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DESIGN AND IMPLEMENTATION OF AN ONLINE DELPHI STUDY TO DEVELOP INDICATORS FOR EVIDENCE-INFORMED POLICY MAKING

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This report describes a Delphi study conducted within the European FP7 project REsearch into POlicy to enhance Physical Activity (REPOPA), whose main objective is fostering evidence-informed policy making in the field of health and physical activity. The Delphi study was designed and implemented for improving and integrating a draft list of indicators for evidence-informed policy making developed by REPOPA researchers to assess the use of evidence in policy processes, organized in thematic sets. The Delphi study involved 76 policy makers and researchers from six European countries – Italy, Romania, Denmark, Finland, United Kingdom and The Netherlands – and was conducted in two rounds consisting of online questionnaires. Preliminary results about the effect of the Delphi on the original indicators are reported.

Keywords: evidence-informed policy making, Delphi, indicators.

CNR-IRPPS

Ideazione e implementazione di uno studio Delphi online per lo sviluppo di indicatori di evidence-informed policy making

Valentina Tudisca, Adriana Valente

2016, p. 27 IRPPS Working paper 88/2016

Questo report descrive lo studio Delphi condotto nell'ambito del progetto europeo FP7 REsearch into POlicy to enhance Physical Activity (REPOPA), che si pone come obiettivo principale quello di favorire l'uso delle evidenze scientifiche nelle politiche riguardanti la salute e l'attività fisica. Lo studio Delphi è stato ideato e implementato con lo scopo di integrare e validare una lista di indicatori di evidence-informed policy making sviluppata dai ricercatori REPOPA per valutare l'uso di evidenze nei processi di policy, divisi per set tematici. Lo studio ha visto il coinvolgimento di 76 ricercatori e policy makers di sei paesi europei – Italia, Romania, Danimarca, Finlandia, Regno Unito e Olanda – e organizzazioni internazionali e si è svolto in due fasi: due questionari online per valutare rilevanza e fattibilità degli indicatori. Il report include i risultati preliminari emersi dallo studio Delphi.

Parole chiave: evidence-informed policy making, Delphi, indicatori.

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Summary

Introduction

The relationships between scientific research and policy making were deeply investigated in the last decades by a number of specialists from many disciplines.

Previous studies produced important results on explanatory factors of knowledge utilization, particularly considering the extent and determinants of the use of scientific research in governmental agencies and the kind of research use (Amara 2004; Belkhodja, Amara, Landry & Ouimet 2007; Réjean Landry, Lamari & Amara 2003). Our referral framework are two kinds of models: models describing the science-policy relationships and models of knowledge production and exchange. The work of Polanyi, who firstly exposed the role of the 'tacit knowledge' in the processes of knowledge production (Polanyi 1967), has been taken up and continued, among others, by Lundvall and Johnson, and Nonaka and Takeuchi (Lundvall & Johnson 1994; Nonaka 1991), who elaborated models to describe how knowledge is shared and transformed. This approach has been integrated including the network dimension (Valente & Luzi 2000) and applied to public health (Kothari et al. 2012).

More recently, specific attention was focused to the knowledge production and translation in policy making environments. In the context of health care, Graham and colleagues proposed a conceptual framework called 'Knowledge to action cycle', in which many dimensions of the knowledge use in policy making processes are considered dynamically, as the identification of relevant knowledge needed for a specific action, the selection and targeting of the tools, the assessment of the results and their sustainability (Graham et al. 2006; Straus, Graham, Taylor & Lockyer 2008). In this framework, further proposals have been made to make this model even more dynamic, for instance emphasizing interdisciplinary components (Huzair, Borda-Rodriguez, Upton & Mugwagwa 2013) or discussing the role of knowledge inter-mediators (Schlierf & Meyer 2013), or expanding it to inclusive and ethical knowledge-to-action process (Government of Canada 2014).

Pülzl and Ramester distinguished the 'transfer' and 'transaction' models (Pülzl & Rametsteiner 2009): in the first one science and policy are seen as separate domains of knowledge construction, while in the second one a 'joint knowledge production' among them is envisaged. It has been suggested that the two models are not necessarily contradictory, given that they can relate to different moments and reflect different purposes (Wehrens, Bekker & Bal 2011). A further concept entering in this debate is the 'policy learning', defined as the collective learning in a policy making context (Sabatier 1993), that may also be connected to the innovation capacity (Borrás 2011).

Other studies dealt with the definition of 'using' science in policy making (Weiss 1979). In order to classify the use of research results in policy making, it has been proposed to distinguish three main uses of research: the *instrumental* use, which occurs when results are used for specific aims or solving a particular problem; the conceptual use, which refers to a more general acknowledgement of a research result, without focusing on its direct application; and the symbolic use, which occurs when research results are simply cited in order to justify or reinforce a decision taken without considering them (Lavis et al. 2002; Nutley, Walter, & Davies 2007; Pelz, 1978; Weiss 1979; de Goede, van Bon-Martens, Putters & van Oers 2012). These

concepts have been further elaborated and also connected with the possible determinants of the type of research use, e.g. characteristics of the research products, the intensity of the links between scholars and users, or users' organizational contextual factors (Amara 2004). Landry and colleagues, modifying the proposal of Knott & Wildavsky (1980), described six stages of knowledge use seen as a process, which include reception, cognition, discussion, reference, effort and influence (Landry et al. 2003). In analyzing the explanatory factors of knowledge utilization, Belkhodja and colleagues synthetized four models: the 'science push' model, the 'demand pull' model, the 'dissemination model' and the 'interaction model' (Belkhodja et al. 2007). The 'science push' model describes a linear sequence from supply of research advances to utilization: researchers are the source of ideas for directing research and users are receptacles for the results of research; in the 'demand pull' there is a linear sequence as well, but this time starting with the identification of the research problems by users, that are the major source of ideas for directing research. In the 'dissemination model', dissemination mechanisms are used to identify useful knowledge and transfer it to potential users; while the key attributes of the 'interaction model' are the relationships existing between researchers and users at different stages of knowledge production, dissemination and utilization. This theoretical framework includes a multiplicity of experiences and results from the literature, and has implications both in the field of knowledge utilization and in the field of organizational sciences.

