NHS111 Online Evaluation

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1 Purpose

This evaluation provides the learning and insights from four locally led pilot sites that operated a NHS111 Online service in England. This evaluation will help inform the future development of NHS111 Online.

The evaluation considered whether NHS111 Online was acceptable to users and offered an opportunity for channel shift, and whether the online approach connected users to clinical care. This evaluation does not provide a comparison of the four pilots areas or the products. It is accepted that the underlying populations in each area are different in terms of their digital uptake, general demography, and the approach to triage, signposting and booking. It is noted that the pilot timeframes were relatively short and the group of users were relatively small in some cases.

2 Approach

This evaluation uses a combination of primary and secondary data sources, including information and data gathered from pilot sites and citizens. Where relevant, secondary data sources have been used from other research, national statistics, other NHS services and similar services in other countries.

3 Key Findings

- The pilots have demonstrated that a safe service can be mobilised which provides an opportunity for transfer of activity from the telephone service to online. Each of the four triage systems that were tested offered a viable solution for NHS111 Online.
- Whilst uptake and utilisation varied for each pilot site, each pilot demonstrated that the online service can connect patients to care.
- Different methods of promoting uptake can be used, however the approach that resulted in 'channel shift' from telephone to online was the use of IVR (in queue) messaging in NHS111 supplemented by auto SMS messaging.
- Triage drop-off rates appear to be lower than previous symptom checkers however this could be due to general uptake in Internet use and differences in the populations.
- Those people that do use the online service and have provided feedback have generally had a very good experience.

• Staff interviewed at pilot sites and analysis of the sorting of cases would indicate that the pilots did not increase demand within the local health system.

4 Conclusion

The learning from these pilots supplemented with data from other health systems and from other online services would continue to support the case for an online interface for urgent care. This evaluation does not recommend one product over another but demonstrates that all products have some similarities and differences but all products tend to support channel shift and management of demand whilst providing patients with a good experience.

To gain further understanding of NHS111 Online and the impact on the health system, larger data sets and linked data will need to be considered. Therefore, the expansion of pilots and further analysis will enable a more robust evaluation.

5 Context

Across the health system and particularly within Urgent and Emergency Care, the rising demand for services and growing needs of the population lend themselves to new ways of delivering services in the NHS, including the use of online channels.

NHS111 Online is a patient facing service developed to enable patients and the public to selfserve part, or all of, the clinical triage process currently delivered through NHS111. It is intended to support the delivery of a transformed Urgent and Emergency care system to act to redirect the growing demand for NHS111 telephone services implementing local channel shift from telephone to online. There is recognition that increasing call volumes need a new set of solutions to meet demand.

The NHS111 Online pilots support the proposals set out in Paperless 2020¹ to improve access to NHS111 services via digital channels. Additionally, the *Next Steps Five Year Forward View*² maps out the major work programmes that the NHS should be focusing on, which includes developing the NHS111 Online digital service to connect patients to Integrated Urgent Care via NHS111. This policy outlines the key deliverables for 2017/18 and 2018/19 in the NHS.

¹ Personalised Health and Care 2020: Using Data and Technology to Transform Outcomes for Patients and Citizens. National Information Board. HM Government. Available at

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/384650/NIB_Report.pdf

² Next Steps on the NHS Five Year Forward View 2017. NHS England. Available at https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THE-NHS-FIVE-YEAR-FORWARD-VIEW.pdf

6 Background

2012: NHS Direct

The NHS111 Digital Prototype project created in 2012, set a clear vision for the NHS provision of symptomatic advice to users through digital channels. In 2011/12, NHS Direct conducted double the number of user interactions through its online services as through its telephone number (4.2 million telephone calls and 10 million digital contacts in 2011/12)³.

2014: NHS111 Learning & Development Pilots

In 2014, the NHS worked with the HSCIC (now NHS Digital) to enhance the Digital Assessment Service (symptom checkers) by piloting various service improvement methods for NHS111 across England. It was established that enhancing digital access will increase access to the Urgent & Emergency Care system. During the pilot period, it was established that 948 people wanted a referral but weren't at a participating postcode. This demonstrated the intent to use digital channels to directly access urgent care services.

2015-2017: NHS111 Online Pilots

In 2017, four pilots were tested across England for triage and assessment. Rising demand in 2015/16 and the need to deliver the outcomes set out in the "The Five Year Forward View" (2014) have highlighted the importance of reinstating a digital option within the urgent care service. "The Next Steps of the Five Year Forward View⁴" has also outlined that NHS111 Online will start during 2017, allowing people to enter specific symptoms and receive tailored advice on management.

The ambition of NHS111 Online is to provide service users with an option to complete, or depending on the clinical nature of presenting symptoms, initiate a clinical assessment online. An online tool integrated with local NHS111 services offers service users self care advice, information on local health care providers or directs them to seek further urgent care advice via telephone or face to face consultation.

