Report on mapping needs, capacities and training programmes in health information

WP6 - Strengthen EU countries health information capacity

Task 6.1. Mapping capacities and education/training programmes in health information across MS: months 1-18

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Executive Summary

In this report we present the results from the study of maping the existing health information capacity building activities in different EU Member States (MS) and associate States, and to qualitatively identify needs for further capacity building activities in future at the European level. This evaluation is the basis for planning of a sustainable capacity building programme in the area of health information, including data collection, data use and analysis, as well as information exploitation for research and evidence-informed policy making.

This is the first attempt trying to map health information courses in Europe. A qualitive approach was used to address the limitations in accessing data. The information of the existing capacity building activities was obtained through both internet search of university courses provided in different MS and through a specialy-designed questionnaire survey targeted for specific experts in MS. Additionally, a literature scoping review on training of human resources for health (HRH) and information systems in public health was conducted, that contributed to the development of the Survey and to frame the achieved results.

Based on the collected information, public health specialists, public health researchers and epidemiologists seem to be the most common users of health information systems. They could be also identified as among the professional groups which are in need of additional capacity building in relation to health information systems and their use, together with statisticians. As we look into the future, In 10 years time, public health programme managers and health professionals (e.g. physicias and nurses) would also seem to benefit from additional capacity building on health information systems.

We found that In EU MS there are already a significant amount of training programs related to health information, both at the university level (undergraduate studies, masters programmes and PhD programmes), as well as vocational training provided for practising public health professionals by national public health institutes, etc.

Clearly more research is needed as well as clarification of concepts regading the professions around public health activities. ASPHER had already pointed-out some differences within Europe MS.

When establishing a sustainable capacity building programme (flagship programme) in health information, the following areas should be considered: data analysis and interpretation, especially interoperability of data sources, derivation of European Core Health Indicators (ECHI) indicators and foresight/scenario analysis; transfer from data to policy, especially policy translation tools and data presentation; data collection methods, sources of data, metrics and indicators, especially issues related to health examination surveys; and data privacy and ethical issues, especially how to deal with requirements of GDPR.

Background

EU member-states (MS) are historically diverse, have individual histories and are at different levels of socioeconomic development. The idea of a unit, bringing all together to the same pace to the highest levels of human development, is an ideal that all European citizens understand well. It is evident that giant steps are being made towards the European ideal. Nevertheless, there is still immense work to be done.

In this report we are dealing with capacity building aspects related to Health Information in Europe. This brings together two different notions: health – comprising citizens' health and wellbeing, public health, global health, one health and human development; and Information – slightly reduced to aspects of statistical measurement for monitoring, surveillance and preparation for public health action. At the European Union level, these two subjects are treated almost in opposite positions, health being prominently a MS driven responsibility whereas statistical information is a wider European concept .

Health information is a comprehensive area, in a maturing process, including indicator development, data collection, data analysis and inference, information management and translational research for developing new policies. Health information is often taught in different courses or as modules of information systems or as part of epidemiology courses, but most of the courses are vertical and theoretical with a focus on one or only some topics.

Health, information, and health information, as many other matters, while being clearly diverse across Europe are also facing the challenges posed by modern social and technological advances. A currently data-driven society poses both challenges and opportunities that must be faced and conquered.

It is also clear, through the diversity of available health information in the EU MS that knowledge and capacities on health information vary beteween EU MS. As an example, only half of the EU MS have conducted a national health examination survey (HES) (1) and have both knowledge on how to conduct a HES and data from a HES to derive certain health indicators such as population level prevalence of hypertension or elevated total cholesterol.

So, this WP6 aims at i) designing, **developing** and evaluating **a capacity strengthening baseline program** at EU level that would support sustainably critical areas of health information use and management and ii) setting a European framework for the MS's information capacity that reduces health information inequalities across MS.

For this, in Task 1 of WP6 (whose results are presented in this report) it was foreseen the need to **identify, map and summarise current programmes in "population health and health system performance analysis and monitoring" in the MS**, including issues related to training, research and policy-making, and an assessment of the needs in these areas.

A **Sustainable Capacity Building Programme (flagship programme)** will be subsequently defined aiming at reducing HI inequalities within and between MS. This programme must be a practical approach, including field training and provide insights for its sustainability.

Documentation on how-to-do this programme and a proposal for the **Sustainable Capacity Building Programme** (flagship programme) will be established. Two institutions will perform a pilot of key elements of this programme. The programme proposal will be evaluated. Final output will be a **Roadmap for capacity building** programme for EU MS.

Mapping Exercise

I. Introduction

This report corresponds to the Task 6.1 -Mapping capacities and education/training programmes in health information across MS, aiming to map, as detailed as possible with the available information, the needs, capacities and education/training programmes in health information across MS.

Data was collected from key informers, such as MS representatives, and relevant EU and WHO projects. The mapping also covers a published literature search,a internet search, and a comprehensive web survey on health information needs and challenges across MSs (Figure 1).

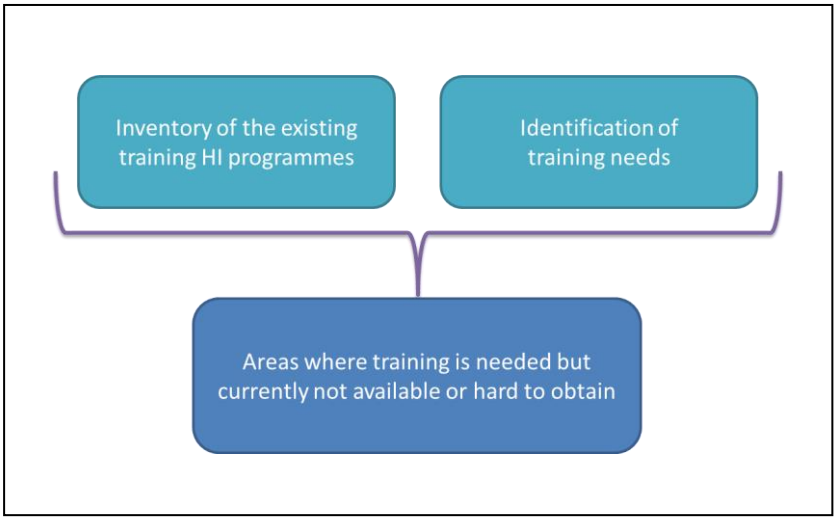

Figure 1 - Mapping European capacities and education/training programmes in health information strategy

Based on the results obtained, a Sustainable Capacity Building Programme (flagship Programme) for the area of health information will be developed and some modules will be tested in 2020 within the framework of the InfAct Joint Action.

II. Methods

We have defined two main strategies for mapping the needs, capacities and programs of education/training in health information in the MS:

- a questionnaire survey, and
- an Internet search.

Additionally, we also conducted a scoping review of the literature on human resources for health (HRH) training and information systems in public health, that contributed to the development of the Survey and to frame the results achieved.

The scoping review

We conducted a scoping review in order to answer the following question:

"Considering the set of responsibilities and activities of public health, what are the main topics and trends of the literature on Public Health Information Systems (PHIS) training?"

The search was carried out in Pubmed and Ebsco databases (October 2018), using English as a reference and the terms "Health Information System" AND "training" in the Title/Abstract/Key Word fields. There were no time restrictions and only free access texts were considered. The records were exported to a Zotero library, following an identification and elimination of duplicates or texts without free access. In addition to publication written in English, records in Portuguese and Spanish were identified. Considering that these texts emerged in the research, its relevance and the team's ability to analyze them, we opted to include them in the review.

References and abstracts were inserted into a Microsoft Excel table and read by two reviewers for acceptance/rejection. In divergent cases, the decision was made through team discussion. Free access documents related to the development, implementation and use of HIS are accepted, as well as articles that address educational initiatives and human resources training needs in this field. All the selected documents were fully downloaded and analysed using MAXQDA (2018 version), suitable software for qualitative research.

Based on the HOT-fit framework to the evaluation of the HIS (2), a qualitative content analysis was carried out to identify the main themes and trends on Human Resources in Health (HRH) and Public Health Information Systems training from the manifest content of the texts, trying to characterize the "emerging issues"(3,4) and identify their impacts on the formulation of policies.

The HOT-Fit framework (Figure 2) looks at the Human side of the HIS, considering both the capacity to use the system (e.g. aligned with the working processes and required skills) and the satisfaction (e.g. not too much difficult to use). The organizational perspective looks at both the structure (e.g. aligned with the working processes) and the environment (e.g., alignment with vertical health integration) provided by the HIS. The technology component covers aspects like system quality (e.g. functionality), information quality (e.g., guaranteeing both the collection and the presentation of information) and service quality (e.g., enabling proper response to service requirements) (2).

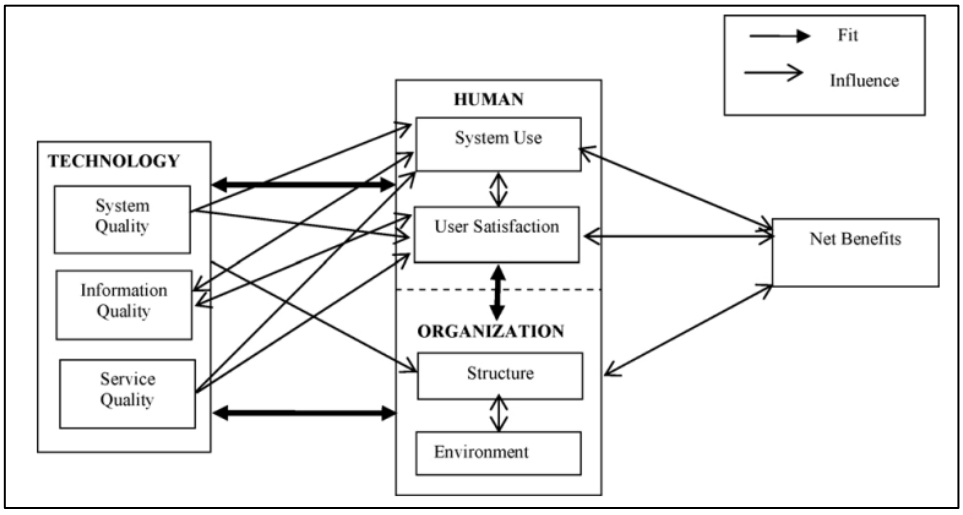

Figure 2 - Human - Organization - Technology fit (HOT-fit) Framework(2)

Health Information Capacity Survey

The health information capacity survey was conducted to characterize existing capacities and training needs for the use and management of health information by public health professionals[1] from EU MS and associated countries. Considering this objective and the need to gather elements for the creation of a Sustainable Capacity Building Programme (flagship programme) in health information, a qualitative, exploratory and expert opinion-based approach was proposed. This is a first approach to have an overview of the capacity in health information.

The Survey was built based on the literature review and in collaboration with specialists and WP6 Partners, who discussed it in various in-person workshop sessions and via e-mail. The final version was approved during the WP6 meeting in Lisbon in March 2019, having been adjusted and tested according with WP6 partners' suggestions.

The questionnaire was installed on the LimeSurvey platform, which allowed its online completion and compliance with EU General Data Protection Regulation (GDPR) (6). The survey included 11 questions organized into 4 groups (identification of the respondent and 3 thematic groups). Due to the qualitive and exploratory characteristics of the survey, at the end of each question there was a text box to add comments about the topic that was being dealt with.

As a strategy to complete the questionnaire with the best coherence, each InfAct national partner was asked to create a small group of experts to discuss these topics, including members of the WP6 team, public health academics, public health authority representatives, and other persons considered appropriate. Each partner also designated a focal point, responsible for maintaining contact with the WP6 team and for ensuring

[1] Besides public health professionals, the public health workforce includes health professionals with certain identifiable selected public health responsibilities, e.g., general practitioners, visiting nurses, physiotherapists, midwives, as well as persons without a health professional background, e.g., teachers, policemen and policewomen, political decision makers, etc. (5)

the correct collection of information from experts and the completion of the online survey.