The work described in this report was conducted within REsearch Into POlicy to enhance Physical Activity (REPOPA), a European project that aims to integrate scientific research evidence and expert know-how with policy making processes to increase synergy and sustainability in promoting health and preventing disease among Europeans. The REPOPA Consortium brings together scientific researchers, experts, policy makers and stakeholders from different disciplines and countries. It also consists of scientific excellence in health research, including physical activity, and links to real life experience in policy making and expertise in knowledge translation in six countries in Europe – Italy, Denmark, Finland, Romania, United Kingdom and The Netherlands – and in Canada.

Aim of this report is to show the process of developing indicators for evidence-informed policy making (EIPM) by means of an online international Delphi study and share the preliminary obtained results. Although several tools have been developed to foster EIPM, in literature there is a recognized gap concerning the availability of indicators – which can be defined as observable traits or variables that are assumed to point to the assessment of some other trait, usually difficult to observe directly – to assess the use of evidence in policy processes (Bertram et al. 2015).

Methods

In order to improve and integrate the indicators for EIPM originally developed by REPOPA researchers, it was decided to perform an international online Delphi study involving researchers and policy makers from the six European REPOPA countries: Italy, Denmark, The Netherlands, Romania, United Kingdom and Finland.

Different participative methodologies have specificities, strengths and weaknesses with respect to particular contexts. In literature, many attempts have been done to assess both the

theoretical aspects of the different methodologies and the effectiveness of a single participative process (Gupta & Clarke 1996; Hung et al. 2008; Rowe et al. 1991; Valente & Castellani 2015).

The motivation of choosing to use Delphi methodology involving different stakeholders is that, in order to foster an evidence-based policy making, 'structural collaborations, interactions and partnership arrangements between researchers, policy makers and other community stakeholders are increasingly seen as potential solutions' (Wehrens et al. 2011), as many examples demonstrate (Cunningham & Wyckoff 2013; Wehrens et al. 2011). Ten main strengths of using Delphi for eliciting expert knowledge were discussed and presented in Castellani & Valente (2012):

1. fast and effective in generating answers:
2. not expensive;
3. not time-consuming for the experts involved, if compared to face-to-face methodologies like focus group;
4. flexible and adaptable;
5. data are easier to be processed with respect to an unstructured face-to-face discussion;
6. it fosters participants' learning during the process (this is the reason why Delphi can be considered as both a learning and research instrument at the same time);
7. it can catch a wide range of correlated variables and multidimensional factors;
8. anonymity encourages the panellists to take up a more personal viewpoint rather than a cautious institutional position;
9. especially suitable for issues that lack of historical data and characterized by high level of uncertainty, because the methodology encourages the emerging of new elements;
10. it provides analytical scenarios and answers that are usually more in-depth compared to the ones provided by other methodologies.

Delphi technique is a qualitative analysis methodology that aims to extract the collective knowledge of a group of experts in the study of a complex system (Rowe et al. 1991). It has been used in many different fields (Gupta & Clarke 1996), like agriculture, justice, economics, management, banking, education, health, including transport and epidemic control (Syed, Hjarnø, Krumkamp, Reintjes & Aro 2010); moreover, it has been successfully used in literature to select healthcare quality indicators (Boulkedid 2011).

A Delphi study is typically structured as iterated open-ended questionnaires, in which participants (panellists) can review their answers in successive steps after receiving a feedback from the answers of the other components of the group. In the traditional format, the iteration aims to reach a consensus among the participants; in one of the variants of the Delphi methodology – the so-called 'policy Delphi' – the aim is not reaching consensus, but the elaboration of analytical future scenarios by experts. Our Delphi aims at combining the two approaches.

Designing the questionnaires

In November 2014 the National Research Council of Italy prepared the first questionnaire and other documentation (letters for invitation and consent) and discussed them with the other project partners.

Delphi panellists were called to validate and improve with suggestions the draft indicators for EIPM developed by REPOPA researchers by means of two rounds of online questionnaires where they were asked to evaluate the relevance and feasibility of the draft indicators, divided into thematic sets. Moreover, they had also the opportunity of justifying their answers by comments and suggesting new indicators. They could choose to answer in English or in their own language. Indeed in January 2015 each country edited own language version in strict relationship with WP4 coordinating team; the revision of the final English version of questionnaires was done by UK partner. Pilot test of the questionnaires was performed involving two professional colleagues external to REPOPA team per country; the following issues were checked: comprehensibility of the text of the questionnaire, possible problems in interpreting the questions, time to complete the questionnaire, possible problems with the online tool, further comments. The results of the pilot test were used to improve and define further details of the questionnaire.

Selection of scales

In the two internet-based Delphi questionnaires – one per round – panellists were asked to rate the level of relevance and feasibility of the indicators developed by REPOPA researchers. By relevance we mean how much the indicator fits to infer the use of EIPM; by feasibility, how much the indicator is doable and measurable. The absolute scales (from 4 to 1) were used (see Table 1), which means expressing a general judgement on the relevance and feasibility of the indicator without comparing to the others.

Table 1. Relevance and feasibility scales

Relevance	
4. Very relevant	The indicator is highly pertinent with EIPM. The indicator is highly useful to infer past, present or future level of EIPM. High priority.
3. Relevant	The indicator is quite pertinent with EIPM. The indicator is quite useful to infer past, present or future level of EIPM. Medium priority.
2. Slightly relevant	The indicator is slightly pertinent with EIPM. The indicator is slightly useful to infer past, present or future level of EIPM and only under very limited conditions. Low priority.
1. Not relevant	The indicator is scarcely pertinent with EIPM. The indicator is not useful to infer the level of EIPM. No priority.

Feasibility	
4. Definitely feasible	The indicator can be easily measured. Information needed* is commonly available and its accuracy is highly probable. The collection of the information is without or of minimal cost.
3. Probably feasible	The indicator can be measured with few limits. Information needed* is frequently available and its accuracy is quite probable. The collection of the information is of reasonable cost and does not impose an inappropriate burden.
2. Slightly feasible	The indicator can be measured only under very limited conditions. Information needed* is not frequently available and its accuracy is slightly probable. The collection of the information has a considerable cost and may impose an inappropriate burden.
1. Definitely not feasible	The indicator can not be measured. Information needed* is seldom or not available and its accuracy is not predictable. The collection of the information has a high cost and definitely imposes an inappropriate burden.

Note: *Information needed is expected to be found:
a. in documents such as policy documents and archives of the organization;
b. by asking to people involved in the policy process.

