



NHS 111 powered by Babylon

Outcomes evaluation

October 2017

Executive summary

- Since the beginning of the trial period on 31st Jan 2017, NHS 111 powered by Babylon has achieved over 15,500 downloads, and has been used to perform more than 9,700 triages¹
- In more than 40% of cases, the app directs patients to self-management outcomes, with the remaining triages most frequently sending people to their GP (28%), or to Urgent & Emergency Care (21%)
- This compares favourably to NHS 111, with Babylon triaging the same proportion of patients to Urgent & Emergency Care (21%) but less than half the proportion of patients to Primary Care (28% vs. 60%), and almost three times the proportion of patients to self-management outcomes (41% vs. 14%)
- Where the user opts to send the outcome to the NHS, the NHS saves an average of £10 through triaging patients to the most appropriate setting for their needs
- A comprehensive clinical review of 74 patients that the app triaged to Urgent & Emergency Care settings found no cases in which the patient should have been cared for in a less acute care setting
- Our symptom checker has been tested against doctors and nurses, and was found to be as safe as, and more accurate than, a nurse or doctor (90.2% accurate vs. 77.5% for doctors and 73.5% for nurses)²
- Prior to launch, our 111 app was tested against all reported “serious incidents” in the pilot area, and triaged patients appropriately in all cases

¹This information is correct for 31/01/2017 to 08/10/2017. Analysis on the following slides may be from an earlier date – see source notes for detail

²Our research is published and available online [here](#).

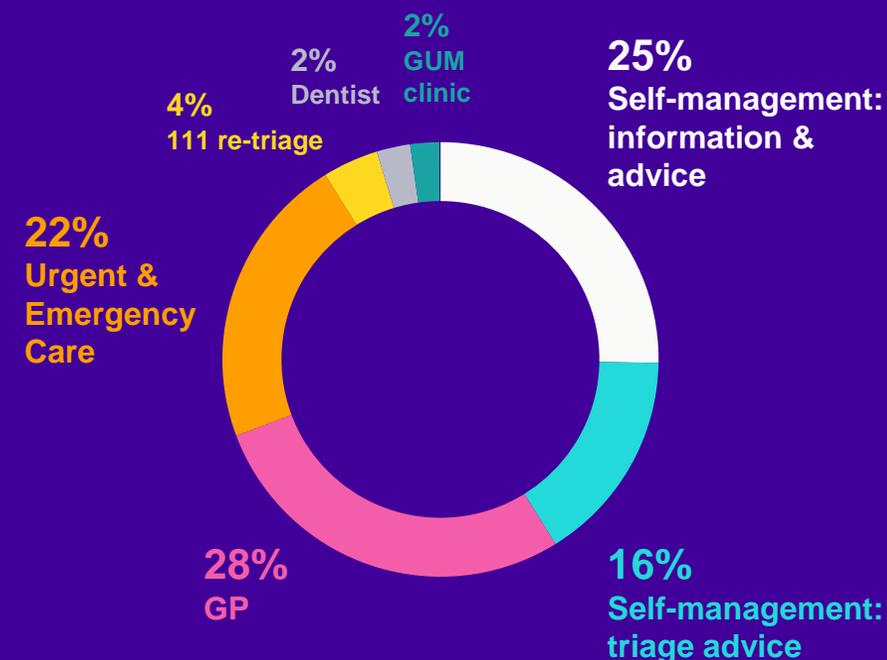
>40% of patients are directed to self-management, with 28% requiring a GP appointment and 22% sent to Urgent or Emergency Care (UEC)

Care setting ¹	“Genuine” interactions	“Experimental” interactions	Total	“Genuine” interactions	“Experimental” interactions	Total
Self-management: information & advice	1,326	1,780	3,106	25%	25%	25%
Self-management: triage advice	835	1,309	2,144	16%	19%	17%
GP	1,477	2,018	3,495	28%	29%	28%
Urgent & Emergency Care	1,147	1,348	2,495	22%	19%	20%
111 re-triage	217	347	564	4%	5%	5%
Dentist	131	86	217	2%	1%	2%
GUM clinic	114	159	273	2%	2%	2%
Midwife	3	2	5	0%	0%	0%
Total	5,250	7,049	12,299	100%	100%	100%

Note: “Genuine” interactions are those interactions in which a patient has explicitly confirmed they consent to share details of their interaction with the NHS for follow up if necessary. “Experimental” interactions are where the patient has not consented (and is therefore deemed to be likely to be experimenting with the app). The exception to this is “Self-management: information & advice”, which has been calculated through the methodology set out in Appendix A.

