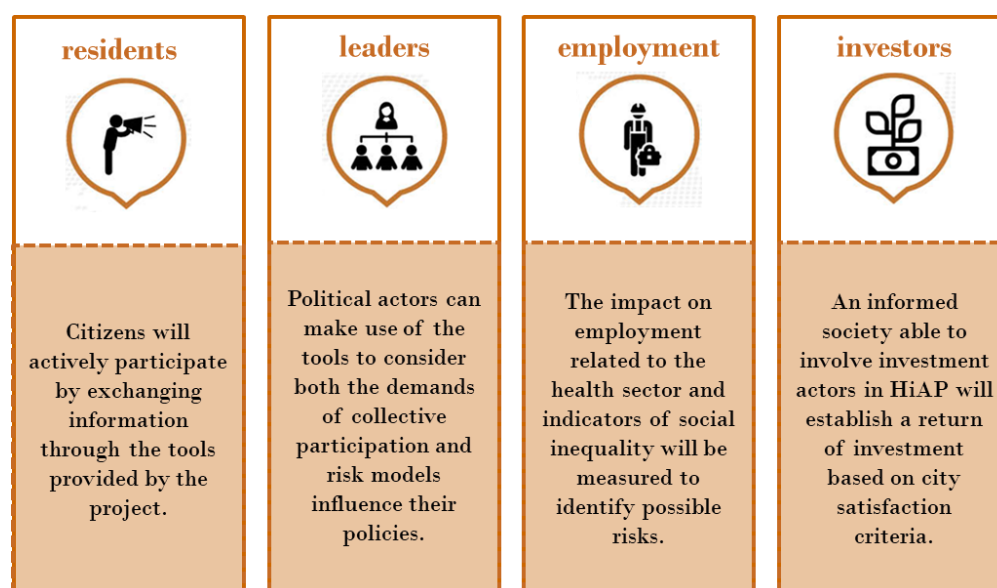


Figure 2. Key points of action.

The next step will be devote to make use of data science tools for analyse the collected information and cluster it in order to generate expert models, such as the MM-HiAP, for easily understanding the level of maturity of each pilot site.

From this expert models and the complementary information of Urban Indicators described in D1.2 CoPs will be able to generate the expertise to evaluate well practices and action lines to improve their local HiAPs. On the other hand, this indicators will be uploaded to public repositories so, citizens can access this data and participate as implicated actors.

6. DEVELOPMENT KEY INDICATORS

The following table defines different objective indicators to assess the maturity level at the different pilot sites. This is a dynamic table where most relevant identified PDKs will be selected by each pilot to be implemented in their maturity model. If any partner identifies additional indicators to include in it, please notify to UPM to be included in line with WP8.

Table 2. Development Key Indicators.

Category	Key	Name	Description	Minimum threshold	Desirable threshold
DEMOGRAPHICAL AND SOCIO-ECONOMICAL	PDK_001	Housing density	# of houses per surface	>80 Houses per Ha	>100 Houses per Ha
	PDK_002	Population education	UIS UNESCO questionnaire score	--	--
	PDK_003	Population employment	Un/employees population ratio	Adjust to the region	Adjust to the region
	PDK_004	Employment equity	Employment by gender	W/M employment ratio disparity < 0.1	W/M employment ratio disparity < 0.1
	PDK_005	Incomes equity	Incomes by gender	Average salary disparity trend positive	Average salary disparity trend positive
	PDK_006	Population critical	Population below poverty line		
	PDK_007	Sidewalk proportion	Sidewalk/road street proportion	>60% sidewalks >50% total street surface	>75% sidewalks >50% total street surface
	PDK_008	Public transport availability	Proximity to the closest public transport service		

Category	Key	Name	Description	Minimum threshold	Desirable threshold
SANITARY SYSTEM	PDK_009	Services proximity	Mean distance to the closest		
	PDK_010	Access equity	Degree of coverage of public health for deprived people		
	PDK_011	Sanitary motility	Mobility of professionals		
	PDK_012	Employees total	Employment figures in the health sector		
	PDK_013	Employees nursery	Employment figures in nursing		
	PDK_014	STD policy	Money spent on campaigns to prevent STDs		
	PDK_015	Awareness campaigns	Integrated programmes in settings, including workplace, schools, hospital		
Category	Key	Name	Description	Minimum threshold	Desirable threshold
INDUSTRY AND ENVIRONMENTAL	PDK_016	Air Quality	Air Quality Statistics Report	<40 ng per m ² 100% population	<40 ng per m ² 100% population
	PDK_017	Acoustic comfort	Noise power and scope	<65 dB >60% population	<65 dB >75% population
	PDK_018	Thermic comfort	Time of thermic comfort hours per surface	>50% comfort hours	>80% comfort hours

