

# The usage of web-based national guidelines for child healthcare- a web analytic study

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## Abstract

The development and dissemination of information- and communication technologies in healthcare is rapid. The purpose of web-based national guidelines is to support professionals in everyday work providing equivalent, safe and qualitative healthcare. Web-based national guidelines are often not implemented effectively in healthcare why studies reflecting different aspects of use and implementation is needed. The aim of this study was to investigate the usage of the web-based national guidelines, *Rikshandboken i barnhälsovård*. In this case study with cross-sectional design, usage of the web-based guidelines was studied for one year using the web analytic tool, Google Analytics. The usage data were analysed with descriptive statistics. The study showed the general usage pattern of RHB, changes in usage through the year and various usage pattern in different user groups. The usage of RHB had increased, the web-based guidelines was used in all county councils/regions and the most common visited web-page was the new national child healthcare programme. This tendency suggests a positive direction towards the RHB aim to contribute to equal, equitable and high-qualitative CHC. The result also showed the importance to study different user groups as the usage pattern differs. This provide valuable knowledge in the development of web-based national guidelines making them useful and relevant for all its users.

**Keywords:** National guidelines, information and communication technology, child healthcare, user experiences, user engagement, Google Analytics

## Background

The development and dissemination of information- and communication technologies (ICT) is rapid and there is a wide range of ICT used for supporting and providing healthcare. These might be management systems, communication systems, information systems, and computerised decision support systems that are valuable in nursing practice in various

ways (De Angelis et al., 2016; Mair et al., 2007; Rouleau et al., 2017). Computerised decision support systems are accessible from various devices such as computers, tablets or smartphones and they support professionals' decision-making for assisting them with guidelines (Mair et al., 2007). The guidelines aim to reduce variability in healthcare and translate research and expert opinions to recommendations in clinical practice (Committee on Clinical Practice Guidelines, 1992; Gundersen, 2000). ICT has the potential to improve accessibility to the guidelines (De Angelis et al., 2016; Jun et al., 2016; Neuhaus et al., 2015) even if the effectiveness is not entirely clear (Neuhaus et al., 2015), and may facilitate nurses learning, their continuing development and growth (Fagerström et al., 2017). Traditional printed guidelines are resource intensive and quickly become outdated while ICT-based have the potential to improve accessibility and credibility because they can be continuously reviewed, updated, and widely disseminated (De Angelis et al., 2016; Jun et al., 2016; Neuhaus et al., 2015;). "Web-based" national guidelines is the term that is used in this study to describe the Swedish Rikshandboken for child healthcare (RHB) [www.rikshandboken-bhv.se](http://www.rikshandboken-bhv.se). ICT and national guidelines are often not implemented effectively in healthcare (De Angelis et al., 2016; Fagerström et al., 2017) why studies reflecting different aspects of use and implementation is needed. Several studies (De Angelis et al., 2016; Jun et al., 2016; Tell, 2018a) have explored the use of web-based national guidelines from the end users' perspective using various methods. Using a web analytic tool could get insight in user experiences (UX), user engagement (UE) and usage patterns from a website viewpoint (Clark et al., 2014; Song, et al. 2018; Vogel et al. 2016;). According to Saura et al. (2017) web analytics are widely used by popular websites to provide useful data about its users, but it has not been the subject of much research. Follow the users behavior "from within" the website could contribute with knowledge useful in improvements of RHB to make it useful for end users, but also be a base for further studies of UX and UE related to web-based national guidelines.

#### *The web-based RHB*

RHB was established as an initiative of the Swedish Paediatric Society in 2005, as decision support for personnel in child healthcare (CHC). Initially, RHB was a password-protected website, exclusive for professionals, available via a previous website for parents. Since 2012, RHB is produced by Inera AB, owned by the Swedish Association of Local Authorities and Regions, in charge of coordination and development of digital services for citizens, professionals and decision makers. Since then RHB has been an open-access website and smartphone compatible via responsive design. The editors at RHB are supported by an editorial board consisting of representatives from the main CHC units in the county council/regions; chief medical officers, CHC coordinators and psychologists. The editorial board communicates opinions, requests and needs from the CHC users to the editors and

invite authors and reviewers from different areas of specialisation: paediatricians, CHC nurses, psychologists, speech therapists, dieticians, physiotherapists and others (RHB, 2017).