A survey user's manual was written and made available to all focal points. A WP6 team member was appointed to facilitate the process, having held videoconferences and exchanged written information for follow-up and clarification of doubts.

All InfAct partners were contacted by email with a request to take part in the Survey. Focal points were identified for 23 of the 30 partners. Ten individual or group videoconferences and more than 150 e-mail interactions were performed. Data were collected between May 14 and June 18, 2019. Only the complete responses inserted in the online platform were considered valid. Results were analysed with IBM SPSS 25 and MS Excel 365 programmes.

A full version of the questionnaire is presented in Appendix 1 of this report.

Internet search

We conducted an Internet search with the aim of creating a database of courses for health professionals, including professionals from non-clinical areas, such as financial or hospital management. The search covered 32 countries, including members of the European Union and InfAct partners.

This online search had four phases:

1. Mapping of courses and curricular units through a Swedish website (www.educations.com)
    a. Keywords: HIS, Information System, Health System, Health Informatics and Public Health.
    b. We did a direct search: the website does not allow to the use of boolean operators.
2. In order to achieve more and better results, we consulted the Portuguese website, www.universia.pt.

3. Search and collection of courses and curricular units of European universities included in the 2019 edition of the world's top 1000 (www.topuniversities.com).
4. Data sharing by InfAct project partners.

The initiatives identified in these four phases were subjected to a process of analysis and selection according to previously defined inclusion criteria. (Table 1):

Table 1 - Inclusion criteria for Health Information courses

Inclusion criteria		
Criteria		**Notes**
Main Criterion	The course should be taught in a country belonging to the EU or in associated countries.	Courses from Serbia were included since they are a member of WP6, despite being still a candidate country to join the EU. Although Bosnia and Herzegovina and Norway appear on the list of countries considered for data collection, these countries were not considered as a priority to our analysis.
Secondary Criterion	Academic courses address to public health/medicine from the perspective of health information	Topics: • Bioinformatics • Clinical Decision Support System • Clinical Documentation Improvement • ehealth and Telemedicine • Health Data • Health Informatics • Health Information System/Management (HIS/HIM) • Hospital Information System • Internet in Health • Medical Education • Medical Image Processing • Public Health Informatics

The information was organized into a table containing the following categories: country, course name, program level, university, target group and teaching language.

Since many of the university websites had scarce or no information in English, Google Translator was used as a search helper on websites that only provided information in a native language (other than English). The keywords were not purposely translated as the research was conducted in English.

III. Results

The Scoping Review

The review allowed us to identify a set of emerging themes in this area. Given the extent of the results, we will focus only on those considered more relevant to the development of the Survey and within the study frame.

Different contexts and HIS are addressed, most of them from outside Europe. Several descriptions of training and education actions carried out were found and suggestions to respond to the needs identified in different contexts, from the provision of short- and long-term training courses to the creation and restructuring of graduate and postgraduate education. International cooperation programs are also important resources to capacity building on public health.

It was still possible to identify a large group of HIS users within and without the health system (Table 2).

Table 2 - Health Information System users

Health Information System users	
Clinical and administrative staff.	Doctors, medical/physician assistants, nurses and midwives, psychologists, pharmacists and clinical nutritionists Records and administrative staff. Public health professional
IT professionals	Informatics and another IT Personal
Managers	Facility and Health System Managers
Local, regional authorities	District M&E officer
Health Information managers	health information management professional
Other professions outside the health sector	statisticians, economists and other professionals outside the health sector
Other stakeholders	Service providers, program managers, politicians, funders, global agencies and other organizations
Health Service users	Health Service users

Among the few studies that describe the skills of health professionals to deal with HIS, most are focused on nurses and physicians. There are also approaches to health

professionals as a generic group . Regarding the topics addressed, the lack of computer skills and the importance of proper electronic health records management are the main focus, with only two articles seeking a broader view for PHIS.

The Survey Results

We obtained 18 (60%) responses to the survey (12 from WP6 members and 6 from InfAct Extra WP6 partners). 3 (10%) partners reported inability to fill-in the questionnaire, 2 (6,67%) showed interest but did not complete the online questionnaire and 7 (23,3%) did not respond to the request (Figure 3).

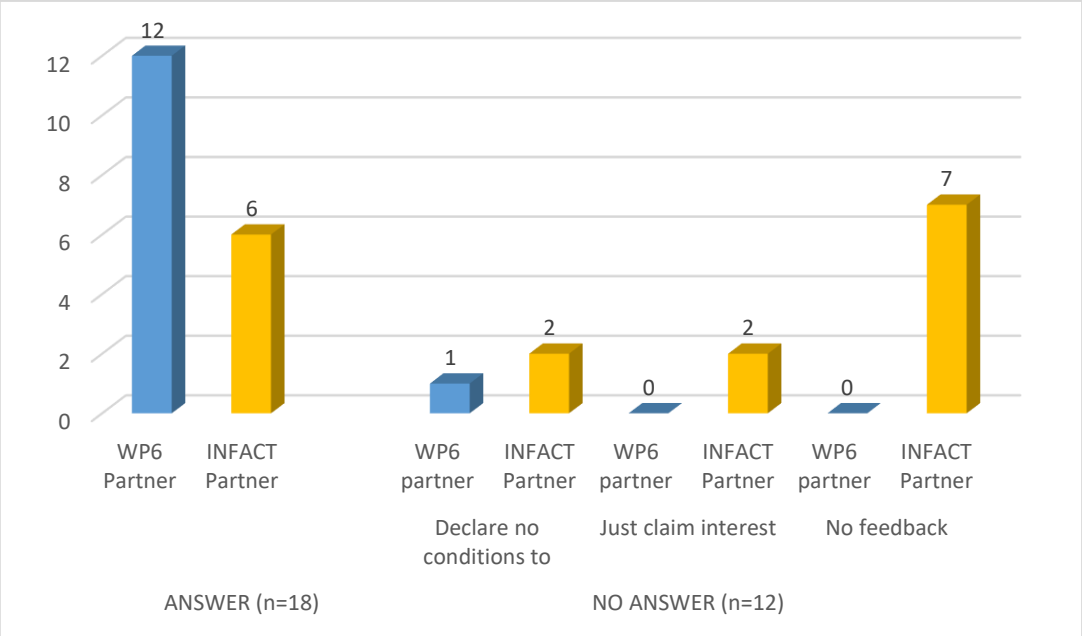

Figure 3 - Response of the partners to the request for participation in the survey on the capacity of health information, by tipe of partne (N=30)r

Figure 4 presents the geographic distribution of the partners who responded to the request for participation in the survey.

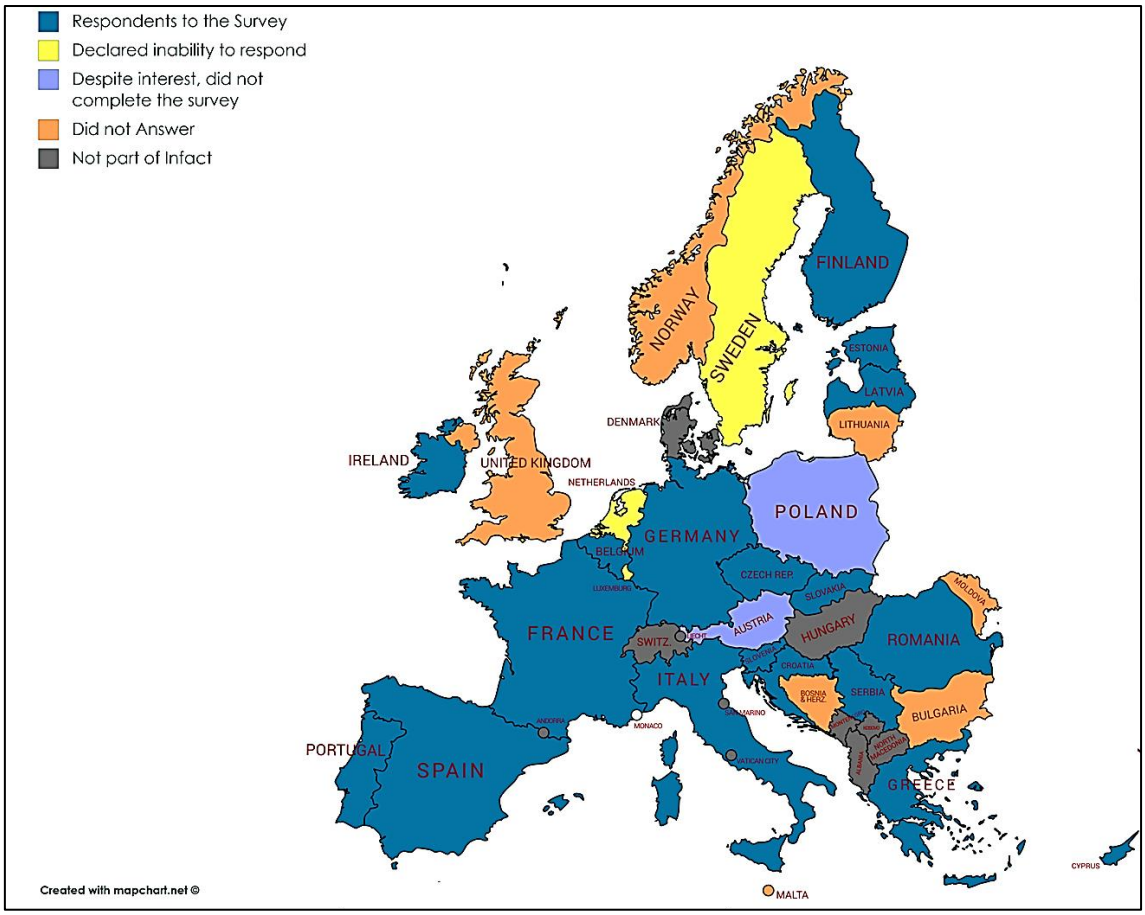

Figure 4 - Response of the partners to the request for participation in the survey on the capacity of health information

Health Information System users

Regarding health information systems, we were interested to find out, in a more detailed prespective, which professional groups were using them.

Experts were asked to rank users from a list of professionals – being 1 the most in need of the system and 12 the least. By calculating the mean of the classification given by the respondents to each profile, we were able to establish the ranking of the set of cases. The ranking enables an exploratory analysis of the opinions.

According to the average opinion of the experts, the Public health information specialists are the most frequent users of HIS, followed by researchers in public health and epidemiologists. (Table 3).

Table 3 - Health Information System user (mean ranking)

Professional profile	Mean Ranking
Public Health Information Specialist	3.06
Public Health Researchers	3.56
Epidemiologist	4.06
Data analyst	4.89
Public Health Program Manager	5.00
Statistician	5.22
Health Professionals	6.11
Social Scientists	6.83
Manager/Administrator	7.06
Economists	7.72
Other	8.00
ICT Personnel	9.11

In Figure 5 we can find the graphical representation of the number of times each profile was classified in the first 4 places of the ranking by the experts.