Questionnaires administration

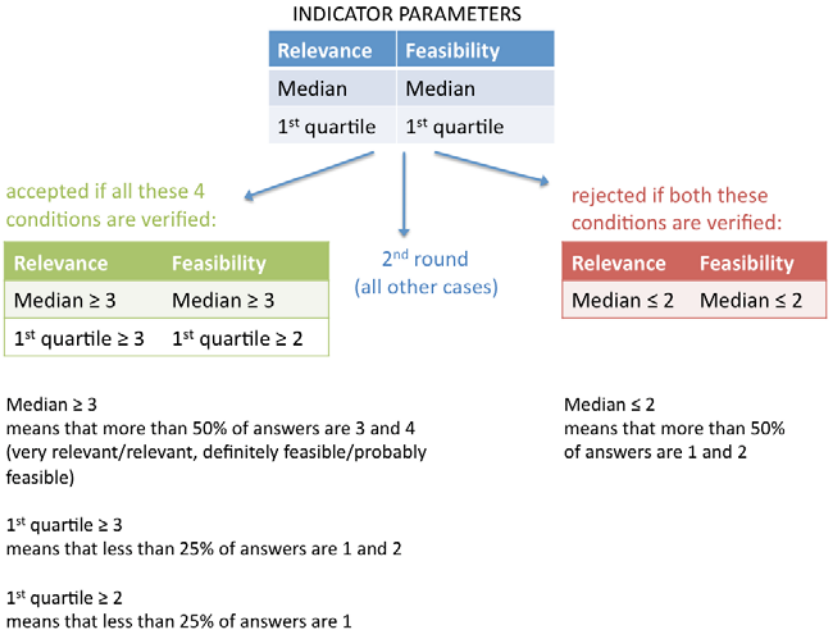
The questionnaires were administered via Limesurvey (https://www.limesurvey.org) software. The main issues related to questionnaire administration and data collection were the following:

- The tool interface was edited by CNR.
- All partners received at least one account for managing the panellists from their own country.
- Training Skype meetings were organized to get the partners familiar with Limesurvey software, coordinated by CNR.
- Automatic invitations/reminders to panellists were managed by each partner.
- All inputs and comments from the first and the second questionnaire were translated by partners from national languages into English.
- Data gathered from the first and second questionnaire were processed and edited by CNR.

Data analysis

The results of the two questionnaires of the two rounds were elaborated in terms of medians and first quartiles of relevance and feasibility. The criteria for including indicators for EIPM in the final validated sets are described by the algorithm showed in Figure 1.

Figure 1. Algorithm for indicators selection



According to the algorithm in Figure 1, the draft indicators for which there was a consensus on high relevance and feasibility (medians of both>=3, first quartile of relevance>=3 and first quartile of feasibility>=2) in the first round were directly included in the core of validated sets; the indicators for which, in the first round, there was a consensus on low relevance and feasibility (both medians<=2) were discarded; remaining indicators, for which a consensus of relevance and feasibility judgement was not reached, were re-evaluated in the second round

questionnaire, in which the quantitative results of the first round were presented to panellists, with summaries of their comments.

In the second round, participants were asked to evaluate again relevance and feasibility of the draft indicators which were neither accepted nor discarded, together with a new set of indicators developed by researchers from first round panellists' comments. In this case the draft indicators which did not reach consensus on both relevance and feasibility were definitely discarded.

Description of indicator sets to be evaluated and integrated by panellists

The process for developing the draft list of indicators for EIPM, that became the core of the Delphi study, is described in another paper, in preparation. However, on the basis of literature analysis on indicators, their possible typologies and development criteria, it has been taken the decision to build REPOPA indicators for EIPM as SMART indicators (Specific, Measurable, Attainable, Relevant, Time-bound). The five characteristics related to being "SMART" rely on a sixth characteristics, that of objectivity. This means that indicators must allow to infer the presence and the extent of EIPM by analysing specific and measurable phenomena and that indicators have also to be based on data that are as far as possible objective and not relied on individual memories and on subjective perception of facts and contexts.

Moreover, while developing the draft indicators for EIPM, the structure in Table 2 was taken into account.

Table 2. Main indicators' features

Target of the indicator	Target institution: - Policy making institutions on local, regional and national level - Research institutions
Use of indicator	- Structural (refers to the institution) - Policy process (refers to the specific policy process)
Measure of indicator	- Binary (yes/no) - Cardinal number - Percentage
Level of data collection	- Policy (policy documents and data) - Institution (institution documents and data) - External (all levels that go beyond policy and institution, e.g. meta-institutions such as ministries, repositories, search engines, population data...)
Type of data collection	- Existing data (the existing data can be further split into raw documents, databases, and so on) - Surveys (may be further split into interviews/observations, etc.)
Time reference	Time range to which the indicator refers. For policy indicators, the time reference must be defined by the institution using the indicator, depending on the policy timing and the phase of the policy that is going to be considered. Once defined, it must be explicitly indicated.

Below the points listed in Table 2 are described:

- *Target of the indicator*: institution to be considered for the evaluation by means of indicators.
- *Use of indicator*:

- The *structural* indicators can be used to assess if the institution structure is fitted to perform an evidence informed policy making. These indicators may be used by policy makers for self-evaluation purposes of their structure.
- The *policy* indicators can be used to assess if the evidence informed policy making is (is going to be, or has been) performed inside a specific policy. For policy indicators, we suggest that these indicators can be used at different stages of the policy making process. Therefore, they may also be used to perform a check of the use of evidence during the initial construction of the policy.

There are often strict relationships between policy and structure (Réjean Landry et al. 2003), for example with reference to mobility, resources, training. Not always the only analysis of the policy can give enough information about the possibility of use of evidence, sometimes one must refer to structural level.

- *Measure of indicator:* it relates to the way of measuring of the indicator. Indicators can be measured as absolute numbers, percentages, boolean (yes/no) values. In the Delphi study there is no reference to the specific way of measuring each indicator because this aspect has to be dealt when using indicators, depending on specific policy characteristics and context.

- *Level of data collection*: it refers to a very practical point, namely acquiring data required in using the indicators, which means who owns these data, the policy administration or the referral institutional structure. This point refers to M and A of the SMART acronym.

- *Type of data collection*: information needed is available in policy documents and archives or by asking to people involved in the policy process.

- *Time reference*: this also is a very practical point useful for measurement. When using the indicator for an analysis, it must be defined (by who uses the indicators, that may be the institution, the project team, etc.) which period of time the data considered to use the indicator refer to. This period may correspond to a policy phase, but not necessarily.