The pilots evaluated here have been undertaken in partnership and co-created with local NHS111 providers and commissioners. These four pilot projects cover a total population of approximately 4.5m.

³ NHS Digital (NHS Direct Legacy Data).

⁴ Next Steps on the NHS Five Year Forward View 2017. NHS England. Available at https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THE-NHS-FIVE-YEAR-FORWARD-VIEW.pdf

7 Digital Use in the UK

Smartphones

Ofcom has reported that the average person in the UK now spends two hours per day on their smart phones to browse the internet, social media, shop and bank online. In August 2015, over a third of internet users saw their smartphone as the most important device for going online, compared to just 22% in 2014⁵. These results may in part reflect why in 2012, there was relatively low uptake of the NHS symptom checker as smartphone and internet usage was also lower at that time. The vast majority (90%) of 16-24 year olds own a smartphone; however, ownership of smartphones in the 55-64 year olds has more than doubled between 2012-2015, from 19% to 50%. This surge is being driven by the increasing take-up of 4G mobile broadband, providing faster online access. Users are doing more with their smartphones year upon year and in many areas of their lives. Therefore, this could be extrapolated to suggest that users will start to access more healthcare services in the future via their smartphone suggest increase even further.

Internet

In 2017, almost all adults aged 16-34 years (99%) were recent internet users. Interestingly, recent internet use in the 65-74 age group has increased from 52% in 2011 to 78% in 2017, closing the gap on younger age groups. Furthermore, recent internet use by retired adults has increased by almost 22% since 2011 to 61% in 2017⁶. This data suggests that the lowest users of the internet are increasingly using it more, over time. Consequently, the results of this evaluation could be extrapolated to the older age groups in a few years' time, meaning they will be higher users of the NHS111 Online services in the future. However, the acuity of their conditions may differ as the over 65 age group are the largest age group to suffer from long-term conditions. Internet usage in the travel industry has often been compared to usage in the healthcare industry (see Figure 1) where there has been a moderate growth in the last 10 years.

⁵ Ofcom: The Communications Market Report UK. 6th August 2015. Available at

https://www.ofcom.org.uk/__data/assets/pdf_file/0022/20668/cmr_uk_2015.pdf

⁶ Office for National Statistics: Internet users in the UK, 2017. Accessed 12th July 2017. Available at https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2017

Figure 1: Internet Activities by Year 2007, 2015 and 2016, Great Britain



The ONS statistics in Figure 1 demonstrate that people are increasingly using the internet for health-related information. Between 2007 and 2016 in Great Britain, internet usage for healthcare more than doubled. This suggests there is the appetite to use digital health services and that users may increasingly use digital health services in the future should internet and smartphone usage also rise.

Internet Penetration Rates

The UK has the second largest internet penetration rates out of the 'Key 30 Economies', meaning that UK users have excellent access to the internet⁷ (see Figure 2).



Figure 2: Internet Penetration Rates By Country in January 2016

Sources: ITU, InternetWorldStats, CIA, national government ministries and industry bodies; UN, US Census Bureau for population data. Accessed 20 July 2017.

With increasing connectivity and mobile phone usage, people now expect everything in their lives to be connected, which is fundamentally changing social behaviours. People are using the internet at an impressively increasing rate and for more uses than ever. The internet is no longer just an information portal; 'it's the electricity of modern society'⁷. This suggests there is great appetite for further digital health services to allow healthcare to be integrated into people's lives and to meet user demands and needs.

⁷ Digital in 2016. We Are Social. Simon Kemp. Available at <u>https://wearesocial.com/uk/special-reports/digital-in-2016</u>



Figure 3: Household Internet Use by Region in England and Wales, 2006 and 2017

Figure 3 shows internet penetration rates in England and Wales vary between over 80% to over 90%, with the highest internet use in London and the South East. This may explain the varying uptake rates for each pilot site.

Source: Office of National Statistics 2017.

4G

By the end of 2015, 4G subscriptions on a mobile device leapt from 23.6 million to 39.5 million (an increase of 67.3%) compared to the year previously⁸. (see Figure 4).



4G 55% vs 35% more online shopping Add to cart 55% vs 33% more online banking 55% vs 40% more TV and video 57% vs 40% more TV and video 63% vs 50% more instant messaging 28% vs 20% more internet calls	
28% vs 20% more internet calls	
Source: Ofcom.	

Almost 80% of households had fixed broadband access in Q1 2015, a rise of three percentage points since Q1 2014. The UK has the fourth fastest internet connection speeds in the world⁸.