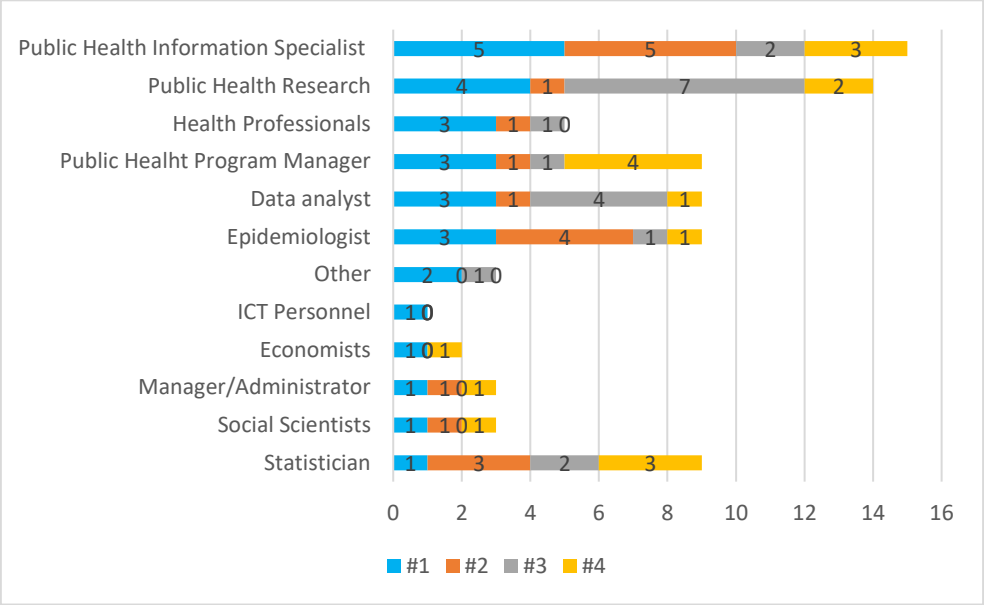

Figure 5 - Number of times each professional profile was classified in the first 4 places of the ranking od HIS frequent Users (experts opinion)

Public Health Information Specialists were reported by 5 respondents as the most frequent users of HIS while Public Health Researchers were referred 4 times and Health

Professionals, Data Analysts and Epidemiologists 3 times each. Two MS specialists chose more than one professional profile as more frequent users and one respondent did not point out any profile as #1 (Figure 6).

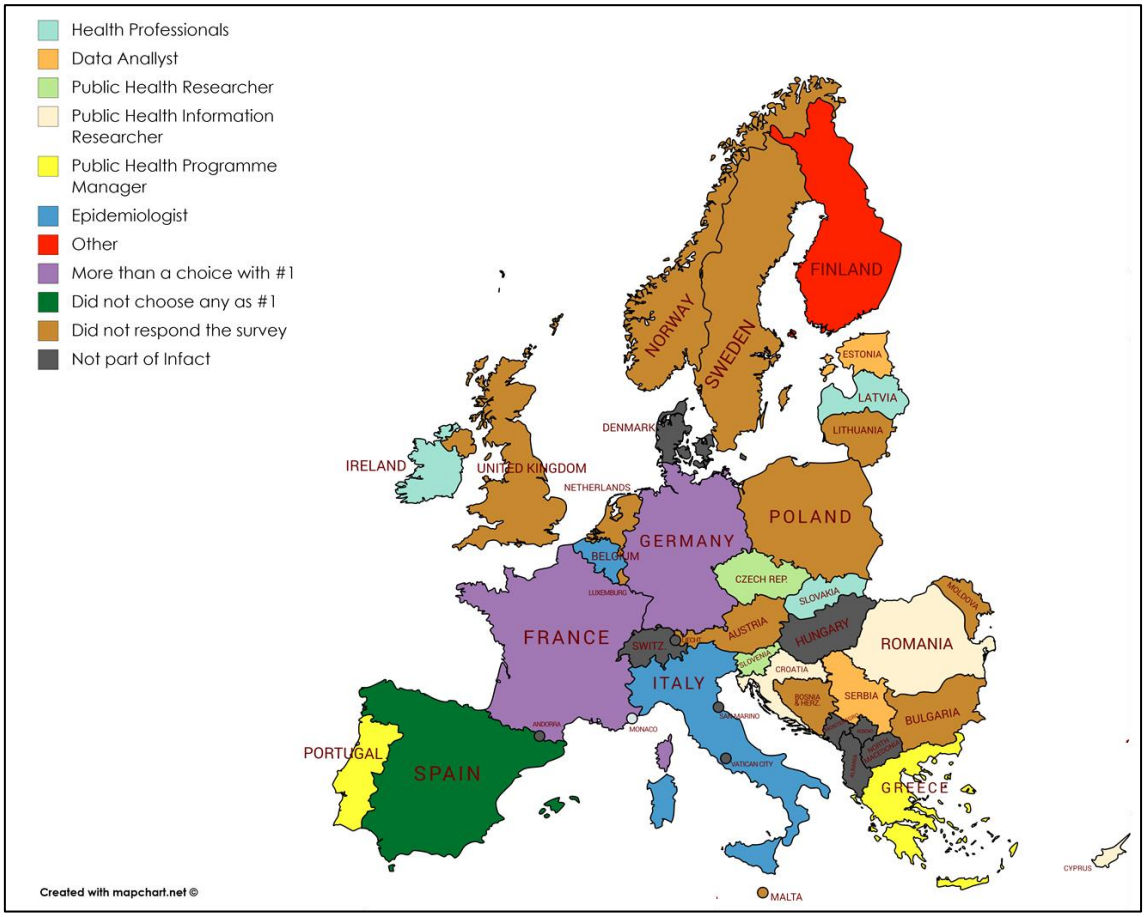

Figure 6 - Professional profile ranked as #1 among the most frequent users of HIS, by country

In order to complete their responses, 6 of the 18 partners identified other professionals (out of the list proposed for ranking) as frequent HIS users, namely “Policy and decision makers at different levels”, “Health insurance professionals”, “public health field specialists”, “Researchers from Pharmaceutical companies”, “NGO members”. Among the "others", there were also references to some professional profiles that were already on the proposed list (such as All Health Care staff, ICT Specialists, system managers), a way of highlighting their importance as HIS users.

Training Needs for HIS users (todays' perspective)

We were also interested to find out which HIS users needed futher capacity building activities now and in a 10 years period.

According to the opinions expressed by the experts, in the present moment, public health researchers, information specialists in public health and Statisticians are those who present the greatest training needs (Table 4).

Table 4 - Need to train the HIS users in the present moment (mean ranking)

Professional profile	Mean Ranking
Public Health Researchers	3.56
Public Health Information Specialist	4.06
Statistician	4.67
Epidemiologist	4.89
Health Professionals	5.00
Public Health Program Manager	5.06
Data analyst	5.50
Manager/Administrator	6.72
Economists	7.00
Social Scientists	7.06
Other	7.44
ICT Personnel	8.11

In Figure 7, we present the number of times each profile was classified in the first 4 places int the ranking of "need for training".

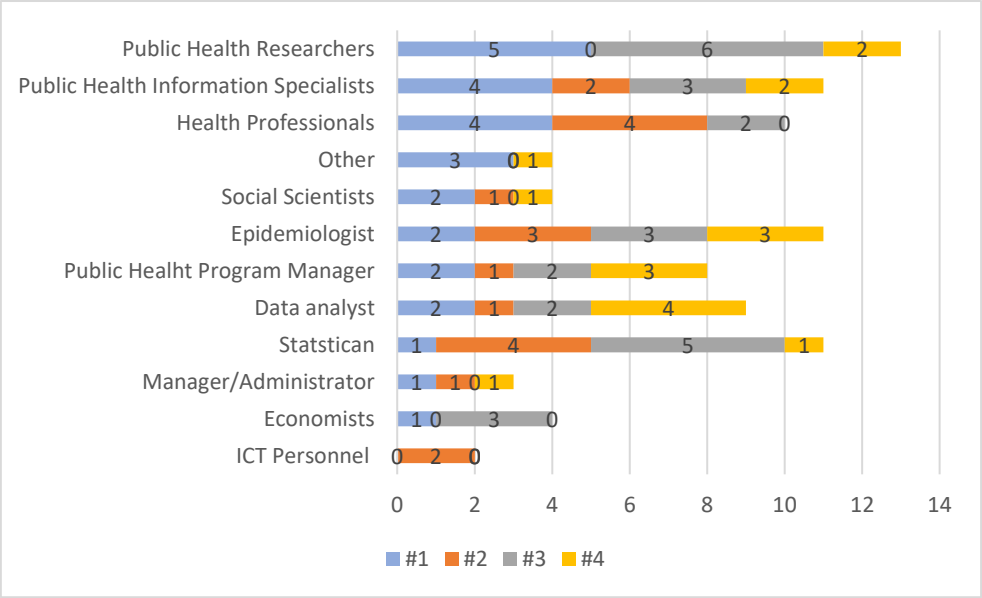

Figure 7 - Number of times each profile was classified in the first 4 places int the ranking of "need for training".(experts opinion)

Public Health Researchers were reported by 5 respondents as the ones with greater need for training at the present time, while Public Health Information Specialists and Health professionals were referred to 4 times each. Two MS specialists chose more than one professional profile and one respondent did not point out any profile as #1 (Figure 8).

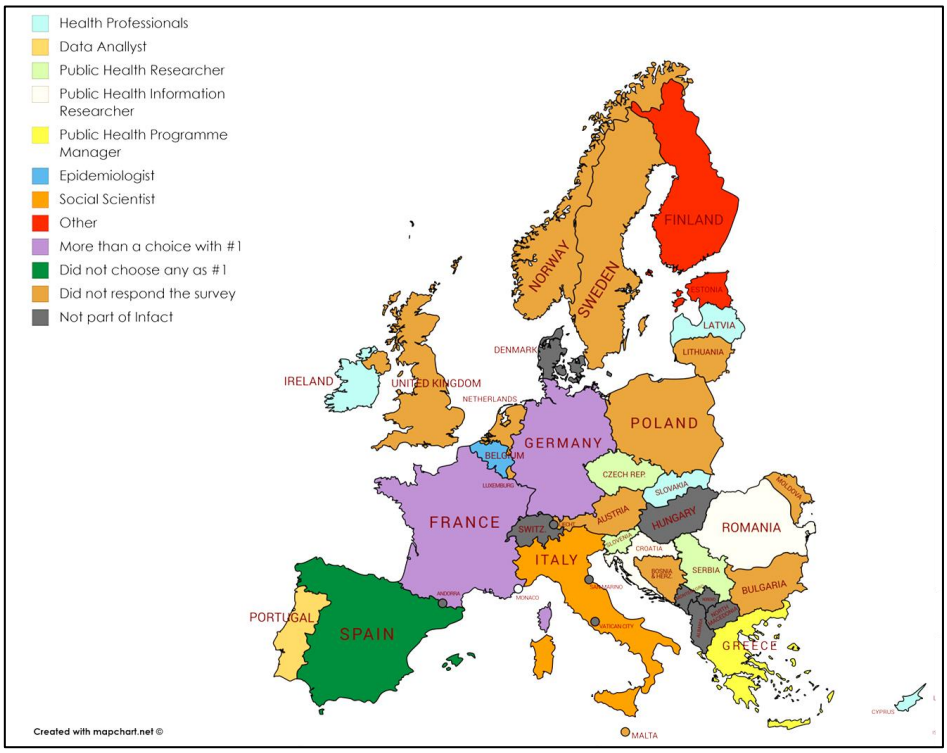

Figure 8 - Professional profile ranked as #1 among those who have the most need for training at the moment, by country

As in the previous question, other professionals were identified as also needing training: “Policy and decision makers at different levels”, “Health insurance professionals”, “public health field specialists”, “Researchers from Pharmaceutical companies” and “NGO members”.

The Needs of training HIS users in the future (a 10 years perspective)

From a perspective of future HIS development, within the next 10 years, MS experts said that priority should be given to the training of public health information specialists, public health programme managers and health professionals (Table 5).

Table 5 - Need to train the HIS users in a ten years perspective (mean ranking)

Professional profile	Mean Ranking
Public Health Information Specialist	3.06
Public Health Programme Manager	4.50
Health Professionals	4.61
Public Health Researchers	4.67
Epidemiologist	5.22
Statistician	5.28
Manager/Administrator	5.78
Data analyst	5.83
Economists	7.00
Social Scientists	7.44
Other	7.50
ICT Personnel	7.89

In Figure 9, we present the number of times each profile was classified in the first 4 places int the ranking of "need for training".