The web-based RHB contains, since 2015, a new national CHC programme in progression to be implemented in Swedish county councils/regions and professional knowledge- and methodological guidance adapted to the CHC program (RHB, 2018). RHB aims to contribute to equal, equitable and high quality CHC by providing guidelines to the professionals in the all Swedish county councils/regions (RHB, 2017). The homepage [www.rikshandboken-bhv.se](http://www.rikshandboken-bhv.se) [Figure 2] is designed to provide an overview of the content on the RHB. There are clickable tabs to web pages with knowledge and methodologic guidance for working at CHC, with the CHC-program and meetings with children and parents. These webpages include links to regional documents and websites in different county council/regions, and links to government websites. On the homepage there are also clickable tabs to news in CHC and on RHB, to research and projects, and to a CHC newsletter. The newsletter is also distributed to subscribers with information about the latest updates and new research periodically. The newsletter was sent to 3352 subscribers in June 2018 (statistic from the editor at RHB). In a collaboration within Inera AB, RHB provides information written to parents to be published on 1177.se, a website that offers general health guidance to citizens, CHC-nurses recommend parents to use 1177.se when they search for health information related to children on the Internet. In this study the concept RHB is used including the whole unit RHB with all its part, inclusive the new national CHC-program.



**Figure 1** The homepage [www.rikshandboken-bhv.se](http://www.rikshandboken-bhv.se) with an overview of the content the CHC-program and immunizations which could be clicked on to get in-depth information.

In 2015, 2376 specialist nurses worked in CHC in Sweden (Tell et al., 2016). Even though the target audience for RHB is professionals in CHC, the website is open accessed which means it is available to anyone. RHB are widely used by CHC nurses, but the use and experiences of the web-based guidelines varied (Tell et al., 2016, 2018b). Earlier studies (ibid.) of UX of RHB shows that the usage is affected by circumstances in the CHC nurses' local context as well as factors related to RHB itself. The CHC nurses belongs to the primary target group for RHB and emphasized that their experiences need to be considered in the development process and improvements of RHB to make the web-based guidelines useful and relevant for them. RHB content must match their needs, cover the complexity of CHC and be kept updated to be reliable. Better use of the possibilities with ICT has been suggested to improve the search function, the structure and design and to be a resource for learning and a useful tool in everyday work (Tell et al., 2016, 2018b).

#### *Website usage*

According to a literature review by Luna et al. (2015), user-centered design (UCD) can increase the adoption and use of ICT in healthcare as well as patient safety and the user satisfaction. UCD implies to a design of ICT focusing on the end users needs and interest (ibid.) and incorporating UCD in the development of decision support systems can improve usability compared with traditional design (Luna et al. 2017). Usability is a common

concept in the research field of human-computer interaction. The term usability is defined by the International Organization of Standardization (ISO) (2018) as the “extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. The usage of RHB could be measured with web analytics and one way is to follow how the users behave on the website i.e. their usage pattern. This could also provide information about UX by measuring UE (Lalmas et al., 2014; Lehmann et al., 2012). UX relate to humans’ use of an interactive product or system; in this study, this refers to web-based RHB, and the emerging perceptions, responses, and activities that come through its use (Hassenzahl, 2010; International Organization of Standardization, 2010). Consideration of the UX is necessary in the design of RHB to ensure that the web-based guidelines are useful for its end users (Hassenzahl, 2010). UE is described as the quality of the UX that highlights the positive aspects of the interactions. UE is based on observations that users not only use technology but also engage with it because they invest time, attention and feelings into its use (Lalmas et al., 2014; Lehmann et al., 2012). According to O’Brian et al. (2018) UE is an abstract, and dynamic construct that is situated in a given context, which makes it challenging to define, design for and evaluate. The measurement of UE can be divided into three methods; self-reported engagement, cognitive engagement, and online behaviour metrics (Lalmas et al., 2014; Lehmann et al. 2012). All three methods have their advantages and disadvantages and can contribute to different aspects of studies. Online behaviour metrics create an opportunity to collect data from a large number of users and determine their depth of engagement with a website without reliance on user subjectivity. The users’ depth of engagement with a website can be measured based on popularity, activity, and loyalty. Popularity is reflected in a high number of visits, activity in how much time users spend on the website, and loyalty in how frequently users return to it (Lehmann et al. 2012). In this study, online behaviour metrics were used to gather knowledge about the quality of the UX of the web-based RHB.