Category	Key	Name	Description	Minimum threshold	Desirable threshold
				>50% of streets surface	>50% of streets surface
	PDK_019	Tree density	Density of trees per section of street	0.2 trees per metre >50% of street length	0.2 trees per metre >75% of street length
	PDK_020	CO ₂ emissions	CO ₂ equivalent emissions per built area	<30 CO ₂ /m ²	<20 CO ₂ /m ²
	PDK_021	PM10 exposition	Particles matter exposure		
	PDK_022	Water demand	Water consumption per litres per house per day	<100 litres per house per day	<80 litres per house per day
	PDK_023	Energy demand	Average energy demand in residences	<80KWh/m ²	<65KWh/m ²
	PDK_024	Green space per habitant	Green space/number of inhabitants.	>10m ² per habitant	>15m ² per habitant
POPULATION HEALTH	PDK_025	Healthy ages	Average healthy ages in elderly (over 65 years old)		
	PDK_026	Extreme temperature mortality	Yearly rate incidence		
	PDK_027	Work accidents rate	Yearly rate incidence		
	PDK_028	Traffic accident rate	Yearly rate incidence		
	PDK_029	Asthma ratio	Yearly rate incidence		

Category	Key	Name	Description	Minimum threshold	Desirable threshold
	PDK_030	Diabetes Type II Ratio	Yearly rate incidence		
	PDK_031	Hypertension risk population	Yearly rate incidence		

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8. Annex I: Maturity Model for Health in All Policies

Maturity Model for HiAP proposed by Storm et al.	
Characteristics	Score-definition (S)
I Recognized	
1. Importance of HiAP recognized to reduce health inequalities	+ importance recognized - importance not recognized
2. Level of visibility as to which activities of sectors contribute to (determinants of) health inequalities	+ aware which activities contribute - not aware which activities contribute
II Considered	
3. HiAP described in policy documents	+ collaboration sectors described - collaboration sectors not described ± collaboration sectors described, but implicitly
4. Collaboration with sectors present (project-based)	+ collaboration with multiple sectors - no collaboration with multiple sectors ± collaboration between only two sectors
5. Collaboration on health inequalities is started	+ > 67% of the sectors - < 33% of the sectors ± 33% -67% of the sectors
6. Activities of sectors contribute to determinants of health inequalities	+ activities > 67% - activities < 33% ± limited number of activities 33% -67%
III Implemented	
7. Concrete collaboration agreements	+ agreements with regard to health inequalities - no agreements with regard to health inequalities ± agreements with regard to health
8. Structural consultations forms present	+ consultation forms exists around health inequalities - no consultation forms exists around health inequalities ± consultation forms exists around health

Maturity Model for HiAP proposed by Storm et al.	
Characteristics	Score-definition (S)
9. Key person HiAP is present (role is clear)	+ role clear regarding HiAP - role not clear regarding HiAP
10. Working from sectors on health inequalities (policy basis)	+ > 67% of the sectors - < 33% of the sectors ± 33% -67% of the sectors
IV Integrated	
11. Broad, shared vision on HiAP (political and strategic)	+ HiAP widely supported and in coherence developed - HiAP not widely supported and not in coherence developed
12. HiAP results visible (both content and process)	+ effects are visible and positive - effects are not visible ± effects are visible, but modest
V Institutionalized	
13. Political and administrative anchoring of the HiAP approach	+ anchoring of HiAP - no anchoring of HiAP ± anchoring of HiAP, HiAP but without targeted funding
14. Continuous improvement of integral processes and results on the basis of the achieved results	+ guidance on improving results and processes - no guidance on improving processes and results
Stage of maturity	
It is calculated as a sum of positive indicators with consensus.	

9. Annex II: Open source resources for extracting key indicators

The following links provide HiAP oriented information useful for the completion of the task. It is recommended for each pilot site to visit them in order to define their indicators.

Global

United Nations databases

<http://data.un.org/>

Google Public Data Explorer

<https://www.google.com/publicdata/directory>

The World bank. Indicative global trends

<http://data.worldbank.org/>

World Health Organisation

<http://www.who.int/gho/database/en/>

Other

UNESCO

<http://uis.unesco.org/uis-questionnaires>

UN- Urban Data

<http://urbandata.unhabitat.org/>

ECHI data tool (only for EU cities)

https://ec.europa.eu/health/indicators/indicators_en

100 Resilient cities

<http://www.100resilientcities.org/cities#/- />

C40 cities

<http://www.c40.org/cities>

Bloomberg Philanthropies

<https://www.bloomberg.org/program/environment/sustainable-cities/#overview>

Test beds Open Data

New York City, Open Data

<https://opendata.cityofnewyork.us/>

Paris, Open Data

<https://opendata.paris.fr/page/home/>

Birmingham, Open Data

https://www.birmingham.gov.uk/info/20011/your_council/952/open_data

Barcelona, Open Data

<http://opendata-ajuntament.barcelona.cat/en>

Singapore, Open Data

<https://data.gov.sg/>