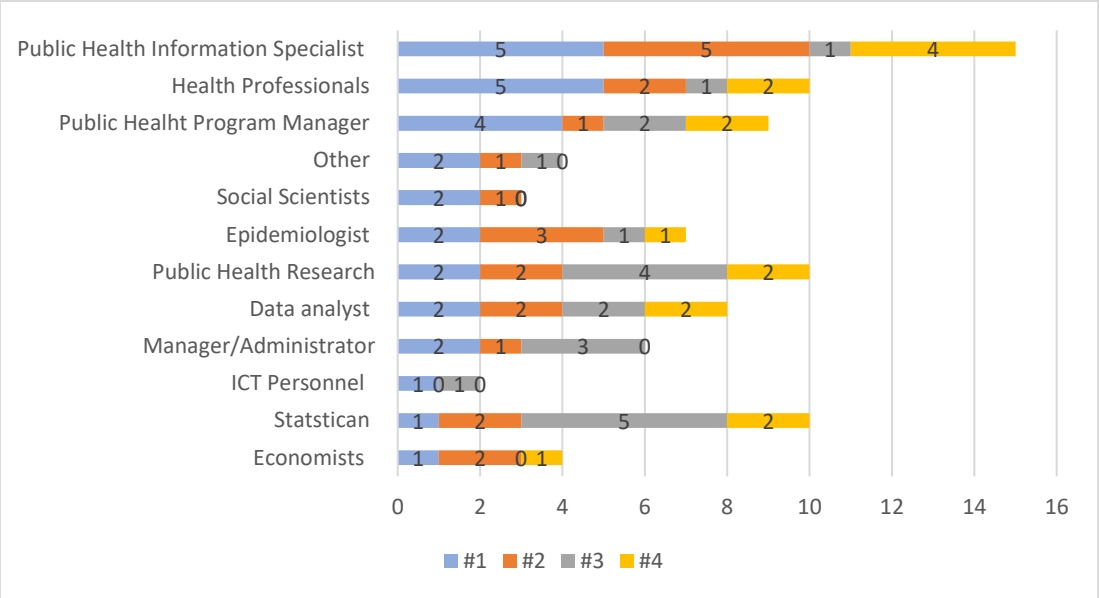

Figure 9 - Number of times each profile was classified in the first 4 places int the ranking of "need for training" in a 10 years perspective (experts opinion)

Public Health Information Specialists and Health Professionals were reported by 5 respondents as the users who most need training in a ten-year development perspective, while Public Health Programme Managers was referred 4 times. Two MS specialists chose more than one professional profile and one respondent did not point out any profile as #1 (Figure 10).

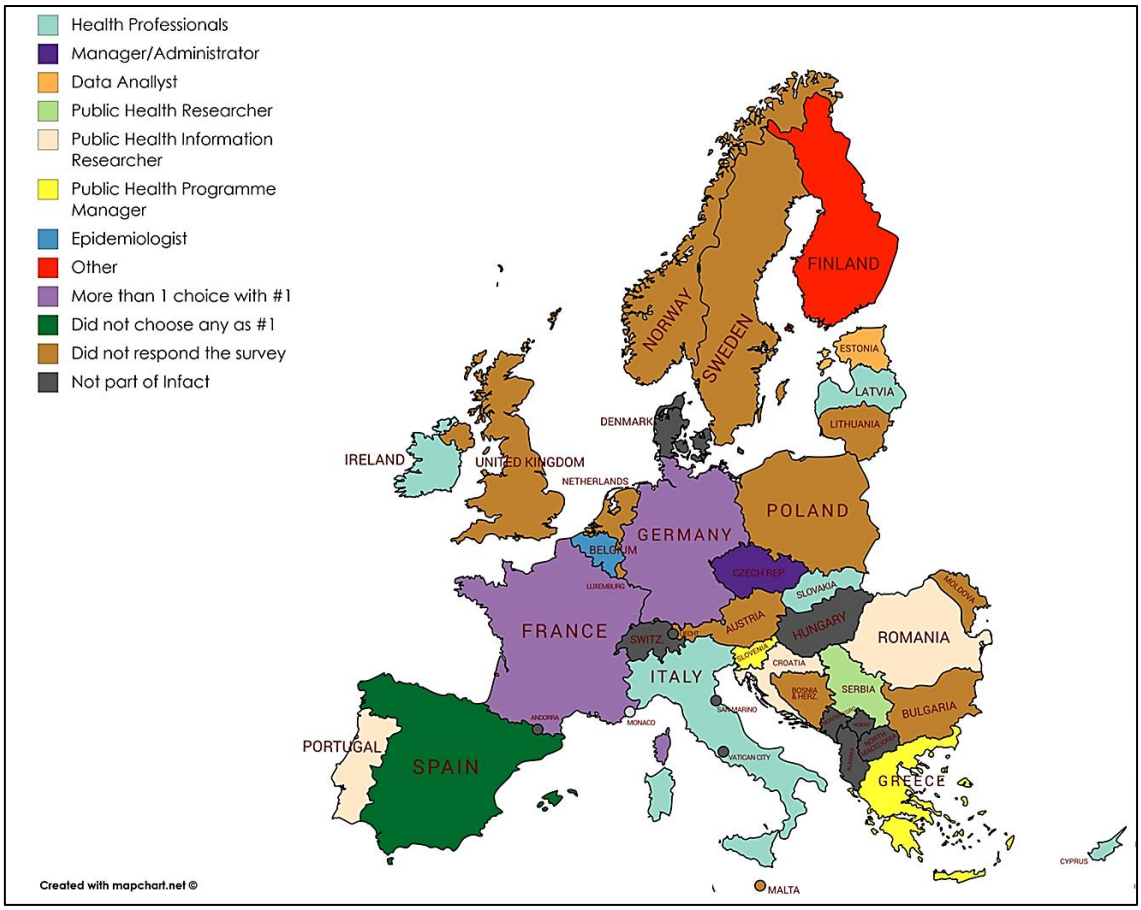

Figure 10 - Professional profile ranked as #1 among those who have the most need for training " in a 10 years perspective, by country

Other actors who should be considered in the training programmes, were those already mentioned "Policy and decision makers at different levels", "Health insurance professionals", "public health field specialists", "Researchers from Pharmaceutical companies" and "NGO members".

According to their visions of the development of HIS and health systems, two of the partners pointed the need to think about new professional profiles (nurse data analysts, Community Agents data analysts and health informaticians) and a more specific training, namely acquiring skills related to big data analysis. One of the partners stressed out the difficulty of presenting training priorities in a 10-year perspective. We all recognize the difficulty of defining priorities for the future.

The analysis of the observations for these three questions (who are the **Health Information System users**, who need capacity building activities now and who will need it in 10 years) allowed the identification of some concerns:

- The need to clarify the concept of a HIS user. Is the user the one who uses the data to produce something or should we also include as users the professionals who, in their routine activity, introduce clinical (or other) information into the system? Should we also include health services users/individuals who generate data through mobile devices?
- The existence of a multiplicity of designations for some professionals and the lack of solid definition of their profile (e.g., public health specialist, ICT specialist), hindering a standardized approach.
- The need to clarify the concept of HIS. Although a definition was proposed to frame the discussion, some experts reflect on whether we should have broader or more restrictive approaches to these systems.

Training Initiatives for HIS Users

The partners were asked to indicate (from a list provided) the types of training initiative more appropriate for each professional profile considered in the research. The type of subject needs to be taken in consideration. In general, the results show that e-learning initiatives, intensive courses (1-2 weeks) and the provision of guidelines are mentioned most, meaning that the experts might consider these to be the most pertinent ways of delivering training to that population (Figure 11).

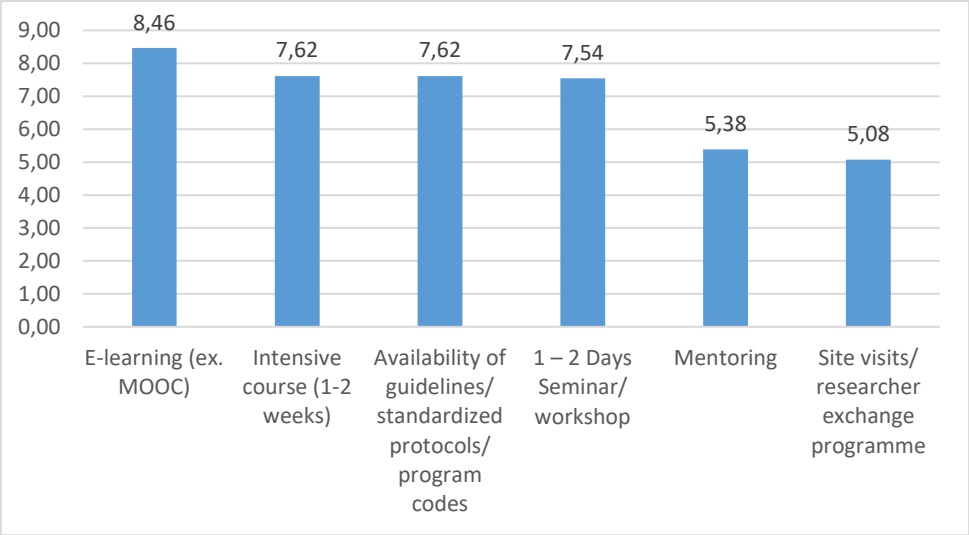

Figure 11 - Mentions by training initiative (Mean number)

All capacity building methods were considered useful for all listed professional groups. When looking at the distribution of suggestions by professional profile we can observe that these are not homogeneous and that even the least chosen initiatives (with lower average) are valued by some partners (Figure 12).

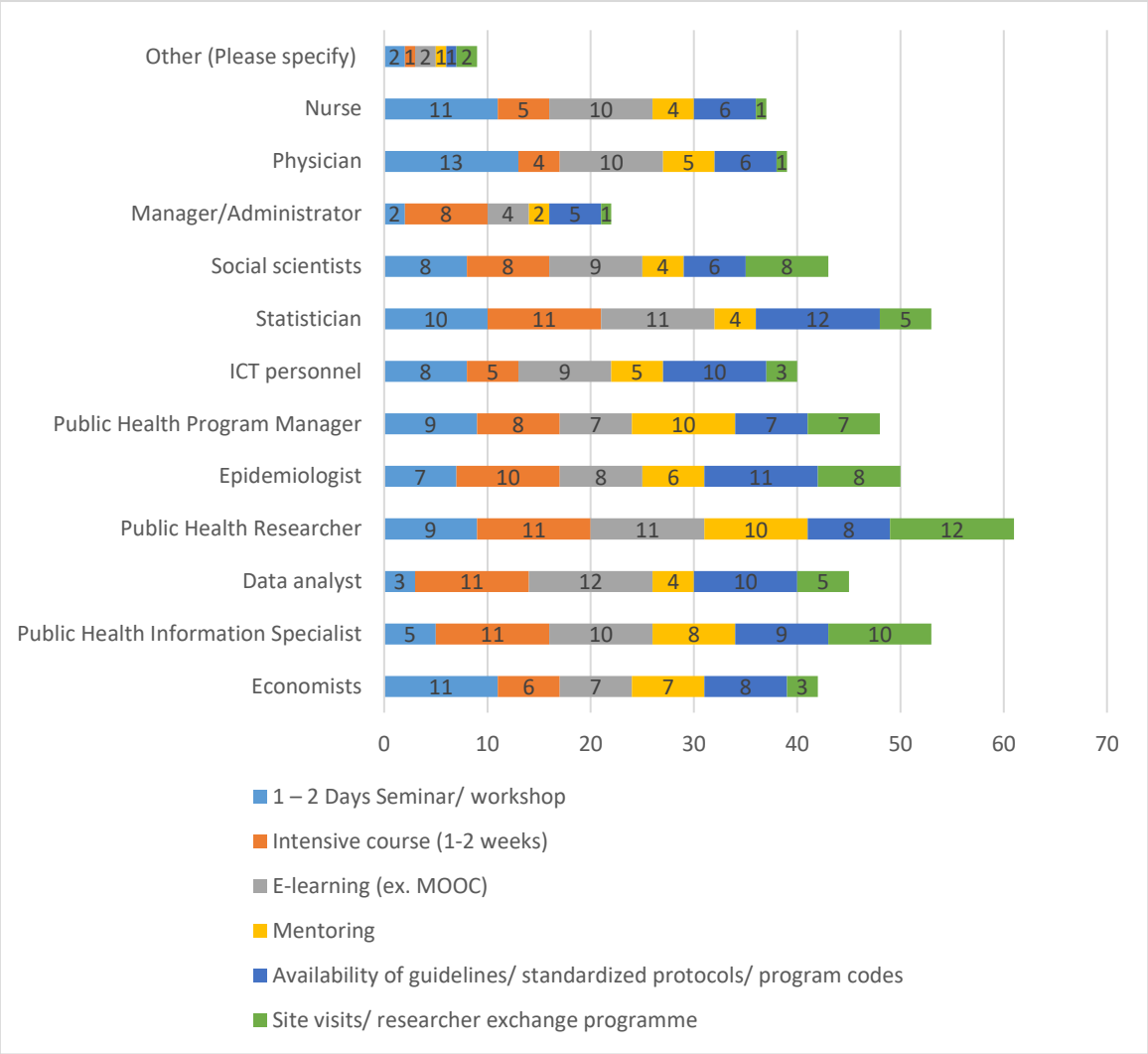

Figure 12 - Suggested Training Initiatives (number of suggestions, by initiative type and Professional Profile)