### *Google Analytics*

Web analytics is conducted to measure, collect, analyze and report Internet data for the purposes of understanding and optimizing web usage (Web Analytics Association WAA, 2018). Google Analytics (GA) (Support.google.com, 2018) is a free web analytic tool providing quantitative data on website usage, usage patterns and UE, primarily from a marketing perspective of online behavior (Clark et al., 2014; Crutzen et al., 2013; Song et al., 2018). Data from GA do not contain any personally identifiable information and are presented in aggregated level. The first time the website is visited a signal is sent from the visitor’s browser to GA, which create a cookie with an anonymous identification number, Client id. The cookie is stored in the computer with the purpose of being a unique

identifier. It is not possible to get information exactly on how many persons visiting the website, since it is the number of unique browsers which counts, referred to as visitors or users (Clark et al., 2014; Song et al., 2018). A visit on the website is called a session which may include one or more pageviews. If a visitor is inactive for 30 minutes, any future activity is counted as a new session. The initial session counts as a new session by a new visitor. Returning users refers to the number of sessions visited through the same Client id. GA prohibits tracking and collection of raw data and produces aggregated data in statistic reports (Clark et al., 2014; Crutzen et al., 2013; Song et al., 2018). The data gathered by GA can be used to determine how the visitors behave, where they come from and what content they are exposed to (Crutzen et al., 2013), which gathered information about their user experiences and UE.

Even if GA is designed to provide insights from a marketing perspective, it is widely used in evaluation of various web-based interventions and for website improvements (Clark et al., 2014). Even if web analytics have not been used in research to such an extent (Saura et al., 2017), GA has been analyzed and used in some studies related to healthcare websites (Clark et al., 2014; Crutzen et al., 2013; McCloskey et al., 2017; Song et al., 2018; Vogel et al., 2016; Vona et al., 2014). However, no research has been found using a web-analytic tool focusing on the usage of web-based national guidelines for CHC. Previous studies of RHB have examined CHC nurses and CHC coordinators use and experiences of the web-based national guidelines using web-surveys, focus groups and interviews (Tell et al., 2015, 2018a, 2018b). Tracking visitor's behavior using GA is independent of the user's memory and interpretation in contrast to self-reported studies and measures (Crutzen et al., 2013). Studies of usage patterns using GA could contribute with complementary aspects and a knowledge base for further studies of UE and UE as well as for improvements of RHB to better meet the user needs.

The aim of this study was to investigate the usage of the web-based national guidelines for CHC, RHB, using the research questions:

- 1) How does the general usage look like during the investigated year?
- 2) In what way does the usage pattern change during the year?
- 3) In what way does the usage pattern differ between high, medium and low frequency user groups?

## Methods

A cross-sectional design was chosen in this case study to describe the status of the phenomenon that is the usage pattern of RHB at a fixed point in time. This case study can be a useful method of exploring a phenomenon that has not been rigorously researched, obtaining descriptive data and creating opportunities to examine usage trends over time (Polit and Beck, 2016). GA standard reports and custom reports were utilized for the data gathering and analysis, and then data were exported to Excel for further analysis.