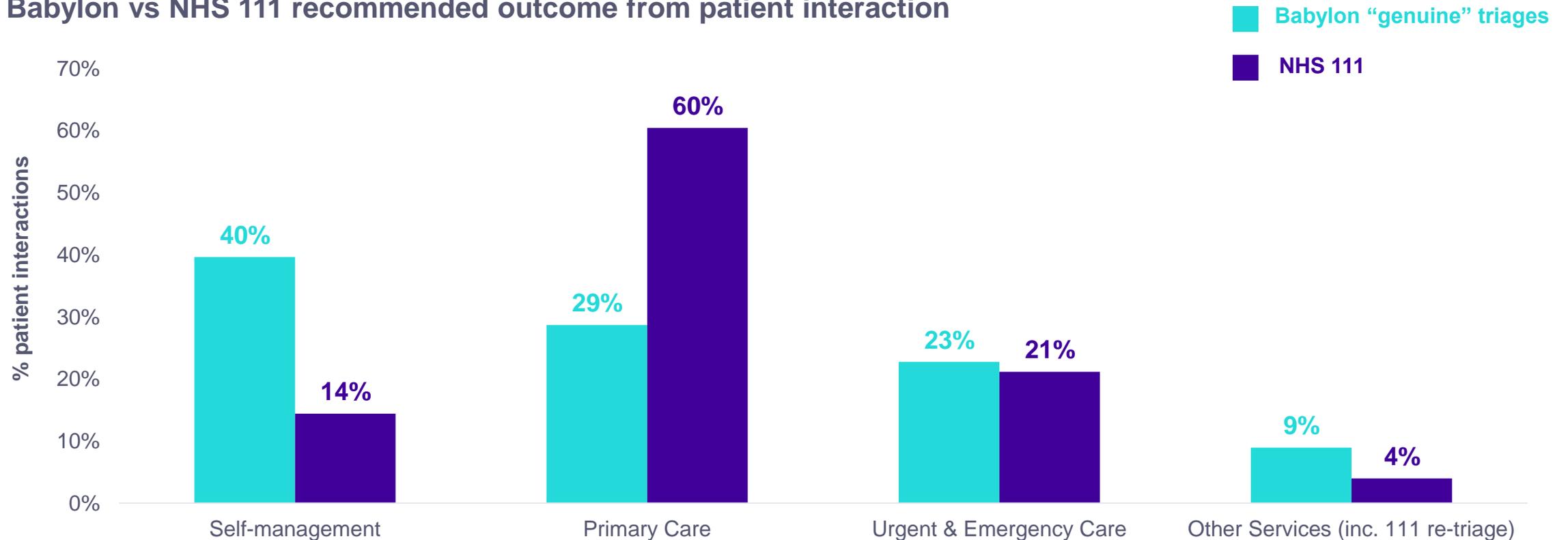
¹The definitions for the “Care settings” data above are set out in Appendix A
Source: Babylon health data from 31/1/2017 to 27/04/2017

