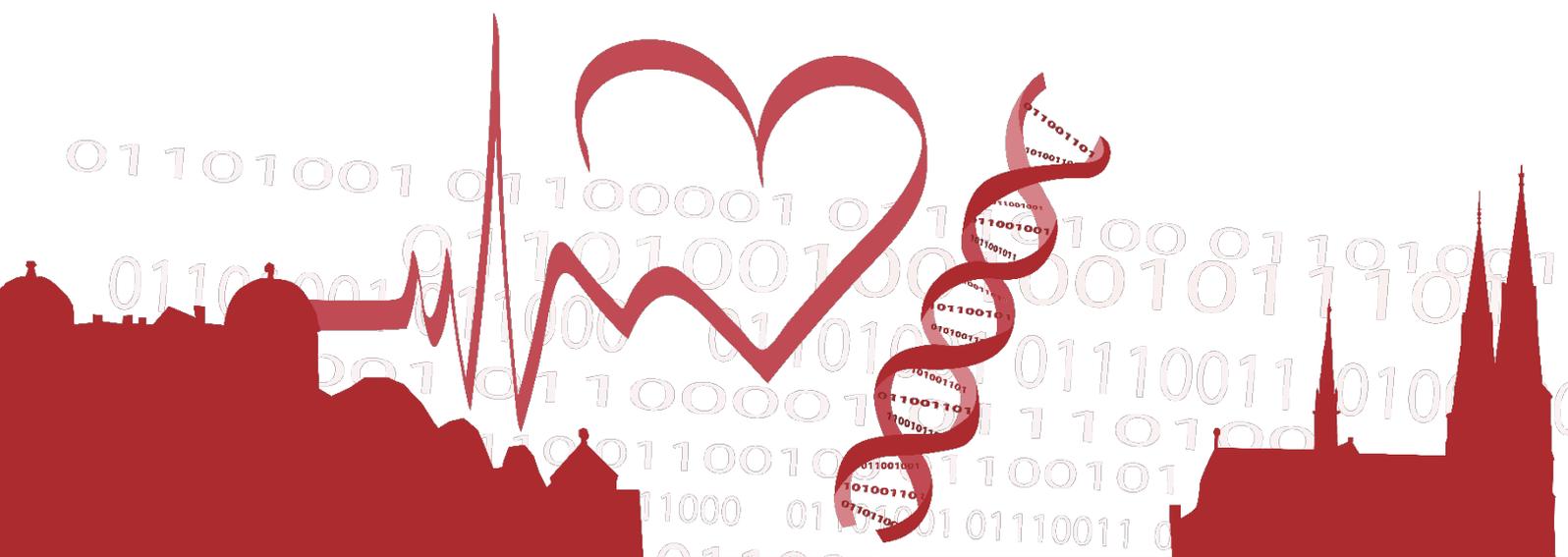


Patient empowerment through digital health in Sweden

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I. Introduction

Digital health is becoming more and more relevant over the past few years, also in Sweden. In recent years, Sweden has been working towards its vision for eHealth for 2025 (1). In this vision, it is described that Sweden aims to be a world leader in 2025 when it comes to utilizing digital tools within the healthcare system. When it comes to digital health, the term patient empowerment is often mentioned as well. Mostly, the goal of all these digital tools is to create better healthcare for patients, where they are more in control of managing their disease.

This project aimed to explore the consequences of patient empowerment in the area of digital health. Mainly, what does this mean for all different kinds of stakeholders, including the patients themselves? To investigate this, I decided on performing interviews with key opinion leaders in the field of digital health. In total, I managed to conduct 16 different interviews with different kinds of perspectives. From these interviews, I tried to find out what patients need to benefit from digital health, but also how patient empowerment can help in developing the digital health sector.

There is a lot of discussion surrounding the term patient empowerment, there is probably enough to fill a whole report with just arguing about which term is best. For this research, I worked with the World Health Organization (WHO) definition of patient empowerment.

