D5.1 Health Information System Peer Assessment Evaluation Report

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Petronille Bogaert for InfAct

Sciensano | Rue Juliette Wytsmanstraat 14 |
1050 Brussels | Belgium| e-mail: infact.coordination@sciensano.be|
Website: www.inf-act.eu|Twitter: @JA_InfAct

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Table of Contents

Executive summary

This document is the Health Information System Peer Assessment Evaluation Report of the Joint Action on Health Information (hereinafter referred to as InfAct) with project number 801553. Work Package (WP 5) focuses on the status of health information systems in EU Member States and regions. Within this Work Package, task 5.1 dealt with mapping and assessing Health Information Systems (HIS). Experts from nine countries performed peer assessments of each other's national HIS.

The methodology applied for these peer assessments was derived from the methodology developed and piloted by WHO Regional Office for Europe in the framework of the WHO European Health Information Initiative (EHII) in which the original format is an external evaluation. Each assessment included a preparatory desk report, two full days of face-to-face interviews with local stakeholders, a final report including a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and SMART (Specific, Measurable, Assignable, Realistic, Time-related) recommendations, and a follow-up stakeholder meeting. Before the assessments the assessors were trained and were provided with a manual on how to carry out a peer assessment.

This report lays out the evaluation of the experience of the participating countries. It focusses on three aspects: what did the assessors learn, what was the experience of the assessors to use the HIS assessment tool in peer review format and what are the advantages of using the tool in peer review format. Recommendations are also formulated on how to potentially improve the HIS assessment tool. The methodology for the peer HIS assessment evaluation was qualitative and based on an analysis of 12 semi-structured interviews.

The peer assessments were a success and had an impact on the participating countries that was much broader than expected. The experience did not only allow them to identify health information gaps and action points in European HISs. It provided them with a thorough understanding of what a health information system is, who the key stakeholders are and what their activities are. It also allowed the participating countries to have proven expertise on how to carry out a HIS assessment. The assessors mastered the art of carrying out an assessment both by understanding the tool and by gaining the necessary skills. Furthermore the assessments were an opportunity for the assessors to network and foster a health information community within and outside their country potentially boosting the HIS in their country.

The HIS assessment in peer review format worked well for the participating countries and was highly recommended to others. The four main advantages are its boost of expertise and knowledge within the country, its networking opportunities, its objectiveness and its informal interviews. The assessors valued each of the steps of

the HIS assessment. The five steps of the assessments brought a different experience and a different kind of personal growth to the assessors.

Finally, based on the experience of the assessors, 17 recommendations were formulated which could be used to assure a successful or improved HIS assessment regardless of its format.

Key points

The peer assessments had an impact on the participating countries that was much broader than expected.

The assessors refined their capability to carry out an effective assessment both by understanding the tool and by gaining the necessary skills through practice.

The assessments were an opportunity for the assessors to network and foster a health information community both within their country, boosting the awareness of the HIS in which they work, and outside, allowing them to look at their own HIS with a more objective lens

The HIS assessment in peer review format exceeded the expected outcome in the participating countries and was highly recommended to others.

The five steps of the assessments brought a different experience and a different kind of personal growth to the assessors.

17 recommendations were formulated which could be used to ensure a successful or improved HIS assessment, regardless of its format.

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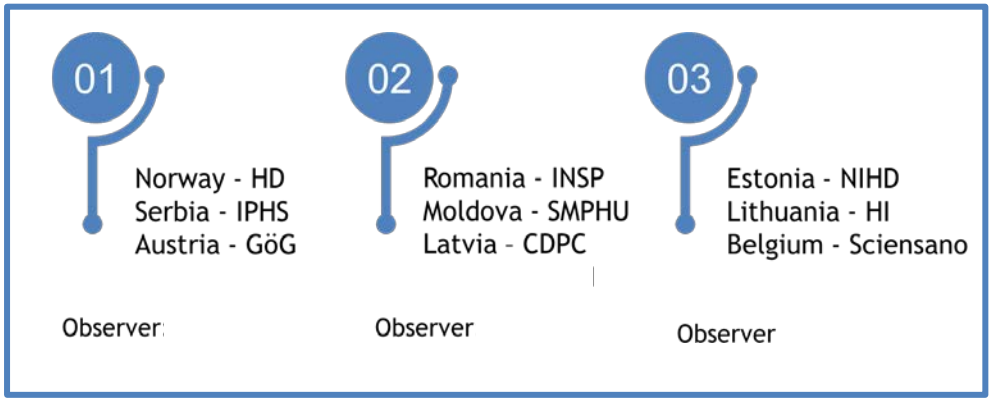
I. Introduction

Within the Joint Action on Health Information (InfAct), Work Package (WP 5) focuses on the status of health information systems in EU Member States and regions. Within this Work Package, task 5.1 dealt with mapping and assessing Health Information Systems (HIS). HISs include data collection, interpretation (analysis and synthesis), reporting and knowledge translation, and the total of resources, stakeholders, activities and outputs to do so[1]. In the context of this Work Package, experts from nine countries performed peer assessments of each other's national HIS.

The objective of the peer review process was to identify health information gaps in countries, and to define action points for direct and long-term improvement and strengthening of HIS. This would help to reduce health information inequalities between countries through peer review. Additionally, it was an opportunity to get to know other players in national HIS, together with international experts in the field.

Assessments were held in Austria, Belgium, Estonia, Latvia, Lithuania, Moldova, Norway, Romania, and Serbia. The nine countries were split in three groups of three countries as shown in Figure 1. Identified experts from each of the three countries were peer reviewing each other's system. In this report they are referred to as assessors.

Figure 1: Groups in HIS peer assessment



The peer assessments were carried out in three cycles. The first assessment in each group took place in the period February – March 2019, the second in May – June 2019, and the third in October – November 2019. The assessments were carried out by one or two peer assessors from each assessing country, meaning a maximum of four assessors in total. All assessors were trained in a two-day course on how to perform the assessment. A contact person in the assessed country acted as the national liaison during the assessment and organised the peer assessment. In this report we call them the host assessor. An observer provided support during the assessment based on previous experience with the assessment methodology, to

[1] Verschuuren M, van Oers H, editors. Population Health Monitoring: Climbing the Information Pyramid [Internet]. Cham: Springer International Publishing; 2019 [cited 2020 Apr 10]. Available from: http://link.springer.com/10.1007/978-3-319-76562-4

ensure that the assessments were performed according to professional standards and procedures.

The methodology applied for these peer assessments was derived from the methodology developed and piloted by WHO Regional Office for Europe[2][3] in the framework of the WHO European Health Information Initiative (EHII)[4]. This items list covers the following domains of HISs: resources, indicators, data sources, data management, national HISs data quality/information products, and dissemination and use. The methodology was adapted to make it suitable for application in high income countries and for peer assessment, as the original tool has been developed for low and middle income countries, and to be applied by a WHO consultant. Another important distinction with the WHO methodology is that the WHO consultant would conduct these assessments at the request of the respective Minister of Health, while the InfAct assessments are initiated by the InfAct national competent authority and executed at the level of health information institutions and experts.

Each assessment included a preparatory desk report, two full days of face-to-face interviews with local stakeholders, a final report including a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and recommendations, and a follow-up stakeholder meeting. After the last cycle, a final meeting was organised in Malta to share the results of the assessment.

During the assessment the host assessor developed a two day programme for the country visits, i.e. a schedule of face to face meetings with stakeholders. Typical stakeholders included Ministries of Health, National Public Health Institutes, Statistical Offices and Health Insurance Funds. The assessors carried out the interviews using a HISs items list, which is part of the WHO support tool. Based on the outcomes of the interviews, the assessors wrote a final report. This final report was then presented to the stakeholders that participated in the assessment through a virtual multi-stakeholder follow-up meeting in the assessed country. The participants jointly validated the final reports, discussed the outcomes and investigated potential next steps. The final reports included a SWOT analysis, as well as SMART (Specific, Measurable, Assignable, Realistic, Time-related) recommendations for improvement, clearly assigned to specific owners amongst the stakeholders approached

The peer assessment exercise was evaluated. This report lays out the evaluation of the experience of the participating countries and is the foundation for two scientific publications. It also provides the HIS assessment manual Health Information System Assessment Manual with the objectives, process and guidelines, and roles and tasks

[2] http://www.euro.who.int/en/publications/abstracts/support-tool-to-assess-health-information-systems-and-develop-and-strengthen-health-information-strategies

[3] http://www.euro.who.int/__data/assets/pdf_file/0006/317544/11-Short-communication-First-experiences-WHO-tool-assessing-HIS.pdf?ua=1

[4] http://www.euro.who.int/en/data-and-evidence/european-health-information-initiative-ehii

II. Aims

The aim of the evaluation is three-fold.

1. It evaluates the learning experience of the assessors of the HIS assessment.

Research question: What did the assessors learn from the exercise?

2. It evaluates the experiences of carrying out the HIS assessment in a peer review format with a focus on the process of the assessment.

Research question: How did the assessors experience carrying out the HIS assessment in a peer review format?

3. It evaluates, based on the experiences, how assessments could be improved.

Research question: How can HIS assessments be improved?

III. Objectives

The objectives for evaluating the experience of the assessors of the HIS assessment were:

a. To evaluate whether the HIS assessment allows identification and exchange of good practices
b. To evaluate whether networks are being built. Did the HIS assessment improve interaction and collaboration between HI experts within and between countries
c. To evaluate whether the understanding of the HIS in own or different country is improved

The objectives for evaluating the experiences of carrying out the HIS assessment in a peer review format were:

a. To evaluate the advantages and disadvantages of the peer review format
b. To evaluate the experience of the assessors with regards to the various steps and elements of the peer review format including:
    i. The training and manual
    ii. The preparation of the preparatory desk report
    iii. The country visit with interviews
    iv. The drafting of the final report
    v. The stakeholder follow-up meeting

The objective of the third aim was to provide recommendations on how to have a successful assessment and potentially improve the assessment.