### *Data collection*

Inera AB use GA with purpose to follow the usage of their services. One of the authors, JT, obtained administrative permissions to GA at RHB to study website usage data. The data about RHB usage were obtained from GA's audience-, acquisition- and behaviour statistical reports (Crutzen et al., 2013; Song et al., 2018; Support.google.com, 2018) for one year (August 1, 2017 to July 31, 2018). Custom statistic reports provide a combination of dimensions and metrics which are not included in the standard reports. The audience report data that were collected about the visitors comprised; number of visitors to RHB, the new and returning visitors, their location on an aggregated level, technical devices used, sessions rate, the numbers of page views, mean session duration and bounce rate. Bounce rate refers to the percentage of visitors who leave the website after viewing only one page (Support.google.com, 2018). Low bounce rate suggests that users are engaging with the service (Song et al., 2018). The acquisition report data that were collected about how the visitors access RHB showed whether this was from search engines, referral from other websites, direction from the browsers, emails or social media. From the behaviour report data, information was collected on occurrences during a session on RHB that is the most visited web pages, time spent on each page view, entrances and exits (Support.google.com, 2018). Entrances refer to the number of times that a specific web page serve as an entrance to RHB and exits refers to the number of times a specific web page is the last one that's viewed by the visitors on RHB (Song et al., 2018). These standard reports included data about the total group of visitors on RHB during the investigated year. Smaller groups of users may have behaviours that differs from the average; thus, the segmented data of defined user groups were collected by creating custom reports. Earlier studies of CHC nurses' use of RHB (Tell et al., 2015, 2018b) revealed their high, medium, and low frequency use of the web-based guidelines. Therefore, the total group of users was divided into the same three frequency user groups in this study. These divisions could contribute with valuable insight into whether and how the usage pattern of high frequency users differ from those of, for example low frequency users and vice versa. Visitors with four or more sessions per month were considered as high

frequency users, visitors with two to three sessions per month as medium frequency users, and visitors with zero to one session per month was considered as low frequency users.

#### *Data analysis*

Usage data for RHB were analyzed using the audience-, acquisition-, behavior- and custom reports from GA (Support.google.com, 2018). Data from the statistical reports were exported to Excel format and analyzed using descriptive statistics. The number of visitors and sessions per day, usage hour during the days of week, technical devices and data about the most viewed web-pages, were listed and compared per month over the investigated year. Total number of page views, average time per session, average number of page views per session and bounce rate were metrics used for measuring UE in the user groups (Lehmann et al. 2012; Support.google.com, 2018;).

#### *Ethical considerations*

Approval to monitoring the usage of RHB with GA was obtained from RHB, Inera AB. All data is presented at aggregated level. IP- addresses cannot be tracked via GA, thus individuals cannot be identified. An ethical self- evaluation was made, and an advisory statement was obtained from the Ethical Review Committee of the Southeast (Dnr EPK 479- 2018).

## Results

### *Overview*

The study showed the general usage pattern of RHB for one year, changes in usage through the year and various usage pattern in the user groups. The result also revealed differences in UE between user groups.

During the investigated year, RHB had 777 488 visitors, resulting in 1 235 168 sessions and 2 899 498 pageviews. Of these sessions, 73 % were made by new visitors to the website and 27 % were returning visitors that is they had visited RHB even before the investigated period. The average duration of time a user spent on RHB was 02:13 minutes including 2,34 pageviews. The bounce rate was 66 %, where users only viewed a single page and vanish without trace. The median was 2 140 visitors per day with the highest number of visitors per day (n 2 705) in January and the lowest number of visitors (n 1 595) in July (Table 1). Smartphone users accounted for 61 % of all sessions, desktop users for 33 % and tablet users for six percent. The highest percentage of smartphone users, and lowest percentage of desktop users visited RHB in July.

**Table 1.** Number of visitors per day per month, number of sessions per day per month and the percentage of devices used to access RHB per month.

Month	Average visitors/day/month	Average sessions/day	Smartphone user/month %	Desktop user/month %	Tablet user/month %
August 2017	2345	3478	66	28	6
September 2017	2483	3902	62	33	6
October 2017	2297	3716	59	36	5
November 2017	1984	3277	56	39	5
December 2017	1782	2809	60	34	6
January 2018	2715	4162	60	33	7
February 2018	2288	3704	60	34	6
Mars 2018	2252	3667	61	34	6
April 2018	2028	3272	61	33	5
May 2018	1951	3267	60	35	6
June 2018	1790	2890	65	30	5
July 2018	1595	2492	72	23	5
<b>Mean</b>	<b>2126</b>	<b>3386</b>	<b>61</b>	<b>33</b>	<b>6</b>
<b>Median</b>	<b>2140</b>	<b>3377</b>	<b>61</b>	<b>34</b>	<b>6</b>
<b>Standard deviation</b>	<b>326</b>	<b>485</b>	<b>4</b>	<b>4</b>	<b>0.65</b>