One of the main effort was to identify the proper thematic areas in order to organize the indicators: the sets of indicators for EIPM were synthetized in order to better fit the two internet-based Delphi questionnaires, in four thematic areas, plus a further set called “Towards complex indicators” including wider, multi-faceted issues relevant for EIPM but too wide to be included in one thematic set. Here is the description of the sets, labeled by a code:

Description of HUMRES: Human resources – Competences and Networking

This set of draft indicators for EIPM is focused on the possible kinds of human resources involved in a policy, besides policy makers, and the skills they are required to have in order to improve EIPM. The 6 draft indicators of this set submitted to the evaluation of experts in the internet-based Delphi rounds include: involving of staff with research experience, of stakeholders, of research institutions (in terms of partnerships or fellowships), provision of training courses on research issues, budget for scientific advise. Among these draft indicators,

“Partnerships with research institutions during the policy” and “Stakeholders working on the policy”.

Description of DOCREP: Documentation – Retrieval/Production

This set of draft indicators for EIPM is focused on possible ways of considering evidence during a policy. The 5 draft indicators of this set submitted to the evaluation of experts in the internet-based Delphi rounds include: procedures for ensuring review of scientific literature, quoting documents containing evidence (for example peer-reviewed scientific articles or reports) in policy documents, producing scientific articles based on policy results, budget for producing/acquiring scientific publications. Among these draft indicators, “Citation of peer-reviewed research articles in policy documents” and “Published scientific articles based on policy results”.

Description of COMPAR: Communication & Participation

This set of draft indicators for EIPM concerns communication and participation of specific groups during a policy. The 7 draft indicators of this set submitted to the evaluation of experts in the internet-based Delphi rounds include: initiatives to inform and gather knowledge from stakeholders and researchers by means of engagement and consultation methodologies, communication methods for vulnerable groups likely to be impacted by the policy. Among these draft indicators, “Initiatives to inform stakeholders during the policy” and “Budget for engagement and consultation methodologies”.

Description of MONEVA: Monitoring and Evaluation

This set of draft indicators for EIPM is focused on monitoring and evaluating the use of knowledge by means of activities and procedures. The 5 draft indicators of this set submitted to the evaluation of experts in the internet-based Delphi rounds include: including EIPM in the evaluation criteria of the policy, procedures for monitoring and evaluating the use of evidence in the policy (including knowledge from stakeholders and target groups), involving researchers and stakeholders in the policy evaluation. Among these draft indicators, “Procedure for monitoring/evaluating the use of research evidence in the policy” and “Researchers working on the policy evaluation”.

Description of TOWCOM: Towards complex indicators

This set includes 8 wider, multi-faceted draft indicators that cannot be confined to one of the previous thematic sets, including: cross-sectoral involvement, leadership role for the use of evidence, organisational culture, timely involvement, clear accountability, enhancing citizens’ participation, producing new evidence on the basis of evaluation, engagement of referral politicians to use evidence. Among these draft indicators, “Person/group taking a leadership role for the use of research evidence in policy-making” and “Timely involvement of researchers in the policy process”.

Research ethics

Before the intervention started, each country sought for ethical clearance (or provided

documents showing it was not necessary for this kind of research) in their respective countries (Edwards et al., 2013). In line with the EC contract, the ethics documents were submitted to EC before the intervention start. In each intervention setting, informed consent forms were filled in, and the data have been analysed anonymously. The research in general followed the ethics guidelines specially developed and accepted by the REPOPA Consortium.

Delphi panel data

The number of panellists to be involved in the two internet-based Delphi rounds was established as 12 panellists per REPOPA country. This number was considered enough to ensure a wide presence of researchers and policy makers as well as to manage possible drops out.

In October 2014 the key individuals to be included in the Delphi panel were identified and in January 2015 all project partners contacted national panellists. 82 panellists were invited to participate to the two internet-based Delphi rounds, 12 per country and 10 from international organization.

a. National panellists

Each partner involved in WP4 (CNR, THL, SDU together with RCPH, UBB, Tilburg University together with CBO, UK partner) prepared a list of national panellists.

The inclusion criteria for each national list, consisting of 12 panellists working in national contexts (as agreed during the internal consultation), were the following:

- 6 from the research area (with reference to their prevalent activity):
  - 4 from public health sector, including HEPA and health equity;
  - 2 from cross-sector areas.

  At least 1 out of the 6 researchers with specific experience in science policy (which means having been director of a department or involved in politics).

- 6 from the policy making area (with reference to their prevalent activity):
  - possibly at least one of them should be strictly a politician;
  - the 5 others from: officials of ministries, health services, and various professionals or managers with an active role in policy making processes, at different stages.

The main criteria for selecting panellists were the high level of competence and the multiplicity of fulfilled roles, answering to one of the criticalities stressed in Mandell & Sauter (1984).

The following additional priority rules were given to partners for panellist' selection:

a. Easy to contact, involve and follow;
b. Previous knowledge of their professional competence;
c. Gender balance: 6 males and 6 females, if possible. Need of both genders to be represented within the two categories;
d. In each National list, both local and national entities need to be represented

In order to classify panellists as policy makers, we considered the following policy making definition:

> …*taking decisions about the proposal and/or implementation of a program, project or activity aimed to an institutional goal, and having the responsibility on it* (Anderson 2014; Haines 1980; Lippi 2007).

Panellists who shared both research and policy roles were included in the "research" or "policy making" category considering their prevalent activity.