IV. Methodology

The methodology for the peer HIS assessment evaluation was qualitative and based on 12 semi-structured interviews. One interview was carried out with the assessors from each country (N=9). Additionally three interviews were carried out with the observer after each cycle. The timeline of the interviews is shown in Table 1.

Table 1: Overview of evaluation timeline

	Cycle 1: Feb-March 2019	Cycle 2: May-June 2019	Cycle 3: Oct-Nov 2019
Group 1	Interview 1 Norway (08/05/2019)	Interview 5 Serbia (10/12/2019)	Interview 9 Austria (15/01/2020)
Group 2	Interview 3 Romania (23/05/2019)	Interview 6 Latvia (15/10/2019)	Interview 11 Moldova (13/01/2020)
Group 3	Interview 2 Lithuania (14/05/2019)	Interview 7 Estonia (14/01/2020)	Interview 13 Belgium (09/01/2019)
Observer	Interview 4 observer (03/05/2019)	Interview 8 observer 21/11/19	Interview 15 observer 23/01/2020

The semi-structured interviews were based on two questionnaires: one for the assessors and one for the observer (Annex 1). The questionnaires were piloted twice with health information experts that did not participate in the exercise. All interviews were carried out by the same person. Interviews were carried out by teleconferencing using GoToMeeting and were recorded. The interviews took up to one hour. The interviews were transcribed using Express Scribe Transcription Software. A qualitative content analysis of the 12 interviews was carried out. The interviews were pooled and a methodology of deductive thematic analysis was used to identify themes that were common across the interviews. The methodology of Braun and Clarke[5] was used consisting of the following consecutive steps: transcribing and repeated reading of the interviews, extracting of codes, collating codes in broader themes, reviewing themes, defining and naming themes, analyzing the themes in relation to the story that is told and in relation to each other, and reporting themes. The coding and analysis were carried out with Nvivo 12.

[5] Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006 Jan;3(2):77–101.

V. Results

A. What did the assessors learn from the exercise?

1. What is a Health Information System (HIS)?

The assessors learned about what a health information system is. This quote illustrates: "*Understanding the HIS was the biggest learning for me. That a HIS starts from data collection and dissemination and it is not only about what data are available basically. It is also about knowledge translation. That is a big factor that I think is often forgotten. And how legislation plays into it.*" Another interviewee confirmes: "*It was a good reminder of what exactly a HIS is and how it is essential for good governance. The HIS has a central part in the health system. The assessment was a good reminder to ourselves of how we are working.*"

The assessment also provided a good overview of the stakeholders in the HIS. An interviewer explains "*I learned that there are more players and stakeholders in the HIS rather than the ones that are producing the data. It is much broader. […] it is not only the data. It is also the way that it is produced in the first place. I was very happy to learn that it is such a broad theme.*" One interviewee sums it up: "*The assessors learned how to appreciate the full breadth of what a HIS is*".

This was also important for the stakeholders that participated in the assessment. "*People did not have a concept of what a HIS was. That was the take home message. It came down to the fact that we have not discussed for more than a decade the HIS as an individual topic*". Another assessor explains: "*The stakeholders start to realise they are part of the HIS even if at first they were not sure how they are connected to it. […] Seeing the agenda of all the institutions that are involved is important.*"

2. The Health Information System in my or another country

The assessment allowed the assessors to understand the HIS in their country. It allowed them to see their own HIS in another light. An example of how this was perceived is shown in this quote: "*I think for me it was that you value the people that are in place [..] because everyone is part of the health information chain. [..] everyone counts and everyone is important in the chain.*" An assessor confirms that she can see some new things and how different institutions are playing together to make up the HIS. "*Maybe it was not all new but I could look at it from another side.*" The assessors and stakeholders realize they are part of a bigger picture. The assessors also learned about the stakeholders in their country. "*The assessments were important for us, the organisers, because we learned a lot of new things about the activity of our stakeholders. Really important to let them talk and to share their experience.*" Another interviewee explains that the assessment helped her particularly to reframe the role of her own institute in the HIS. This importance of understanding the activities and the role of the HIS players was repeated in various interviews.

Multiple assessors mentioned that when the assessment took place in their own country they did not discover new strengths or weaknesses. The assessors were experts working in the field for years. However, having the information compiled, prioritised and documented into a final report helped them in various ways. "*I think it is good to move from implicit*

knowledge to explicit knowledge", explains an assessor, "*Especially, because the findings are acknowledged by external assessors allowing credibility*". Another assessor highlights: "*I will conclude that I did not find out new facts but I had a different view on the strong or weak points which could be derived from the facts.*"

The experience of the assessors was also enriching due to the fact that they were exposed to other HIS which contrast to their own HIS. In an interview the following was said: "*The assessments have definitely helped the assessors to expose themselves to other systems and see their own systems more objectively. It has helped the peers to look outside of the box.*" As nicely quoted during this interview, an assessor explains: "*It is the differences that make us see how we can improve our systems.*" Another assessor explains that she now has the knowledge about three countries' HIS that she can use in her everyday life to improve her practice. This is confirmed by another assessor: "*Of course getting information of HISs of two very developed countries was very useful for us to see if we are going in the right direction as a country and as a HIS or if we should change something. It was very useful.*"

3. Health Information system assessment tool

The assessors learned how to carry out a HIS assessment which many of the assessors found key. "*I enjoyed the process. I think knowing about the process might be more important than to know about my HIS*" explains an assessor. Another assessor said that it was very useful for her to know the methodology of peer HIS assessment because the assessment has the same basic steps as any kind of assessment. She concludes by saying that now she is able to transfer her knowledge on peer reviewing to others. Having the assessment in cycles allowed the assessors to go through multiple assessments, to better understand the tool and build up their expertise. This is illustrated during an interview: "*The first reports were much more difficult to write. We were much more trained for the second report*". Various other assessor confirmed in their interview that the experience comes from doing the assessment multiple times. It takes practice to build up the expertise to carry out interviews, which many assessors did not have previous experience with, explained the observer. It is important to note that many areas needed to be covered in a limited amount of time and hence the assessors needed to carefully consider which elements to address in more detail during the interviews with the stakeholders. Similarly, writing out the SWOT and SMART recommendations for the final report was challenging in the limited amount of time, according to the assessors. However, the assessors feel confident now to repeat the exercise, as illustrated here: "*If you would need an evaluation of your own system at a moment in time or an assessment on a specific item or part of the system. I am better equipped to do this kind of activity.*" One assessor states: "*The final report can be used for training purposes both in mine and other agencies.*"

4. Organization, communication and reporting skills

Besides learning how a HIS assessment tool works, the assessors also developed various skills such as organization, communication and reporting skills. Firstly, the assessors learned how to organise an assessment in their country. This developed their organization skills as the country visits were limited to two days and included interviews with many HIS stakeholders in their country. An assessor acknowledges that organising the country visit is difficult because there are many different participants that need to fit in a specific time span. The

number of interviews and the length of the interviews were not fixed. An assessor explains: "*Initially I had 30 stakeholders identified. I managed to reduce them to 20. We managed well in 45 minutes discussion.*" It was also up to the assessors to decide how much information to provide to the stakeholders prior to the interview and how to convince them to participate in the exercise. Besides the organization of the assessment as a host, the assessors also had to organize their work in a team. The assessors had to distribute the work between themselves in each group. The tasks included taking notes, questioning the stakeholders and drafting of the reports. An assessor illustrates: "*I was happy that I did not have to take such a very active role during the interviews. I was not the person that talked the most during the interviews. I asked questions but there was division of labor and that is that we felt most comfortable with*".

Secondly, the assessors gained communication skills. The assessors needed to find the right cues to engage with the stakeholders, as explained during an interview. It is about cultural sensitivity and how to use words in certain context. An interviewer explains that there was a different kind of culture of communication between actors and it was interesting for them to learn about them. The assessors had to be sensitive to cultural differences and had to interview stakeholders and areas they were less familiar with. Typically, difficulties were encountered during the health insurance interviews or when talking to policy makers. These difficulties decreased over time. One interviewer phrases it like this: "*I think what we are trying to achieve here with the peer assessment is to help the peers develop their own turf by knowing other people's turf.*"

Finally, the assessors developed their reporting skills. They had to evaluate the value of the strengths and weaknesses keeping in mind the culture and the system that is in place in the HIS being assessed. As explained by an assessor: "*It was interesting to put the SWOT in order after hearing all the information you got in two days which is quite extensive.*" Multiple assessors explained they learned how to formulate actionable recommendations and to carefully consider how to report the SWOTs. The reporting skills also improved over the course of the exercise. "*The first report was much more difficult to write. The other one was easier to prepare and to notice what was missing, what should be added and what was not clear.*" illustrated an assessor.

5. Networking

The HIS assessment provided networking opportunities for the assessors both within the country and within the group. In an interview it is explained that this assessment placed the host assessors more on the local map in their health system, not only in their HIS. It also created an opportunity for the host assessor to carry out a central role for a few days and to be approached by different stakeholders. Some of the hosts said: "*This stakeholder has not spoken to me in 3-5 years and now he is excited and enthusiastic with new proposals*". So being a host assessor definitely improved networking in health information communities in the countries according to an interview. In another interview the assessor stated: "*The assessment helped me to meet a new player in the field which ended up being a really good contact*". Others pointed out that the assessments were a good opportunity to talk to the stakeholders about strategy, human resources, or the general HIS and not to restrain to their usual specific health information topic. "*By creating informal relationships*", one assessor

explains, "*it helps to work better together and to produce better results.*" It also becomes clearer what the activities of the different stakeholders are.