RHB was mainly used in Sweden (92 %), but it was also visitors from other countries as Germany (2%), Finland (1%) and Norway (1%). RHB was used in all county councils/regions in Sweden, with the highest frequencies of visitors from the largest regions; Stockholm (33 %), Västra Götaland (18 %) and Skåne (14 %). Organic search, visits from search engines, led to 83 % of the visits, other channels were direct traffic (11%), referral web-sites (4 %), social media (1%) and e-mail (1%). The most used browser was Safari (47 %) followed by Chrome (30 %) and Internet Explorer (14 %). RHB was most frequently used from Monday to Thursday (16-18 % of all sessions), and in lesser extent on Fridays (14 %) and weekends

(8-10 %). Lowest bounce rate, 52 %, had desktop users with a mean session length at 02:47 minutes with 3,13 pageviews. Smartphone users had the highest bounce rate, 78 %, with a session length at 01:08 minutes and 1,65 pageviews.

#### *Differences between user groups*

The largest group of users was the low frequency user group which made 610 346 sessions during the investigated year. The medium frequency user group made 277 889 sessions. The smallest user group with high frequency users made 346 933 sessions (Table 2). Comparison of metrics for UE in the different groups of users revealed that the group of high frequency users spent more time at RHB, visited more pages, had lower bounce rate than the groups of medium- and low frequency users. The group of users who accessed RHB via the newsletter had an average session time at 03:27 minutes including 4,13 pageviews.

**Table 2.** Total numbers of sessions, total numbers of page views, number of pages per session, average time per session, and bounce rate by the different user groups.

	High frequency user-group n 42 579	Medium frequency user-group n 124 665	Low frequency user-group n 610 244
<b>Total n of sessions</b>	346 933	277 889	610 346
<b>Total n of page views</b>	1 406 720	559 602	933 176
<b>N of pages/session</b>	3.16	2.14	1.75
<b>Average session duration</b>	00:03:11	00:01:40	00:01:32
<b>Bounce rate %</b>	50	66	75

The group of high frequency users accessed RHB via desktop in the highest degree, which differ from the other user groups who accessed RHB via smartphones in higher extent (Table 3). This user group also accessed RHB via email in higher degree than the others. Search engines was the most common way of entering RHB in each user group, followed by direct traffic. The high frequency user group were most active used RHB from 0700 until 1700 during Mondays-Thursdays (18-20% per day). RHB was visited by 14% on Fridays and 5-6% per day during the weekends. The medium frequency user group visited RHB from Monday to Thursday (16- 17 % per day), and from Friday to Sunday (10-13% per day) and 60 % were most actively used RHB from 0700 until 1700. Even if the majority, 56 %, of the sessions by the low frequency user group were made from 0700 until 1700, almost half, 44 % of the sessions were made between 1800-0600. RHB was used from Monday to Thursday (16-17% per day), and from Friday to Sunday (11-13 % per day).

**Table 3.** The percentage of devices and channels used to access RHB by the different user groups

Devices and channels %	High frequency user-group n 42 579	Medium frequency user-group n 124 665	Low frequency user-group n 610 244
Desktop %	60	31	31
Smartphone %	38	65	63
Tablet %	2	4	6
Search engines %	63	81	83
Direct %	23	13	12
Referral %	8	4	3
Social %	0	1	1
E-mail %	6	1	1

#### *The most visited web pages*

Table 4 shows the ten most viewed web pages, numbers of page views, average time at the web page, their entrance, exit and bounce rate. RHB homepage had the highest entrance rate and was also the most viewed page followed by nine web pages. These web pages included both “category web pages” and “texts web pages” with more in-depth information. The visitors spent less time on the “category web pages” and more time on the web pages with in-depth information which also had a higher bounce rate. The “top 10” table-list of popular web pages, appeared fairly consistent during the year, with the exceptions of some topics that were more relevant to the seasons such as “children and the sun” during May-July, “child’s sleep” during April to July and “Infection guide” during September-October”. The visitors read about children and sun and children’s sleep during the sunny and bright months and about infections during the autumn. It was found differences in the “top 10” table-list between the user groups. The most visited web pages, except RHB homepage, by the high frequency user group were “category web-pages” and “text web pages” about vaccinations, the national CHC programme, paediatrics, newborns, infant formulas and screening for depression. In the medium frequency user group “category web pages” and “text web-pages” about infant formulas, the national CHC programme, vaccinations, eye disorders, child’s growth and breastfeeding problem were the most visited. The “top 10” web pages, except RHB homepage, by the low frequency user group were text web-pages about rashes and dots- infections, eye disorders, infant formulas, child’s sleep and child’s growth. The possibility in GA to measure the use of RHB internal search function has been available since 2018 mars 7e. From that date to July 31e,

3,35 % of the visitors used this function to search for information. The most common search term was EPDS, a screening questionnaire for post- partum depression, with 2753 searches.