A process in which patients understand their role, are given the knowledge and skills by their healthcare provider to perform a task in an environment that recognizes community and cultural differences, and which encourages patient participation (2).

Many people are advocating for different terminology but considering that most scientific literature still uses patient empowerment, I decided to use this term as well (3). In literature, the term patient empowerment also usually refers to the control patients have over their health and their involvement in their healthcare.

There is also a lot of terminology around digital health or eHealth. According to ZDNet, digital health or electronic Health (eHealth) can be defined as the area in which technology helps to improve a person's health and wellbeing (4). Within digital health, there are several distinctions. There is telemedicine, which is perhaps the most well-known form of digital health. Telemedicine delivers healthcare remotely using telecommunications technology (5).

Then there are Electronic Health Records (EHR), which aim to digitalize all records of patients into one program (5). Lastly, there is mobile Health (mHealth) which delivers healthcare through personal mobile devices, such as mobile phones and wearables such as smartwatches (6). The focus of this research was mostly on mHealth and telemedicine, which has the most direct benefits to patients. EHR were mentioned during some interviews as well, especially on the topic of data and data sharing.

As a final note, this project and the report that came from it should be considered a compilation of many perspectives and not as anything definitive. It is my view on the subject as it is now, although I know that there is still a lot to learn and that it is nowhere near maturity. It is also impossible to include all the learnings from the interview because that would simply be too much. Therefore, the focus was on the patient empowerment part, things such as reimbursement system were left out. This report should be considered a guide for future studies, made to inspire others to consider the area of digital health in Sweden.

2. Results

The results from the interviews will be presented in the form of three statements that can be considered the main findings from the gathered data. Different stakeholders were identified during the process of collecting information, eventually grouped into five different stakeholders. In general, there were healthcare providers (HCP), patients, authorities, policymakers, and suppliers. There has been an interview with at least 1 of each stakeholder, although the section of HCP has been underrepresented, with only one interview. The interviewees are mentioned as sources when it came to certain statements. However, some statements appeared in more than one interview. In that case, I only mention the interview in which the statement first appeared.

2.1 Inability to share data

The first statement that will be discussed in the result section of this report is

It is currently not possible to share data between different stakeholders.

This is something that came up during most of the interviews as something that now hinders the progression of digital health usage and integration in Sweden. I, therefore, considered it worthwhile to have a closer look at the consequences of this for all involved stakeholders.

At the time of writing, HCP in the public sector are only capable of using digital tools that are within the reimbursement system. Getting accepted into the system is the only way for private companies to gain access and gives them the ability to share the data of their users with the HCP (Interview C Jarnling, 20 Nov 2020). This also means that if certain digital tools are not in the reimbursement system but still out on the market, they may be used by patients while their HCP does not have access to it. Due to current regulations, there are very limited possibilities for data sharing between the public and the private sector (Interview J Dexe, 3 Dec 2020)

With the inability to share data but the simultaneous emerging of different digital tools comes the situation where HCP might be forced to log in and out of different systems to gather all data that is available on their patients. At one point in time, the Stockholm region alone counted 1600 IT systems that were being used (7). Not only is this cumbersome and requires effort, but it also increases the chances that mistakes are made (7). They can either be mistakes when reading the data output because different systems might show data differently or mistakes with

data input if the HCP must put in new data after meeting with a patient. The data input could also be relatively time-consuming. Added to this, HCP might be able to make better decisions when it comes to their patients, due to the higher resolution of data that is available. Currently, healthcare is reactive and episodic with patients with a chronic disease meeting their doctor only once or twice a year. Digital tools should enable continuous self-monitoring, for higher safety and better adaptation of medication. Overall, many patients are willing to become more engaged in their healthcare through digital tools (Interview S de Haas, 4 Dec 2020). Acquiring more data might also assist the HCP in diagnosing patients, increase the quality of follow-up visits, and make it easier to refer the patient to the right HCP if necessary.