Within the assessor groups, the assessments created strong relations. This is illustrated during an interview: "*The opportunity to share experience and to have someone you can contact when you need information. This is very important. It is a good opportunity. I did not think about it beforehand.*" In another interview future collaboration is ensured: "*We will communicate in the future. Possibly when we have another project. I think we can always count on each other. I feel free to ask anything.*"

B. How is the HIS assessment working in a peer review format?

1. What are the advantages and disadvantages of the peer review format?

a) Advantages of the peer review format

According to the interviews one of the advantages of the peer review format is the fact that it is less formal in peer review format compared to an external WHO reviewer. "*The atmosphere in the assessments during the actual interviews was quite relaxed*", is said during an interview, "*as a consequence, during the assessment, stakeholders in the country spoke more openly.*" One assessor witnesses: "*Some of my informers agreed to speak more candidly openly because they were peers.*" Others confirmed the peer assessors were well received on the ground and people opened up easily. People were talking to equals. "*In our case the assessment was really a conversation*" says one of the interviewees. Another assessor confirms: "*There was a big openness from our government and our Ministry of Health to be part of this process.*"

Another advantage is that by carrying out the assessments in peer review format you build up the expertise and knowledge in the health information expert from the countries being assessed rather than an external consultant. During an interview it is explained as such "From my point of view, the country benefits more from the peer assessment because the capacity is built to carry out their own assessment. Somewhere in the national public health institute two people are trained to do a peer assessment and know the method." Moreover, the experience and knowledge is exchanged between the countries. The assessors learn how their HIS compares to another one. One assessor sets it out clearly: "*We learn from each other. Every time the assessors puts a question forward during the assessment he or she also relates the question to his or hers own experience*". Additionally by carrying out the assessment in peer review format experts simultaneously build up their capacity to carry out an assessment. Moreover, a complete picture of the assessment is provided as participation in all steps of the assessment is required. See section A for more details.

Increased objectiveness is another advantage of the peer review format. Having the assessment done by multiple assessors has an impact on the objectiveness of the assessment, as was pointed out by multiple interviewers. "*It was useful to have more experts in the field. A much larger area of health information could be covered. It is always better to have a bigger pool of knowledge than to have the assessment done by a single person.*" Another interviewer said: "*When you have at least experts from two countries to*

ask the same question, you have more opportunity to have better questions from different points of view."
Moreover, the peer assessments have the advantage to create a network. As explained during an interview: "*You create a new identity: a health information community.*" The assessments also increase the networking of the assessors: "*You actually help the assessors to climb a little bit during the assessment because the stakeholder starts looking at them a bit differently during the assessment. It has definitely placed them more on the local map in their health system, not only in their HIS.*"

b) Disadvantages of the peer review format

One of the disadvantages of the peer review format may be that the assessment is not carried out upon a request from the Ministry of Health to the WHO. Therefore it might be more difficult to get access to some of the stakeholders in the peer review format. However, the assessors were well placed in the HIS according to an interviewee which allowed them to use their network to engage with stakeholders in the assessment. This was confirmed during multiple interviews such as through this quote: "*Eventually we all managed to get the right stakeholders on board with very few exceptions.*"

Another challenge is the potential credibility and implementation of the recommendations. An interviewee explains: "*The challenge is to be taken seriously because people will say: what is this about? Why do I need this? Does this have an impact?*" Therefore the engagement to take up the recommendation might be lower in the peer assessment format by not having the weight of the WHO. The stakeholder follow-up meeting was not organized face-to-face in the peer assessments which might have led to losing the momentum.

2. The experience of the assessors with regards to the various steps and elements of the peer review format

The training in Moldova and the HIS assessment manual for peer review

The training was appreciated by all participants. During the training the HIS assessment manual for peer review was explained and participants were split into groups to carry out preparatory exercises. Some examples of experiences include: "*It was incredibly interesting. It was good to learn about this. It was good to put things in a bigger context. The manual is a good cookbook. Everything was explained.*" The manual is very self-explanatory remarked an assessor. "*You understand what is going on and you understand what you have to do. In the beginning it seemed harder: such a big tool and everything should be filled. It seemed a lot, but then in practice when you are doing it, you catch the ideas and it goes well.*"

Some of the assessors found the training too detailed, others found it not enough detailed. What was not clear was how it all comes together and how much time and effort was needed. As explained by an assessor: "*I found it quite abstract at the time.*" One recommendation for improvement was to explain that not all the HIS items on the list had to be covered during the interviews.

The preparation of the preparatory desk report

The preparation of the preparatory desk report took more time in the first cycle explained multiple assessors. "*It was difficult for them to identify what was the most useful information and they tended to go into too much detail. This improved over time.*", was mentioned during an interview. The preparatory reports were felt by the assessors to provide a good background on the HIS to be assessed. It allowed the assessors to be better prepared for the country visits. One assessor stated that she felt the quality of one of the preparatory reports was not that good, which was reflected in the assessment itself. Language was sometimes an issue when preparing the report, as the information was not always available in English, explained the assessors. Moreover, it was questioned by one assessor whether the report should have a formalised structure or whether it would be enough to have bullet points. A recommendation was made to have a template with an excel sheet where the assessor could write in some points that are important to them.

The country visit with face-to-face interviews

The assessors found the layout of the country visits very satisfactory. Although the assessors indicated that there was a lot of information during the interviews, there was usually enough time for questions. It was pointed out that it was important to explain what a HIS is to the stakeholders before the interviews. The assessors thought it was important for the stakeholders to know what to expect from the assessment. The observer facilitated this by introducing the exercise beforehand.

The assessors sometimes experienced difficulties to engage stakeholders. The most difficult stakeholder to engage was the health insurance fund(s) according to the assessors. However, overall, "*Those who were well placed in the HIS did not experience difficulties to engage the local stakeholders.*" an interviewer explained. Difficulties could also be experienced during the country visits. Depending on how familiar the assessors were with the activities of the stakeholder, they experienced difficulties during the actual interviews. During an interview the following is explained: "*Those with a wider experience could better exchange with a wider range of stakeholders very actively. Based on their background they may feel more or less comfortable asking certain questions. The wider the background the more capable in carrying out the assessment*."

An additional challenge according to the interviews was the organisation of the country visits in two days and to identify the right local stakeholder. Stakeholders had to have the required knowledge and communication skills. As one assessor put it: "*Some stakeholders like to talk and talk. Others that were expected to talk did not talk that much. They were asked a question and just said yes or no.* […] *it is unexpected and unpredictable sometimes.*" A balance had to be found between responsiveness, interest and competency according to the assessors.

A suggestion was made on how to improve the country visits. It was suggested to provide a profile for the assessor and the local stakeholders. An assessor explained: "*Skills and qualification could be specified and made explicit. Additionally, expertise knowledge and background could be spelled out a bit more. It does not need to be fulfilled but it could be spelled out.*" Other elements that could be considered when drafting the profile according to the assessors were: "*The breadth of the experience of the assessor can be considered as a broader experience makes a better assessor.*" "*Not being afraid to talk to people and the ability to relate to them.*" and "*Ability to stay neutral.*"

The importance of having the right stakeholder was highlighted as such: "*Speaking to the right stakeholders is key because it is also a way to ensure the recommendations you are making are pilotable and implementable.*"

The drafting of the final report

The assessors experienced the final reports to be useful and they appreciated the format. "*The structure is excellent. It is very readable. It really responds to what policy makers are willing to read. It is really what they want to know.*" stated an assessor. The assessors said it was not easy to do the SWOT analysis and to prepare the SMART recommendations because you had to be very short and to the point. An assessor witnessed: "*Every word is weighed against the interest of the different stakeholders. I liked writing the report, it was a very good exercise. I also liked receiving it.*" Over time, the assessors explained that they became more practiced at it and recognised it was best to draft the SWOT and recommendation right after the country visit. They also started to realise that they needed to dedicate a specific timeslot right after the assessment to do the SWOT analysis.

The stakeholder follow-up meeting

The stakeholder follow-up meeting was the most difficult aspect to organise. The assessors stated during the interviews that they struggled to have all stakeholders participate and engage. During an interview the recommendation was made to organise the stakeholder follow-up meeting face-to-face at the end of the country visit rather than virtual after a few weeks. "*The main issues can then be highlighted without losing the momentum.*" was given as a reasoning. "*It is later that feedback can then be given about the final report, the feasibility to take up the recommendations and whether they will be followed up or not.*" The interviewee continues. Another recommendation was made during an interview which suggested that the Ministry of Health should organise the stakeholder follow-up meeting or to have a bilateral with the Ministry of Health to ensure ownership of the recommendations

The organisation of the assessment in three cycles

The assessors appreciated the fact that the assessments were carried out in three cycles. For most of them, three was the right amount because it was easier to work in smaller groups and more cycles would have increased the workload and made communication more complex. An assessor explains why three cycles was ideal for her: "*My fear was that two times was enough, because after the second time we understood everything, the whole process. But at the end, after the third cycle, we were completely clear about the steps and the procedures.*" The ability to perfect the use of the assessment increased in the last cycle according to the assessors.

Workload

Some assessors were surprised by the workload. They indicated that the assessments took more time than expected or planned. Most of the assessors had busy schedules and had difficulties postponing daily activities. "*Also the two day country visit was very intense, which allowed us to go in depth in one system and really work on it hard*", as an assessor explains.

Observer function

The assessors appreciated the presence of the observer. "*In my opinion*", an assessor stated, "*the observer had a positive impact on the evaluation.*" Other assessors confirmed that the observer must be present in this kind of assessment and that without him the assessment would have been much harder to implement. The observer briefly described the purpose of the exercise and gave the assessment an official role by starting the meeting and moderating the discussion according to the assessors. The assessors did perceive the observer more as a moderator. "*He was asking very relevant questions at the right time*" explained an assessor. "*The observer allowed to share experience and facilitate the discussion.*"

Group composition

The assessors enjoyed the group composition. Some countries in the same group had similar HIS, other groups had more diverse HIS. Both set-ups were perceived as enriching by the assessors. According to the interviews, the advantage of having similar HIS helped to see how similar issues can be addressed differently and boosted comprehension. An assessor witnessed: "*The group was well selected because we have the same starting point 20 year ago. It is interesting to see how each country found its own way of development. After that it is very easy and useful to make a comparison.*" The disadvantage of having similar HIS, according to the interviews, was that it was more difficult to remain objective during the assessment because similar countries knew most of the information already. As stated during an interview: "*The secret in choosing the peers, is striking a balance between how close and how far their HIS is from each other.*"

VI. Discussion

A. What did the assessors learn from the exercise?

The assessments were found to be very useful and were highly appreciated by the assessors. The expectations were that the assessors would learn from four main areas (i) in the identification and exchange of good practices, (ii) the interaction and collaboration between HI experts within and between countries, (iii) the understanding of the HIS in own or different country, and (iv) in the identification of strengths, weaknesses, opportunities and threats in the national HIS under assessment and possible recommendations. However, it turned out that some of the most valuable experiences were also made in other areas.