**Table 4.** The 10 most visited web pages, numbers of page views, average time at the web page, entrance, exit and bounce rate during the investigated year.

Web pages	Page views	Average time	Entrance n (%) a	Exit (%)	Bounce rate (%)
RHB homepage	281 355	00:00:45	231 940 (18.7)	27.8	28.2
The national CHC-program (category)	141 562	00:00:39	42 588 (3.4)	22.1	56.4
Vaccinations (category)	65 073	00:00:22	10 769 (0.8)	6.3	10.4
Infant formulas (texts)	48 081	00:03:51	41 017 (3.3)	83.2	86.6
Rashes and dots- infections (texts)	47 908	00:01:21	36 684 (2.9)	64.5	67.3
Pediatrics (category)	46 209	00:00:37	4 953 (0.4)	10.9	21.3
Eye disorders (texts)	37 066	00:04:05	33 247 (2.6)	89.6	91.9
Vaccination schedule (texts)	36 955	00:03:33	16 268 (1.3)	64.6	75.9
Overview- the national CHC-program (texts)	34 487	00:04:45	29 096 (2.3)	84.3	92.8
Newborns (category)	32 456	00:00:35	3 403 (0.2)	10.1	25.9

a Only several of the most viewed web pages are included in the table as the number do not add up to 100%.

## Discussion

The result gave an overall picture of the usage over the investigated year and the various usage patterns among the user groups. The number of sessions during august 1, 2017 to July 31, 2018 were 1 235 168 sessions which showed that the usage of RHB has increased over the years. Tell et al. (2015) report a usage of RHB with 103 645 sessions during six months in 2012, 297 295 sessions the same period 2013 and 517 097 sessions in 2014. Since then, the new national CHC programme (RHB, 2008) has been a part of the updated RHB, which could possible explain the increased usage. The result showed that RHB is used in all county councils/regions, the usage has increased and the most visited web-pages, except the homepage, was the national CHC programme, valuable knowledge in the evaluation of the web-based guidelines possibilities to reach its aim; contributing to equal, equitable and high quality CHC. RHB do not use the function in GA to measure formulated goals for the website, so called conversions (Support.google.com, 2018). This function

could generate valuable information about the development of the web-based guidelines and gathering deeper understanding of user experiences.

As RHB is open access, the result does not reveal if it is the target group, professionals in CHC, or other consumers, as parents, that are the users. GA does not distinguish data by different users of RHB (Clark et al., 2014; Crutzen et al., 2013; Song et al., 2018). However, earlier studies have shown that RHB is widely used by CHC-nurses in Sweden and 76 % of them were high frequency users of RHB (Tell et al., 2016) using the same definition of frequency groups as in this study. The high frequency user group accessed RHB in largest extent via desktop from Mondays to Fridays during regular office time and visited category web pages and methodological content such as the national CHC-programme and immunisations. It can be assumed that the professionals in CHC are using RHB during working time in highest degree, to get information related to the CHC programme, and mainly access RHB through a desktop in their consulting room at the CHC center. Earlier studies of CHC nurses use of RHB shows that they mostly used RHB via desktop and to a smaller extent had access to smartphones in their work (Tell et al., 2016, 2018b). The low frequency user group visited RHB, via smartphones, after office time in higher degree, were more active on the weekends and they visited in higher degree text web pages about specific symptoms. These could indicate that this user group in larger extent access RHB as private persons and not as professionals, thus it can be a CHC nurse using a private smartphone at leisure time. In a study of a Finnish governmental website (Paukeri, 2017) similar patterns regarding time for access to the web-sites could be seen comparing authorities and applicants use of the website.