The ability to share data would also enable to bring healthcare closer to the people, so that it is possible to move away from the visits to care centers and instead focus more on care at home (Interview P Sundström, 9 Dec 2020). To do this, there would need to be quite an investment in education, because otherwise, you cannot expect people to go home and take care of themselves without proper knowledge of how to do exactly that.

For patients, the fact that their data is not being shared is a big issue. This goes especially for patients with chronic conditions that visit different HCP often, because they must tell their story over and over (Interview S de Haas, 4 Dec 2020). If digital patient journals could integrate and aggregate patient data, every HCP could have insight into the entire patient journey up until that point (with the patient's consent for sharing that data). This is especially helpful if we want to work towards a more holistic approach to healthcare, where diseases are being viewed from different angles by different professionals. It is also very important in more acute situations, where patients travel to a different region, become ill, and need instant medical care. If their HCP does not have access to all their data, it might lead to dangerous situations such as serious allergic reactions to medication (Interview S de Haas, 4 Dec 2020).

If people could access their health data in the same way as they can access their bank data, they might be more compliant to treatment or in general just more aware of their health status (Interview P Sundström, 9 Dec 2020). This would allow for easier preventive measures or secondary interventions. The negative consequences of the inability to share data are hitting patients with chronic conditions the hardest because they are the group of patients that will most likely benefit the most from digital tools. Considering that 50% of the Swedish population has a chronic disease, and they consume 80% of the healthcare budget, this is something to consider (Interview P Sundström, 9 Dec 2020).

A side note here is that simply giving patients access to their data might not reach the empowerment that is desired. To fully give patients an understanding of their health, you will also need to educate and engage them (Interview K Hehenberger, 30 Nov 2020). Moreover, patients might not forever want to give their data away for free. As of now, people usually do

it because it is beneficial for the greater good, for all people suffering from the same disease. However, in the future, there might be a shift towards patients demanding something of value in return for their data (Interview F Bolin, 13 Nov 2020). For both patient compliance and endurance, it is essential to build services that provide continuous personal value to the patient.

Moreover, most digital tools that are available now rely on the patient to put in their data to track e.g., symptoms or side effects. An ideal feedback loop would be that the input data raises alarm at the HCP if necessary, while at the same time the patients get direct feedback on how to manage their intervention. Currently, most tools lack either one of these things (Interview B Ryll, 8 Dec 2020). It is difficult to develop a tool with a closed feedback loop if there is no ability to share data between different parties. Private companies will probably decide to sell their products directly to users/patients, which will change the whole healthcare landscape quite a bit (Interview F Söder, 18 Nov 2020).

The fact that it is hard to give back valuable feedback to the user, also makes the development of a good digital tool becomes harder. Patients give their data but if they will not receive anything that they perceive as valuable in return, they will stop using the digital tool (Interview J Christensson, 26 Nov 2020). This makes user retention very difficult for companies, which affects their business model. Of course, many other factors play a role when it comes to the development of digital tools and subsequent user retention, but the lack of data transfer between the tool and HCP plays a role.

The inability to share data puts a certain halt to innovation within digital health. There are many different players in the field at this moment, but there is no real collaboration yet. This will slow down the rate of innovative solutions that can be produced and put into practice (Interview F Söder, 18 Nov 2020). To come to free data sharing would make it easier for authorities to evaluate new healthcare innovations. If it is not possible to share data between parties, how are the authorities supposed to evaluate if the innovation is working properly compared to what is already out there and has a positive impact on healthcare in Sweden? SKR is currently working on a place to gather the information that is important for suppliers that want to introduce a digital tool on the Swedish market (Interview P Sundström, 9 Dec 2020). This is a step in the right direction, with at least all information in one place, although the actual data that these digital tools will generate will stay unavailable to most.

Not being able to share data also in a way makes healthcare more unequal than it has to be (Interview A Ekholm, 19 Nov 2020). The Swedish authorities might be hesitant to fund digital tools because the law says that healthcare should be equally accessible to all. However, in making it hard for digital tools to be implemented (through the inability to share data), healthcare becomes more unequal because most suppliers focus on B2C sales. Only the people

who have enough money to spend it on these digital tools will be able to use them, hence creating inequality between different socio-economic groups.