⁸ The Communications Market 2016: Telecoms and Networks. Ofcom. Available at https://www.ofcom.org.uk/__data/assets/pdf_file/0026/26648/uk_telecoms.pdf

8 Behaviour Change

Devices and programs using digital technology to foster or support behaviour change (digital interventions) are increasingly being adopted for use in patient diagnosis and treatment, self-management of long- term conditions, and in prevention. They could potentially revolutionise the ways in which patients can monitor and improve their health behaviours and health care by improving outcomes, reducing costs, and improving the patient experience. The ways in which users engage with digital interventions are changing as fast as the technologies for delivering them, and it is important that methods of conceptualising and assessing engagement keep pace. The "effective" engagement required for behaviour change support is therefore likely to differ, depending on the users and their contexts, and can only be determined by analysing complex patterns of relationships between usage, user experiences, and outcomes. Policy makers and practitioners need to consider whether commissioning a digital service will improve outcomes for the population compared with current practice or if it will reduce the cost of health care provision without a significant loss of effectiveness⁹.

⁹ Developing and Evaluating Digital Interventions to Promote Behavior Change in Health and Health Care: Recommendations Resulting From an International Workshop. Susan Michie, Lucy Yardley, Robert West, Kevin Patrick, Felix Greaves. J Med Internet Res 2017, vol. 19, iss. 6, e232.

9 System-Wide Service Patterns and Trends

Telephone calls to NHS111 have increased over the past 3 years, with 15 million calls taken in 2016/17. Looking at past trends, this figure is expected to rise in the coming years, putting a strain on the service, if other approaches to triage are not considered (see Figure 5).



In England, the call volumes have continued to increase and based on current trends, are likely to continue increasing (see Figure 6).



Figure 6: Estimated Projected Trend Lines for NHS 111 Calls 2018-2020

Source: NHS Digital.

Learning from Australia

Australia introduced an online symptom checking service for urgent care in July 2014. The data from Health Direct, the telephone based service in Australia, shows that they too were experiencing a rise in demand.

Looking at Figure 7, the green trend line demonstrates the overall trajectory of call volumes in Australia based on historic call volumes over a 4-year period. The black trend line is fitted to call data from July 2014 to June 2017. It can be seen in the first chart that call volumes are expected to continually rise over time. In the second chart, the trend lines have been adjusted to start at the same point in July 2014.







This data from Health Direct shows overall transactional volume split by phone, web, and app. It appears to show that online service supports demand management and indicates channel shift from telephony to online. It has resulted in channel shift overtime increasing to approximately 33%. The populations of Australia and England have some similarities including some of their patterns of use of the internet and some similarities in the underlying heath system. The Australian system is a symptom checking service without any connection to services at this stage.

Channel Shift

The NHS111 Online pilots provide a new route for users to access NHS urgent healthcare services, which has previously not been tested. To ensure that the pilots improve quality and

efficiency in urgent care whilst establishing cost-savings, <u>modelling work</u> will need to be considered to understand the impact of channel shift.

It has already been established <u>here</u> that users are increasingly using their smartphones for all aspects of their lives and so it can be presumed that there is increasing appetite for using digital health services. A high benefit with high quality clinical outcomes and user satisfaction, coupled with low effort will provide the greatest impact to enable channel shift.

9.1.1 RCGP Surveillance Data

RCGP Surveillance Data was reviewed in March 2017, for the conditions that 1.5 million patients presented with in primary care across 200 GP practices. The three largest contact groups were:

Condition	Unique Contacts	Median Age (Years)
Respiratory	150,000	35
Upper respiratory tract	100,000	22
Common cold	54,000	16

The conditions mentioned could be amenable to remote closure, resulting in them being largely influenced by channel shift to digital health services, such as NHS111 Online. This would reduce some pressure and demand on GP services.

Additionally, the average age profile of these top three conditions is lower, meaning they are more likely for channel shift as the younger population are the highest users of the internet and smartphones.

10 Finance and Activity Models

To consider how NHS111 Online needs to be planned for in the future and to ensure appropriate development, it is necessary to consider what will impact channel shift and digital uptake and adoption going forward. Any digital health services will need to mirror these changes to ensure services are relevant and meet the needs and demands of the population.

NHS111 Online uptake across all pilots varied between 2 - 15%, but on average was approximately 6%. This variation relates to the approach to promotion and the underlying population internet usage, with pilot sites of higher internet penetration rates experiencing the greatest channel shift from telephony to online services.

It has been determined that the shift from telephony to online triage services in Australia over a 3-year period is approximately 33% (Figure 7). With increasing internet penetration rates and smartphone usage across all age groups over the next 3 years, it is predicted that this channel shift to digital triage services could be greater in England going forwards.

Internet usage for healthcare has doubled in the past 10 years. Recent internet use in 65-74 year olds has increased by 26% from 2011-2017. If this rate of increase stays consistent, we can expect 88% of this age group to use the internet by 2020, and it could be also envisaged that an increasing cohort of these patients will use the internet for their healthcare.

Financial Modelling

Using the <u>Australian triage volumes</u>, the relationship between web and app triages and phone triages was modelled using linear regression, to provide an estimate of the number of phone triages expected each month, based on the number of online triages, using the formula:

Calls= a*Online+ b

From this, it can be established that for every 8 online triages in Australia, there is 1 less phone triage. If every phone triage costs £12, then every online triage would save $12 \div 8 =$ £1.50.