1-2 day seminars/workshops would fit best for nurses, physicians and economists; intensive courses for managers/administrators and public health information specialists; E-learning for social scientists and data analysts; mentoring for public health programme managers; guidelines, standardized protocols and programme codes for epidemiologists, ICT personnel and statisticians; and site visits and researcher exchange programmes for public health researchers (Figure 12).

In the open comments section, it was suggested that formal modular academic training programmes of 3 to 12 weeks would be useful for specific learning and could be used towards a formal qualification in Health Information Systems. Examples include Data

analytics and visualisation; Data quality and assurance; Data architecture and coding; Data interpretation and epidemiology.

Also, part time degrees, masters in Health information/informatics are useful for professionals engaged and immersed in this field. Online forum opportunities can result in collective learning through shared online resources/learning/question and answer forums.

Availability of Health Information Training

These questions intended to identify the availability of training initiatives in health information systems. More than an exhaustive list of initiatives, we have sought to understand whether there is a formative response in three thematic areas:

- Health information on data sources, standardized data collection tools and Epidemiological methods;
- Data analysis and exploitation;
- Translation from data to policy;

Experts were asked to, within these categories and according to a list of specific topics, identify the existence of a set of specific education courses (undergraduate, master and doctoral courses, advanced studies for the Professional development) and training initiatives for public health professionals and others, as well as the main providers and the format of this offer. Several MS experts found difficult to separate from other training.

The modules integrated in undergraduate courses (for example, statistics and epidemiology in medical courses) or postgraduate courses (for example, global health module in a master's degree in international politics) should not be considered in the answers.

The results show that 6 out of 17 specific themes are available in at least 75% of the countries analysed. Universities and public health institutions are the main providers of

the initiatives and the most common format of training is the Seminar/Workshop (Table 6, Table 7, Table 8).

Looking at the initiatives on "Health information on data sources, standardized tools for data collection and epidemiological methods", we find a high availability of seminars/workshops related to all topics, provided primarily by universities or public health organizations (Table 6).

Table 6 - Availability of courses and training initiatives in health information on data sources, standardized data collection tools, and Epidemiological methods

	Available (N=18)		Most frequent provider (among those available)		Most frequent format (among those available)	
Main Course Theme	n	%		%		%
Health examination surveys (surveys with objective measurements and collection of biological samples additional to questionnaires)	13	72,2%	Public Health Organization	46,2%	Seminar/Workshop	38,5%
Health interview surveys (surveys based only on questionnaires)	14	77,8%	University	42,9%	Seminar/Workshop	50,0%
Health records (hospitalizations/ patients records)	15	83,3%	Public Health Organization	60,0%	Seminar/Workshop	80,0%
Registries (mortality or disease-specific registries, such as cancer registry, diabetes registry)	16	88,9%	Public Health Organization	56,3%	Seminar/Workshop	62,5%
Longitudinal epidemiological studies	16	88,9%	University	62,5%	Seminar/Workshop	50,0%

Regarding the qualification in "data analysis and exploration", there was high availability of seminars/workshops in "Calculating health statistics" and "projections of health outcomes/risk Factors". It also highlights the low availability of initiatives related with "interoperability of data sources".

Universities and Public health Organizations are the main providers of training (Table 7).

Table 7 - Availability of courses and training initiatives related to data analysis and exploration

	Available (N=18)		Most frequent provider (among those available)		Most frequent format (among those available)	
	n	%		%		%
Calculation of health statistics	16	88,9%	University	56,3%	Seminar/Workshop AND Onsite Course	37,5%
Projections of health outcomes/risk factors	14	77,8%	University	50,0%	Seminar/Workshop	50,0%
Health system performance assessment (HSPA)	13	72,2%	Public Health Organization	38,5%	Seminar/Workshop	61,5%
Burden of disease (concept and methods – YLL, YLD, DALY)	13	72,2%	University	46,2%	Seminar/Workshop	53,8%
Data Management	13	72,2%	University	46,2%	Seminar/Workshop	53,8%
Foresight / Scenario Analysis	11	61,1%	University	54,5%	Seminar/Workshop	54,5%
Derivation of indicators for the European Core Health Indicators (ICHI) short list	9	50,0%	Public Health Organization	55,6%	Seminar/Workshop	33,3%
Interoperability of data sources	7	38,9%	University	71,4%	Seminar/Workshop	85,7%

In general, there is a lower availability of initiatives in the areas framed by "translation from data to policy" (Table 8).

Table 8 - Availability of courses and training initiatives related to translation from data to policy

	Available (N=18)		Most frequent provider (among those available)		Most frequent format (among those available)	
	n	%		%		%
Communication strategies and tools	12	66,70%	University	50,0%	Seminar/Workshop	50,0%
Health Regulation	11	61,10%	Public Health Organization	54,5%	Seminar/Workshop	81,8%
DATA presentation	10	55,60%	University	50,0%	Seminar/Workshop	70,0%
Policy translation	9	50,00%	Public Health Organization	44,4%	Seminar/Workshop	44,4%

In the open questions, 6 partners reported that in their country there are already extended training cousers on offer but that they do not have the ability to accurately describe it. On the other hand, 8 partners reported that the specific topics considered in the Survey are, in part, integrated into more complex undergraduate or postgraduate courses. The utilization of online training tools is also pointed out (e.g. Health examination surveys) as a relevant resource and opportunity.

Themes for a Sustainable Capacity Building Programme (flagship programme) on health information

We asked experts to comment on the importance of a set of themes to include in a Sustainable Capacity Building Programme (flagship programme) on health information and to identify other content areas they might think are necessary and relevant.

All the issues proposed were considered either extremently useful and very useful by the majority of the respondents (Figure 13). Among the included topics, the following six were considered as *Very helpful* or *Extremely helpful* by more than 75% of respondents:

- data analysis and interpretation;
- from data to policy: Evidence, translation and communication;
- data sources, metrics and indicators;
- data presentation methods;
- health data collection methods;
- public health studies and surveys.

The following four topics were considered Extremently helpful by more than 35% of the respondents:

- data analysis and interpretation;
- from data to policy: evidence, translation and communication;
- data presentation methods;
- data privacy and ethics.

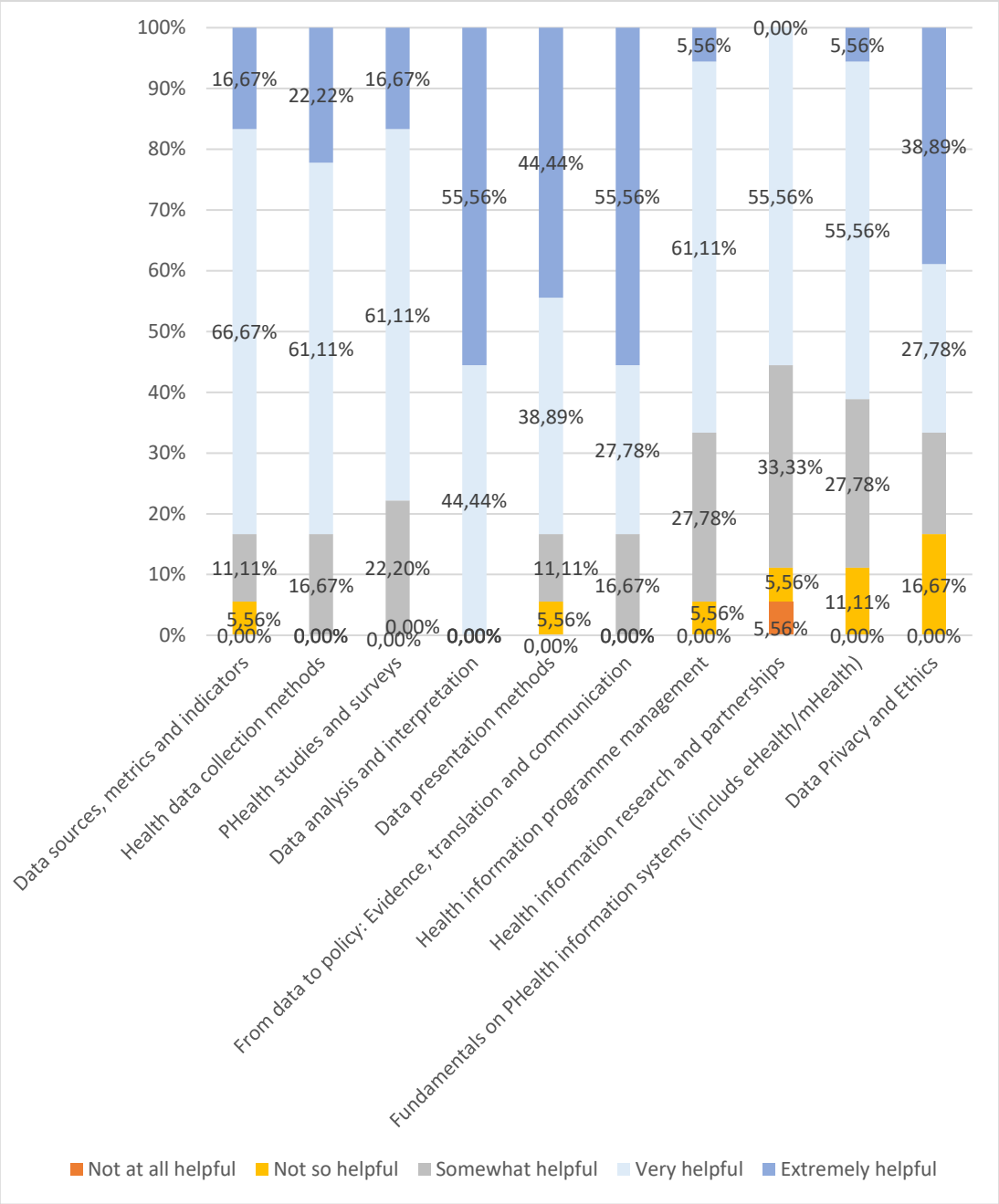

Figure 13 - Relevance of themes to be included in a Sustainable Capacity Building Programme (flagship programme) - expert opinion

In addition, the following comments were raised i) data privacy and ethics – particularly data protection and requirements of GDPR, ii) secondary data analysis – including data sharing, repositories and data integration; and iii) data presentation methods – the design and implementation of stakeholder dashboards with easy to access results.

Country participation in international capacity building activities

This question was not mandatory and had no predefined options, so the answers varied and reflected different perspectives of the theme.

