Accessible and clear statistics for explorers and experts

Vedrana Milosevic, Swedish Social Insurance Agency, vedrana.milosevic@forsakringskassan.se

Abstract

Swedish Social Insurance Agency (Försäkringskassan) is one of 29 agencies in Sweden responsible for official statistics. In 2017 the department of analytics at Försäkringskassan started an agile project aiming at more accessible and clearer official statistics within our area of responsibility. During the project unconventional statistical presentation was explored, such as a statbot (statistical robot similar to chat functions on various webpages) and storytelling as well as more traditional ways of presenting statistics.

In February 2021 a new and improved webpage www.fk.se/statistik was released, which relies on common statistical presentation familiar to our users, such as key figures, a statistical database and commented statistics. It is not a new way of presenting statistics, what is new is the way in which we came to the result.

Through agile working methods statisticians worked closely with user experience (UX) designers, art directors (AD), copywriters, communication specialist and web developers to develop and user test different ways in which statistics can be made more accessible and clearer. As part of the agile working method, iterative user testing was done during the project. By interviewing current users, two user groups were identified, the explorers and the experts. The characteristics of the explorers are that they aren't familiar to social insurance and/or statistics. The experts on the other hand are accustomed to social insurance and/or statistics.

The characteristics of an explorer or an expert could be applied to other areas then social insurance. Continuous user testing is needed to keep statistics accessible and clear to both explorers and expert users.

Keywords: user testing, user groups, agile project management, statistical presentation

1. Introduction

As an official statistics producer Swedish social insurance agency (Försäkringskassan) is obliged to make accessible and clear statistics. To achieve this, the agency started an extensive project aiming to make our statistics more accessible and clearer through various methods. User test were one of the methods used to achieve the aims of the project.

From e-mails sent to the statistics department at Försäkringskassan it was clear that users had a hard time finding what they were looking for. When users had found the statistics, they were looking for the statistics were presented in a static excel-table which rarely coincided with user's needs. Another issue that was clear from these e-mails was that users had some difficulty understanding the statistics. In the light of these problems a project was started to make the statistics accessible and clear.

Two different user groups were identified through target group analysis: "experts" and "explorers". On one hand the experts wanted themselves to determine and choose the statistics they were interested in and not having static tables. On the other hand, explorers wanted highlights of the most popular statistics presented with some support to interpret the statistics.

The user tests were done in an agile project. The core of agile projects is to release benefits to users throughout the project and not just at the end of the project. This is achieved by doing development in several iterations. This was also applied to user testing in this project. Working in teams with system developers, user experience (UX) designers, art directors (AD), copywriters, web editors, communication specialists, web developers and statisticians we iterated a new statistical webpage for the Swedish social agency.

2. About the study

The best way to find out what users want is to ask them. To recruit users to user tests, we searched among e-mails that were sent to the statistics unit's email address. Among those contacts 24 external users and 10 internal users were asked to participate in our user tests. The list of users was used throughout the project both during the pilot study and in the implementation project. None of the

users that participated in the user tests were compensated monetarily. They participated either during their working hours or on their spare time.

2.1 Pilot study

A pilot study was initiated to identify users and their needs. A target group analysis was made by a digital agency.

Figure 1. Process of the pilot study

Start-up workshop → Interviews → Co-creation workshop → User testing → Vernissage

The target group analysis was made by interviewing users such as scientists, journalists, statisticians and analysists at other agencies in government and parliament, business and students with different levels of knowledge about statistics and social insurance. The user tests in the pilot study were conducted by two UX-designers and an art director from the digital agency.

The interviews included questions about what he/she worked with, what kind of statistics they used and what they did with the statistics. The purpose was to find out how comfortable they were with using statistics and how much they knew about the social insurance. The interviews also included more specific questions, for example how they wanted statistics presented and in what format. The concluding question was what their dream scenario would be regarding statistical presentation. 12 persons were interviewed among them were statisticians, analysts, scientist and journalists. The interviews were done as digital meetings and- were recorded.

The digital agency compiled the results of the interviews from which we co-created (digital agency together with in house UX-designers, communication

specialists, web director, copy writers and statisticians) ideas and prototypes that matched the results from the interviews. The ideas and prototypes didn't only come from the interviews but also by reviewing statistical and other webpages to find features that could and should be used when developing a new statistical webpage. We reviewed statistical webpages in Sweden, Europe and international. We also reviewed features on webpages that we frequently used and appreciated for example streaming webpages Netflix and HBO, flight booking sites like Norwegian and hotel booking like Airbnb and booking.com and also web shops like H&M.