If the trends are modelled to establish what the call volumes would be in three years time i.e. June 2017, then there would have been around 20,000 more calls per month without the online service. This would result in even greater pressure on the telephony service.

If the cost of telephony in Australia is similar to the UK (£12 per call), then the saving would be around £250k per month. An important proviso is that this doesn't take into account whether there are more Emergency Department, Primary Care or Ambulance costs arising from the introduction of the online service.

Channel Shift to Digital Services

Internet penetration rates vary across regions in England (see Figure 2), and therefore it can be expected that rates of uptake of NHS111 Online services will also vary across England. Assuming that NHS111 Online will see a 33% channel shift from telephony to online services over the next 3 years to 2020, mirroring the Australian model, digital uptake can be estimated per region in England (see Table 1). London and the South East will see the greatest channel shift, whilst the North East, West Midlands and Yorkshire and Humber will see the least channel shift. These illustrative workings provide an early estimate of system impact and how demand can be managed in the future. For more detailed channel shift modelling, see <u>Appendix I</u>.

Table 1: Internet Penetration	n Rates and Estimated	Channel Shift From	NHS111 Calls to	Online Services b	y Regions in England
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Region in England	Internet Penetration %	% Channel Shift By Region		Call Volumes	Online Triages	Call Volumes	Online Triages	Call Volumes	Online Triages	Call Volumes	
		2018	2019	2020	2017	20)18	2019		2020	
North East	85.0	9.4	18.7	28.1	3,764,540	351,984	3,412,556	703,969	3,060,571	1,055,953	2,708,587
North West	88.1	9.7	19.4	29.1	5,649,202	547,973	5,101,229	1,094,815	4,554,387	1,642,223	4,006,979
Yorkshire and the Humber	86.8	9.5	19.1	28.6	5,720,706	543,467	5,177,239	1,092,655	4,628,051	1,638,982	4,081,724
East Midlands	87.8	9.7	19.3	29.0	5,491,697	532,695	4,959,002	1,060,996	4,430,701	1,591,494	3,900,203
West Midlands	86.4	9.5	19.0	28,5	4,770,421	453,190	4,317,231	906,380	3,864,041	1,360,047	3,410,374
East of England	90.3	9.9	19.9	29.8	6,953,726	688,419	6,265,307	1,381,010	5,572,716	2,072,210	4,881,516
London	92.7	10.2	20.4	30.6	6,308,292	3,735,208	5,664,846	1,286,892	5,021,400	1,930,337	4,377,955
South East	91.6	10.1	20.2	30.2	8,889,868	897,877	7,991,991	1,792,197	7,097,671	2,687,407	6,202,461
South West	89.2	9.8	19.6	29.4	5,514,043	540,376	4,973,667	1,081,855	4,432,188	1,622,783	3,891,260

Sources: Ofcom 2017; NHS Digital; NHS111 MDS.

11 Pilots

Pilots Background

The four pilots cover two web based interfaces (West Yorkshire and Suffolk), one app with a chat bot style user interface (North Central London) and one voice-activated avatar (West Midlands); each using a different set of clinical triage algorithms. They include the digital version of NHS pathways as well as other commercial and third party services designed for web based clinical triage. In all cases, patients completing a triage receive a disposition. Disposition mix varies across pilots. End points include the ability to connect directly to a local GP out-of-hours service, connect to NHS111 for a call back, to self-care advice or to other appropriate services like a local pharmacy.

The four pilots are:

- The NHS Pathways service in West Yorkshire;
- The Sense.ly system in the West Midlands;
- The Expert 24 system in Suffolk; and
- The babylon system in North Central London.

Local Population Profiles

The four pilots cover a total population of approximately 7.53 million (see Table 2). Patients are directed to NHS111 Online products via in-queue NHS111 telephone message in order to target patients already actively seeking care. In two of the pilots SMS messaging was also used to provide potential users with a download link.

Location	Solution	Start date	Population						
West Yorkshire	Pathways	06/03/2017	819,000						
West Midlands	Sense.ly	13/03/2017	4,600,000						
Suffolk	Expert 24	06/03/2017	631,000						
London	babylon	30/01/2017	1,480,000						

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Each of the pilot areas varied in terms of population size, number of GP practices and the largest age group in the population (see Table 3).