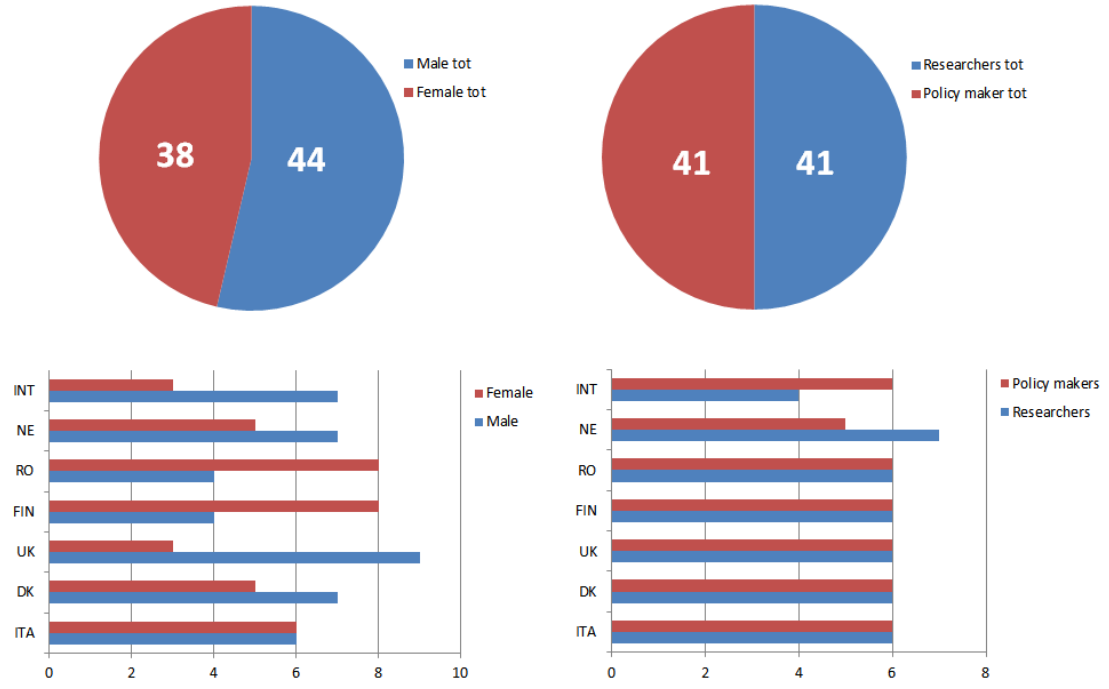
Moreover, one researcher or policy maker could be replaced by another kind of stakeholder if she/he had particular knowledge relevant for the Delphi (e.g. methodological experts, vulnerable group associations' representatives).

b. Panellists working at international level

Besides selecting national panellists, partners provided suggestions for a further group of panellists working at international level, including people from international organizations, such as WHO, EU, UNESCO, etc. These panellists were selected with the consensus of partners, considering a maximum of 10 panellists.

The 82 invited panellists were equally divided in researchers and policy makers and gender balance was respected (see Fig. 2). Numerous competences were present in the whole panel, e.g. Physical Activity, Public Health, Epidemiology, Health Promotion, Policy Analysis, Sociology, Sports, cross-sector.

Figure2. Features of the 82 panellists invited to participate to the two internet-based Delphi rounds, including country distribution among males and females and researchers and policy makers.



Finally 76 panellists out of the 82 invited answered at least one of the two Delphi questionnaire, from different sectors relevant for policy making for physical activity and health promotion:

a. 68 panellists working (with reference to their prevalent activity) in national contexts. Each partner selected and followed up to 12 panellists for its country.

b. 8 extra panellists from the international area.

Confidentiality

Panellists remained anonymous throughout the two Internet Delphi rounds; names circulated only between REPOPA researchers. After completing the second round, panellists were given the opportunity to provide explicit consent for their names to be included in the list of participants, to be made public only in scientific reports and articles, conferences and other presentations related to the conducted research.

Information described in the following format was collected for each panellist proposed by the country research team:

Name:
Gender:
Main role of panellist: ☐ Research ☐ Policy making
If Research: ☐ public health sector (specify: …) ☐ cross-sector area (specify: …)
If Policy Making: Area of activity (if appropriate): …
Main organization:
Main role inside the organization:
Competences:
Direct knowledge of the panellist (e.g.: previous work with the REPOPA partner):
☐ Yes ☐ No
Notes (e.g.: specific reasons for selection):

In the following sections detailed information is provided for each country Delphi panel and the group of panelists from international area. The tables include the whole list of the 82 panellists that accepted to take part to the internet-based Delphi rounds. Six of the 82 invited experts did not answer no one of the two questionnaire, but they have been included to be thorough, distinguished by the sentence “did not participate” in the column “Notes” of the tables. Having not contributed to the results of the study at all, they were not counted while calculating the dropout rate between the two internet-based Delphi rounds.

Italian panellists

According to previously mentioned rules for selection of panellists, Italian panellists were chosen among researchers and policy makers coming mainly from health field, but even from cross-sector areas that integrate physical activity with epidemiology, social policy and education. Italian team preferred to involve people who usually perform both the roles – researcher and policy maker – or that, at least, had experience of both (in the first case, ”type” in the table refers to the prevalent activity). Panellists are affiliated to universities or research centres, hospitals or health companies both at local and national level (see Table 3).

Table 3. Description of the Italian panellists

Italy	Gender	Type*	Role	Competences	Notes
Panellist 1	Male	Researcher	Research Director at a national health institution	Public Health, Environmental epidemiology and prevention	
Panellist 2	Female	Researcher	Director of a health department at regional level	Public Health, Epidemiology and prevention	
Panellist 3	Male	Researcher	Researcher of a national/regional health agency	Epidemiology, health economy	
Panellist 4	Male	Researcher	Research director at a national research institution	Public Health and technology	
Panellist 5	Male	Researcher	Health researcher and manager of a national Health Foundation	Public health	
Panellist 6	Female	Policy maker	Officer in Regional Department for Public Health	Public health, prevention and evaluation	
Panellist 7	Male	Policy maker	Director of a consortium between local Municipalities and local Health Agencies	Public health	
Panellist 8	Female	Policy maker	Director of a Department in the Ministry of Health	Public health and Innovation	
Panellist 9	Female	Policy maker	City council member and Officer at a Local Health Agency	Public health and local policy	
Panellist 10	Female	Researcher	Research Director and Director of a Department of a Research Institution	Public health, epidemiology and health promotion	
Panellist 11	Male	Policy maker	Responsible of the Prevention Service of local health agency	Public health, health and work safety	
Panellist 12	Female	Policy maker	City assessor for health and social affairs	Social and Health policy	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

Danish panellists

Following the inclusion/exclusion criteria, the Danish partners collected a list with suggestions for more than 25 potential Delphi panellists who were contacted and invited. 12 participants accepted to participate in the first two steps of the Delphi study. Several panellists are experienced with both research and policy making. DK team focused on involving both experienced researchers and policy makers from the fields of public health, but also cross-sector areas such (social or environmental) epidemiology, political science or public policy. Having experience often goes in line with being in a leading position which at times posed a challenge on motivating the panellists to participate in both rounds of the Delphi (see Table 4).