These co-creation workshops resulted in prototypes, ideas and topics that were used in the user tests to trigger reactions and describe how they would interact with the product. During the user testing, users reasoned aloud what they would like or wanted to happen when clicking on a feature and the UX-designer asked questions to understand their reasoning. This method was repeated in four iterations, see figure 2. Five of the 12 persons that were interviewed were part of the user testing of prototypes.

Figure 2. An example of development of theme pages through four iterations

The pilot study ended with a vernissage where refined versions of the prototypes were presented and one could interact with for example the statbot and vote for which prototypes that one appreciated the most and wanted realized.

2.2 User testing in implementation

The pilot study gave us the information needed to go on with a project to realize some of the products that the pilot study had put forward. Out of 10 prototypes we prioritized four to realize and to do further user testing on. The four prototypes were a statistical home page, benefit pages, statistical database and commented statistics. These four were prioritized because they were believed to create the biggest difference in getting us closer to the user experience that was described by the users in the pilot study. Also, they were assessed by the complexity of development and the estimated gains from realizing the prototype and found to be the ones that should be realized.

The first thing that was done before user testing was begun was to develop mock versions of the prototypes so that we and the users could interact with the products. This was done in four iterations over two days together with IT-system developers, UX-designers, Art-directors (AD), copywriters and statisticians. In these iterations the statisticians represented the role of expert and the other professions represented the role of the explorer.

From these mock versions UX-designers, AD and copywriters were able to do the first series of user tests of the statistical database on the experts.

Five experts were interviewed for about 1.5 hour. The user test consisted of two parts. In the first part the expert was given post-it with different features in a statistical database that they were asked to prioritize. They could also add a feature if there wasn't a post-it with that feature. In the second part of the test the expert was given a task to find statistics about sickness benefit in the municipality of Blekinge during 2002-2005. They were instructed to reason aloud about how they made different choices when trying to solve the task. The test was done both in person and as digital meetings. In both cases the

tests were recorded as a skype-meeting so that all personnel (not just the person leading the test) could see their interaction and hear the questions and reasoning.

In the second round of user testing some of the insights from the first round of user tests were implemented in the mock-versions and new testing was done on both experts and explorers. Again, the users were given a task and were instructed to reason aloud how they made different choices when trying to solve the task.

This was the last interaction with user groups for feedback on the benefit pages and the statistical database. Instead we turned to another statistical product being developed in this project, commented statistics.

Commented statistics purpose is to answer common questions about social insurance statistics, and to put figures in context. In the example of sickness benefit, common questions are how many are on sick leave and which diagnoses are the most common. The target group of commented statistics is mainly the explorers who need support with using the statistics. The user test made on commented statistics were about 20 minutes and done on 5 explorers.

The user tests were based on two commented statistics, sick benefit and parental benefit which are the benefits most sought after as regards to statistics. We also asked users whether they wanted commented statistics on other benefits and if they perceived the information as objective (as they are descriptive official statistics). We also wanted to test if the entrance from the benefit page to the commented statistics was clear and what kind of content they expected to find.

The user tests on commented statistics were the last ones done in the project. In between user tests we had an inhouse reference group that were used as if they were experts and explorers to get their opinions when real users weren't available so that the project didn't get stuck.

3. Results

3.1 Pilot study

The target group analysis done in the pilot study showed that users can be grouped by how experienced they are using statistics and their knowledge about social insurance, see figure 3.