Firstly, the identification and exchange of best practices did take place but was not the most important aspect of their learning. What was more important for the assessors was to see their HIS from another perspective and potentially more objectively. It was about seeing how things can be done differently. It provided opportunity for the assessors to think outside of the box and see opportunities of how they could improve their HIS by being exposed to two other HISs.

Secondly, the interaction and collaboration between health information experts within and between countries was more important than initially expected. By organising an assessment, the host assessor got a much better understanding of the stakeholders in their country and their activities. It allowed the host assessors to create relations with the stakeholders and to discuss other topics than what their usual jobs allowed them to, such as strategy. It also offered an opportunity for the host assessor to be placed on the map of their national HIS. By working together within the country and in groups, networks were created which can be seen as a health information community. The assessors pointed out that they liked working together and that they will continue their exchange beyond the lifespan of InfAct.

Thirdly, the understanding of what a HIS is was very important for both the assessors and the stakeholders. The assessments allowed the assessors to have a comprehensive, birds eye view of what a HIS is. It also allowed the assessors to value their work and the place they have in the system. The local stakeholders realised they were part of something bigger and the value of each of the participants to the HIS became clear and was appreciated.

Fourthly, what was valued more by the assessors, was the opportunity to learn how to carry out a HIS assessment, rather than the identification of strengths, weaknesses, opportunities and threats in the national HIS under assessment. Furthermore, they appreciated the opportunity to familiarise themselves with the different steps in the process, such as carrying out a SWOT assessment and formulating SMART recommendations. Additionally, they improved their organisation, communication and reporting skills. Especially communication skills seemed to have been strengthened during this exercise as the assessors had to carry out face-to-face interviews with diverse stakeholders with different areas of expertise and cultural/social sensitivities.

B. How is the HIS assessment working in a peer review format?

The HIS assessment in peer review format worked well for the participating countries. The experience of the HIS assessment in peer review format was truly valued by the assessors. Some felt strongly about this: "*If you need to have done this evaluation have it done by peers, by all means.*" One of the main advantages according to the assessors is the informal approach of the country visit interviews allowing more open and candid discussions. On the other hand, the peer review format was experienced to have less weight than when carried out by the WHO. It is a tradeoff between having more easy going assessments and having more credibility. Another advantage is the fact that a peer review assessment boosts the knowledge and expertise within the countries. When preparing for the exercise, it was expected that, through stimulating the improvement of HIS and the exchange of best practices, the assessments would contribute to capacity building in European countries, which in turn may lead to the reduction of health information inequalities between countries. This may have been the case but based on the evaluation it seems that the reduction of health information inequalities may rather have been addressed through the experience and knowledge that was built in the countries. This was achieved both by gaining the expertise to carry out an assessment and by bringing a better understanding in the country on what a HIS is and of what it is composed. Both assessors and local stakeholders understood that they are part of a bigger picture and understood the value of the different stakeholders in this bigger picture. Throughout the assessment, communication and networking among stakeholders was facilitated allowing closer relations and collaborations to be built. A health information community was built through the assessment allowing interaction within and across countries. This combination of elements can boost the HIS of the participating countries and address inequalities. Finally, a true advantage of the peer review format was the design in cycles. This allowed the assessors to perfect their knowledge on the tool and their skills for its implementation.

The assessors appreciated each of the steps of the assessment. The five steps of the assessment brought a different experience and a different kind of personal growth to the table. Firstly, the training was essential to familiarise the assessors to the tool. The tool can be perceived as being very complex and difficult to implement. The training was important to try to disentangle the complexity and manage the expectations. Secondly, the preparatory desk report was essential to provide background on the HIS to be assessed. It pushed the assessors to synthesise the available information and boosted their reporting skills. Thirdly, the country visits with face-to-face interviews challenged their communication skills. They had to organise the country visits in the country lobbying for participation and engagement of the local stakeholders. During the country visits in the other countries they had to adapt their way of questioning from one interview to the other which developed their confidence, cultural sensitivity and interview versatility. Fourthly, the drafting of the final reports was complex due to the SWOTs and the phrasing of the SMART recommendations. The assessors had to compile all the information from the interviews, translate their findings into the predefined format and prioritise after thorough analysis. This required an in depth understanding of the HIS they assessed. Finally, the hosto assessors had to organise a stakeholder follow-up meeting to bring the different stakeholders together and to support the adoption and implementation of the recommendations. Compromises had to be taken considering the feedback from the different stakeholders whilst keeping the recommendations as a target.

C. Recommendations on how to improve the HIS assessment

Based on the evaluation, 17 recommendations can be made to improve the HIS assessment. These were extracted from the experience of carrying out the HIS assessment in peer review format, but could also be useful to improve the tool regardless of its format.

1. **Aims and objectives:** Make the purpose of the exercise very clear to the participating countries. Clarify the level of detail that is required during the country visits to the stakeholders.
2. **Group composition**: Have a group composed of different profiles as team members and represent diverse HISs.
3. **Manual**: Better define the role of the host assessor in the manual. How involved should the person be? Expand the manual with sample letters and invitations. Explain that not all the HIS items list have to be covered one by one during the interviews.
4. **HIS items list**: Add standardized probing questions instead of indicators to the HIS items list. Allow the stakeholders to prepare the assessment by having seen the assessment list if requested.
5. **Length of the assessment:** Extend the length of the country visits from two to three days. This would allow to reduce the intensity of interviews and to organise the final stakeholders meeting on the third day.
6. **Semantics**: Agree on terminology and definitions before the country visits.
7. **Language**: Provide a one pager on the process and a description of what a HIS is that could be translated to local language. Potentially consider having a translator.
8. **Engagement**: Have an official instance send out the invitation letters to the stakeholders e.g. Ministry of Health. Have an official instance take ownership for the implementation of the recommendations, potentially through a bilateral with the Ministry of Health.
9. **Profile**: Have a description of the profile that the assessors and local stakeholders should have.
10. **Host assesso**r: Assure the host assessor has a good communication and reputation with local stakeholders, has the ability to stay back and let the stakeholders speak.
11. **Preparation**: Have a clear division of tasks and equal participation in the groups. Meet before the country visits to discuss the task distribution and at the end of the stakeholder meeting to discuss the SWOTs and SMART recommendations during a dedicated time slot.
12. **Stakeholders**: Always involve a core minimum of stakeholders. Potentially assess the level of openness of the stakeholders and the relation the host assessor has with these stakeholders.
13. **Observer function**: Assure the observer has the ability to introduce the exercise clearly and be on the same line as the host assessor for this introduction.
14. **Intermediate conference**: Organise a conference between the groups along the process to exchange between the groups**.**
15. **Preparatory report**: Have the host assessor prepare the preparatory report. Replace the format of the report by a less formal excel list with main points.
16. **Stakeholder meeting**: Organise the meeting at the end of the country visit and face-to-face. Organise an open forum with all stakeholders.
17. **Repetitions**: Repeat the assessment multiple times and promote an assessment every 3 to 4 years or have an audit cycle to ascertain progress of the uptake of the SMART recommendations and propose any change in direction or new challenge.

VII. Conclusions

The peer assessments were a success and had an impact on the participating countries that was much broader than expected. The experience did not only allow them to identify health information gaps and action points in European HISs, but also provided them with a thorough understanding of what a health information system is, who the key stakeholders are and what their activities are. It also allowed the participating countries to have proven expertise on how to carry out a HIS assessment. The assessors refined their capability to carry out an effective assessment both by understanding the tool and by gaining the necessary skills through practice. Furthermore the assessments were an opportunity for the assessors to network and foster a health information community both within their country, boosting the awareness of the HIS in which they work, and outside, allowing them to look at their own HIS with a more objective lens.

The HIS assessment in peer review format exceeded the expected outcome in the participating countries and was highly recommended to others. The four main advantages are its boost of expertise and knowledge within the country, its networking opportunities, its high degree of objectiveness and its informal interviews. The assessors valued each of the steps of the HIS assessment. The five steps of the assessments brought a different experience and a different kind of personal growth to the assessors.

Finally, based on the experience of the assessors, 17 recommendations were formulated which could be used to ensure a successful or improved HIS assessment regardless of its format.

Annex1: Questionnaires for semi-structured interview

Interview with assessor
The participation to this questionnaire is voluntary and you can stop at any time. The interview is being recorded. Would you like to participate to this questionnaire?
Section I: focus on content
What did you learn during the assessment? *Sub questions. Each sub question should be covered:* What did you learn with regards to: • identification and exchange of good practices • interaction and collaboration between HI experts within and between countries • the understanding of the HIS in own or different country • identification of real strengths, weaknesses, opportunities and threats in the national HIS under assessment and possible recommendations.
What has been the impact of the assessment on your work?
What happened in your country after the assessment? *(Each sub question should be covered)* • Impact of exchange of good practices • Impact of knowing each other (network) • Impact of better understanding HIS • Impact of recommendations or SWOTs
Section II: focus on process
How did you experience the HIS assessment in peer review format and the steps we have gone through?
Sub questions on process. Each sub question should be covered: What was your experience with: • The training in Moldova and manual • The preparation of the preparatory desk report • The country visit with face-to-face interviews • The drafting of the final report • The stakeholder follow-up meeting • Organisation in three cycle

When you think of the processes (list elements in sub question above), were there aspects you struggled with or think you dealt well with? *Things that may come up. They do not all need to be covered:* • Work-load • Interview difficulties/strengths • Struggles with cultural aspects/language • Preparation (well/not well) • Organisation interviews • Length of assessment
Sub questions on role: • How did you experience your role of assessed?   o How prepared did you feel to carry out your role? • How did you experience having two countries and an observer carrying out the assessment? • What did you think of the role of observer?
What are the advantages or disadvantages of the peer review format according to you?
What do you think of the assessment sheet?
How do you think the process of the peer review format could be improved?
What do you think are key elements to make a peer review successful?
Is there anything else you would like to say?