Table 3: Indication of the Underlying Populations in Pilot Areas

	West Yorkshire	West Midlands	Suffolk	North Central London
Largest Age Range in Population (Years)	15-34	0-34	45-69	25-44
Number of GP Practices	105	820	64	210
Average Number of Patients per GP Practice	7800	5610	9859	7048
Opportunity areas to focus on for non-elective admissions as a whole in terms of spend and outcomes	MSKTraumaEndoMH	 MSK MH Trauma GU Endo 	 Neuro GI Endo MH 	GIMHEndo
Areas of improvement by disease prevalence and incidence	 Alcohol- related harm Diabetes TB Incidence 	 Alcohol- related harm Diabetes TB Incidence STIs Self- harm 	• Suicide	 Alcohol- related harm Diabetes TB Incidence STIs

Sources: PHE Fingertips Health Profiles¹⁰, NHS RightCare Packs¹¹. Accessed 20 July 2017.

¹⁰ Public Health England Health Profiles. Available at https://fingertips.phe.org.uk/profile/health-profiles
¹¹ NHS England RightCare Packs. Available at https://www.england.nhs.uk/rightcare/

12 Uptake

Uptake can be defined and measured in various ways. For the purposes of this evaluation, uptake is defined as the shift from telephony to online services.

Uptake Methods

Methods of promoting uptake were tested across the pilot sites. This included:

- IVR in-queue message;
- IVR generated SMS;
- SMS Messaging from GP practices (Learning & development pilot in 2014);
- GP practice waiting area televisions; and
- General marketing

The highest uptake resulted from IVR in-queue messages and IVR SMS. Previous learning programmes have demonstrated that GP practice reception screens have also offered moderate uptake, and it was acknowledged that GP practice level SMS messaging needs to be more targeted. Additionally, general marketing needs to be balanced along side other approaches.

Downloads or Registrations

Total downloads or registrations across all pilot sites was 10,902 from 30 Jan 2017 until 30 June 2017 (see Figure 8). Accepting that the design of each pilot varied including the starting date, footprints covered, method of uptake, and the underlying population it is not advisable to compare the pilot sites, however, overall this demonstrates that with controlled marketing there is demand for online services.





The sudden increase in the West Midlands pilot is due to the significant expansion of the pilot area, whilst the early spike in the Leeds pilot was due to "GP Text" advertising. For all pilots this also assumes app and website uptake is comparable.

The relative uptake in each area does more generally correlate with underlying internet penetration rates and does in part explain differences in uptake (see Figure 3 and Figure 9). It also indicates that any future roll out will need to factor in these differences.

Figure 9: Relative Uptake Rate by Geography



Completing Triages

Each pilot uses a different set of clinical triage algorithms from web-based and chatbot style to a voice activated avatar. Total completed triages across all sites was 8671 with an average completion rate of 73.99% as of 30 June 2017 (see Figure 10).





Source: NHS Digital.

There may be multiple reasons why users elect not to complete the entire triage process. Some users may be seeking health information or are seeking reassurance, others may elect to use another channel once they have undertaken some initial assessment. Whilst the amount of time taken for online triage varied between pilots, in most cases these ranged from approximately 80 seconds to 130 seconds, i.e. between 1 and 2 minutes; this is relatively lower than the average length of a NHS111 telephone call which is approximately 7 minutes at the triage stage.

Demand Profile

The demand profile on an average daily basis mirrors the telephony service and would suggest that the online service does not seem to generate extra demand based on these pilots.

Across all pilots the online service has generally greater use at the beginning of the week and again towards the end of the week. The middle of the week had slightly lower usage. This varied to differing extents between pilots. In London, triage use was more evenly spread across the week, whereas in Suffolk the weekend appears to be when most usage occurs.

In general, the times of utilisation seem to suggest that users are similar in their demand profile which starts at 0700 and continues until 2300 each day. The hour of day that users engage with online services in Suffolk and London correlates with times of general availability i.e. after work in the evening around 6pm and then a later increase at 9pm. However, in the Leeds pilot, users peaked in the morning at approximately 9am and then again close to lunchtime.

Device Use

More than half of all users of the NHS111 Online pilots in Leeds and London accessed the service via an iPhone using iOS or the Safari browser (see Figure 11 and Figure 12). It is also interesting to note that in 2012, 39% of all smartphone users used iOS compared with 26% using Android. More young people using the NHS111 Online services, and who are also female, could explain why there is a larger proportion of iOS usage as 66% of 15-34 year olds use iOS, compared to 46% using Android in 2012 (see Figure 13).



Figure 11: Mobile Downloads by Source and OS from 31/01/2017- 17/07/2017 in London

Source: babylon data. Accessed 20 July 2017.



Figure 12: Registrations by Device Type in Leeds

In London, whilst the SMS intervention has shown to increase the number of downloads, the majority of downloads occur organically (see Figure 11). This success could be a result of marketing. The majority of users in Suffolk accessed the NHS111 Online service via a desktop machine, and only 13% using a mobile device (see Table 4). This could be in part explained by the older age profile of Suffolk, as they are less likely to own smartphones.

Table 4: Registrations by Device Type in Suffolk

% Sessions on a desktop machine	82%
% Sessions on a mobile	13%
% Sessions on a tablet	5%

Source: Expert 24. Accessed 30 June 2017.