Figure 3. User groups
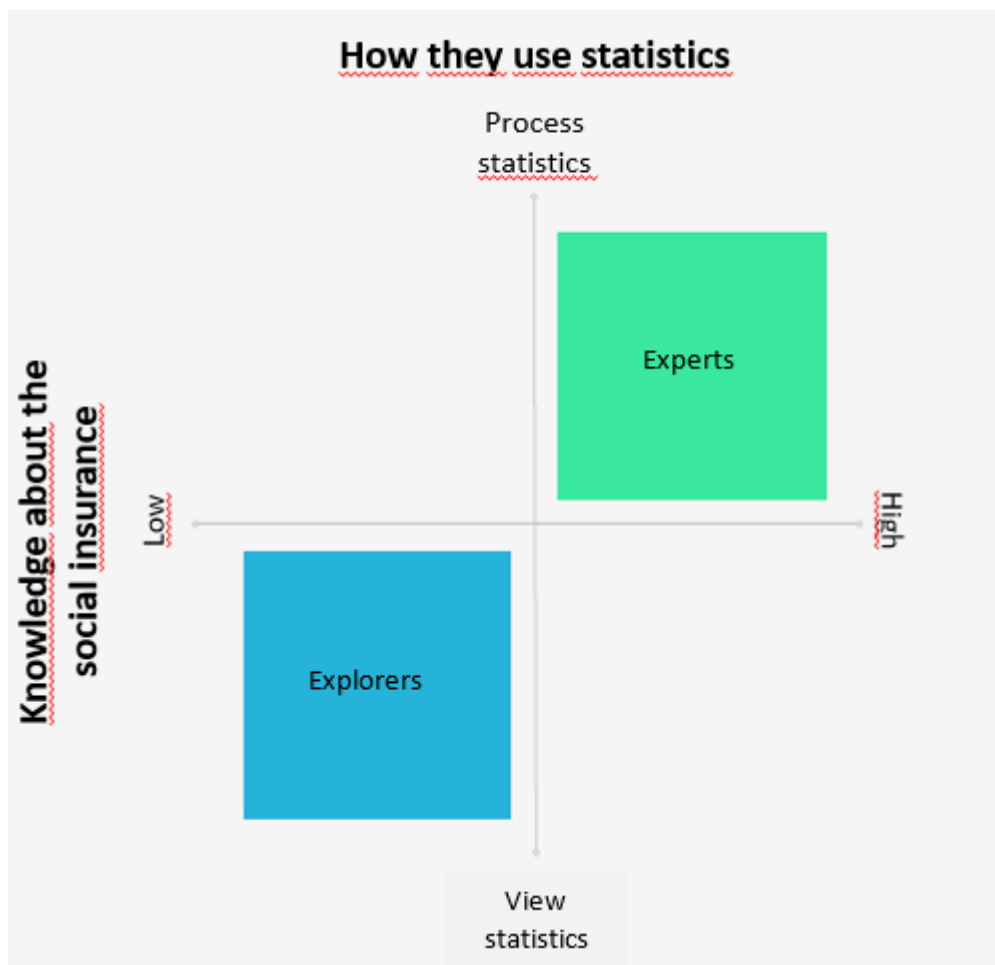
User testing showed that the experts revisits the webpage, and are accustomed to social insurance and using statistics. They usually want to customize statistics to their needs and aren't strangers to combining statistics from different agencies. Their need is to filter tables that are downloadable to excel. One important result was that they are not interested in working with statistics on their smartphone. Examples of experts are statisticians and analysts working in government, parliament and government agencies.

The explorer rarely visits the webpage and doesn't have much experience working with statistics nor about social insurance. The explorer uses google to find information and prefers visualized statistics and descriptive statistics. Alike the expert, the explorer wants to be able to customize the statistics to their needs but with the difference that they need support with understanding the statistics and technical language. Their needs are diagrams in combination with descriptive statistics, optimizing search engines, to use a less technical language and also spread statistics in social media. Examples of explorers are journalists, students and the general public.

First round of user tests in implementation project
In the first round of user test some important insights were made about functions and how users navigate to and in the statistical database.

The user test consisted of two parts. The first part the expert was given post-it with different features of a statistical database that they were asked to prioritize. The most important features of the statistical database were prioritized as follows:
1. Export table
2. Detailed information about the statistics
3. Filter function
4. Present the statistics in a table

In the second part of the test the experts were given a task to find statistics about sickness benefit in the municipality of Blekinge during 2002-2005. All of the experts found the statistics that were asked of them. Almost all experts went straight to the statistical webpage of Social insurance Sweden (one of them googled there way here) to solve the task. From the statistical home page, they navigated to the statistical database through a benefit page. Even though there was a direct link to the statistical database on the statistical home page. From there they chose the correct social benefit though there are

other similar benefits, indicating that the experts are familiar with the social insurance system.