Interview with observer
What was your experience of carrying out the HIS assessment in peer review format?
What are the advantages or disadvantages of the peer review format according to you?
Sub questions on role: *(Each question should be covered)* • How did you experience your role of observer? • What do you think are the advantage or disadvantage of having an observer during the assessment? • How prepared did you feel to carry out your role? • How did you experience having two countries and an observer carrying out the assessment? • What were the differences between the groups in the first cycle?
How do you think the process of the peer review format could be improved?
What do you think are key elements to make a peer review successful?
Where there aspects the assessors or assessed struggle with or dealt particularly well? *Things that may come up. They do not all need to be covered:* • Work-load • Interview difficulties/strengths • Struggles with cultural aspects/language • Preparation (well/not well) • Organisation interviews • Length of assessment
What do you think the participants learned from the assessment? What did you learn? *Sub questions. Each sub question should be covered:* What did they learn with regards to: • identification and exchange of good practices • interaction and collaboration between HI experts within and between countries • the understanding of the HIS in own or different country • identification of real strengths, weaknesses, opportunities and threats in the national HIS under assessment and possible recommendations.
Is there anything else you would like to say?

Sciensano | Rue Juliette Wytsmanstraat 14 |
1050 Brussels | Belgium| e-mail: infact.coordination@sciensano.be|
Website: www.inf-act.eu |Twitter: @JA_InfAct

WP5 Task 1: Health Information System Assessment Manual

Objectives, process & guidelines, and roles & tasks

September 2018

Authors : WP 5 Taks 1 Partners
Marieke Verschuuren, Neville Calleja, Petronille Bogaert
Sciensano | Rue Juliette Wytsmanstraat 14 |
1050 Brussels | Belgium| e-mail: infact.coordination@sciensano.be|
Website: www.inf-act.eu|Twitter: @JA_InfAct

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InfAct Health Information System Assessment manual
Objectives, process & guidelines, and roles & tasks

Version 1.0 | Feedback provided during training in Moldova (Sept 2018) processed

Table of Contents

1. Introduction

Within the Joint Action Information for Action (InfAct), Work Package (WP 5) focuses on the status of health information systems in EU Member States and regions. Within this Work Package, task 5.1 deals with mapping and assessing Health Information Systems (HIS). In the context of this Work Package, after receiving a two day training[1], experts from nine countries will perform peer assessments of each other's national HIS.

The methodology applied for these peer assessments will be derived from the methodology developed and piloted by WHO Regional Office for Europe[2][3] in the framework of the WHO European Health Information Initiative (EHII)[4]. This methodology has been adapted to make it suitable for peer assessment, as the original tool was developed for application by a WHO consultant. An important distinction with the WHO methodology is that WHO works through the Ministries of Health, while the InfAct assessments are initiated and executed at the level of health information institutions and experts.

The peer assessments are expected to have beneficial effects on several levels. First of all, they will result in the identification of strengths and weaknesses in the national HIS under assessment. This will stimulate actions to improve the assessed systems, and will lead to the identification of good practices that can also be used in countries that are not taking part in the assessments. Other countries can also learn from the experiences that will be gained during the assessments, and build on these when assessing their own HIS. Through stimulating the improvement of HIS and the exchange of good practices, the InfAct Joint Action will contribute to capacity building in European countries, which in turn may lead to the reduction of health information inequalities between countries. The series of assessments will be evaluated in order to establish to what extent these objectives have been met, and how the methodology could be improved for future application.

This document is the InfAct HIS assessment manual. It defines the objectives of the HIS assessment and how the assessment process is organized. It provides guidelines for the execution of the assessments and describes the roles and tasks of the different types of experts involved.

[1] This training will take place in Chisinau, Moldova, on 26-27 September 2018.
[2] http://www.euro.who.int/en/publications/abstracts/support-tool-to-assess-health-information-systems-and-develop-and-strengthen-health-information-strategies
[3] http://www.euro.who.int/__data/assets/pdf_file/0006/317544/11-Short-communication-First-experiences-WHO-tool-assessing-HIS.pdf?ua=1
[4] http://www.euro.who.int/en/data-and-evidence/european-health-information-initiative-ehii

2. Why: Objectives of the HIS assessments

2.1. For the assessed country

- Overview and mapping of the various elements that make up the national HIS within that country;
- Insight into strengths and weaknesses of the national HIS, and increased awareness thereof among stakeholders;
- Concrete suggestions for improvement of the national HIS;
- Sensitisation of wide range of stakeholders, including players outside health, to the existence of a health information system of which they form part;
- Improved interaction and collaboration between key health information stakeholders within the country and between countries.

2.2. For the peer assessors

- Insight into the organization and functioning of HISs in other countries, including good practices and possible solutions for problems in their own HIS, and common challenges for which common approaches may be developed;
- Experience with performing a HIS assessment, thus becoming more objective in assessing one's own system, and facilitating the follow up of the HIS assessment in their own country.

2.3. For the InfAct Joint Action/European countries

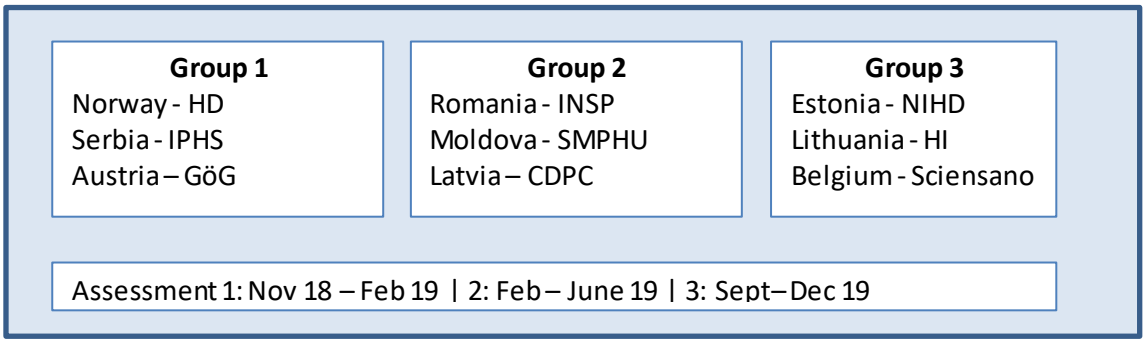
- Building capacity in European countries:
    - Through the dissemination of the experiences gained in the nine assessments;
    - Through the dissemination of good practices identified in the nine assessments;
    - Through the identification of common HIS challenges for which joint solutions may be developed, possibly in the context of the future European Research Infrastructure or a similar sustainable solution.
- Fine-tuning, piloting and evaluation of a HIS assessment tool for peer-review application.

3. How: Process and guidelines

3.1. Three cycles of three peer assessments

The HIS assessments will take place in three cycles of three peer assessments. In total, the HIS assessments will be carried out in nine countries. In each group of three countries, each cycle one country is being assessed by the other two countries. The first assessment in each group will take place in the period November 2018 – February 2019, the second in February – June 2019, and the third in September – December 2019 (see figure 1). The assessments will be carried out by one peer assessor from each assessing country, meaning two assessors in total. Ideally, the same person carries out the two assessments.

Figure 1. Country groups and assessment schedule



3.2. Assessment characteristics: broad approach at a generic level

As the basis for the assessments, a broad definition of a HIS is applied:

'A health information system is the total of resources, stakeholders, activities and outputs enabling evidence-informed health policy-making. *Health information system activities relate to all phases of population health monitoring. These are data collection, interpretation (analysis and synthesis), health reporting, and knowledge translation, i.e. stimulating and enhancing the uptake of health information into policy and practice. Health information system governance relates to the mechanisms and processes to coordinate and steer all elements of a health information system.'*[5]

For a schematic overview of the different activities, stakeholders, outputs and resources, see Annex 1. Using this definition implies that the assessment will not just include (the availability of) health data, but also the generation of health information and knowledge, the use of health information and knowledge translation, and health information governance.

As the available resources are limited, the HIS assessment will be carried out at a generic level. This will result in the identification of areas and elements in the system that are currently functioning in a suboptimal way and hence require strengthening. The health information stakeholders in the assessed country can use this information to set priorities for the improvement of the national HIS, and pinpoint specific technical areas that require further developmental work and capacity building. Hence, the assessments should be seen as a first step in a longer-term HIS improvement process.

[5] Population Health Monitoring. Climbing the information pyramid. Verschuuren & van Oers, editors. Springer Nature (in press).

Following up on the outcomes of the assessment is not within the scope of the InfAct assessments, however, it is up to the assessed country if and how to develop follow up activities.

3.3. Starting point: preparatory desk review

The assessment process begins with a preparatory desk review by the two peer assessors. It is recommended that the assessors start with the desk review no later than six weeks prior to the assessment. The main aims of the review are to:

- Identify possibly already existing assessments results/reports that can be used as the basis for this assessment exercise;
- Get a basic overview of available data, indicators and health information products;
- Get a basic overview of the organisation of the national health system and the national health information system and their mutual relations;
- Get insight into the specific functions, roles and responsibilities of identified stakeholders in the HIS;
- Identify existing strategies and HIS activities that can form a basis for future improvements.

It is emphasized that the desk review aims to create a general overview of existing or potential problems in the HIS. This review should be used as the starting point for the assessment exercise, and *not* as a comprehensive, detailed HIS description. The interviews during the actual assessment should be used for exploring the HIS and its problems in more depth. It is estimated that 3 full days of work for each peer assessor on average would be required for performing the desk review (provided that the peer assessors have received the necessary information from the contact person(s) in the country under assessment).

As preparation for the desk review the contact persons(s) in the country under assessment need to provide the assessors with relevant documents. During the training in September 2018, suitable information sources for the review are identified. See box 1 for examples. The documents provided should contain relevant information, it is up to the contact person to decide how old the documents should/can be (e.g. 20 years old documents can still provide valid information) – as long as the documents are still applicable currently. The contact person(s) in the assessed country provides the necessary documentation to the peer assessors through the OpenLucius InfAct platform (https://workspace.inf-act.eu/), and support with translation, if necessary. Please note that a pragmatic approach using tools such as Google Translate will often provide the assessors with enough information for assessing which parts of a document are relevant for the desk review[6]. The contact person(s) in the assessed country can assist in subsequently fine-tuning the translation of the relevant passages.

