

Assessing European national health information systems in peer review format: lessons learnt

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Background: Systematic assessments of a country's health information system (HIS) help identify strengths and weaknesses and may stimulate actions for improvement. They represent a capacity-building process for the country assessed as well as for the assessor. The joint action on HISs (InfAct) developed a peer-to-peer assessment methodology adapting an established WHO support tool. The aim of this study is to identify lessons learnt and the added value of the InfAct peer assessment for the assessors. **Methods:** A qualitative evaluation of the peer HIS assessment was performed based on 12 semi-structured interviews: nine interviews were carried out with assessors from nine participating countries, and three with an observer (present during assessments). The interviews were carried out between May 2019 and January 2020. Interviews were analysed using qualitative content analysis. **Results:** The interviews revealed the experiences of the assessors mainly occurred in five areas: assessors strengthened their understanding of what a population-based HIS is; they strengthened their understanding of how a HIS operates in different countries; they learnt how to carry out a HIS assessment; they strengthened their organization, communication, negotiation and reporting skills and they strengthened the networks in health information within and between countries. **Conclusion:** Since the assessors are key personnel in their respective national health systems, the impact of the assessment is not limited to the assessor alone but may extend to stakeholders in their country. The deployment of the InfAct HIS peer assessment, anchored in systematic HIS capacity building across European countries, is recommended.

Introduction

Health information is one of the building blocks for the development of health systems.¹ Population-based health information systems (HISs) encompass data collection, analysis and synthesis, reporting and knowledge translation, and the underlying resources, stakeholders, activities and outputs to do so.² A population-based HIS comprehensively covers both healthy and non-healthy populations in areas of prevention, promotion, cure and care.³ HISs go beyond healthcare information systems, which are often patient-centred.

The development of robust, high-quality HISs is a vital mechanism to assist policy-makers in achieving their objectives and delivering information that forms the basis of robust policy.^{1,2} Therefore, it is important to carry out HIS assessments. A HIS assessment is an evaluation of the functioning of main elements of a national HIS. They help to set the state-of-play, to identify strengths and weaknesses in the HIS and to stimulate actions for improvement. HIS assessments also represent a capacity-building tool, as shown in the EU Joint Action on Health Information (InfAct).^{4,5} In the past, HIS assessments have been carried out by the Organization for Economic Co-operation and Development (OECD) and the World Health Organization (WHO).^{6,7} WHO developed a methodology to assess HISs and confirmed its value and relative ease of implementation.⁴ InfAct built on this methodology to develop a peer HIS assessment methodology where experts from different countries assess each other's HIS.^{4,8}

Assessment of national HIS by foreign HIS experts may help to strengthen HIS, but little empirical research has looked at the actual functioning of these peer HIS assessments. This study reports on the perspective of assessors who conducted peer HIS assessments with the InfAct network as a case study, to identify lessons learnt on HIS peer assessment methodology.

Methods

Study setting

This study is part of a wider research project. The methodology has been described elsewhere and is summarized here in brief.^{3,4} HISs in nine European countries were assessed based on their interest expressed in InfAct.^{5,8} They were split in three groups of three countries. The assessments took place in three cycles; each time one country was assessed by assessors from two other countries in the same group. The InfAct peer assessments took place between February and November 2019.

Assessment approach

The assessments were carried out by one or two peer assessors from each assessing country, meaning a maximum of four assessors in total. Most assessors had long-standing experience from working with their own HIS. The assessor of the country where the assessment took place acted as host and organized the peer assessment by

arranging the interviews with stakeholders of the assessed country. Thus, each assessor carried out two assessments and acted as a host once. A single observer familiar with the original WHO assessment methodology provided support during all assessments to ensure that the assessments were performed according to professional standards and procedures.⁷ Each assessment included a preparatory desk report, a country visit with semi-structured face-to-face interviews with local stakeholders, a final report and a follow-up stakeholder meeting.

The hosts developed a two-day programme for each country visit. Typical stakeholders included Ministries of Health, National Public Health Institutes, Statistical Offices and Health Insurance Funds. The assessors carried out the interviews using a HIS items list, covering the following domains: resources, indicators, data sources, data management (including digitalization), national HIS data quality/information products and dissemination and use.⁸ Based on the outcomes of the interviews, the assessors prepared a final report, which was discussed with the host and presented to the local stakeholders through a virtual multi-stakeholder follow-up meeting. The participants jointly validated the final reports, including a SWOT (strengths, weaknesses, opportunities and threats) analysis and SMART (specific, measurable, assignable, realistic, time-related) recommendations.

