GP at hand
Progress to date

November 2018

Executive summary

What is GP at hand?

- The leading digital-first NHS GP practice, powered by Babylon technology

- Over 35,000 registered members, with over 1,000 joining each week

- Digital-first approach significantly improves the value to people using the service, as well as to the NHS

What makes it a high-quality service?

- GP at hand brings together Babylon's artificial intelligence and clinical expertise to provide a service that is safe, clinically effective and highly accessible – 24/7/365

- Unlike traditional general practice, the default is to cater for each individual's needs digitally, with in-person consultations only where necessary

How does Babylon's technology work?

- Babylon's AI provides a safe, accurate and immediate symptom checking service, alongside a full AI Healthcheck to predict future disease risk and coaching to stay as healthy as possible

- The GP portal streamlines consultations and reduces clinician paperwork – allowing them to focus on patient care

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GP at hand is the leading digital-first NHS primary care service

- NHS GP appointments available on phone within 2 hours, 24/7 – free at the point of need

- Members switch to GP at hand, automatically de-registering from their existing practice

- Payment follows the patient, largely based on age/sex adjusted capitation

- GP at hand holds a GMS contract with the NHS, and has a technology partnership with Babylon

NHS England

NHS Hammersmith and Fulham Clinical Commissioning Group

Commissioners

babylon GP at hand
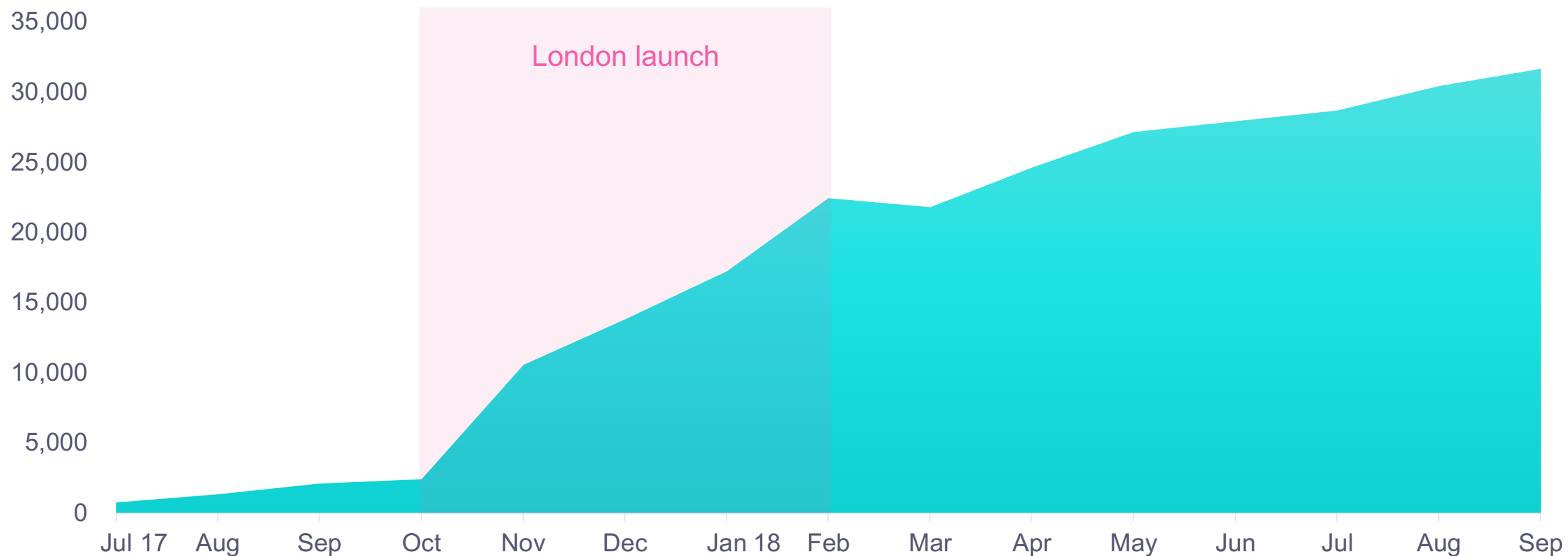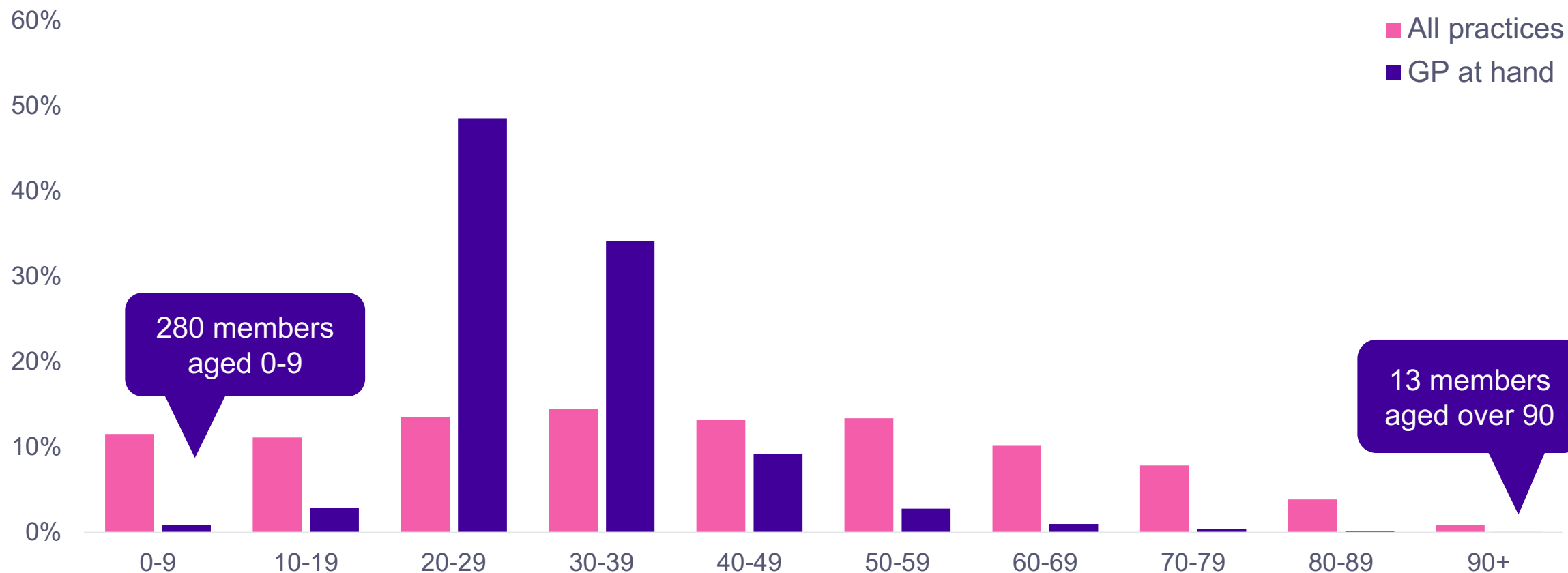
NHS GP Partnership