Based on the provided information, the assessors draft a short report (not more than 10 pages); see Annex 2 for the preparatory report template. If possible, the peer reviewers will deliver the preparatory report no later than three weeks prior to the assessment. In this way, the outcomes of the desk review can be used for fine-tuning the assessment programme.

Box 1: Typical information sources that can be used for the preparatory desk review

- Previous HIS assessments carried out by the former Health Metrics Network of WHO, or by WHO Regional Office for Europe* based on the Support tool to assess health information systems and develop and strengthen health information strategies, or similar assessment

[6] E.g. https://www.onlinedoctranslator.com/en/

exercises, such as by IANPHI and OECD e.g. Strengthening Health Information Infrastructure for Health Care Quality Governance;
- Health Systems in Transition (HiT) series of the European Observatory on Health Systems and Policies;
- National health information policies and strategies and/or (health information paragraphs in) national health policies and strategies;
- Relevant legislation;
- Strategy documents, mission statements, activity reports etc. of key health information stakeholders (e.g. national statistical office, national public health institute, national insurance company);
- Reports on health (information) system development projects from donors (e.g. World Bank);
- Databases containing general public health indicators, e.g. WHO's Health Information Gateway, Eurostat database, OECD Health Statistics (particularly useful to assess the degree of reporting currently in place in that country;
- State of health by European Commission
- Country profiles such as provided by WHO, WHO-Euro's Health Information Gateway, and the World Bank;
- WHO ICD Implementation Database (WHOFIC).

* NB: Reports of WHO Regional Office for Europe HIS assessments are not publically available, they need to be requested from the Ministry of Health.

3.4. Actual assessment strategy: semi-structured interviews

During the training in September 2018, the relevant HIS stakeholders to be included in the assessment have been identified[7]. With this information, the contact person(s) in the assessed country develops a programme, i.e. an overview of which stakeholders will be interviewed (including which specific expert(s) within each institution and organisation), and proposed duration and timeslots for the interviews.

Based on previous experiences, when well structured, stakeholder meetings should not take more than 1-1.5 hours. It is possible to interview several experts at the same time, especially around the same topic. Often, this is an efficient way of obtaining a lot of information in a short span of time, especially when it concerns multiple experts from the same institution or related institutions performing similar tasks. The host should aim for as convenient a location(s) as possible for the meeting. Meetings should be batched in such a way as to minimise the number of locations and number of moves the assessor(s) have to make during the interview days, thus maximising on the time actually used for interviews. Mealtimes can also be used to have meetings with stakeholders – albeit these may be somewhat less formal. Be aware, however, that in a group certain people are less likely to speak up (because of personal characteristics or because their boss may also be in the same room). One understands that, within a limited field of expertise, there may be some strained personal relationships. The host should make sure to manage these to the best of his/her abilities and inform the assessor(s) if these could affect the conduct of the meetings. Preferably, the programme is finalized no later than four weeks prior to the assessment, allowing adequate time for making the actual interview arrangements.

[7] The selection of stakeholders to include may be altered/improved based on the outcomes of the preparatory desk review, see paragraph *Starting point: preparatory desk review*.

The Joint Action on Health information's (InfAct) coordination will provide an invitation letter template to be sent to the selected stakeholders. The invitation letter will emphasize that the expertise of the addressee is necessary for obtaining an accurate overview of the functioning of the HIS (i.e. we need everyone's expertise to get a complete picture). Additionally, the invitation letter should point out the benefits for the addressee (e.g. making new contacts, possibilities for initiating solutions for problems he/she encounters in his/her daily work). Most importantly, please note that this invitation letter should already include information on the multi-stakeholder meeting that will be organized after the assessment (see paragraph 3.6)

The assessment period within the country will be two days[8]. During these two days, the two assessors will conduct semi-structured interviews with the included health information stakeholders, using the HIS assessment item list in Annex 3 for guidance[9]. It is emphasized that the assessment is explorative and qualitative in nature, i.e. the aim of the exercise is *not* to put a score on the HIS or to quantitatively compare it to some sort of standard.

During the interview, they will take notes, which they will summarize afterwards:

1. in the HIS assessment item list (see annex 4 for an example), and subsequently,
2. in the form of a SWOT analysis (see below).

It is recommended that the two assessors prior to the assessment discuss the division of work (e.g. for each interview, one assessor will conduct the interview and one will take notes; who will conduct which interviews). During the interviews, the two assessors will be accompanied by the main national contact person from the receiving institution, the observer and, for part of the assessments, the evaluator (see the section below on Roles and tasks). The assessor(s) needs to master how to be polite and yet always keep the discussion on track in order to obtain as much information as possible within the limited timeframe. A short informal meeting between the assessors should happen every evening, to discuss the proceedings of the day, seek consensus on any issues that were brought up and assess whether any further issues need to be explored during the following day's assessment.

The proposed outline for these two days is as follows:

- Start off with a briefing with the receiving institution/contact person(s): go over the programme once more, discuss possible last minute changes, etc.
- Semi-structured interviews.
- End with a debriefing with the receiving institution/contact person(s).

3.5. Reporting: SWOT analysis and SMART suggestions for improvement

The outcomes of the assessment will be summarized in the form of a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis, and a set of concrete suggestions for improvement. See Annex 5 for an example of a SWOT analysis. Preferably, the SWOT is finalized no later than three weeks after the assessment. The concrete suggestions for improvement should be formulated according to the SMART criteria (see box 2), preferably divided according to whether they can be achieved in the short, medium or long term. Where relevant and feasible, the suggestions for improvement will be complemented with good practices either from the countries of the assessors, or from other countries. Contact details for experts from other countries that might be able to advise on specific

[8] The participants have three days of travel allowance. The assessment schedule could look like this: **day 1:** morning travel, afternoon assessment; **day 2:** assessment and **day 3:** morning assessment and afternoon travel.
[9] The spreadsheet provided here is based on the short version of the assessment score sheet of the *WHO Support tool to assess health information systems and develop and strengthen health information strategies*. The WHO version has been (slightly) adapted to suit the purposes of the InfAct HIS assessment.

problems can be provided as well. The filled in assessment score sheet is to be provided as an Annex, in addition to the list of stakeholders interviewed. See Annex 6 for the template of the assessment report.

It is advised to have a feedback round with the contact person(s) in the assessed country before finalizing the report, to check whether the findings and suggestions for improvement are clear and recognizable for the receiving country. The assessors and contact person(s) in the assessed country could plan a teleconference for this purpose, which they could also use to prepare for the multi-stakeholder follow-up meeting (see below).

Box 2: SMART criteria

Specific – target a specific area for improvement.
Measurable – quantify or at least suggest an indicator of progress.
Assignable – specify who will do it.
Realistic – state what results can realistically be achieved, given available resources.
Time-related – specify when the result(s) can be achieved.

3.6. After the assessment: multi-stakeholder follow-up meeting

To conclude the assessment process, it is recommended that the contact person(s) in the assessed country organises a (physical) meeting with all the stakeholders included in the assessment and the assessors. The assessors can participate by tele- or videoconference to prevent additional travelling. In this meeting the assessors present their findings, and the participants jointly discuss the outcomes, and, if possible, agree on concrete follow up steps.

During the training in September 2018, participants formulated tips & tricks for organizing and conducting the multi-stakeholder meeting. These have been summarized in box 3.

Box 3. Tips & tricks for the multi-stakeholder meeting

Organizing the meeting:

- If possible, try to organize the multi-stakeholder meeting back to back with another event, such as a national public health conference, to limit the inconvenience.
- Prior to the meeting, share the draft meeting report with the involved stakeholders, to see whether they feel that the findings are valid and recognizable (see the schedule in paragraph 3.7 below).

Presenting the findings:

- Consider who would be the best/most suitable presenter(s) in the given context.
- Start with the strengths.
- Use visuals/infographics.
- Use short presentations, consider splitting the presentation of findings in several parts.
- Anonymize the findings and think carefully whether you will not bring someone into a difficult position when presenting the findings at the level of institutions.

Ensuring concrete follow-up steps:

- Create a momentum for action: get media coverage, present the outcomes at an international conference.

- Find health information champions/ambassadors, people who are motivated and willing to make an effort to stimulate improvement.
- Look for quick wins: issues that can be improved through collaboration at the level of experts/technicians (i.e. issues that do not need to go through higher managerial or political levels) and/or issues that can be resolved at no or low cost.
- Make a formal report of the multi-stakeholder meeting that can be referred to afterwards ('this is what has been agreed by all stakeholders').

3.7. Summary of the entire assessment process

When*	What	Who
Week -6 or before	Provide necessary documentations for desk review	Contact person(s) assessed country
Week -6 or before	Start preparatory desk review	Assessors
Week -5	Clarify any issues with existing documentation and demand any additional documentation, as required.	Assessors
Week -4	Start with planning and making arrangements for the interviews & multi-stakeholder meeting, send out official invitation letters (could also be send earlier)	Contact person(s) assessed country
Week -3	Finalise preparatory desk review	Assessors
Week -2	Fine-tune assessment programme based on outcomes desk review (if necessary);	Contact person(s) assessed country
Week -1	Agree on working arrangements during the interviews	Assessors
Week 0	Assessment	Assessors and contact person(s) assessed country
Week 1	Start writing assessment report	Assessors
Week 2	• Feedback round draft assessment report (version 1): feedback from contact person(s) in assessed country • Start preparing for multi-stakeholder meeting	Assessors and contact person(s) assessed country
Week 3	• Feedback round draft assessment report (version 2): feedback from the interviewed stakeholders • Finalize meeting preparations	Contact person(s) in assessed country distributes report on behalf of assessors; stakeholders provide feedback**
Week 4	Multi-stakeholder meeting	Assessors and contact person(s) assessed country
Week 5	Finalize assessment report and distribute	Assessors and contact person(s) assessed country

* Recommended timing

** Only mistakes/grave omissions or possible clarifications - this should be made clear when distributing the draft report

3.8. At the end of full assessment cycle: reports on country experiences

Next to the reports on the outcomes of the assessments, each country is expected to deliver a report on their experiences participating in the assessments. These are short reports that are prepared at the end of the full assessment cycles (i.e. in the beginning of 2020). A template will follow in due time.