Among the 18 partners, 12 reported 32 attendances in at least 25 different national and international activities. Besides these, 4 partners indicated participation in training activities but did not specify which and 2 did not mention any participation (Table 9).

Table 9 - initiatives reported by the experts (N=18)

Number of specific initiatives reported by the experts (N=18)		
	n	%
Do not mention participation in initiatives	2	11,11%
They participated but did not specify which	4	22,22%
One initiative	4	22,22%
Two initiatives	3	16,67%
Three initiatives	1	5,56%
Four initiatives	1	5,56%
Five initiatives	3	16,67%

There is some clear international dynamics on public health information. The reported initiatives were organised and conducted in collaboration with national partners - such as public health Institutes and universities - and international organizations or networks such as WHO, EUPHA, ASPHER, ECDC, World Bank, European Health Forum Gastein, International Research Network, UNECE, GoFAIR initiative, IANPHI, and EUROMED- Joint Projects for the exchange of researchers.

Internet search results

The purpose of the data analysis was to describe the formative offer that European countries have to offer, namely the distribution and duration of the courses, the type of programme, the credits confered and the language of instruction.

In the initial research, American universities have the largest availability of courses on offer compared with. In opposition to the Europe, it was very easy to find out courses that are related to Health Information.

Over the 4 phases of the research were identified 1026 courses, that were organised by country. In order to narrow the list of findings to health information courses, the data and analysed according to the inclusion criteria defined in the methods chapter. The courses found are from 19 countries and no initiatives were identified in 10 countries. Given the complexity of the information, it was not yet possible to collect data for 3 countries (

Table 10).

Table 10 - Health information courses offer, by country

	Country	Notes
Countries where it was possible to identify HI courses (n=19)	Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, Netherlands, Portugal, Romania, Serbia, Spain,Sweden, United Kingdom,.	
countries where it was no possible to identify courses (n=10)	Cyprus, Luxembourg Malta Moldova	No universities in the top 1.000
	Bosnia Herzgovina Bulgaria, Latvia, Slovakia Croatia	Without Health Information courses in the universities the top 1.000.
	Slovenia	Does not appear to have Health Information courses but, on the other hand, has some course units.
No time to complete search (n=3)	Norway Poland Hungary	Results will be shown later, by the end of the year.

Considering the extent of the information collected, it was only possible to analyse in detail data from 15 countries, in which 315 courses were identified and integrated in the database (Figure 14).

Detailed information on the courses available in France, the United Kingdom, Germany, the Netherlands, Hungary, Norway and Poland will be completed and made available later this year.

Database with information on countries that have not been analysed in this report is available for download here:

https://www.dropbox.com/s/zuf7hyzhwhwnjqq/Courses%20around%20Europe%20about%20%C2%ABHealth%20Information%C2%BB.docx?dl=0

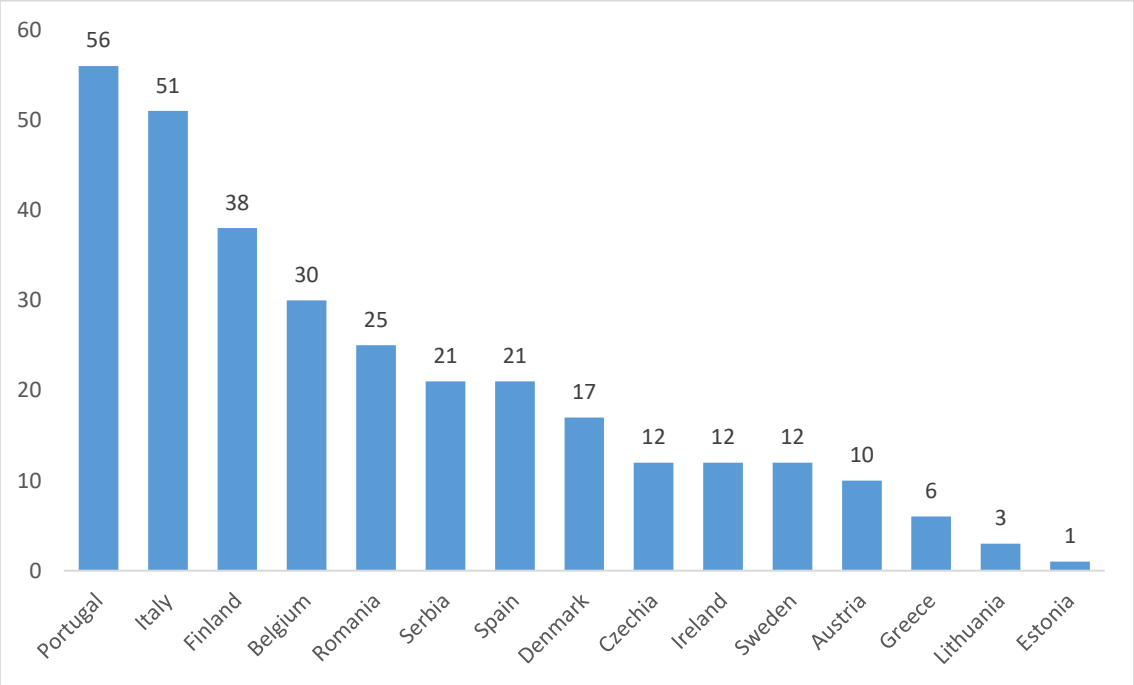

Figure 14 - Number of courses across some European countries (N=315)

Programme Level masters and doctorates are the most frequent courses in this sample (Figure 15). We have also identified a smaller portion of more specific courses: short-term

courses (17 cases); «University Certificate» courses (14) and Continuous Medical Education (13).

However, for the purposes of analysis and to maintain homogeneity among all countries, only those Course Units that were not associated directly with any Masters/PhD, etc., were considered[2]. Thus, of the 7 course units, only 2 will be part of the analysis since they are independent course units. However, the Curricular Units that are not part of this analysis will be found in the database provided.

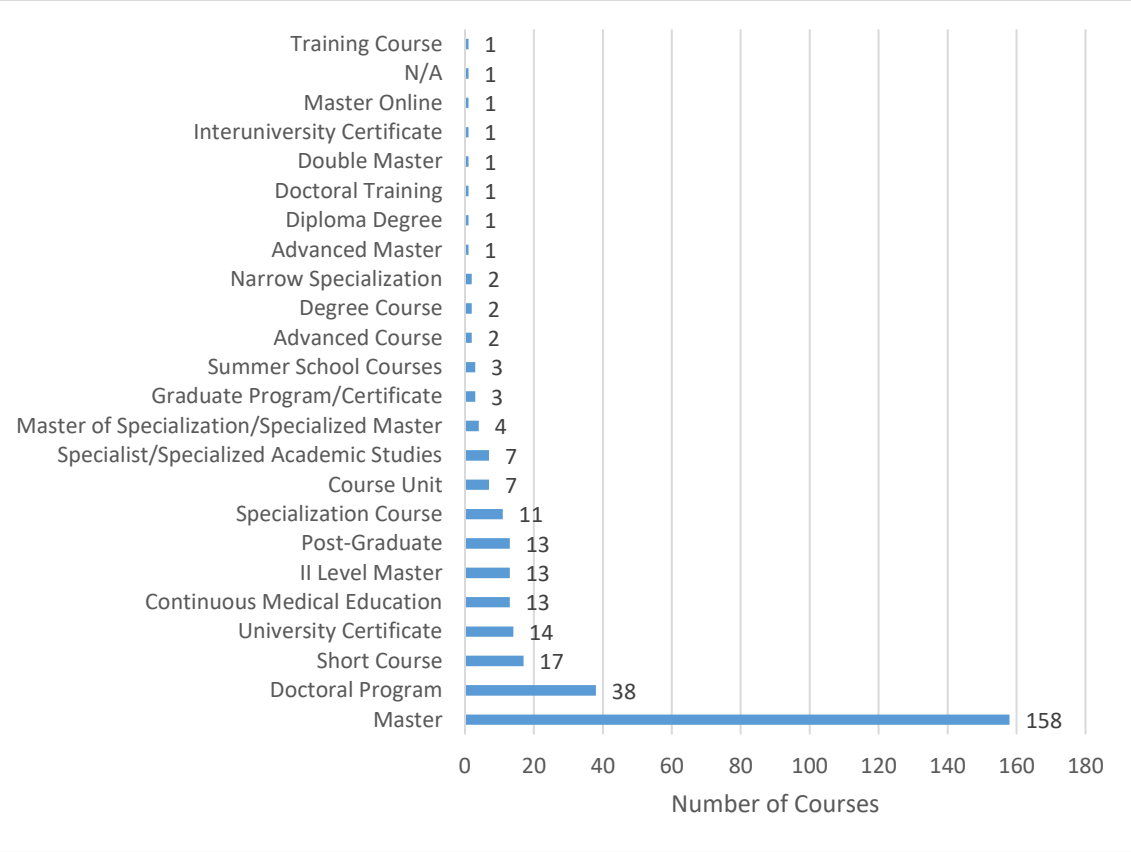

Figure 15 - Programme Levels across some European courses

When analysing the duration of these courses, it was clear that there is a relative predominance of two-year courses (n = 114), a value partly explained by the duration of

[2] We have collected course units related to the theme of 'Health Information' which can be consulted in the database. Course units that are associated with Masters/PhD, etc, were not analyzed because the objective was to study only academic courses. However, the presence of course units in the database means that there are not only academic courses in 'Health Information'.

the masters, usually 4 semesters. We identified 60 courses lasting 1 year (19,05%) and another 54 courses (17,14%) lasting less than one year. It was not possible to obtain information about the duration of 16,51% of the courses (n = 52). There were 20 courses (6,35%) lasting four years, while 10 courses (3,17%) were only 3 years of duration. Five courses (1,59%) were only one and a half years long (Figure 16).

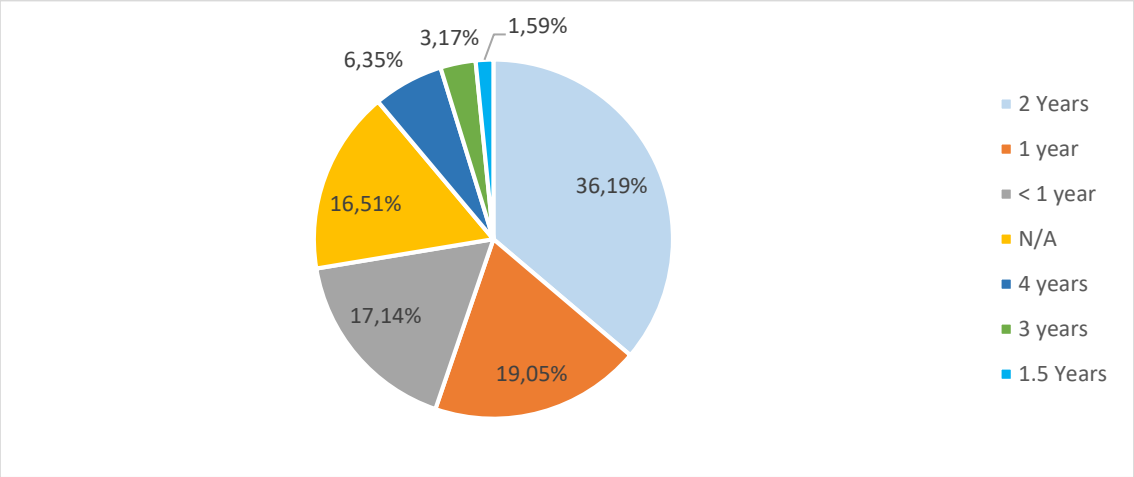

Figure 16 - Duration of diferente European courses (%)

In our search, it was possible to identify two types of credits: the *European Credit Transfer System* (ECTS) and the *Crediti Formativi Universitari* (CFU) used in Italy. However, for the purposes of analysis, since there is equivalence between these two accreditation systems, the Italian courses with CFU credits will be considered as courses with ECTS credits.