Data collection and analysis

A qualitative evaluation of the peer HIS assessment was performed based on 12 semi-structured interviews. An interview was carried out with one assessor from each country ($N=9$). Additionally, three interviews were carried out with the observer, one after each cycle. The interviews were carried out between May 2019 and January 2020.

The semi-structured interviews were based on two questionnaires: one for the assessors and one for the observer (Annex 1). All interviews were carried out by the same person (P.B.). Interviews were carried out by teleconferencing using GoToMeeting®, lasted for 1 h and were recorded. The interviews were transcribed using Express Scribe Transcription Software®. A qualitative content analysis was carried out. Common themes across the interviews were identified using deductive thematic analysis with the following consecutive steps: transcription and repeated reading of the interviews, extraction of codes, collation of codes into broader themes, reviewing themes, defining and naming themes, analysing the themes in relation to the story that was told and in relation to each other and reporting themes.⁹ The coding and analysis were carried out with Nvivo 12®.

Results

The learning experiences of the assessors mainly occurred in five areas. Firstly, the assessors strengthened their understanding of the concept of a HIS, i.e. what a HIS is in general. Second, the assessors strengthened their understanding of the context of a HIS, i.e. how a HIS operates in different countries. Third, the assessors learnt how to carry out a HIS assessment. Fourth, the assessments allowed the participants to strengthen their organization, communication, negotiation and reporting skills. Finally, the assessments strengthened networks within and between countries.

1. The concept of a HIS

The assessors learnt about what a HIS is, as illustrated by this quote: 'I learnt most about understanding what a HIS was. 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.' (I8). Another interviewee confirmed: '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.' (I5).

The assessment also provided a good overview of the stakeholders in the HIS. An assessor explained: 'I learnt that there are more players and stakeholders in the HIS rather than the ones that are producing the data. It is much broader.' (I4). The observer summed it up: 'The assessors learnt how to appreciate the full breadth of what a HIS is'. The assessor continued: '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.' (I4).

2. The context of a HIS

The assessment allowed the assessors to understand their own country's HIS and the role each stakeholder plays in it. The assessment allowed them to see their own HIS from another perspective, as 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.' (I4). I4 stated that it became more evident of how the different institutions play a part in the HIS. The assessors realized they are part of a bigger picture.

The assessors also learnt about the stakeholders in their country: 'The assessments were important for us, the organisers, because we learnt a lot of new things about the activity of our stakeholders. Really important to let them talk and to share their experience.' (I9). Another assessor (I8) explained the assessment particularly helped to reframe the role of their own institute in the HIS. The 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 who had been working in the field for years. However, having the information compiled, prioritized and documented into one report did provide an added value. One assessor explained 'I think it is good to move from implicit knowledge to explicit knowledge. Especially, because the findings are acknowledged by external assessors allowing credibility' (I8). Another assessor highlighted: '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.' (I1).

The learning experience of the assessors was also enriching since they were exposed to other HISs. The observer 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.' An assessor explained: 'It is the differences that make us see how we can improve our systems.' (I7). Another assessor explained that they now have knowledge about three countries' HISs which can improve their practice (I4). This was 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.' (I5).

3. The HIS assessment tool

The assessors learnt how to carry out a HIS assessment, which many of the assessors found of key importance. 'I enjoyed the process. I think knowing about the process might be more important than to know about my HIS' explained an assessor (I1). Another assessor said it was very useful for her/him to learn and implement the methodology of the InfAct peer HIS assessment because now she/he can transfer her/his knowledge about peer reviewing to others (I5). Having the assessment in cycles allowed the assessors to go through multiple assessments, to better understand the tool and develop their expertise. This was illustrated by an assessor: 'The first reports were much more difficult to write. We were much more trained for the second report' (I5). Various other assessors confirmed 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. According to the assessors, it is important to note that many areas needed to be covered in a limited amount of time and hence they needed to consider which elements to address during the interviews with the stakeholders. Similarly, writing out the SWOT analysis and the SMART recommendations for the final report was challenging in the limited amount of time, according to the assessors. However, the assessors now feel confident to repeat the exercise within their respective HISs, share their own learning experience with others or train others to use the tool: '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.' (19).