4. Who: Roles and tasks

4.1. Contact person(s) in the assessed country

The main role of the contact person(s) in the assessed countries is to act as the national liaison during the assessment, and their main task is to organise the peer assessment. This includes:

- Providing the peer assessors with relevant documentation for the preparatory desk review, and helping with translation, if necessary;
- Organising the logistics of the assessment: planning the meetings with the stakeholders, arranging transportation for the assessment team to travel between interview locations if necessary, arranging for translation if necessary; supporting the assessment team in finding a suitable/practically located hotel;
- Accompanying the assessment team during the interviews with HIS stakeholders;
- Providing feedback on the outcomes of the assessment process to the interviewed stakeholders, ideally through a multi-stakeholder meeting (see above);
- Contributing to the evaluation of the HIS assessments (e.g. filling in questionnaires, participating in interviews).

4.2. Peer assessors

The main role of the peer assessors is to act as independent, professional assessors. This includes being aware that the assessment is not an investigation, but an exchange of experiences and knowledge between peers, and conducting themselves according to this principle. An important objective of an assessment is to create engagement. In addition, the assessors should be open to sensitivities that may exist in the assessed countries, and follow the lead of the contact person(s) in the assessed countries in this regard.

The main task of the assessors is to carry out the assessment in the two other countries in their country group. This includes:

- Performing a desk review in preparation for the actual assessment;
- Interviewing the selected HIS stakeholders and taking notes;
- During the assessment, consulting the observer on elements of the assessment approach that might be altered/improved;
- Summarizing the outcomes of the assessment in a SWOT format, and formulating concrete suggestions for improvement;
- Presenting their findings in a multi-stakeholder meeting in the assessed country a few weeks after the assessment (the assessors do not need to travel to the assessed country again but can participate by tele- or videoconference);
- Contributing to the evaluation of the HIS assessments (e.g. filling in questionnaires, participating in interviews).

All these tasks should be carried out by the two peer assessors jointly. This implies that they will need to collaborate and consult with each other throughout the entire assessment process.

4.3. Observer

The main role of the observer is to act as an independent observer. His/Her main task is to ensure that the assessment is carried out according to professional standards and procedures. This includes:

- Providing guidance to the peer assessors and the contact person(s) in the country under assessment during the (preparation of the) assessment process, at their request;
- Observing whether the professional standards and procedures as elaborated in this document are adhered to, and give advice/guidance if necessary;
- Taking note of situations in which the agreed standards and procedures are not working out as anticipated, and giving advice on how to best adapt to the specific local situation;
- In case of adaptations to the approach have been made, giving advice on whether these adaptations would also be beneficial for the assessments that will follow later in the cycle, and discuss recommendations with any other observer and the peer assessors;
- Writing a short document (1-2 pages) after each observed assessment, providing lessons learned and tips & tricks for future assessments;
- Contributing to the evaluation of the HIS assessments (e.g. filling in questionnaires, participating in interviews).

There will be one observer. This is Neville Calleja from the Ministry of Health in Malta. He has experience with applying the original WHO assessment methodology[10] in countries through his work as WHO consultant. A second observer may be introduced if needed.

4.4. Evaluator

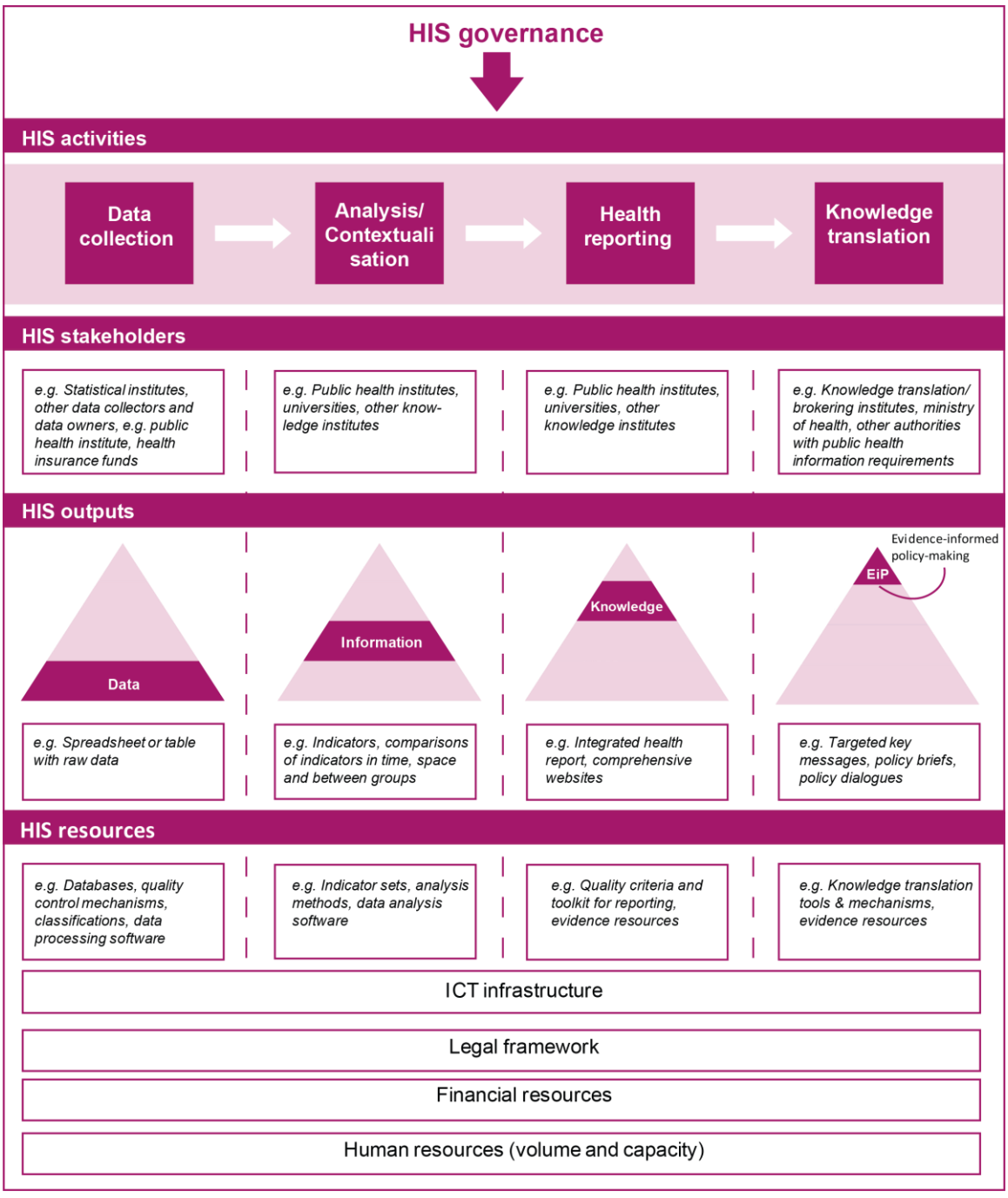
The main role of the evaluator is to act as an independent evaluator, and the main task is to assess whether the objectives as predefined for the assessed country, peer assessors and the InfAct Joint Action, have been met. This includes:

- Operationalising the objectives and elaborating a SMART framework for measuring to what extent the objectives have been met;
- Gathering data both during and after the assessment process;
- Summarising the evaluation outcomes in a report and scientific paper(s), including recommendations for improvements in the assessment approach.

Petronille Bogaert of Sciensano in Belgium will be the evaluator.

[10] See the Introduction.

Annex 1. Schematic overview of the (coherence between the) various elements of a HIS



Population Health Monitoring. Climbing the information pyramid. Verschuuren & van Oers, editors. Springer Nature (in press).

Annex 2. Template for preparatory report

- Executive summary
  1 page general, overarching summary.

- Background
  Basic geographical and epidemiological information (e.g. population size, % of population living in rural areas, GDP, life expectancy at birth, main causes of death, member of EU and OECD?)

Creating a basis for the HIS assessment: HIS state of the art

- Main health information stakeholders
  Main health information stakeholders and their roles and (legal) mandates in the HIS.

- HIS regulatory framework
  Overview of main policies, strategies and legislation in force that are relevant for operating the HIS.

- Overview of main data sources and data flows
  - *Administrative sources, registries, health interview survey/health examination survey.*
  - *Health information flows between the various elements of the health (information) system (e.g. from local health authorities to the Ministry of Health, from hospitals to the health insurance company, from the statistical agency to the public health institute).*
  - *If relevant, this section should also include subnational levels.*

- Overview of main indicator sets
  Overview of main indicator sets in use at the national level, and, if relevant, also at subnational levels.

- The international dimension
  To what extent can international data delivery requirements (Eurostat, WHO, OECD) be met?
  To what extent is the country participating in international health information projects?

Identifying strengths and weaknesses: Existing assessments

- Existing HIS assessments
  Overview of the main findings of existing health information assessments or comparable exercises (if applicable).

Identifying possibilities for synergies: Planned and ongoing reforms

- Planned and ongoing reforms
  Overview of planned and ongoing health information and relevant health system developments/improvement activities, including investments (if available), and including the responsible stakeholder(s).