13 Symptoms and Users

Symptoms

When considered as a whole, the programme indicates that the following symptom groupings may lend themselves to greatest online interaction:

- Abdominal
- Headache
- Dental
- Skin
- Sexual health

In the West Midlands, abdominal pain, pain more generally and headache were pathways that attracted the greatest utilisation, whereas in West Yorkshire, dental pathways were disproportionately more utilised than others.

Users

13.1.1 Age

From all pilots it can be concluded that the majority of users of NHS111 Online fall within the age range of 18-35 years. This is similar to the results of the NHS Direct data. Suffolk has a lower proportion of 18-35 year olds than the national average; this may indicate that uptake for NHS111 Online services may be lower here than in other areas of the country. London and the West Midlands have a higher proportion of younger people than the other pilot sites and therefore uptake in these areas may be greater.



Source: NHS Digital at 30 June 2017.

As outlined <u>earlier</u>, internet usage is highest amongst the younger half of the population in the UK. This is reflected in the results of the age mix of users of the pilots, with more users between 18-35years (see

Figure 14). As a result, it can be assumed that those more likely to use the internet in daily life are more likely to use digital health services. This also reinforces the same conclusions drawn from the NHS Direct report in 2012^{12} .

13.1.2 Gender

Gender is broadly similar across all pilots, with all showing a higher percentage of female users (see Figure 15). This is in line with NHS Direct findings in 2012, where it was reported that females were the higher users of the symptom checkers.



However, national UK data shows that males are more likely to use the internet than females. The proportion of men who had recently used the internet was 90% in 2017 compared with women at 88% (see Figure 16).

The difference in recent internet use between men and women was larger in the oldest age groups. Recent internet use by men aged 65 to 74 years was 79%, and by men aged 75 years and over, was 47%. This compares with recent internet use by women in these age groups at 76% and 35% respectively¹³.

¹² NHS Digital (NHS Direct Legacy Data).

¹³ Office for National Statistics: Internet users in the UK, 2017. Accessed 12 July 2017. Available at https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2017





Source: Office for National Statistics. Accessed 12 July 2017.

14 Outcomes

Overall, the outcomes for users of the online services indicate that their needs result in lower acuity outcomes compared to telephone users, i.e. a greater proportion of self-care, generally more users that need primary care and a smaller proportion that require more urgent services. This is further reinforced by other online based triage platforms including eConsult, which also reports the majority dispositions of a lower acuity, including pain, tiredness, coughs and headache (in descending order of volume)¹⁴.

Accepting that each of the pilots used different methods of triage and sorting due to the underlying products, the aggregated data across all sites provides some insights for the programme as a whole. The majority of online users will either be directed to a primary care service, mainly GP, dental or pharmacy (circa 40%), approximately 20% will result in a clinical call back from a 111 clinician, another 18% will be provided with self care, up to 20% will either be directed to 999 or to an Emergency Department; and about 2% will require other services such as GUM (see Figure 17).



Source: NHS Digital at 30 June 2017.

Overall from the pilots, less users are directed to primary care services, and more for self management (see Figure 18), than from the NHS111 telephone service. Similar outcomes for 999/ED have been found.

¹⁴ eConsult for NHS: Data outcomes for United Kingdom, 23 June 2017. Accessed 19 July 2017.





The West Midlands pilot directs a high proportion of people to call NHS111 (37%) and for self care, whilst in North Central London, very few people are redirected or called back (4%).

The Leeds pilot directs a high proportion of people to primary care or non-emergency services (61%), with a relatively low level of self-care. By contrast, the West Midlands pilot redirected far fewer people to primary care (11%) with a relatively low level of emergency care referral.

The Suffolk pilot had a much smaller volume of outcomes and therefore solid conclusions cannot yet be drawn about how they differ relative to the other pilots. However, the data thus far has shown it directs a high proportion of users to call NHS111 when compared with the other pilots (39%).

Appointment Booking

In all pilots, if patients required urgent care, their details were transferred to local urgent care services (e.g. GP OOH, emergency dental) using different interoperability methods, ensuring they do not have to repeat themselves. This has been integrated into existing operational workflows. Between 70 - 80% of those cases that were referred into NHS111 or the clinical hub received a booked appointment.

15 User Intent

In two of the pilots (Suffolk and North Central London), patients were asked what they *intend* to do, based on advice they are given; this provides an indication on how likely users are to have followed the outcomes from the online service.

Triage impact on user behaviour is affected by triage accuracy and compliance. Triage accuracy depends on both clinical precision, but also usability as if users ultimately are not able to understand and answer a question accurately, the most clinically precise algorithm won't matter. It appears that users make conservative choices when given education and information.

The data from Suffolk and North Central London support the hypothesis that high triage outcomes are more likely to be a result of users answering questions inaccurately, but who then self-correct. This hypothesis can be extrapolated to other areas with similar demographics and digital maturity.