They found the filters easy to use. Each choice in the filter is presented as a tag which can also be used to unchose an item but this function wasn't used by the experts. The statistics is presented in a line diagram by default but can also be presented in a bar diagram and a table. The expert likes seeing the statistics presented in a diagram even though they in the first part of the test preferred to get the statistics in a table. We also tested how they would like to filter period (years, months). In the export-function they want information about the date and a link to the webpage. None of the experts needed a link to share to social media. It was also clear that the experts use the statistical database on a computer in desktop-mode and not on a smartphone or tablet.

All users appreciate that there are default statistics chosen before they made their own choices. They did not recognize the short text that explained what the default statistics was showing and when asked they didn't feel that it contributed in any way.

What most users struggled with was finding the right statistical table among ten other statistical tables on sickness benefit. We had tried through clear headings but it was apparent that these needed to be even more helpful in assisting users to find the statistics they were looking for.

A desired feature was the ability to choose all items when there are many in a filter for example geographical data. Furthermore, the logic of the filters was built so that when no items are chosen then all statistics are presented, while the users expected the opposite. This was modified before releasing the statistical database.

3.3 Second round of user tests in implementation project

In the subsequent user tests some of the insights from the first user tests were implemented and further testing was done on both experts and explorers where they were given a task and were instructed to reason aloud about how they made each choice when trying to solve the task.

3.3.1 Statistical home page

Figure 4. Development of the statistical home page
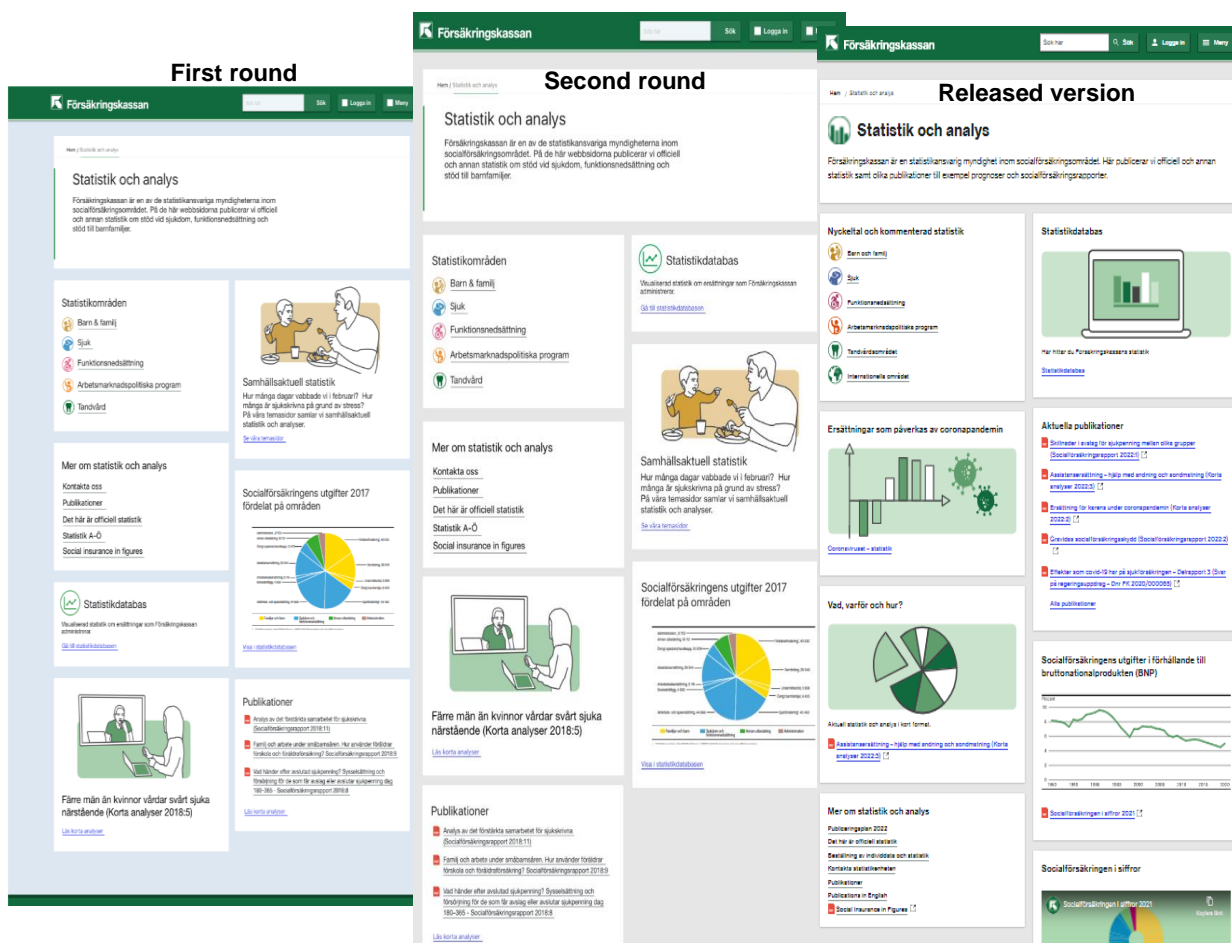
Some of the changes that were made for the second user test was that the entrance to the statistical database was set higher up on the statistical home page (see figure 4, first and second rounds) which resulted in that more users saw the entrance to the statistical database but this made them unsure of which entrance to use. The conclusion from this finding was that we do wanted the entrance to the statistical database at the top of the page but we needed to work more with the texts to describe the differences between the two entrances so that user's expectations are adjust to what they can find.