Outcomes of “genuine” app interactions



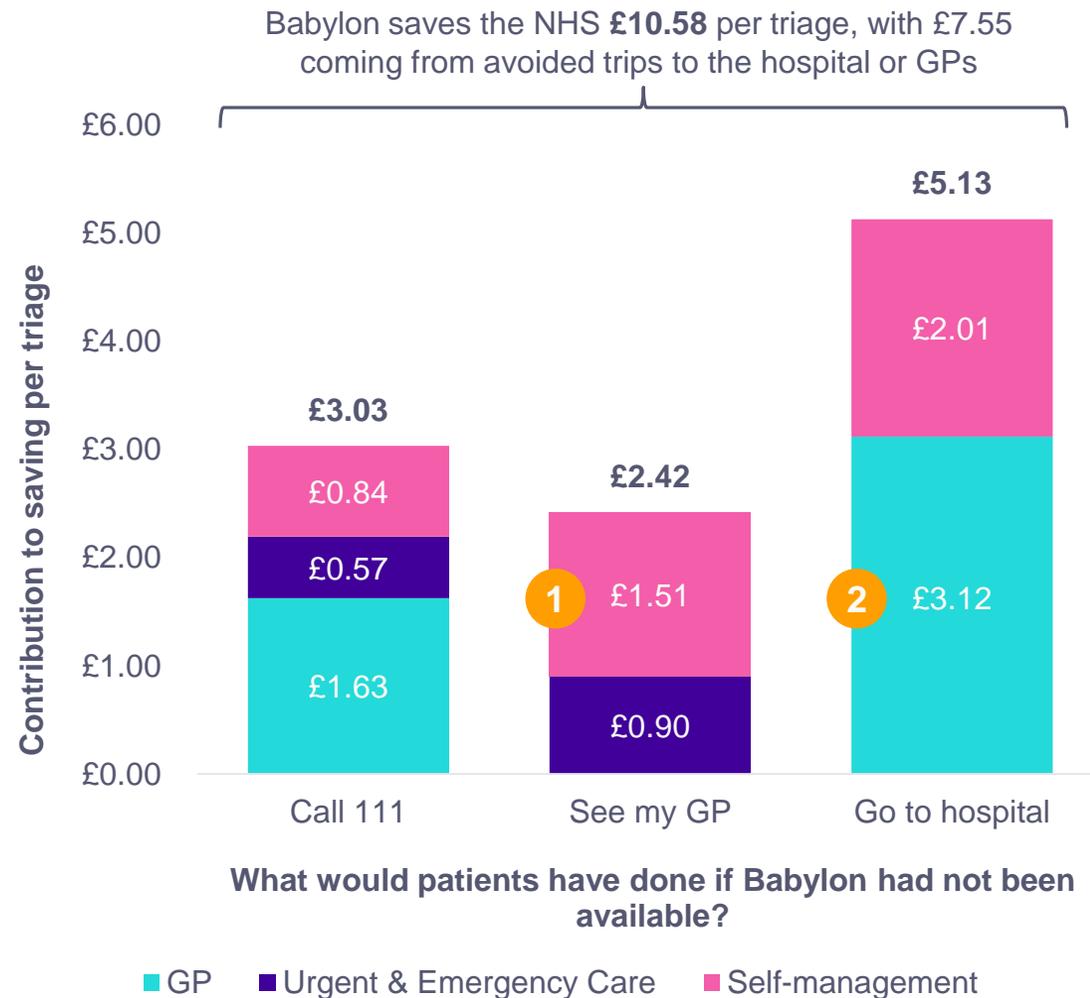
This compares favourably to NHS 111 with Babylon sending a similar proportion of patients to UEC, but half as many to Primary Care

Babylon vs NHS 111 recommended outcome from patient interaction



Source: Babylon data from Babylon health, data from 31/1/2017 to 03/07/2017. NHS 111 data is a simple average (i.e., non-weighted, as raw data is not available) of the 12 months to February 2017 from "[NHS 111 minimum data set February 2017 - National](#)", where Self-management is "% Not recommended to attend another service"; Primary Care is "% Recommended to attend primary and community care"; and Urgent & Emergency Care is "% Ambulance dispatches" + "% Recommended to attend A&E"

For every “genuine” triage, the NHS saves an average of >£10



Example 1

- A patient uses our triage, and is advised to self-manage
- They respond to a survey question and indicate that, had Babylon not been available, they would have seen their GP
- The NHS saves £31 for the GP appointment, as the GP appointment would have been unnecessary
- This scenarios occurs in 4.88% of all triages
- 4.88% of £31 is £1.51, which is the contribution this makes to the savings total per triage