If sharing data would become more commonly performed, companies would have a higher chance of succeeding in bringing their products to the patients. It would also benefit the Swedish industry because more companies would choose Sweden as a market. Right now, market penetration e.g., diabetes tools is relatively high because of the B2C sales (Interview A Ekholm, 19 Nov 2020). However, these companies are usually from the US or other big players. If private companies manage to get reimbursement for their product, they can share data with the private sector and the healthcare providers in there. Then you get a situation like in diabetes care, where HCP are aware of the tools that are available to patients and work together with them (Interview A Ekholm, 19 Nov 2020).

If policies were changed and data was more easily shared, Swedish companies would also get a higher chance of bringing their product to the patients. It will also make it easier to shift to secondary prevention and health promotion (Interview F Söder, 18 Nov 2020). If patients have more insight into their data, they might be more encouraged to take steps to protect their health. There could be new standards that are developed with data sharing at the forefront. This would make evaluations of digital tools more straightforward.

There is already a positive example of a national platform in which data is being shared, this is the digital prescription service (Interview C Jarnling, 20 Nov 2020). It is used by both the public and private sector and gives patients a much more insightful list of the medications that have been prescribed to them. I think that this example shows that is possible if you open up data for a collaborative effort between the regions and companies such as Kry, that also use the prescription service.

2.1.1 Summary

The inability to share data results in quite a few obstacles for the different stakeholders. There is the issue of different regions using different EHR that are not compatible with each other and also the inability to share data between the regions and healthcare provided by the municipalities. Patients find that the digital tools that they use are not compatible with the healthcare system because the data does not reach the HCP. This causes them to share their story multiple times, which can be frustrating. That these tools do not exchange data with the HCP or with other tools make for a non-integrated system in which HCP are not able to use the full potential of data that is available. The education to have patients empower themselves through digital tools would be relatively time consuming but should be compared to the

positive effects of adherence to the tool. Fully developed feedback loops are another thing that would increase patient adherence.

If data sharing would be possible between different stakeholders, it would allow for fewer visits for patients to care centers because their data is immediately available to HCP. It would also open up the possibilities for innovation and entrepreneurs that want to move into the digital health space. Sharing data will drive equality within the system and will allow for a move towards secondary prevention.

2.2 A multitude of needs

The second statement that we will look at in this report is

Every patient has different needs when it comes to digital health

With the patient at the center of this research, it became clear during the interviews that developing and implementing digital tools was highly dependent on what the needs were in certain patient groups. This diversity of needs has an impact on all the shareholders.

Digital tools that can monitor from a distance or that make consults easier and less time consuming might improve the relationship between HCP and patients. Their relationship might become more of a continuous dialogue between the two, instead of singular visits (Interview P Sundström, 9 Dec 2020). The tools will allow for more frequent monitoring, therefore providing more data points for the individual patient. With the different needs considered, HCP might be able to use tools that are specifically tailored to groups of patients that have different needs (Interview L Håkansson, 7 Dec 2020).

For patients, they definitely understand their needs but are not always aware of what kind of support they could get from self-monitoring (Interview H Ahlén, 18 Nov 2020). And some patients perhaps do not want to be involved in their healthcare process so much, which could also be a need (Interview J Christensson, 26 Nov 2020). So, this needs to be considered when changing the perspective on what patients need. With patients catering to their own needs, it is also important to take into consideration that these patients than might 'become their disease'. If you are for example a chronic patient and you need to constantly monitor your vitals to relay this information to your HCP, it will always be at the forefront of your mind. This might be an extra burden for patients, especially on the days that they are feeling well and do maybe not feel like thinking about their disease at all (Interview J Christensson, 26 Nov 2020).