3.3.2 Benefit page

Figure 5. Development of the benefit page
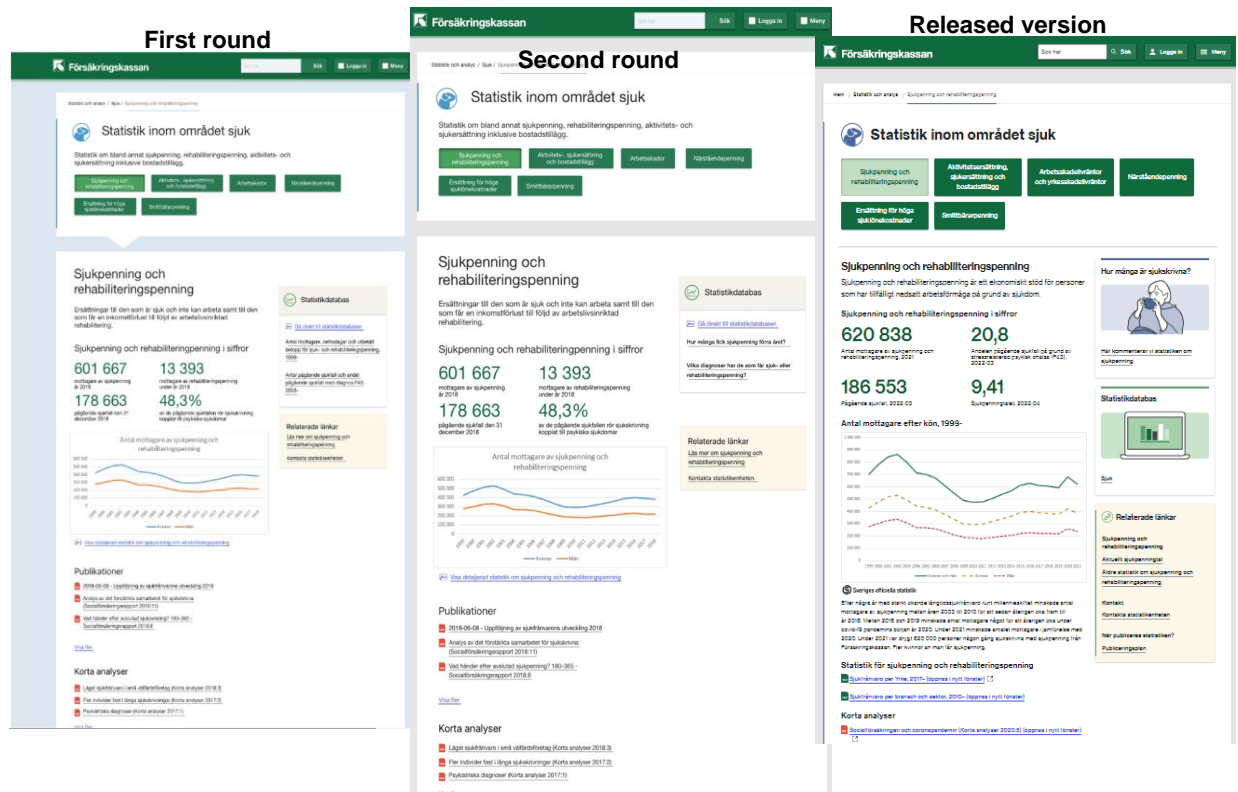
On the benefit page the test showed that it wasn't obvious to all users that a social benefit was already chosen. Another ambiguity on the benefit pages was that it wasn't clear that the key figures were clickable. If one clicks on the key figures one ends up in the statistical database. The conclusion we arrived at from these findings was that we have to work further with the graphics of the key figures to make it more evident that they are clickable. One thing that was obvious to all were the links to the statistical database from the benefit page.