We registered 102 courses with 120 ECTS (32,38%) and 96 courses (30,48%) without any information about the respective credits. 68 (21,59%) courses have credits ranged between 60 and 100 ECTS in which credits ranged between 60 and 100 ECTS and 23 courses (3,0%) with less than 60 ECTS. The courses with 180 ECTS represented 5,08% (n= 16), while the number of courses with 240 ECTS (n = 89) represented 2,86% (Figure 17).

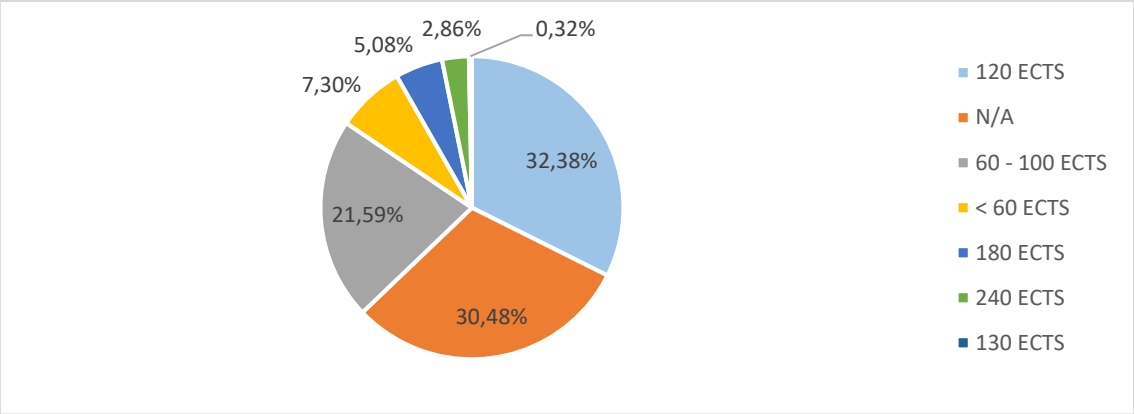

Figure 17 - Credits across European Courses (%)

Figure 18 shows the language of instruction in the referred courses. For 73 of the 315 (23,17%) HIS courses, there was no information about the language of instruction. In the remaining cases, we verified that English (n=72), 22,86 % of the total) is the most common language and Italian courses comprised 13,65 % of the cases (N=43).

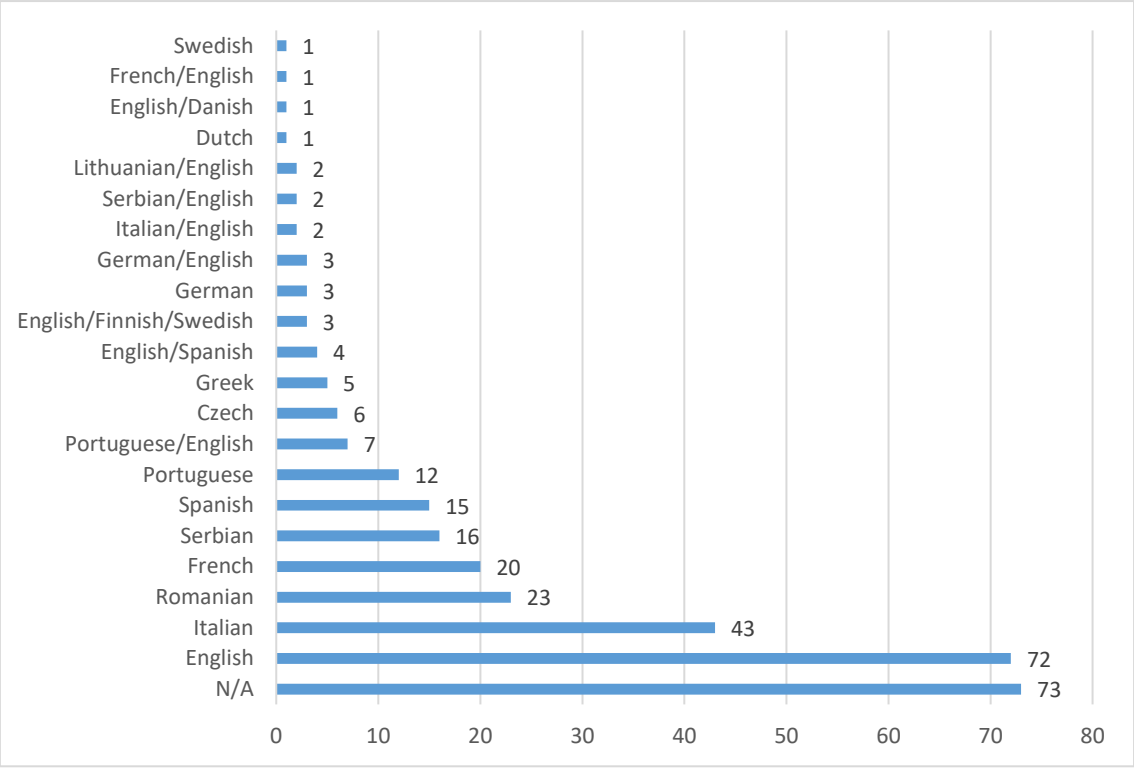

Figure 18 - Language(s) of instruction of European courses

Limitations on data collection

This was the first approach to understand the reality of health information capacity building in Europe. The approach is mainly qualitative and based on expert opinions.

The lack of common concepts applicable to all countries (e.g. Public health professional, health professional, masters courses, short-term courses, etc) was one of the major limitations of this study. It was found that the different terminology used by the specialists conditioned the responses to the Survey and the internet search. We felt this difficulty at the beginning of the study preparation, but we considered it important to address this limitation to understand and discuss the diversity of the results.

The application of the Survey was conditioned by factors related to the form, because the online platform selected to install it does not offer solutions that help to limit fill errors in ranking issues.

The survey aimed to collect data and opinions on the training offer and training needs in Europe. The qualitative approach chosen allowed a characterization that, although not being rigorous and detailed, meets the perspective of the specialists and allows to have an overview and to frame the next steps of the project.

Despite the indepth discussion between the partners during the preparation of the research, the recommendations issued and the monitoring of the focal points during data collection, there were some disparities in the way data were collected and, in some cases, there were errors in completion of the form due to difficulties in interpreting the questions.

The online research faced several obstacles that limit the quality and scope of the collection made, including the unavailability of information in English. Although we used a translation tool to try to circumvent this difficulty, there is a great possibility that not all initiatives have been identified. In addition, differences in the quality and quantity of information disclosed by institutions on their websitesand scarcity of data or disparity between the elements provided in the local language and in English can also be seen as limitation.

As the Portuguese team had a better knowledge of the university and public health environment, assistance was requested to all InfAct project partners (not just WP6) in order to have 'inside' information for the development of the database. Despite several appeals, not all partners contributed to this collection of data on the courses of their country and therefore this remains a limitation.

IV. Discussion on results and implications for further WP6 and InfAct work

Sound and reliable information is essential to structure, develop and guarantee sustainability of health systems and to ensure the success of their interventions. The results are very enlightening: Public health information is clearly a growing field and health information systems are essential to support public health activities. As a result, it is necessary to provide rigorous training and education for professionals, giving them knowledge, skills and tools to produce, manage and use information in a robust and reliable way. Now and in the next 10 years.

There is evidence that the availability of health information and the possibilities for using it for evidence-informed policy making varies between EU MS (7,8). It is clear now, due to the contributions of the MS teams, that the existing capacity building is growing. With this mapping exercise, and despite its limitations, it was possible to identify a multiplicity of training initiatives throughout Europe, undertaken by universities, public health organizations, associations and private organizations, as well as initiatives of capacity building that happen on a regular basis. However, the experts, and the literature, point to the necessity to reinforce the training (9–11).

As in other public health related areas, the diversity of concepts, professional profiles and training initiatives associated with Health Information Systems that our results show, indicate the importance of a harmonisation of the definitions and requirements for the training of professionals in the use and management of these systems in public health activities in Europe, which should have institutional support at the highest level**(11)**.

It was possible to understand that HIS are more commonly used by public health information specialists, public health researchers, epidemiologists and data analysts. Training needs focus on public health researchers, public health information specialists, epidemiologists, data analysts and health professionals. In a 10-year development hase, training needs change somewhat, but not substantially. However, the identification of new profiles of specialists are emerging. Although these data help to have a better understanding of the evolution of HIS, we have to bear in mind that this is only indicative since there could be several biases.

Despite the limitations, the research on the availability of training initiatives in each country shows that there is a large supply, diversified and spread throughout Europe – there is an opportunity to standardize, even with defined credits, a training offering directed to Health information. On the other hand, partners have been involved in international capacity initiatives, namely in short-, medium- and long-term training initiatives to define guidelines or standardized protocols.

The importance and the role of the training of professionals in the immediate and long-term emerges from the analysis of the results. As in other studies, the skills for data analysis and treatment or to empower professionals to use the applications are the most valued by the specialists, but it is desirable that other areas of knowledge, such as system design or ethics will be integrated into the programs.

There are specific issues that would require more extensive capacity-building activities at EU level. In the area of data sources, standardized data collection tools and epidemiological methods, most of the topics were already relatively well covered with existing training activities in the MS. Only in one case additional capacity building activities might be needed -health examination surveys (HES). In the area of data collection, several topics seem to require additional capacity building activities: interoperability of data sources, derivation of indicators for the European Core Health Indicators (ICHI) shortlist and foresight/scenario analysis. For translation from data to policy areas, all topics were lacking systematic training though out the MS but especially training on policy translation and data presentations would need strengthening at the EU level.

With regard to the HIS capacity building, the scoping review identified a set of issues that can be systematized around three interrelated axes relevant to the definition of the flagship training:

I) *Collection, management and use of data:* Several papers address the need to increase the skills of Health professionals to use clinical data collection tools, such as electronic health records or tally sheets, as well as improve their technical capacity for sampling design, conducting research and for processing, managing

and analysing data. Data presentation and communication are also referred to as skills to be developed.

II) *Health Information System design, implementation and development:* Some authors argue that although short-term training programs are important, they are not sufficient, even advocating the need to empower the workforce for different aspects of HIS like architecture and design (e.g. user-centred design or usability assessment), as well as for the implementation process, in order to promote motivation and adhesion while preventing problems of lack of usability.

III) Informatics and technology (IT): The improvement of computer skills is a recurrent subject, often referred to by professionals as a major need, along with the capacity to use digital tools for recording, processing and storing data. IT training includes not only basic skills and the use of digital tools to manage data, but also of Ehealth devices or geographical information systems (GIS) for mapping the health of populations.

From the survey results analysis, including lack of existing capacity building activities and the need for topics identified by respondents for future sustainable capacity building programmes on health information, the following areas with clear need for coordinated EU level capacity building activities could be identified:

- Data analysis and interpretation, especially interoperability of data sources, derivation of ECHI indicators and foresight/scenario analysis.
- Transfer from data to policy, especially policy translation tools and data presentation.
- Data collection, sources, metrics and indicators, especially issues related to health examination surveys.
- Data privacy and ethical issues, especially how to deal with requirements of GDPR.

Although more research is needed in these areas, as well as clarification of concepts about professions around public health activities, this provides a good basis for preparation of a sustainable health information capacity building programme and setting up a roadmapof how to reach this goal. Additional to these identified topics, we should also consider new, emerging topics such as mydata, big data, and artificial intelligence in

public health and how these could be integrated as part of a comprehensive health information system.

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Appendix

I – Survey Structure

II – Database

III- Response of the partners to the request for participation in the survey on the capacity of health information

I – Survey Structure

HEALTH INFORMATION CAPACITY SURVEY

This project is funded by the Health Programme of the European Union

Based on the opinion of Public Health experts, this survey aims at characterizing existing capacities and training needs for the use and management of health information by public health professionals in EU Member States and associated countries.

Its application is part of the *InfAct – Joint Action on Health Information* project (WP6).