When their needs are being met, patients will feel more secure in their health. They will become more informed about their conditions and knowing that their HCP knows their needs might lessen the burden of living with a chronic disease (Interview S de Haas, 4 Dec 2020). It is comforting for these patients that their HCP knows their individual needs and that they will get a sense of really being listened to (Interview L Håkansson, 7 Dec 2020). The digital tools might also be a sort of support for patients, when they do not know how to explain something the data can speak for them and guide interventions. Digital tools will allow the right intervention at the right time. Therefore, managing their condition will take less time and their needs are met in a better way, increasing their quality of life.

With many patients having different needs, it is difficult to test which digital tools work and which do not, before they are approved. With the way that medical devices are being evaluated now, this is a very slow process. This does not match the fast pace of digital development. A change might be needed in the way that clinical trials are being run, to produce sufficient clinical evidence for digital tools while keeping a faster pace (Interview JM Jansen, 6 Nov 2020). If done correctly, more data on different groups of patients will grant more precise healthcare. A focus can be put on preventive health more than it is being done now, if everyone in the population is a chronic patient with needs that shift over time (Interview F Söder, 18 Nov 2020). So healthy people might not need anything more than tips on an effective lifestyle, whereas others could be efficiently helped with their condition.

For suppliers and developers, meeting patients' needs is perhaps easier said than done. Because how can you be sure that you are investigating what patients want? Patient advocates or people that participate in studies are biased because they might be more involved in managing their disease than the general population. By including these patients in your development process, you still do not get the complete picture (Interview JM Jansen, 6 Nov 2020). From the interviews, it also became clear that patients often cannot express their real needs. An example was given from Parkinson patients who wanted to see their doctor more often (Interview H Ahlén, 18 Nov 2020). Since that was not a viable solution to their problems, the service designers started to investigate what their underlying needs were, why did they want to go to the doctor so bad? When they investigated this, they found that most of the problems that the Parkinson patients wanted to talk about to their doctor, could be managed much better by nurses or digital services. This could potentially make it difficult for suppliers to know exactly what they need to develop for it to work for most patients.

It might seem easier for companies to include only objective measurements, vitals that you can express in numbers, and create algorithms on (Interview D Petrini, 10 Nov 2020). However, looking into patients' needs and including those into the digital health tool as well will give a much broader picture of the complete state of wellbeing of a patient (Interview D Petrini, 10 Nov 2020). Including these measurements into digital health tools will make communication

between patient and HCP easier, so both parties will benefit from really looking at an individual level.

2.2.2 Summary

If there would be more focus on the patient's individual needs, this would improve the relationship between HCP and patient. It would become more of a continuous dialogue instead of fragmented visits throughout the patient's journey. Moreover, self-monitored data could be used as an interpretation of a patient's needs. Sometimes the data might be able to convey what a patient is not able to explain to their HCP.

It would also allow for the development of individual interfaces for specific groups. This would lead to a better-informed patient and a patient that collects more data points, which will lead to higher precision in the treatment and care this patient receives.

2.3 The rise of companion devices

The final statement to be presented is

Digital health tools could be used as companion devices

Companion tools mean that digital health tools would be used as an addition to treatment, not a replacement or a full treatment.

Digital tools as companion devices might, if they are not designed correctly, put an increased strain on patients. Especially if you need to combine multiple tools. If you are a chronic patient and you already need to think about your treatment every day, it might not make sense to use something that is only an addition to your already busy 'schedule' of managing your disease. However, this would of course hopefully be different if the digital tool is well-designed and instead eases something of the burden that is living with a chronic disease (Interview J Christensson, 26 Nov 2020).

If digital tools are implemented as companion devices, it might give a more holistic approach to the way that patients are being treated. They will be able to receive more traditional forms of treatment, supported by a digital tool that contributes to this treatment or eases the burden of it by e.g., reminding patients to take their medication. For patients who are hesitant about

digital devices or who are not particularly confident around technology, introducing digital tools as a companion to the existing treatment might lower the barrier to use these tools. For some patient groups, it might be more difficult to utilize these companion tools, when it comes to the nature of their condition or their age (Interview S de Haas, 4 Dec 2020). For these patients, special care needs to be taken to ensure that they can benefit from digital tools as well as any other patient. The introduction of digital companion tools could also help to make people more confident in managing their disease if the tool makes it easier to check if they are 'on the right track'. A digital tool that displays that your values are fine for now might give ease of mind until the next doctor's visit is planned (Interview I Petrini, 10 Dec 2020).