Example 2

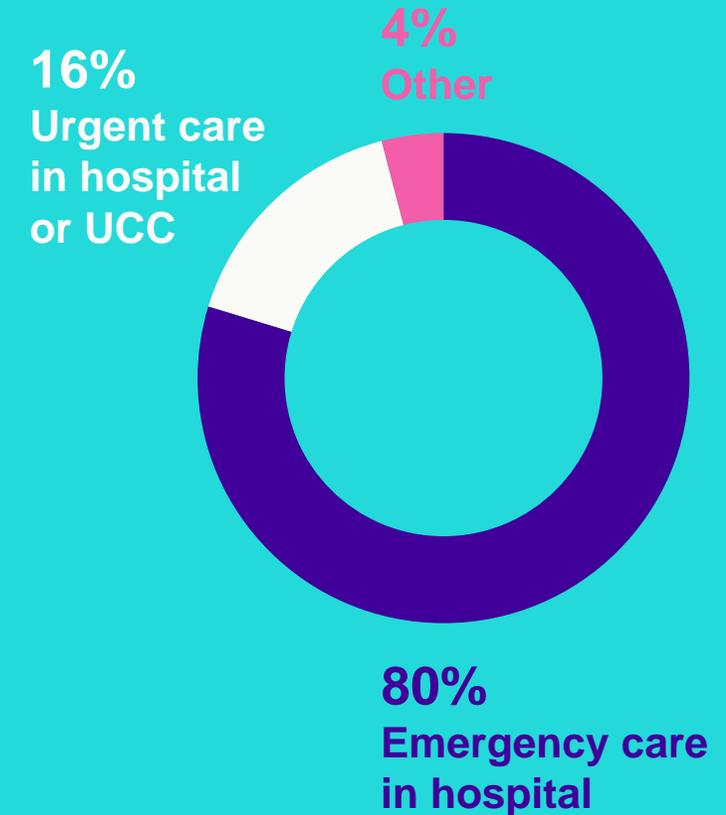
- A patient uses our triage, and is advised to see their GP
- They respond to a survey question and indicate that, had Babylon not been available, they would have gone to hospital
- The NHS saves £138 from avoidance of the A&E attendance, minus £31 for a GP appointment, which is £107
- This scenarios occurs in 2.91% of all triages
- 2.91% of £107 is £3.12, which is the contribution this makes to the savings total per triage

Note: N = 1373; data collected from 31 Jan – 8 Oct 2017; small fluctuations in the sample can result in significant changes to total savings, as e.g., 1 patient that would have gone to A&E has 13x the savings of 1 patient that would have called 111; see appendix for detail
 Source: Babylon health data, sourcing on non-Babylon inputs provided in Appendix B.

Clinical outcomes indicated that all patients sent to Urgent & Emergency Care could not have been treated appropriately in a less acute care setting

- “Urgent and Emergency Care” (UEC) refers to cases in which a patient is referred to an urgent care setting for treatment
- 3 Babylon doctors undertook a comprehensive clinical review of the first 74 triages that resulted in a patient being referred to UEC and had consented to share data with the NHS
- This review process confirms that in all cases, patients required UEC, and hence were appropriately sign-posted by the app
- The review found:
 - 59 (80%) required Emergency Care in hospital
 - 12 (16%) required Urgent Care in hospital or at an Urgent Care Centre
 - 3 (4%) had other care requirements e.g., they may have been best cared for by their cancer nurse, if they had one

Most appropriate care setting for patient directed to “Urgent & Emergency Care” dispositions



Source: Clinical review of 74 triages that led to patients being directed to secondary care in February 2017

Appendix A: Care settings data definitions and methodology 1

1. We provide information for both those “genuine” patients that opted to share PID with the NHS, and those that did not.

- This is because the question used to identify “genuine” patients is phrased to identify patients that have opted in to data sharing (and therefore are eligible to be contacted by 111).
- The number of “genuine” patients may therefore be significantly higher, as we are likely to have some patients interested in an opinion from our artificially-intelligent triage, but who do not want to be contacted by the NHS (e.g., those with “embarrassing” medical complaints, or concerns about data security).

2. “Self-management: information and advice” reflects our estimation of those patients that had a genuine health query resolved through our leaflet services (“Health A-Z”) function.

- In addition to our artificially intelligent symptom checker, we provide patients with access to information leaflets on symptoms and conditions linked to NHS Choices in our “Health A-Z” feature.

- It is important to recognise the role these clinically-validated information services play in reducing demand.
- However, to avoid over-estimating the impact of the Health A-Z function, we have:
 - Avoided double-counting uses of Health A-Z by having a maximum count of 1 use of Health A-Z per patient, per day
 - Removed all leaflets accessed on the same day as a “genuine” triage from our analysis – this avoids any double-counting of a patient’s use of the app where they may have used both Health A-Z and triage to address a genuine health concern.
 - Pro-rated uses of Health A-Z by the proportion of “genuine” to “non-genuine” uses of the symptom checking function. Given that we do not record the split between “genuine” and experimental uses of the “Health A-Z” feature in the app, our fairest estimate of this breakdown is the split we see from users for “genuine” and non-genuine clinical triages.
 - Removed all leaflets visible on the first screen when the user opens Health A-Z from the analysis – patients are more likely to have been clicking on these for experimental purposes, even if some (e.g., abscess) are likely to have been genuine