Table 4. Description of the Danish panellists

Denmark	Gender	Type*	Role	Competences	Notes
Panellist 1	Female	Researcher	Senior researcher at a national research institute	Public Health, Epidemiology, clinical research, prevention	
Panellist 2	Female	Researcher	Lector at a national Public Health research institute	Public Heath, Health promotion, Medical & social epidemiology	
Panellist 3	Male	Researcher	Researcher at a national research center for working environment	Public Health, Epidemiology, Occupational Health	
Panellist 4	Male	Researcher	Director of a national research institute	Public Health, political science, Epidemiology, Public policy	Only 1st round
Panellist 5	Male	Researcher	Leader of a research institute	Public Health	
Panellist 6	Male	Researcher	Professor in a research institute	Sociology, Social science, policy analysis	Only 1st round
Panellist 7	Female	Policy maker	Mayor for Health and care administration on local level	Political science, Public Health, local policy	
Panellist 8	Male	Policy maker	Mayor, member of local health council	Public administration, public policy	
Panellist 9	Female	Policy maker	Head of section in national Board of Health	Public Health, Health Promotion, Epidemiology	
Panellist 10	Male	Policy maker	Quality director of a national NGO	Health economics, Public health, Policy analysis, Epidemiology	Only 1st round
Panellist 11	Male	Policy maker	Health policy director on regional level	Health care, Public Health	Did not participate
Panellist 12	Female	Policy maker	Project leader on local level, works on local policies	Public Health, Health promotion, local policy	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

UK panellists

In the United Kingdom (UK) 44 invitations were sent to individuals who met the criteria set out in the Delphi panel selection guidance provided by the WP leader. Of the forty four, twelve accepted. Majority of them had both an extensive academic background and experience of health enhancing policy development. They have been involved in developing UK guidance and policies together with the UK department of health and are therefore individuals recognized for their expertise and leadership in in the field (see Table 5).

Table 5. Description of the United Kingdom panellists

United Kingdom	Gender	Type*	Role	Competences	Notes
Panellist 1	Male	Academic	Lecturer in Exercise Programming	Physical Activity, Health and Exercise Science	
Panellist 2	Male	Policy Maker	Director . Physical Activity Consultant -	Health Promotion/Physical Education Teaching and Coaching	
Panellist 3	Female	Academic	Professor in Ageing and Health	Community Health and Preventive Medicine/Health Services Research Public Health Education and Promotion/Physical Therapy/ Knowledge Translation/Geriatrics	
Panellist 4	Male	Academic	Professor of Exercise and Health Sciences	Physical activity/ exercise/psychology/obesity/public health/ mental health/ageing	
Panellist 5	Male	Academic	Programme Leader – centre for diet and activity research	Population-level interventions/evidence synthesis/ relationships between transport, the environment, physical activity and health	
Panellist 6	Male	Policy Maker	Medical Specialist in Sport & Exercise Medicine	Family Medicine Sport & Exercise Medicine	
Panellist 7	Male	Policy Maker	Policy analyst-National Institute for Health and Clinical Excellence	Policy analysis Sustainable development Public health Physical activity	
Panellist 8	Male	Policy Maker	Field Chair – Health and Exercise Science	Health, Sport and Science	
Panellist 9	Female	Policy Maker	Assistant Director – Heart Foundation	Health policy	
Panellist 10	Male	Academic	Director of the Research Institute for Clinical Exercise and Health Science	Health & Exercise Science	
Panellist 11	Female	Policy Maker	Senior Physical Activity Policy Specialist – Department of Health	Health policy	
Panellist 12	Male	Academic	Senior Lecturer-Department of Health & Physical Education	Health & Physical Education	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

Finnish panellists

In Finland 12 invitations were sent to individuals representing national policy-making and research representing not only health and physical activity fields but also fields like public policy, management and law. Three of the invited panellist were politicians i.e. members of the Parliament (two accepted the invitation). In the selection Finnish team focused more on the

experience on policymaking and relevant research instead of gender balance. Totally nine person accepted the invitation, seven women and two men. Many of the panellists have participated in the process where the Government of Finland aims to increase the utilization of well-research information. Panellists were affiliated to universities, ministries/government bodies, research institutes and NGO (see Table 6).

Table 6. Description of the Finnish panellists

Finland	Gender	Type	Role	Competences	Note
Panellist 1	Female	Researcher	Professor	Social and health management, University	
Panellist 2	Male	Researcher	Professor	Public policy, University	
Panellist 3	Male	Researcher	Director of a research institute	Sports Science and Sports medicine, Research institute	Did not participate
Panellist 4	Female	Researcher	Head of a team	Physical and work functioning, work safety, National Institute on Occupational Health	
Panellist 5	Female	Researcher	Research Director	Cross-disciplinary research interests related young people, multiculturalism and racism. Political challenges of contemporary welfare states, Research Network	
Panellist 6	Male	Researcher	Director of education in NGO	Sports philosophy, sport sociology, sports administration, National sports NGO	
Panellist 7	Female	Policy maker	General Secretary	Sports policy, Sports planning, National Sports Council	
Panellist 8	Female	Policy maker	Ministerial Advisor	Transport policy	Did not participate
Panellist 9	Female	Policy maker	Science Specialist	Regional development, innovation policies, governance and evaluation, Prime Minister's Office	
Panellist 10	Female	Politician	Member of Parliament	Active in sport and physical activity and public health issues, the Parliament of Finland	
Panellist 11	Female	Politician	Member of Parliament	Active in sport and physical activity and public health issues, the Parliament of Finland	
Panellist 12	Male	Politician	Member of Parliament	Active in sport and physical activity and public health issues	Did not particpate

** Only the prevalent role between researcher and policy maker is indicated in the Type column.*

Romanian panellists

In accordance with the inclusion criteria described in REPOPA WP4 research protocol, the Romanian panelists were selected from researchers and policymakers in the health and other related fields. However, given the particularities of the Romanian HEPA policy development system, the majority of the stakeholders were chosen from the sport field, from the public, private and civil society representatives. The central role of the sport sector in Romanian national and local HEPA policy development was documented in previous REPOPA WPs (e.g. WP1 and WP2), in which Romania was involved. The final list of panelists comprised stakeholders from several Ministries' staff, public Universities teaching staff, other governmental national and local institutions representatives, and research staff from NGOs

involved in health policy analysis (see Table 7).