3.3.3 Statistical database

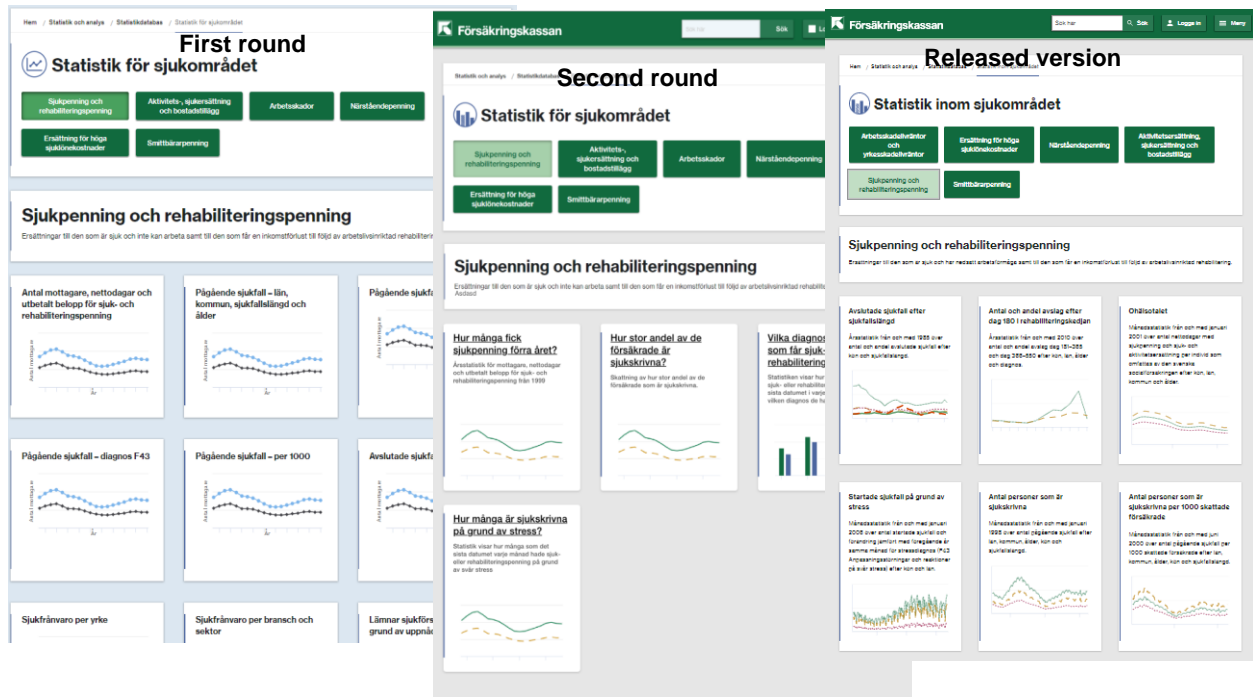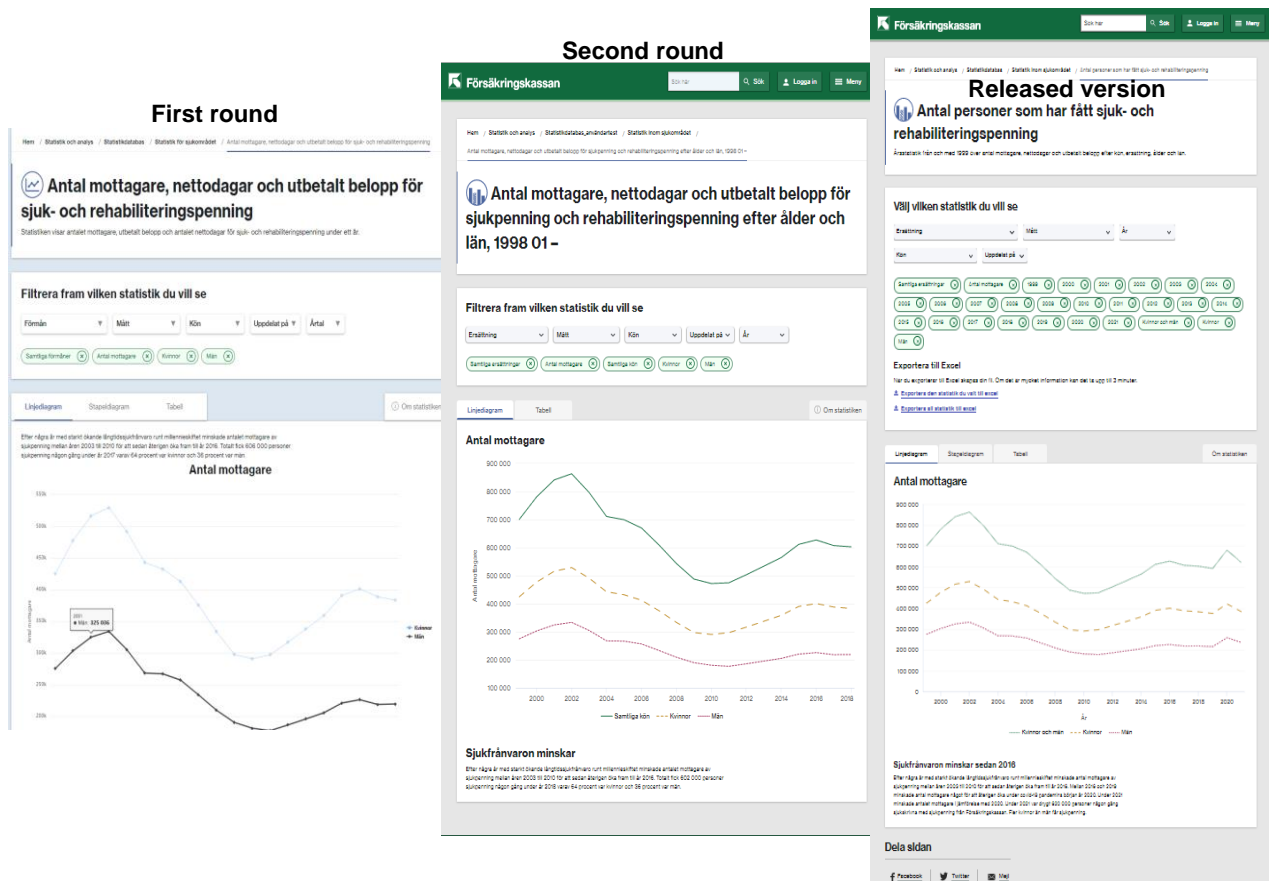Figure 6. Development of the statistical database