When it comes to policymakers and authorities, they should be very clear on what classifies as a companion tool. There should be a clear definition so that everyone speaks the same language, something that has been proven to be relatively difficult in the area of digital health. With companion tools, there might be a drive towards a stronger healthcare consumer market, where patients pay for their tools (Interview F Söder, 18 Nov 2020). Moreover, there are already tools today that are being bought and used by people, such as fitness bracelets and other wearables.

2.3.1 Summary

By developing digital tools as companion devices, there is the possibility of offering a more holistic approach to treating patients. The devices would be complementing to their already existing treatment. A well-designed companion tool is easily adopted by patients and will add benefits to the way that they manage their disease. It might also lead to fewer visits to the care centers, with patients taking care of themselves at home, which is also reducing the spread of infectious diseases. Lastly, digital tools as companion devices might lead to interesting market dynamics, where the consumer buys their own healthcare devices instead of them being prescribed and provided through the healthcare system.

3. Discussion

This discussion is mostly reflections on what has emerged from the interviews. It will be segmented into three statements and the reflections are based on the different stakeholders.

3.1 To share or not to share?

The first statement and finding from the interviews was that it is currently not possible to share data and that this affects all stakeholders.

As the situation is now, not having access to all the data from a patient can result in difficulties when HCP want to follow up on their patients, either those who have severe acute disease or those with chronic conditions. It gets even more complicated when patients with chronic conditions seek treatment outside of their home region, for whichever reason. It is at those appointments difficult for HCP to quickly get an overview of previous treatments if it is even possible at all to get these overviews. This can be frustrating for the HCP and patients both and can lead to situations where they are not able to communicate clearly because both parties do not have the same insights.

In an ideal situation, HCP would have full access to their patients' data. With this, HCP might relieve their workload, if they manage to have their patients monitor themselves at home and be able to have access to this data whenever it is time for a consult. It could save time if the collected data looks good and the patient does not even have to come in. It would also be possible to intervene earlier if the data from the patient is not looking good. As a bonus for the HCP, patients might come into a visit more 'prepared' and well-informed about their disease. An important note that needs to be made here is that at the same time, digital tools could increase the workload of HCP if not developed or managed correctly. More data could amount to more work if the standard of practice does not change at the same time. This could for example occur if the HCP needs to login to different systems to retrieve all the data of the patient. Or when data that is being collected on a patient is not structured in a simple overview, meaning that it will take the HCP extra time to go through all the data that has been collected up to that point. In an ideal situation, there would be an incorporation of digital tools with one another. This could be for example in the form of a platform that would allow data sharing and integration. Also, the data flows need to be analyzed automatically by algorithms that only alert the HCP and the patient when there they need to be alerted about for example a high risk for an upcoming exacerbation.

If it was possible to see more of the patient's data, both from within the public sector and from the external private sector, HCP might be able to offer more holistic care to their patients. There is probably a lot to gain here if you could give this group of patients easier access to their data and allow HCP to offer a more holistic approach.

When it comes to patients, the most important thing for them is to gain some sort of feedback on the data they put into the digital tool. To close a feedback loop on a digital tool, someone should have a look at the input data and give something back to the patient. This is currently not possible between private and public providers, so perhaps there will be a shift towards private providers? Say you go to a private clinic for your chronic disease and the HCP prescribes you a digital tool, from which the data can be read by this HCP. You then have a closed feedback loop, although the data might not show up in the public health records.

For suppliers, a change in data sharing might enable companies to move away from a mostly B2C business model, which is in practice hard to sustain. It would also help suppliers in the process of developing their digital tool if they have a better overview of what kind of data is out there and what specific data should be collected for their targeted patient group. A more open approach to data sharing will also allow suppliers to develop new tools based on the data that has become available. Of course, any data will need to be anonymous, but smaller companies that might have an excellent idea but not the resources for a big clinical trial to test out their product can rely on data that has been previously gathered through products that measure similar outcomes.