Table 7. Description of the Romanian panellists

Romania	Gender	Type*	Role	Competences	Notes
Panellist 1	Male	Researcher	Teaching staff and researcher in a public university Vice-President of Romanian Sport for all Federation	HEPA Sports Club Management	
Panellist 2	Female	Researcher	Director - Center of interdisciplinary research, affiliated to a national public university	HEPA Physical activity pedagogy	
Panellist 3	Male	Researcher	Director of a Non-Profit organization conducting policy analysis	(Health) Policy analysis	
Panellist 4	Female	Researcher	Doctoral School Director in a national public university	HEPA Sport Psychology	
Panellist 5	Female	Researcher	Teaching staff and researcher in a public university Vice-President of Romanian Sport for all Federation	HEPA Public health - Professional diseases prophylaxis in pharmacy students	
Panellist 6	Male	Researcher	Deputy Director of a national sport research institute	Sport for all (Performance) Sport research	
Panellist 7	Female	Policy maker	Director of a regional public health institute – public sector	Public health Clinical Research	
Panellist 8	Female	Policy maker	General Secretary of Romanian Sport for all Federation	HEPA development HEPA programs management	
Panellist 9	Female	Policy maker	Director of a regional public health institute – public sector	Public health (Internationally funded) HEPA programs management and implementation	
Panellist 10	Female	Policy maker	Secretary General of a national federation	HEPA School and University Sports	
Panellist 11	Female	Policy maker	Superior Adviser Ministry of Youth and Sports	Sport recruitment programs HEPA	
Panellist 12	Male	Policy maker	Former Minister Teaching staff in public university	Education Policy Health Policy	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

Dutch panellists

According to previously mentioned rules for selection of panellists, Dutch panellists have been chosen among researchers and policy makers coming mainly from the public health field, with knowledge and expertise of the policy process. All Dutch panellists have a wide experience in this field, some with more experience on evidence-informed policymaking, and others more on working cross-sectoral. Panellists (see Table 8) are affiliated to universities, national and local research institutes, ministries (national) and municipalities (local).

Table 8. Description of the Dutch panelists

Netherlands	Gender	Type*	Role	Competences	Notes
Panellist 1	Male	Researcher	University professor	Health sector, Physical activity	
Panellist 2	Female	Researcher	Professor at a university and manager PH at national health institute	Health sector; Health Impact Assessment; Physical activity	
Panellist 3	Male	Researcher	Professor at a university and chief science officer at national health institute	Health sector and evidence informed policy making Public Health policy, monitoring and reporting	
Panellist 4	Male	Researcher	Researcher and knowledge broker	Health sector and evidence informed policy making interface at national level	
Panellist 5	Female	Researcher	Researcher at national health institute	Public and mental health at professional and academic level; national and local evidence informed policy making	
Panellist 6	Female	Researcher	Professor at a University	Cross-sector and social epidemiologist	
Panellist 7	Male	Researcher	Researcher at a university, local and regional professional and academic	Cross-sector and healthy lifestyle	
Panellist 8	Female	Policy maker	Policy maker at the national ministry	Health promotion, sports policy national level	
Panellist 9	Male	Policy maker	Policy maker at the national ministry	Public health and Sport	
Panellist 10	Female	Policy advisor	Policy advisor and researcher at local level (Community Health Services)	Public health and evidence-informed policy making at local level	
Panellist 11	Male	Politician	Alderman medium size municipality (local)	Public health, Cross-sector	
Panellist 12	Male	Politician	Alderman at small sized municipality (local)	Public health, Cross-sector	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

International panellists

In Table 9 the demographic profile of the international panellists is reported.

Table 9. Description of the international panellists

International	Gender	Type*	Role	Competences	Notes
Panellist 1	Female	Researcher	Member of the executive committee of a European society for research, President of a laurea degree course	Health and physical activity	
Panellist 2	Male	Policy maker	Vice president of a European association of hospitals, Health director of an institution for health care and research	Public health	
Panellist 3	Male	Researcher	Scientific officer of a European research centre	Policy innovation indicators	
Panellist 4	Male	Policy maker	Coordinator of a Department of an international health organization	Public health and health promotion	
Panellist 5	Male	Researcher	Chair of an international society of research	Health	Did not participate
Panellist 6	Male	Policy maker	Officer of the secretariat of a European network of health organizations	Health	Did not answer to the second round questionnaire
Panellist 7	Female	Policy maker	Director of an European research organization in the public health field	Public Health, Health promotion	
Panellist 8	Male	Policy maker	Ministerial advisor for a European social and health ministry. Collaborations with EC and WHO	Public Health, health promotion, (global health) policy development	
Panellist 9	Male	Researcher	Professor and Expert adviser to the EC's Health and Research Directorate	Public Health, Health promotion and prevention	Did not participate
Panellist 10	Female	Policy maker	National Institute of Public Health National physical activity focal point for implementation of Council Recommendations on promoting health - enhancing physical activity across sectors	Public Health and Health Services Management Health services promotion Children Hygiene Specialist	

** Only the prevalent role between researcher and policy maker is indicated in the Type column*

Results

In this section the results of the two internet-based Delphi rounds are briefly presented, where each set is labeled with its code.

The effect of the Delphi study on the original sets

The first round questionnaire allowed to directly validate 14 draft indicators for EIPM of the original sets for which consensus on both high relevance and feasibility was immediately reached, according to the algorithm described in METHODS; these indicators were not submitted to further evaluation in the second round. However a summary of the comments provided by panellists about them was available for panellists while answering to the second round.

The remaining 9 draft indicators of the original sets were resubmitted to panellists in the second round, accompanied with a summary of panellists' ratings and comments. In the second round panellists were also called to rate relevance and feasibility of 8 new draft indicators emerged as suggestions in the first round from panelists' comments and elaborated by REPOPA researchers.

Considering also the suggestions from panellists, at the end of the process, 25 draft indicators were validated and 6 draft indicators were discarded because considered low in relevance or feasibility. The validated final list includes most of the draft indicators from the original sets and some new ones elaborated on the basis of panellists' suggestions The main results obtained are described below on the basis of panellists' ratings and comments.