Figure 7. Development of reports in the statistical database

In the second round of user tests the headings of the statistical reports were written as simplified questions with an added introduction on the webpage where all statistical reports are presented (see figure 6, Second round). This made it easier for the users to find the statistics they were looking for. But the users pointed out that the headings can't be to simplified in the case a user´s question doesn't match the heading but the statistics do have an answer to their question. In addition, the entrances to the statistical rapports were made more visually clickable since the first test showed that some users thought that they had come to the statistics when they were on this page.

In the statistical report (se figure 7) we also made some changes to the heading for this second round of user tests. Since we had simplified the heading on the previous page we tried to keep the long descriptive heading in the statistical rapport but the users didn't like that.

Since this was the first time we tested the statistical database on the explorers we found that they had some trouble understanding all the filtering but unlike the experts they used the tags and found them helpful in showing which choices they made. Still, the explorers had some trouble understanding the terminology in the filters such as compensation, measure and divided on.

Unlike the experts, the explorer googled their way to the statistics webpage.

All users appreciated and mainly used the diagram-function to visualize the choices that they had made through filters. Nobody noticed the text beneath the diagram which´s purpose was to describe what the diagram shows and, in that way, support the explorer´s use of the statistical database. This result was a bit uncertain since the size of the heading was wrong, the heading was to big so when entering the statistical report, the diagram and the text beneath wasn't visible. When asked about the text beneath the diagram none of the users found it important rather it was nice to have. Another factor contributing to not seeing the diagram and text are the tags that occupy a lot of space.