3.2 To each their own

The second thing that came up during the interviews a lot was the fact that all patients have different needs when it comes to their healthcare. This plays a role in digital health tools, development, and implementation.

Overall, for HCP if every patient needs individual treatment, it will mean that there is more to choose from and much more to understand than there is now. The HCP needs to ask different questions than they do now, healthcare practice will need to become even more investigational. It will require a big change in the way that healthcare is structured now because it will mean that the patient has more information to add to the way they are being treated. It will be necessary to strike a balance between what the patients want and what the HCP thinks will be good for the patient. Currently, there is the Patient Act of 2015 that already ensures that patients have more to say in the way that their disease is managed. However, as much as digital health tools might become a part of the patient's life, not everyone will have the same skills and

knowledge as an HCP. It is therefore important to combine the patient's insights into their disease with the knowledge of the HCP to get a complete overview.

With emerging digital tools, patients would be able to collect more data which would give HCP more frequent data points on to base their assessments on. With patients from all different backgrounds doing this, there would be an increase in the diversity of data. All this combined would allow for a more tailored treatment, which would probably be more effective. Fitting tools close to patients' needs will hopefully lower the costs by treating patients more effectively. It will also increase the overall quality of life for people that live in Sweden if they feel the healthcare system is well-designed and there to help them.

In an ideal situation, meeting the patient needs will lead to better sales from the supplier's perspective and perhaps easier integration into the healthcare system. It would also increase patient compliance if they have a tool that is fitted closely to their needs. It is very frustrating for patients to use something that is designed 'for them' but then does not work specifically for them. Take for example neurological patients, their conditions can take many different forms with different debilitating characteristics. If you are a supplier designing something, you must take all these characteristics into account, so you make sure that your product is valuable to a large group of patients.

For authorities and policymakers, it would be relatively complex to cater to individual patient needs. There is the risk of the increasing complexity of regulations and the control on what can be on the market. It will require a huge change in legislation and the overall healthcare system to cater to individual patient needs. With the current healthcare system running in a manner where efficiency is key, with as few visits to the doctor for as short a time as possible, it will be a challenge to make this cooperate with the vision of every patient being treated as an individual (8). There will be a need for more frequent regulatory innovation since it is currently difficult to approve more and different tools. It will be time-consuming for authorities to keep up to date on all innovations, especially because the technology in the digital health area moves fast. They will also need to keep evaluating tools once they are in use, which will take up quite some time as well. And with the focus on shifting to more preventive health, comes the challenge to govern this.

An idea that emerged during one of the discussions regarding the results, is that one thing that might drive the utilization of digital tools forward is to create a sort of Fear of Missing Out effect. So, for example, when patients go into the hospital, they get to pick between a room with a bunch of monitors and sensors and a normal room. The HCP could explain the benefits of going into the 'digital' room, which might increase patient participation. It might be hard to realize what you are missing as a patient if you do not get to experience it for yourself.

3.3 Companion devices are a patient's best friend

The third statement was that digital tools should be used as companion devices. This is something that came up later during the data collection, therefore the discussion part is a bit more extensive than the results part.

Considering that there are already quite some digital tools out there, it might be difficult for HCP to decide which ones should be used as companions to the existing treatment. Take for example the diabetes treatment market, where there are many different platforms and tools to keep track of patients' values. Which one of these tools will be the best one, which ones will be recommended? Is it up to the system to decide this by deciding which tool gets reimbursement? Or will HCP have a say in this too, together perhaps with patients? Is it possible to use multiple tools, or is that too confusing and labor-intensive for HCP? This can also be referred to when talking about data sharing in statement one. Data sharing would allow for a meta-analysis between different tools on a regional or national level.