In Suffolk, overall users would have followed the advice given, however for those with an ED or 999 outcome, they appeared to be less likely to follow the course of action; a greater proportion reported that they would seek advice from primary care or self-management. The London pilot also indicates that there was generally good agreement between the option presented to the user and their intent. The only exception was that where users were presented with an urgent or emergency outcome, they indicated that they would seek advice from a GP.

In general, there is a high degree of agreement between offer and intent for primary care, self care and calling NHS111, however for more urgent or emergency outcomes there seems to be a preference to seek further advice.

User Lab Testing

User lab testing was designed and conducted by an NHS Digital Senior User Researcher to provide an indication as to what aspects of the online triage systems/products presented under test conditions work well or less well for users. The research sessions were conducted in a usability lab and were observed by members of the Health Innovation Network (HIN) Evaluation Team in person or via live web streaming and video recorded.

Insights from lab testing:

- Some users said they would use NHS111 Online for less serious or urgent health problems;
- It was seen by some as a better way of looking up symptom information than typing into Google;
- Using an online service could be quicker than using the phone depending on the product used;
- Other users said they preferred to speak to someone and would still phone NHS111; and

 Users were in favour of the integration of their NHS111 Online journey with their medical records if they had given permission and if they felt the triage tool had understood their problem correctly.

For the full report of user experience and testing by the HIN, please see Appendix II.

16 User Experience

Patient experience has been collected across the pilots using similar approaches. Overall, 70% or more of users reported a positive experience across the pilots. Comparatively, this is a higher level of reported satisfaction than for other online services, which can usually found to be around 60%; although comparable to other physical health services which report similar levels of patient experience.

- Overall, over 1500 users reported a good experience with the online service, with 70% or more having a positive experience;
- Overall, 70-80% of users were satisfied with their online experience at all pilot sites;
- In Leeds just under 80% (n=17) of users were fairly or extremely satisfied with their online experience; a slightly higher proportion would recommend this service to a friend of family member (see Figure 19);
- In the West Midlands, 70% of those surveyed would use the app as their 1st or 2nd point of access if they were feeling unwell; 91% of those surveyed would tell their friends about it; and 89% of those survey found the app easy to use (n=44);
- In Suffolk a similar proportion were satisfied with their online experience, 72% (n=25) (see Figure 20); and
- In London, 70% of users provided 5* and 4* ratings (n=1463) (see Figure 21).

Across the pilots, patient experience has been gathered through a range of in-application survey options; which in some cases have been followed up. While the overall numbers are low there is useful qualitative information on patient experience.

Leeds

In Leeds, there was a low response to the online survey that was built into the site. Direct feedback from service users and staff suggest that users with onward fulfilment have had a more satisfactory experience:

Figure 19: Patient Experience in Leeds

Users' satisfaction. We'd like you to think about your experience of using NHS 111 Online today. Overall, how satisfied or dissatisfied are you with your experience today? (Respondents could only choose a single response)

Response		20%	40%	60%	80%	100%	Frequency	Count	
Very satisfied							47.1%	8	
Fairly satisfied							29.4%	5	
Neither satisfied nor dissatisfied							11.8%	2	
Fairly dissatisfied							5.9%	1	
Extremely dissatisfied							5.9%	1	
							Mean	1.941	
						Stan	dard Deviation	1.197	
Valid Responses									

Would users recommend to friends and family. How likely are you to recommend NHS 111 Online to friends and family if they need similar advice or help?

Response	20%	40%	60%	80%	100%	Frequency	Count	
5. Extremely likely						47.1%	8	
4. Likely						35.3%	6	
Neither likely nor unlikely						5.9%	1	
2. Unlikely						0.0%	0	
1. Extremely unlikely						5.9%	1	
0. I don't know						5.9%	1	
Mean								
Standard Deviation								
Valid Responses								

(Respondents could only choose a single response)

Source: NHS 111 Online Leeds, data from Verint Survey Tool. Accessed 20 July 2017.

West Midlands

The results from a survey of 44 people (males/females aged 18-70) established that:

- 70% of those surveyed would use the app as their 1st or 2nd point of access if they were feeling unwell;
- 61% of those surveyed found the tone and language used clear and understandable;
- 91% of those surveyed would tell their friends about it; and
- 89% of those survey found the app easy to use.

Suffolk

In general, approximately three quarters of users in Suffolk were likely or extremely likely to recommend this service to friends or family (see Figure 20). Whilst the response rate is low, it provides an indication about the service.



Source: Expert 24. Accessed 12 July 2017

London

In London, 50% of patient interactions with the app are for 5 stars, with a Net Promoter Score of 36% (see Figure 21).