For your guidance, the main concepts are the following:

Health Information is the data and knowledge that health professionals use to support their decisions, usually available in the health information systems.

Health Information Systems refer to any system that captures, stores, manages or reports information related to the health of individuals or populations, or the activities of health organisations.

This definition incorporates routine information systems, disease surveillance systems, and includes laboratory systems, patient records systems and resource management systems. It includes aspects related with working processes (e.g. decision-making), people skills and technology.

At a policy level, decisions informed by evidence contribute to more efficient resource allocation and, at the delivery level, information about the quality and effectiveness of services can contribute to better outcomes.

Completion of the Survey

Each national partner should designate a focal point responsible for gathering the necessary information from a group of experts and for completing the survey.

The completion of the form must be carried out without interruption and by a single operator.

(click to access a PDF version of survey)

All questions and clarifications may be directed to the WP6 team (via andre.beja@ihmt.unl.pt).

There are 20 questions in this survey.

QUESTION #1

In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data.

By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.

*

Please choose **only one** of the following:

◯ Yes

◯ No

QUESTION #2

Please provide us the following information:

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

QUESTION #3

Considering the context of your country, **please rank which profiles of professionals most often use** public health information systems in support of their Public Health Activities.

- *Please answer this question by following the suggestions, but be free to add new ones by entering them in the text box of Question #3b*

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

❗ Only numbers may be entered in these fields.

	Rank - #1 represents the greatest need and #12 the lowest need
Health Professionals (e.g. MD, Nurses, Psychologists, Pharmacists, Other)	
Economists	
Manager/Administrator	
Statistician	
Data analyst	
Public Health Researcher	
Public Health Information Specialist	
ICT personnel	
Public Health Program Manager	

	Rank - #1 represents the greatest need and #12 the lowest need
Epidemiologist	
Social scientists	
other (please specify in Question #3b)	

QUESTION #3b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #3.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data . By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #4

Considering the context of your country and the Public HIS users identified in the question below, please **rank the greatest needs regarding knowledge and skills** for public health information.

- *Please address this question following the suggestions, however be free to add new ones by entering them in the text box of Question #4b.*

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are expected to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

❗ Only numbers may be entered in these fields.

	Rank - #1 represents the greatest need and #12 the lowest need
Health Professionals (e.g. MD, Nurses, Psychologists, Pharmacists, Other)	
Economists	
Manager/Administrator	
Statistician	
Data analyst	
Public Health Researcher	
Public Health Information Specialist	
ICT personnel	
Public Health Program Manager	

	Rank - #1 represents the greatest need and #12 the lowest need
Epidemiologist	
Social scientists	
Other (specify in question #4b)	

QUESTION #4b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #4.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #5

Considering a **10-year development perspective** for the HIS of your country**, rank the greatest needs for developing knowledge and skills** for public health information.

- *Please address this question following the suggestions, however be free to add new ones by entering them in the text box of Question #5b.*

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

❗ Only numbers may be entered in these fields.

	Rank - #1 represents the greatest need and #13 the lowest need
Health Professionals (e.g. MD, Nurses, Psychologists, Pharmacists, Other)	
Economists	
Manager/Administrator	
Statistician	
Data analyst	
Public Health Researcher	
Public Health Information Specialist	
ICT personnel	
Public Health Program Manager	

	Rank - #1 represents the greatest need and #13 the lowest need
Epidemiologist	
Social scientists	
Other (Specify in Question #5b)	

QUESTION #5b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #5.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #6

Please **indicate which cadres of public health professionals mostly need further training** in health information in your country and the appropriate type of training (may choose more than one):

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

	1 – 2 Days Seminar/ workshop	Intensive course (1-2 weeks)	E-learning (ex. MOOC)	Mentoring	Availability of guidelines/ standardized protocols/ program codes	Site visits/ researcher exchange programme	Other	Not Applicable
Economists	☐	☐	☐	☐	☐	☐	☐	☐
Public Health Information Specialist	☐	☐	☐	☐	☐	☐	☐	☐
Data analyst	☐	☐	☐	☐	☐	☐	☐	☐
Public Health Researcher	☐	☐	☐	☐	☐	☐	☐	☐
Epidemiologist	☐	☐	☐	☐	☐	☐	☐	☐
Public Health Program Manager	☐	☐	☐	☐	☐	☐	☐	☐
ICT personnel	☐	☐	☐	☐	☐	☐	☐	☐
Statistician	☐	☐	☐	☐	☐	☐	☐	☐
Social scientists	☐	☐	☐	☐	☐	☐	☐	☐
Manager/Administrator	☐	☐	☐	☐	☐	☐	☐	☐
Physician	☐	☐	☐	☐	☐	☐	☐	☐
Nurse	☐	☐	☐	☐	☐	☐	☐	☐

	1 – 2 Days Seminar/ workshop	Intensive course (1-2 weeks)	E-learning (ex. MOOC)	Mentoring	Availability of guidelines/ standardized protocols/ program codes	Site visits/ researcher exchange programme	Other	Not Applicable
Other (Please specify in question #6b)	☐	☐	☐	☐	☐	☐	☐	☐

QUESTION #6b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #6.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #7

Please fill out the table below regarding **Health Information-related courses available** in your country **concerning data sources. standardized data collection tools and Epidemiological methods** (availability, access, contents).

- *Please address this question following the suggestions, however be free to add new ones* by entering them in the text box of Question #7b

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please choose the appropriate response for each item:

	Provider						Format							
	Not available	Public Health Organization	Health Association	University		Not Avail	Not available	Seminar/worshop	onsite course	e-learning	site visits	researcher exchange	others	
Health records (hospitalizations/ patients records)	◯	◯	◯	◯	◯	◯								
Registries (mortality or disease-specific registries, such as cancer registry, diabetes registry)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	
Health interview surveys (surveys based only on questionnaires)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	
Health examination surveys (surveys with objective measurements and collection of biological samples additional to questionnaires)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	
Longitudinal epidemiological studies	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	

	Provider	Format
other (specify in Question #7b)	◯ ◯ ◯ ◯ ◯	◯

Provider: Not available; Public Health Organization; Health Association; University

Format: Not available; Seminar/worshop; onsite course; e-learning; site visits; researcher exchange; others

QUESTION #7b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #7.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #8

Health Information Training: Please fill out the table below regarding ***Health Information-related courses available*** *in your country* ***concerning DATA analysis and exploitation.***

- *Please address this question following the suggestions,* however be free to add new ones by entering them in the text box of Question #8b

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please choose the appropriate response for each item:

	Provider						**Format**						
	Not available	Public Health Organization	Health Association	University			Not available	Seminar/worshop	onsite course	e-learning	site visits	researcher exchange	others
Calculation of health statistics	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Projections of health outcomes/risk factors	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Health system performance assessment (HSPA)	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Interoperability of data sources	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Derivation of indicators for the European Core Health Indicators (ICHI) short list	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Burden of disease (concept and methods – YLL, YLD, DALY)	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯
Data Management	◯	◯	◯	◯	◯		◯	◯	◯	◯	◯	◯	◯

	Provider						Format							
	Not available Public Health Organization Health Association University					Not Avai	Not available Seminar/worshop onsite course e-learning site visits researcher exchange others							
Foresight / Scenario Analysis	◯	◯	◯	◯	◯	◯								
Other (specify in question #8b)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	

QUESTION #8b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #8.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #9

Health Information Training: Please fill out the table below regarding **Health Information-related courses** available in your country **concerning translation from data to policy.**

- *Please address this question following the suggestions,* however be free to add new ones by entering them in the text box of Question #7b

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please choose the appropriate response for each item:

	Provider						**Format**						
	Not available	Public Health Organization	Health Association	University	Another	**Not Available**	**Other**	Not available	Seminar/worshop	onsite course	e-learning	site visits	researcher exchange	others
Health Regulation	◯	◯	◯	◯	◯	◯	◯							
DATA presentation	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Communication strategies and tools	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Policy translation	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Other (specify in Question #9b)	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

QUESTION #9b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #9.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #10

Please choose **how useful the following capacity building topics would better fit as modules of a flagship training program** on Health Information in your country (choose only one option per row).

*

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

	Not at all helpful	Not so helpful	Somewhat helpful	Very helpful	Extremely helpful
Data sources, metrics and indicators	☐	☐	☐	☐	☐
Health data collection methods v	☐	☐	☐	☐	☐
Public health studies and surveys	☐	☐	☐	☐	☐
Data analysis and interpretation	☐	☐	☐	☐	☐
Data presentation methods	☐	☐	☐	☐	☐
From data to policy: Evidence, translation and communication	☐	☐	☐	☐	☐
Health information programme management	☐	☐	☐	☐	☐
Health information research and partnerships	☐	☐	☐	☐	☐
Fundamentals on Public Health information systems (including eHealth/mHealth)	☐	☐	☐	☐	☐
Data Privacy and Ethics	☐	☐	☐	☐	☐

QUESTION #10b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #10.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

QUESTION #11

As far as you know, **has institution of your country participated in existing international capacity building activities** in the past year? If so, please give us the following details:

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, and I am aware that I can withdraw my consent at any time. participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

	Activity designation	Role (Organizer/ Lecturer / Student / Other)	Type of capacity-building activity	Partner institution (e.g. WHO, ASPHER)	Location	Timeline
activity 1						
activity 2						
activity 3						
activity 4						
activity 5						

QUESTION #11b

If you wish, you can add comments or suggestions regarding the topic addressed in Question #11.

(Please note that the answer to this question is not required)

Only answer this question if the following conditions are met:
Answer was 'Yes' at question '1 [Q1]' (QUESTION #1 In the context of participation in the InFact survey and in accordance with the General Data Protection Regulation, you are requested to pronounce about the referred processing of your personal data. By clicking YES, I authorize the processing of my personal data, such as name, email and other information concerning my participation in the InfAct Survey.)

underneath this box there are technical questions about the survey, ignore them

Please write your answer here:

thank you for your help

Submit your survey.
Thank you for completing this survey.

II – List of Courses

Database with information on countries that have not been analysed in this report is available for download here:

https://www.dropbox.com/s/zuf7hyzhwhwnjqq/Courses%20around%20Europe%20about%20%C2%ABHealth%20Information%C2%BB.docx?dl=0

III- Response of the partners to the request for participation in the survey on the capacity of health information III- Response of the partners to the request for participation in the survey on the capacity of health information

Response of the partners to the request for participation in the survey on the capacity of health information

Country	Wp6 Partner?	Focal Point?	Survey Completion
1. Austria	No	Yes	No
2. Belgium	Yes	Yes	Yes
3. Bosnia Herzegovina	No	No	No
4. Bulgaria	No	No	No
5. Croatia	Yes	Yes	Yes
6. Cyprus	No	Yes	Yes
7. Czech Republic	No	Yes	Yes
8. Estonia	No	Yes	Yes
9. Finland	Yes	Yes	Yes
10. France	No	Yes	Yes
11. Germany	No	Yes	Yes
12. Greece	Yes	Yes	Yes
13. Ireland	Yes	Yes	Yes
14. Italia	Yes	Yes	Yes
15. Latvia	Yes	Yes	Yes
16. Lithuania	No	No	No
17. Luxembourg	No	Yes	Not able to answer Partner alleged lack of human resources to collect data
18. Malta	No	No	No
19. Moldova	No	No	No
20. Netherlands	Yes	Yes	Not able to answer Partner expressed disagreement with the Survey content

21. Norway	No	No	No
22. Poland	No	Yes	No
23. Portugal	Yes	Yes	Yes
24. Romania	Yes	Yes	Yes
25. Servia	Yes	Yes	Yes
26. Slovakia	No	Yes	Yes
27. Slovenia	Yes	Yes	Yes
28. Spain	Yes	Yes	Yes
29. Sweden	No	Yes	Not able to answer Partner claimed not to have information available in a qualitative manner acceptable
30. United Kingdom	No	No	No