4. Organization, communication, negotiation and reporting skills

As mentioned in a previous study, besides learning how a HIS assessment tool works, the assessors also developed various other skills that are important when performing a HIS assessment.⁴ This article provides evidence on how this was achieved. First, the assessors learnt how to organize an assessment in their country. An assessor acknowledged that organizing the country visit was difficult because there were many different participants to fit in a specific time frame. The number of interviews and length of the interviews were not fixed. Furthermore, it was up to the host to decide how much information to provide to the stakeholders prior to the interview and how to convince them to participate. This developed their organizational skills as the country visits were limited to two days in which interviews with many local stakeholders had to be planned. An assessor explained: 'Initially I had 30 stakeholders identified. I managed to reduce them to 20. We managed well in 45-minute discussions.' (17). In addition to the organization of the assessment as a host, the assessors also had to organize their work in an international team. The assessors had to distribute the work between themselves in each group. The tasks included taking notes, questioning the stakeholders and drafting reports.

Second, the assessors gained communication skills. 'The assessors needed to find the right cues to engage with the stakeholders', explained the observer. This concerns cultural sensitivity and interview versatility. The observer explained that there were different communication cultures depending on the local stakeholders. An assessor confirmed that they had to be sensitive to cultural differences and had to interview stakeholders in areas they were less familiar with. Difficulties were typically encountered during the interviews with health insurance representatives or policy-makers. These difficulties decreased over time, as the assessors became familiar with other stakeholders' fields of expertise. According to the observer: '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.'

Third, the stakeholder follow-up meeting developed the assessors' negotiation skills. The assessors had to incorporate comments from the stakeholders in final reports, while staying true to the information collected during the interviews.

Finally, the assessors further developed their reporting skills. They had to evaluate the value of the strengths and weaknesses keeping in mind the culture and system of 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.' (16). Multiple assessors explained that they learnt how to formulate actionable recommendations and to carefully consider how to report the SWOTs. Their reporting skills improved over the course of the exercise.

5. Networking

The HIS assessment provided networking opportunities for the assessors, both within the country and within the InfAct group. The observer explained that this assessment increased the visibility of the hosts within their own health systems. It also created an opportunity for the hosts to play a central role during the assessment, and to be approached by different stakeholders. One host said: 'This stakeholder has not spoken to me in 3–5 years and now he is excited and enthusiastic with new proposals' (12). In another interview, the host stated, 'The assessment helped me to meet a new player in the field who ended up being a really good contact' (11). Being a host improved networking in health information communities in the countries according to the interviews. Others pointed out that the assessments were a good opportunity to talk to the stakeholders about strategy, human resources or HISs in general, and not to be limited to their usual specific health information topic. 'Creating informal relationships', one assessor explained, 'helps us to work better together and to produce better results.' (14). It also became clearer what the activities of the different stakeholders were, according to the assessors.

Within each assessment group, the assessments created strong relations among experts from different countries. This was 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.' (19). In another interview, the connections that were created during this exercise were a strong base for future collaboration, '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.' (15).

Discussion

Lessons learnt

Some important lessons were learnt by the assessors participating in the InfAct peer assessment. These include obtaining a better understanding of HISs, identifying practices between HISs, learning the InfAct peer HIS assessment methodology, creating stronger networks and improving their skill set. These lessons may have important, wider consequences as discussed below.

First, there are different understandings of what a HIS is, ranging from narrow definitions equating a HIS with an electronic health record system or a central database to more comprehensive definitions.^{7,10–12} The InfAct assessment methodology is based on a broad definition, as it aims to improve the utility of the HISs for different levels of decision-making, not only, e.g. at the hospital level. The assessors were in a unique position to understand the comprehensiveness of HISs ranging from data collection, interpretation and reporting to knowledge translation, and how these different components (should) interact. HISs of which the different components are not well integrated face different problems, such as duplication of data collection, lack of consistency, lack of coordination and governance, unclear priorities and ineffective data collection and analysis.^{3,12–17} The assessors also reported to have learnt by seeing how things can be done differently. This highlights the importance of HIS assessments in a peer review format as a potential method for knowledge transfer and exchange, where peer assessors are both knowledge producers as well as knowledge users.¹⁸ In addition, understanding and learning from the peer review format can provide additional knowledge to the participants which then can be transferred for better policymaking. The assessors will bring back this knowledge and expertise to the wider health information community in their own country and they can use this knowledge to improve and innovate the national HIS. It is likely that the InfAct HIS assessments will have this spill-over effect as the assessors are key players in the HIS strategic decision-making processes in their countries. Additionally, the assessments strengthened the positions of the hosts