Illustration of calculation logic:

Description	#
Total leaflets accessed through Health A-Z	8,874
Total leaflets accessed minus leaflets appearing on initial phone screen when Health A-Z is selected	8,569
% of leaflets accessed that were not accessed on the same day as a “genuine” triage, and were not accessed on the same day as another leaflet	38%
“Self-management: information and advice”	3,106

Appendix A: Care settings data definitions and methodology 2

3. The remaining care settings correspond to:

Care Settings	Definition
Self-management: triage advice	Patients that used our triage function and were directed either to self-manage or attend a pharmacist
GP	Patients that used our triage function and were directed to book an appointment with their GP, either on a routine or urgent basis
Urgent & Emergency Care	Patients that used our triage function and were directed to attend a hospital. This does not distinguish between A&Es, Urgent Care Centres or 999. Patients are offered one or both of a “Find a Hospital” button, or a “Call 999” button. Where symptoms indicate it would be unsafe for the patient to drive, only the “Call 999” button is presented
111 re-triage	This typically arises where a patient has used our triage function to input symptoms that are not consistent with any conditions in our knowledge base, but are not sufficiently at risk to warrant attending a Hospital setting. These cases receive a callback from 111 for safety-netting purposes.
Dentist	Patients that used our triage function and were directed to contact a Dentist
GUM clinic	Patients that used our triage function and were directed to contact a Genito-Urinary Medicine clinic
Midwife	Patients that used our triage function and were directed to contact a Midwife

Appendix B: Savings per triage calculation methodology

Table A: Where patients said they would have gone vs. where Babylon triaged them to (Illustrative data)

What would you have done...?	GP	Dentist	Urgent & Emergency Care	Self-mgmt.	Midwife	GUM clinic	111 re-triage	Total
Call 111	13%	2%	4%	6%	0%	0%	1%	27%
Go to hospital	3%	1%	2%	2%	0%	0%	0%	7%
NHS website	2%	0%	1%	2%	0%	0%	0%	6%
See my GP	10%	0%	3%	5%	0%	1%	0%	18%
None of the above	19%	3%	7%	9%	0%	1%	3%	41%
Total	48%	5%	16%	24%	0%	2%	4%	100%

Table B: Savings for each combination in Table A (Actual data)

What would you have done...?	GP	Dentist	Urgent & Emergency Care	Self-mgmt.	Midwife	GUM clinic	111 re-triage
Call 111	£12	£0	£12	£12	£12	£12	£0
Go to hospital	£107	£0	£0	£138	£138	£138	£0
NHS website	£0	£0	£0	£0	£0	£0	£0
See my GP	£0	£0	£31	£31	£0	£0	£0
None of the above	£0	£0	£0	£0	£0	£0	£0



Table C: Contribution to total savings per triage

	GP	Dentist	Urgent & Emergency Care	Self-mgmt.	Midwife	GUM clinic	111 re-triage	Total
Call 111	£1.61	£0.00	£0.50	£0.75	£0.00	£0.05	£0.00	£2.91
Go to hospital	£3.22	£0.00	£0.00	£2.08	£0.00	£0.17	£0.00	£5.47
NHS website	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
See my GP	£0.00	£0.00	£0.86	£1.56	£0.00	£0.00	£0.00	£2.41
None of the above	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00
Total	£4.83	£0.00	£1.35	£4.39	£0.00	£0.22	£0.00	£10.79

- Savings are accrued where use of the Babylon app has resulted in patients using less, or less expensive, healthcare resource than they indicate they would have done had the app not been available
- Savings per triage are calculated by multiplying the values indicating the values in the first table with the corresponding saving in the second table.
- Savings have been calculated on the basis that:
 - A GP attendance costs £31¹
 - An A&E attendance costs £138²
 - Each use of the NHS website is free
 - Calling 111 costs £12³
- **Note:** data in Table A do not match “Care settings” data as they are based on all “Genuine” triages that responded to our evaluation question “What would you have done instead of using this service?” between 31/01/2017 and 09/04/2017

¹PSSRU Unit Costs of Health and Social Care 2016 cost per GP appointment lasting 9.22 minutes without qualification costs of GP

²A&E attendance cost £138 based on Department of Health Reference Costs 2015/16

³NHS 111 total costs per call based on conversations with 111 providers