The group of high frequency users accessed RHB via email in a higher degree than the total group of users and the medium and low frequency user group, which could be an indication that there are more subscribers on the RHB newsletter in the high frequency user group. Even if email was a channel used by only a few percent of the visitors it is worth to note, as users accessed via this channel had the longest average duration of time on RHB and visited more page views than the average user during the year, i.e. a higher UE. Professionals in CHC need to keep abreast of new knowledge and to be able to work in accordance with current guidelines (Swedish society of Nursing, 2017), thus the newsletter could have an important role provide them with new research and up-dated information.

Almost three quarters of the sessions were made of new visitors to RHB, they had not visited the website before the investigated year. As a high number of returning visitors has been used as an indicator for UE with the website (; Lalmas et al., 2014; Lehmann et al., 2012; Song et al., 2018) this result point at disengagement by the users of RHB. According to Clark et al., (2014) it is not possible to draw conclusions about unique numbers of

visitors as well as returning visitors. Cookies, that are used to recognize unique browsers, could be cleared, a visitor can return to the website using a new device or a different browser and will be counted as a new visitor. These could imply that a visitor e.g. access RHB via a work place desktop daytime and return via a private mobile phone on the evening. User in the high frequency user group can also be a user in the low frequency user group. These are biases in analysis and interpretation of data from GA which make it challenging to draw conclusions about individual visitors Thus, in this study user-groups are studied and not individual visitors.

Number of page views, the amount of time the users spend on the website and bounce rate are other metrics for measuring UE (Lehmann et al. 2012; Support.google.com, 2018). With this point of view the comparison between the different user groups showed a higher degree of UE in the high frequency group than the other user groups, as this group spent more time at RHB, visited more pages and had lower bounce rate. A higher bounce rate among smartphone users (68,7 %) compared with desktop users (50,0 %) were also found in a study of Vogel et al., (2016). The bounce rate differs from 50% among the high frequency user group to 75% against the low frequency user group. The “top 10”-list over most visited web pages showed a higher bounce rate from “text web pages”, which could be interpreted as disengagement, but also that the user found exactly what looking for on that specific page, but still counts as a bouncer (Clark et al., 2014; Crutzen et al., 2012; Song et al., 2018). Looking at the three web pages on the “top 10”- list with highest bounce rate, they were also those pages where users stayed the longest time, which may indicate that the visitor read the content on the page. According to Clark et al., (2014) these aspects raise the question if a bounce rate at 70-80%, as often seen, may not be as bad as it first appears.

The number of visitors and sessions on RHB were relatively stable throughout the year, with dips in December, June and July. These months contains a lot of holidays, which could explain a decrease in use by CHC-professionals at work. The same pattern with dips during these months could be seen in the study of a Finnish governmental website (Paukkeri, 2017). It could be assumed that the higher use of smartphones and lower usage of desktop in July compared with the rest of the year also could be explained by holidays and absence from the work place computer.

GA is designed to provide insights from a marketing perspective and provide aggregated data. This is a limitation when using GA in research. Even if the web analytic tool has been used in scientific studies the aggregated data made it difficult to test statistical significance for rigorous research purpose. The validity is limited when it comes to draw conclusions about UE from the conceptions of users, sessions and bounce rate (Clark et al., 2014; Song

et al., 2018). Thus, in this study the metrics of the website and its flows were in focus and the results generate valuable data which could be used to monitor the trends for the web site usage.

## Conclusions

The study showed the general usage of RHB, changes in usage through the year and various usage pattern in the user groups. The usage of RHB has increased, the web-based guidelines are used in all county councils/regions and the most common visited web-pages was the new national CHC programme. These data indicate that RHB is developed in the right direction reaching the aim to contribute to an equal and equitable CHC of high quality by providing guidelines to the professionals in the whole country. The result also showed the importance to study different user groups which usage pattern differs from each other and the group as a whole. This provide valuable knowledge in the development of web-based national guidelines making them useful and relevant for all its users. GA offered useful data on aggregated level on the usage patterns of RHB but need to be used in combination with other studies of user experiences. Further studies of user experiences using qualitative methods are suggested to get deeper knowledge of different user groups need and requests of web-based national guidelines.

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