In the diagrams the users appreciated being able to hover along the lines or bars to get the exact numbers but they were missing information about the

measure for example instead of just presenting the number 10 065 they wanted also to know of what, 10 065 net days.

In the first user test it was very clear that the experts wanted to be able to export the statistics. In this second test this need was met with the ability to export the statistics as a table to excel.

For some features we got the same results as in the first user test. The users preferred to check all boxes to get all statistics and not the other way around. Users wanted the feature to be able choose all items in a filter especially when there are many items for example all municipalities.

From these two rounds of user testing we concluded that on the whole we were on the right path. The next step was to publish a beta-version of the statistical database and a benefit page about sickness benefit. These pages had the possibility to leave anonymous feedback as comments or to give points 1-4. We got 18 persons giving the betaversion 3,4 points out of 4, see figure 8.

Figure 8. Points from beta-version release of benefit page and statistical database
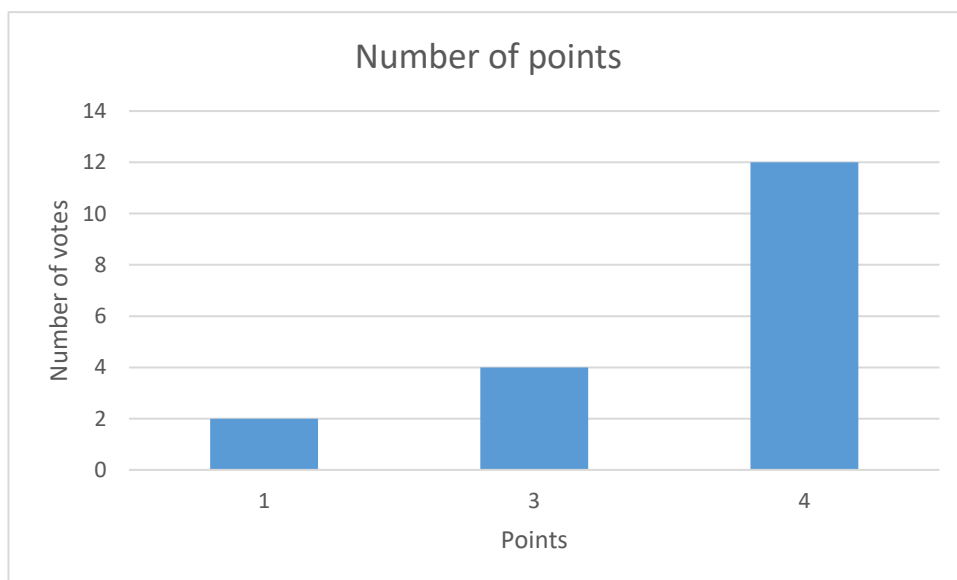
The comments that we got on the beta version were predominantly positive, and it was deemed as accessible and relevant. A feature that we hadn't come across in the user tests but came through the feedback of the beta version

was the need for open data in the form of API (application programming interface).

3.4 User tests on commented statistics

The user test on commented statistics was done with explorers. The test showed different expectations on the entrance (a banner). Firstly, the heading expressed as a question coincided with what was found while the link text made the users think it might be a deeper analysis then the descriptive statistics that were found in commented statistics. The user test showed that the users liked this type of information and that it is easy to assimilate and objective. Still, it wasn't clear to them why we had chosen only some of the statistics available for each benefit. As users were positive towards commented statistics they thought it would be appreciated if more social benefits had commented statistics.

4. Discussion

The characteristics of an explorer or an expert could be applied to other areas and agencies then social insurance. With this in mind other agencies could make use of the target group analysis when developing their own webpages and also learn from our mistakes when developing for example features to a statistical database.

Thanks to in-depth interviews with expert users and thorough reviews of similar webpages and features we were able to develop statistical products that weren't far of what the users wanted from such products. Even today, we continue to develop the statistical webpage based on insights made from these user tests. Continuous user testing is needed to keep our statistics accessible and clear to the explorers and experts.

This way of user testing, i.e. giving the user a task to solve isn't the best way to see how users explore a webpage since they are focused on solving the task. But since we have had different ways of giving feedback and much of the

feedback is similar independent of from what source it came from we can trust the results.