For HCP, the fact that digital tools will be used as companion tools might be reassuring for those that are still a bit skeptical about the digital tools making their way into the healthcare system. Companion tools will allow for HCP to rely on them for decision-making support, therefore eventually decreasing the complexity of treatment decisions. It will allow them to delegate some of the treatment to the patients since they will have the companion tools to support them.

For patients, it will be important to get educated on how to use their companion devices. Not everyone is equally proficient in using technology, especially when it comes to their health. So, either the HCP or specialists in digital health should be able to explain to patients how exactly to work with their tools. It would then be interesting to see if this time how this time spent educating patients will relate to time saved by them using these tools. So, will patients be able to come to their HCP less if they are educated more on how to utilize their tools? Or will this eventually only add to the workload of the healthcare system without really gaining time by fewer and fewer patients coming in?

If digital tools are companion tools, it might be easier for policymakers to push the use of them forward, when they join discussions of for example HCPs or authorities. This would in turn ensure that these tools are used more often and at a larger scale than they are being used right now. If the data transfer is done properly as described in statement one, consumer digital tools might be adding value without causing strain on the healthcare administration or budgets.

For suppliers, promoting digital tools as companion devices might be a driver towards a stronger healthcare consumer market. This would mean that the consumer would buy their tools like they are already doing now with wearables such as fitness bracelets. However, something to consider with this is that if a lot of companies start producing their own devices and start to collect their data, you get a sort of lock-in effect. There would be a lot of suppliers creating different tools, but these would not work together or get integrated into a bigger system. It is one way to run the system, but it should be considered if this is the best way or if other options are preferable. A national system for data sharing with international standards would support a more integrated system.

Moreover, developing these digital tools would have to ensure a multitude of support, since they are used in addition to existing treatment. They will need to remember that feedback loops are encouraging for users and perhaps move into the area of gamification, to ensure that patients will keep using the digital tools to support their treatment. As discussed earlier, the companion tools have to be well-designed to bring relief to (chronic) patients, instead of just another thing they need to keep track of. Another thing to consider is that if devices are marketed as a companion, an addition to what is already there, how suppliers will convince users and payers that it is completely necessary to have.

Regulatory changes might be easier when it is about something that is not a replacement but an addition to what already exists. It is less risky to implement new things when they are supporting something that is already there, which will also go for digital tools. Adding to that, if the device is a companion device and it is classified in a lower risk class, it will be easier and less costly for suppliers to develop and produce the digital tool. It might also be easier to market when it is not focused on replacing something, which is always riskier to promote. With more companies working on digital companion tools, companies can build on each other's strengths. This will be positive for incremental innovation. There might be a really big market here for suppliers.

4. Conclusion

From the results and the discussion, there are many opportunities within digital health to create a better healthcare system for patients. Digital health might offer a future where both patients and HCP are more well-informed and this will allow for more precise care, that is catered individually to each patient. It also shows that there are huge possibilities for innovation and entrepreneurship. Currently, there are some limiting factors, such as data sharing, but these issues might be resolved through smart entrepreneurs that find ways around this. There are also interesting market opportunities when patients are becoming consumers themselves. The start of this has been made by wearables, but there are many more possibilities to explore and benefit from this upcoming area of digital health.

Sweden as a country has emphasized the importance of digital health by sharing its vision for eHealth for 2025 (1). To achieve this vision, I think it is important to keep in mind what has been written down in this report. It is easy to get stuck in what is not working well and what needs to be improved, but it is so important to look at what can be done in the current digital health environment. Other countries are starting to restructure their healthcare system to become more digital and Sweden should not stay behind. It could offer a good opportunity to become an example country in the area of digital health if Sweden takes steps in the upcoming years to for example enable data sharing and put more focus on individual patients.

All in all, the three statements that have been explored in this report all show opportunities which might ensure that digital tools that are being developed now, will make an impact on patients' lives. I believe that allowing for more data sharing options, more personalized approaches to digital tools, and introducing tools as companion devices will eventually make a real difference in patients' lives.

5. References

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6. List of interviewees

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