and placed them more visibly on the map of their national HIS. It is expected that strengthening the knowledge and expertise of the assessors and the position of the hosts will result in benefits for the related HISs. This is important as currently there are still many challenges in national HISs in Europe, hampering the optimal use of data for the development of robust health policies.^{3,19,20} Especially during the COVID-19 pandemic, both the importance of health information for policymaking and the current flaws in HISs became very clear.^{10,16,17,21–24}

Second, moving beyond the assessor, the stakeholders in the respective countries reported that they realized they were part of a larger system, in which the role and value of each participant in the HIS became clearer. As such the impact of the HIS assessment also for this reason reached beyond the scope of the assessor into the wider community.

Third, the interaction and collaboration between health information experts, within and between countries, was emphasized as important by multiple assessors. By collaborating within the country and in groups, health information networks were created. The assessors pointed out that they will continue their exchange beyond the lifespan of InfAct. This highlights the potential of the method for contributing to knowledge transfer and exchange.¹⁸ Moreover, during a pandemic (international) networks are key to support rapid response.^{25,26} By strengthening the interaction between HIS players, within and between countries, the HIS peer assessment may have strengthened the HISs and their resilience.

In conclusion, the InfAct peer assessment contributed towards strengthening of HIS on multiple levels, as evidenced above. The added value of the peer assessment tool and methodology went beyond improving solely the capacity of the assessors. Most recently, the COVID-19 crisis highlighted the need to strengthen HISs and their resilience.^{16,17,21,22} The HIS assessments provide an ideal tool for this.

Strength and limitations

A possible limitation may be that only one researcher carried out the analysis. However, this is probably alleviated because some of the assessors are co-authors (L.A., H.L. and A.E.S.), and because the findings were revised by outsiders who had access to the results (H.v.O., H.V.O. and M.V.). A possible second limitation may be that the assessors were interviewed directly after their country had been assessed. For some assessors, this meant they had only done one assessment, for others that they had already gone through multiple rounds. Their experience might have changed along the process, although in this way a more comprehensive overview of the different experiences throughout time was obtained. A strength of the study is the diversity of the assessors and participating countries. Based on the United Nations geoscheme for Europe, all four regions of Europe were covered. This endorses the generalizability of the findings.

Recommendations

This study showed that the InfAct HIS peer assessment brought value to the assessors by increasing their capacity and skill sets. The lessons learnt are expected to also have an impact beyond the assessors alone. A spill-over effect is expected where the knowledge is used to improve and innovate national HISs. Therefore, this study strongly recommends the wide deployment of the InfAct HIS peer assessment, anchored in systematic HIS capacity building across European countries. Two European projects; Population Health Information Research Infrastructure²⁷ and Joint Action Towards the Health Data Space,²⁸ are already carrying out assessments based on the positive experience of InfAct. However, to improve HIS

capacity building across European countries, the implementation of InfAct HIS peer assessment should be organized at European level, and in a systematic and structured way.

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Data availability

The data underlying this article cannot be shared publicly due to the privacy of individuals that participated in the study. The data will be shared on reasonable request to the corresponding author.

Key points

- Assessors strengthened their understanding of the concept of a HIS and how a HIS operates in different countries by carrying out the InfAct HIS peer assessments.
- Assessors learnt how to carry out a HIS assessment and strengthened their organization, communication, negotiation and reporting skills by carrying out the InfAct HIS peer assessments.
- The InfAct HIS peer assessments strengthened HIS networking within and between countries and created a HIS community.
- The deployment of the InfAct HIS peer assessment anchored in systematic HIS capacity building across European countries is recommended based on the findings.
- HIS assessments create added value from the perspective of the health systems assessed, including increasing the skillset of the assessors as parts of their own countries' HISs.

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