- Annex: list of documents reviewed

Annex 3. HIS assessment item list

Category & nr	Item	Explanation/Elaboration situation in the country
I. Resources		
Policy & planning_1	The country has up-to-date legislation providing the legal framework for all relevant components of the national HIS: ideally, this legal framework also covers an evidence-informed policy cycle	
Policy & planning_2	There is a comprehensive, written HIS strategic plan in active use and it is implemented at the national level	
Policy & planning_3	The ministry of health has established a multisectoral HIS coordination mechanism with the other main HIS stakeholders in the country (e.g., a task force on health statistics); this coordination mechanism has a clear role and mandate	
Policy & planning_4	There is a routine system in place for monitoring the performance of the HIS and its various subsystems	
HIS institutions, human resources and financing_1	The institutions with official roles in the health information system (e.g. the ministry of health, national statistical office, national public health institute, subnational health authorities) have adequate and sustainable capacity in core health information sciences (epidemiology, demography, statistics, ICT, knowledge integration (including forecasting), health reporting, knowledge translation)	
HIS institutions, human resources and financing_2	The institutions with official roles in the health information system (e.g. the ministry of health, national statistical office, national public health institute, subnational health authorities) have adequate and sustainable resources for their health information activities	
HIS Infrastructure	Adequate ICT infrastructure (e.g. computers, data management software, internet access) and adequate ICT support is in place at the national level, at relevant sub-national levels and at hospital/provider level.	
II. Indicators		

Indicators_1	Core indicators have been selected in a transparent way and implemented for national and relevant subnational levels, covering all categories of health indicators (e.g. determinants of health; health system inputs, outputs and outcomes (health systems performance assessment); health status; health inequalities)	
Indicators_2	Reporting on the set(s) of core indicators occurs on a regular basis	
Indicators_3	The usefulness and completeness of the core indicators is periodically evaluated together with policy-makers and other end users	
Indicators_4	There is adequate alignment between the core indicators used at national and at sub-national levels; there is adequate alignment between the core indicators used by the different sub-national health authorities	
III. Data Sources		
Census	The country has adequate capacity to: (1) implement data collection; (2) process the data; (3) analyse the data: and (4) disseminate the analyses and the (micro)data	
Civil Registration and Vital Statistics (CRVS)_1	There is high coverage of deaths registered through CRVS	
Civil Registration and Vital Statistics (CRVS)_2	There is high coverage of cause-of-death information recorded on the death registration form	
Civil Registration and Vital Statistics (CRVS)_3	There is high quality of cause-of-death information recorded on the death registration form: there is a low proportion of all deaths coded to ill-defined causes	
Civil Registration and Vital Statistics (CRVS)_4	The country has adequate capacity to: (1) implement data collection; (2) process the data; (3) analyse the data: and (4) disseminate the analyses and the (micro)data	

Population-based surveys_1	The country has adequate capacity to: (1) conduct regular population based surveys (including sample design and field work); (2) process the data; (3) analyse the data: and (4) disseminate the analyses and the (micro)data.	
Population-based surveys_2	The health and statistical constituencies in the country work together closely on survey design, implementation and data analysis and use	
Health and disease records (including disease surveillance systems)_1	The country has adequate capacity to: (1) diagnose and record cases of notifiable infectious diseases; (2) report and transmit timely and complete data on these diseases; and (3) analyse and act upon the data for outbreak response and planning of public health interventions	
Health and disease records (including disease surveillance systems)_2	There is a high level of implementation of the *International Statistical Classification of Diseases and Related Health Problems version 10* (ICD-10) for reporting hospital discharge diagnoses	
Health and disease records (including disease surveillance systems)_3	Adequate and sustainable resources for operating the national cancer registry according to international standards are available	
Health service records_1	There is a comprehensive electronic health service based information system that brings together data on discharge diagnoses, procedures and other treatments and services provided and their costs from all public and private facilities	
Health service records_2	The electronic health service based information system has a cadre of trained health information staff, both at the central level and at the level of facilities, and regular training to keep the staff's knowledge up to date and to guarantee a sufficient pool of trained staff is provided	
Health service records_3	There is a mechanism in place for verifying the completeness and consistency of data from facilities and for feeding this information back to the facilities	

Resource records_1	There is a national database of public and private-sector health facilities with complete coverage. Each health facility has been assigned a unique identifier code that permits data on facilities to be merged.	
Resource records_2	There is a national human resources (HR) database that tracks the number of health professionals by major professional category working in either the public or the private sector with complete coverage	
Resource records_3	There is a national database that tracks the annual numbers graduating from all health-training institutions with complete coverage	
Resource records_4	Financial records are available on general government expenditure on health and its components (e.g., by ministry of health, other ministries, social security, regional and local governments, and extra budgetary entities) and on private expenditure on health and its components (e.g., household out-of-pocket expenditure, private health insurance, NGOs, firms and corporations)	
Data sources general_1	There are adequate human resources and equipment for maintaining and updating the various health services records and resource databases described above and for producing and disseminating outputs based on these databases	
Data sources general_2	The periodicity and timeliness of the routine data collections as described above is adequate and meets the demands of the end user (e.g. health facility managers, health insurance companies)	
Data sources general_3	Data from the electronic health service based information system is readily available for public health monitoring (i.e. policy support) and research purposes and are actually being used for such secondary purposes	
Data sources general_4	Regular assessments of the completeness and quality of the routine data collections as described above take place	
IV. Data management		

Data management_1	There is a written set of procedures for data management including data collection, storage, cleaning, quality control, metadata requirements, analysis and presentation for target audiences, and these are implemented throughout the country	
Data management_2	There is an integrated data warehouse at central level containing data from all population-based and institution-based data sources, both at the national and relevant sub-national levels, and a user-friendly reporting utility accessible to various user audiences	
Data management_3	A unique patient identifier is in place that allows for the linkage of various data sources at the subject level and such integrated data analyses are regularly performed	
V. National HIS data quality/information products		
Information products_1	Policy makers, at the national as well as at the relevant sub-national levels, have access to all the information they need to support their policy decisions, i.e. there are no major information gaps. In particular, all data and information necessary for monitoring the targets of the national health strategy are available	
Information products_2	The data collection method for core indicators is in line with (inter)national standards and recommendations	
Information products_3	The country is able to meet all data delivery requirements from the international organizations of which it is a member/with which it is collaborating	
Information products_4	The timeliness with which the data for official indicators are being collected and the timeliness with which these indicators are being computed and reported is adequate and meets the needs of policy makers	
Information products_5	The periodicity with which the data for official indicators are being collected and the periodicity with which these indicators are being computed and reported is adequate and meets the needs of policy makers	

Information products_6	The consistency over time of datasets from major data sources used for computing official indicators is high	
Information products_7	The coverage of major data sources used for computing official indicators is high; representativeness of estimates based on these sources is good	
Information products_8	Official indicators can be disaggregated by demographic characteristics (e.g. sex, age) socioeconomic status (e.g. income, occupation, education) and locality (e.g. urban/rural, major geographical or administrative region).	
Information products_9	In-country adjustments use transparent, well-established methods	
VI. Dissemination and use		
Dissemination and use_1	Senior managers and policy-makers demand complete, timely, accurate, relevant and validated HIS information and know how to interpret and use it	
Dissemination and use_2	Integrated health reports, including information on the core indicators and their disaggregations, are publicly distributed regularly	
Dissemination and use_3	Integrated health reports, including information on the core indicators and their disaggregations, are demonstrably used in (national and sub-national) health policy making processes	
Dissemination and use_4	Adequate mechanisms for knowledge translation* are in place and functioning well	
	* E.g. resources, tools, networks and platforms to structurally support the uptake of health information in policy making, i.e. to structurally support evidence-informed policy-making	
Dissemination and use_5	Making health information available for research and contribute to publications. Participation in (inter)national projects and networks.	

Annex 4. Example of filled in HIS assessment item list

Category & nr	Item	Information summarized by assessors
Indicators_1	Core indicators have been selected in a transparent way and implemented for national and relevant subnational levels, covering all categories of health indicators (e.g. determinants of health; health system inputs, outputs and outcomes (health systems performance assessment); health status; health inequalities)	• Different indicator sets (partly) covering public health are in use by different institutions (public health institute, health insurance company, statistical agency). An overarching core set is not in place. • The existing indicator sets mainly focus on health care and health system performance assessment. • There are hardly any indicators on health inequalities.
Population-based surveys_1	The country has adequate capacity to: (1) conduct regular population based surveys* (including sample design and field work); (2) process the data; (3) analyse the data: and (4) disseminate the analyses and the (micro)data. *These include health interview surveys, health examination surveys, household surveys.	• Regular national Health Interview Surveys are carried out by the Public Health Institute at the request of the Ministry of Health. • There is limited capacity at the Public Health Institute for analyzing the data; there is potential for better use of the data. • The Public Health Institute is investigating the possibilities for producing aggregated data sets as open data. • There is no regular Health Examination Survey in place, and there currently no plans for establishing this in the future.

Annex 5. Example of a SWOT analysis of a HIS

Key issues highlighted in the mission terms of reference	
	To assess the health information system in the Land of Oz. (?joint HIS/eHealth system assessment)
Process and methodology followed for the HIS assessment	
	The health information system was assessed on the basis of a condensed version of the Support Tool developed by WHO Europe.
Key mission findings	
	<u>Strengths</u> - Statistical capacity available in Health Information Unit - High IT capacity within country - Winkies Postgraduate Medical Faculty training capacity on ICT by HCPs <u>Opportunities</u> - Plan for new evidence-based health strategy in the short term - Plan for new eHealth standards - International donors willing to support above - Experience with eHealth systems within NGOs; private sector; certain regions - Pressure by local IT industry to develop national eHealth standards - 2016 Autumn School on Health Information to be held in Emerald City
	<u>Weaknesses</u> - Existing health information system based on mostly paper-based data collection based on aggregate statistics - Lack of universal unique identifier <u>Threats</u> - General mistrust in official health statistics - Inflexibility of health information system to generate bespoke statistics - Rigid data protection framework - Fear of retribution in case of adverse performance indicators - No legal recognition for electronic signatures

Annex 6. Template for the HIS assessment report

1. One-page executive summary
2. SWOT analysis
3. SMART suggestions for improvement (for the short, medium and long term) & good practices
4. Annex: Full filled-in HIS assessment item list
5. Annex: List of stakeholders interviewed

Sciensano | Rue Juliette Wytsmanstraat 14 |
1050 Brussels | Belgium| e-mail: infact.coordination@sciensano.be|
Website: www.inf-act.eu |Twitter: @JA_InfAct