All the draft indicators proposed for the set HUMRES were validated except those concerning internships at research institutions and allocation a budget for scientific advise. Involvement of stakeholders in the policy required further evaluation in the second round. The draft indicator concerning the budget was also the only one discarded of the second set DOCREP, where a second evaluation was required for the production and quotation of scientific articles within the policy. All the draft indicators included in the set COMPAR were validated, gaining high consensus on their relevance and feasibility. The draft indicators included in MONEVA were all validated directly in the first round, except the involvement of stakeholders in policy evaluation, which was discarded in the second round. All the multi-faceted issues which influence EIPM included in TOWCOM reached high results in terms of relevance; according to the algorithm, they were evaluated only in the first round and kept as validated result for fostering EIPM. The new draft indicators proposed by panellists in the first round and evaluated in the second round concern involving researchers with policy making experience for set HUMRES, use of evidence briefs and reports on policy results from other organization for the set DOCREP, communication competences among the staff who interacts with stakeholders and fostering knowledge sharing between different stakeholders for the set COMPAR. Two more of the new draft indicators suggested, concerning budget for external evaluation of the policy and administrative procedures allowing timely employment of research staff and scientific advisors, were discarded when submitted to evaluation in the second round.

The most interesting insights emerged from panellists' comments and ratings are the following (Tudisca et al., in preparation).

The involvement of stakeholders in policy was one of the most commented and faceted topics. The highest consensus on both high relevance and feasibility was achieved by the issue of knowledge exchange with stakeholders, including both informing them and gathering knowledge from them. On the one hand it emerges that communication to stakeholders would be essential to update on progress and dissemination of any results; on the other hand, also gaining knowledge from stakeholders by engagement and consultation methodologies was considered very relevant in order to create a social environment ready to support policies. However the awareness of criticalities emerged: it has been noticed that communication with stakeholders can only be effective if the different parties – policy makers, researchers and stakeholders – are willing and capable to "put themselves in the others' shoes"; moreover, gaining knowledge from stakeholders can be hard and there are no defined rules or methodologies to get it, because everything depends on the specific context. The two new indicators proposed by panellists imply the awareness of these criticalities. Panellists demonstrated more prudence in evaluating the issues concerning a more active role of stakeholders. Indeed the issue concerning stakeholders working on the policy evaluation was finally discarded. From the comments we can argue that the resistance to accept a more active involvement of stakeholders in policy is mostly related to the risk of conflict of interests. The fear is that stakeholders may make pressure in order to defend their own interests.

The issue of involving researchers in the policy process was less controversial for panellists: in most cases, both the communication with and an active role of researchers in policy were easily accepted already in the first round, including the evaluation process.

As for the set DOCREP, the obtained results show that the issue of acquiring evidence from documents was easily accepted already in the first round. However, the two indicators concerning, respectively, citing scientific results from peer reviewed journals and producing evidence on the basis of the policy, were submitted to further evaluation in the second internet round and were finally accepted. Looking at panellists' comments, it can be argued that the reason why these issues raised more perplexities could be linked to the lack of time of policy makers and their lack of familiarity with scientific literature; and even possible lack of access to it. However both citing scientific results from peer reviewed journals and producing evidence on the basis of the policy were considered useful to save time in future policies. A few solutions have been suggested by panellists to overcome the possible obstacles in using these indicators. For example, policy makers could be helped by specific offices, like the press office, to produce documents on policy results; and policy makers could be provided by evidence briefs (which should be recognizable by a definite format and focus on a specific topic) to acquire scientific literature.

All the issues related to budget were discarded from the indicator list except the one concerning communication. This confirms communication as one of the most important and agreed point. However this result does not mean that budget problems do not exist, because from panellists' comments it emerges that fostering EIPM can be impeded by budget problems. Consequently the main reason could be related not to the content of indicators per se, but to their feasibility: the lack of dedicated budgets for the considered aspects of EIPM could impede their inclusion while building measurable indicators.

Panellists' drop out

It has to be specified that one of the main challenges of a Delphi study is keeping panellists on board, in order to complete the iterative evaluation process. In Tables 10 and 11 the number of responses gathered in the first and second round by the 82 selected panellists are reported for each country. Six out of the 82 experts did not answer any of the two questionnaires. The resulting dropout rate between the first and second round, excluding the six experts who did not participate at all, is satisfying: only the 5,2%.

Table 10. Number of Delphi responses by country

Country	No. of 1st round responses	No. of 2nd round responses
Denmark	11	8
Finland	9	9
Italy	12	12
Netherlands	12	12
Romania	12	12
United Kingdom	12	12
International	8	7
Total	76	72

Table 11. Details of the international panellists

Proposing team	Contacting team	No. of panellists contacted	No. of 1st round responses	No. of 2nd round responses
Italy	Italy	5	4	4
Denmark	Denmark	3	2	2
Netherlands	Italy	2	1	0
Romania	Romania	1	1	1
Total		11	8	7

Discussion

The two internet-based Delphi rounds allowed to test for relevance and feasibility and to improve the originally proposed draft indicators for EIPM, produced on the basis of previous REPOPA research and literature analysis, with 76 policy maker and researchers from different sectors relevant for policy making for physical activity promotion, including national and EU politicians and experts from international organizations. The answers to the two questionnaires of Delphi panellists led to discard some of the draft indicators proposed, because they were considered of low relevance or feasibility, and to validate at international level a final list of 25 draft indicators for EIPM organized in four thematic sets - 19 of them from the original list, 6 of them proposed by panellists in the first round and validated in the second round - and 8 wider, multi-faceted issues that influence EIPM (from the initial list). The final sets were further tested during national conferences that took place in the six European countries involved between January and March 2016, aimed at contextualizing at national level the output of the two internet-based Delphi rounds by involving researchers and policy makers at national and local level (this will be object of another paper), with the final aim of producing evidence briefs at national level for improving EIPM targeted to policy makers and researchers, and guidance resources at European level for helping policy makers while using the indicators.

The production of knowledge from the interaction among researchers and policy makers in

the field of health and physical activity and across sectors, mediated by REPOPA researchers, provides the basis for the development of tools that foster EIPM in Europe, both at national and local level and across countries. The obtained results will be circulated among stakeholders in the field of health and physical activity. The work of networking conducted within WP4 in order to implement the Delphi study will make the dissemination easier.

This result was possible thanks to an intense team-work: the international Delphi study was performed by all European partners in a synchronized way. The two internet-based Delphi rounds required a strong coordination in defining the content of the questionnaires, choosing and following panellists, translating from English to national languages and vice versa all the used materials.

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