Source: babylon data from babylon health, data from 31/1/2017 to19/07/2017. 1463 patients surveyed. Net Promoter Score is calculated by subtracting the % of 1, 2 and 3 star ratings from the % of 5 star ratings. Accessed: 20 July 2

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17 Appendix I: Channel Shift Modelling Data for NHS111 Online

Projected Call Volumes

Projected average call volumes to 2020 using linear progression if no other NHS111 intervention is introduced:



18 Appendix II: Health Innovation Network Evaluation Report

Summary of User Testing Insights

Phase of User Journey	User experience insights from Apps	User experience insights from Web-based solutions
Getting started on the journey	It is not possible to draw conclusions about the start of the journey for the two apps since this was not covered in the research.	Comparing the two web-based products showed it is important to provide a quick, easy means of accessing important information and getting started, as in NHS Pathways. The page design of Expert 24 hindered speed.
Collection of demographic information	User demographics are collected as part of the registration process.	Some users disliked being asked for personal information at the start of a web form, e.g. the mandatory request for a phone number at the start of Expert 24. Past experience shows that this increases drop-out rates and incomplete triages. It is best to ask for personal details only when necessary.
Health problem capture	The favoured approach for users combined audio and free text functionality, with a result-driven approach as a back-up.	NHS Pathways search system worked reasonably well but Google-style search results design needs to be improved.
Users need to know the system understands their problem	The babylon body map system was unsuccessful due to uncertainty when the symptom was not a pain, e.g. coughing or vomiting. Some users said it was difficult to use and did not accommodate multiple symptoms.	Where users only explained their problem via questions asked as in Expert 24, they had to complete triage before learning if the system had understood their problem. One user thought it better to input this in an unstructured format as in the other tools.
Clarity of questions and accuracy of answers and flow	Providing question and answer options that accurately capture a user's symptoms consistently is very difficult. There are problems with all the triage tools tested.	Providing questions and answer options that accurately capture a user's symptoms consistently is very difficult. There are problems with all the triage tools tested.
If users feel the questions miss out important details about	All of the tools tested had some question- associated problems. In most cases the problem related to a specific question-	All tools had some question-associated problems. In most cases the problem related to specific question-types.
their symptoms, they doubt the accuracy of outcome and not be inclined to follow the advice	type.	Users felt this was particularly true of NHS Pathways. Expert 24 has frequent examples of questions that require the user to spend time reading information in order to answer.
Recommendation/ call to action	babylon was the only tool that gave less urgent outcomes than the 111 phone service, which lead to some users offering	Expert 24 and NHS Pathways were similar in the outcomes reached, both having a tendency to give the problems a higher urgency rating.
The result of using the		

triage tool needs to	a lower rating.	Expert 24 has a multi-step process at the end of the
match up to the user's	5	triage for some outcomes, asking supplementary
expectation. In the case	One user of babylon missed the call-to-	questions. This was frustrating for users.
of this research, the	action information presented on the	
111 phone experience	screen	User experience at the end of the NHS Pathways was
provided a benchmark		straightforward and clear, although many
against which users		users missed the 'What to do in the meantime'
could measure the	As the outcome result for all	advice
online tools.	5 Sense if users was a call from a 111	
	result would have matched that of the	Lisors ware positive about links to NHS Choices
	nhone service. This outcome could be	content where these featured
	frustrating for some users who may think	content where these reatured
	they should have phoned in the first	
	instance. Furthermore, the lack of	
	anv clear call-	
	back timescales made users doubt the	
	value of this outcome.	
	Users were positive about links to NHS	
	Choices content where these featured	
Design and approach	The chatbot style used in babylon was	Many were negative about the use of a narrative,
.	unfamiliar to a less web- savvy user who	medical consultation-type style, the long explanatory
	re-read a question already answered and	text and the user of additional screens in Expert 24. In
	missed key information about what to do	general, this made Expert 24 seem very long and
	at the end of triage.	some of the messages jarred with users. Users were
		positive about the factual, basic approach taken in
	The use of voice in Sense.ly split	NHS Pathways as this made the tool easy to use
	opinions. Some were very positive about	
	having the questions spoken and would	
	like this feature added to	
	other tools. Others were negative.	

Summary of Clinical Testing

This aspect of the research consisted of recruiting senior clinicians to test each of the four products under non-lab conditions and answer some pre-defined questions relating to the clinical accuracy of the product and the usability.

Platform	% Clinical Agreement	Pros	Cons
Expert 24	95% (43 responses)	 Good flow and easy to use Early red flag identification Reassuring last page with advice Professional Good systems 	• Not enough questions

babylon	84% (32 responses)	 Quick and reliable More suitable for pre-primary care 	 No back button to change answers Be good to get advice on interim measures Upfront request for information Download an app
NHS Pathways Online	59% (41 responses)	NHS logo instilled confidenceFelt authoritative	 No reasoning to decisions Repetitive questions Clunky Could offer more self-care advice
Sense.ly	30% (10 responses)		 Did not like avatar Struggled to get the right path

For full details of the research studies, please contact NHS England.