babylon

Provides technology and clinical services

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GP at hand now has more than 35,000 registered members and continues to grow quickly

GP at hand registered members

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GP at hand is available to people of all ages, currently most popular with people aged 20–40

Legend: All practices (pink), GP at hand (purple)

280 members aged 0-9

13 members aged over 90

Age groups: 0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89, 90+

Y-axis: 0% to 60%

5

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Age/sex capitation means Babylon GP at hand receives 33% less funding per member than average practices, while offering >3x the contracted hours

£191 — Practices with <20% 15-44 year olds

£139 — Average for all practices

£93 — babylon GP at hand

Annual payment per patient

NHS core contract hours: 08:00 – 18:30 Mon-Fri

GP at hand hours: 24 hours/day, 7 days/week

Annual payment per patient

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Safe: Well-trained clinical teams, technology, and an open and empowered culture

- **Well-trained:** GPs undergo specialist training in virtual consultation, with ongoing peer-review of consultations

- **Technology-assisted:** Verbatim recordings support ongoing clinical audit, and workflow tools to standardise pathways and proactively alert where follow-up needed

- **Transparent:** Members and clinicians able to review every chatbot and virtual consultation in full – no "he said, she said" debates

- **Empowered:** Safety-first environment in which clinical teams are encouraged to raise concerns

Safe: Multi-disciplinary teams coordinate care for the most complex members

- Our dedicated, multi-disciplinary teams provide inter-consultation continuity and care coordination for people with complex needs

- Led by a medically qualified full-time Complex Care Coordinator, plus 4 GPs, a nurse, and admin support staff

- Currently >50 patients managed by this team, with patients being identified by GPs, notes summarisers, and patients themselves

Case study 1: Complex mental health
Mr M is a 39 year old man with bipolar disorder and borderline personality disorder, who registered with GP at hand in 2017. His care had previously been compromised as he was unable to leave the house due to anxiety, and subsequently was lost to follow-up by local mental health services for failing to attend appointments. Our care coordinator is able to liaise frequently with local teams and is facilitating a domiciliary assessment by his local CMHT.

Case study 2: Drug dependence
Mr Z is a 40 year old man with a history of opioid dependence. He is under the care of his local addiction team and using buprenorphine maintenance therapy. When he registered with GP at hand in Jan 2018, he had also begun misusing clonazepam, obtained illicitly. Our teams have worked with his addiction team to agree a benzodiazepine reduction plan and continuation of his buprenorphine therapy.

Effective: Full suite of Babylon technology supports clinical teams to provide consistent, high quality care
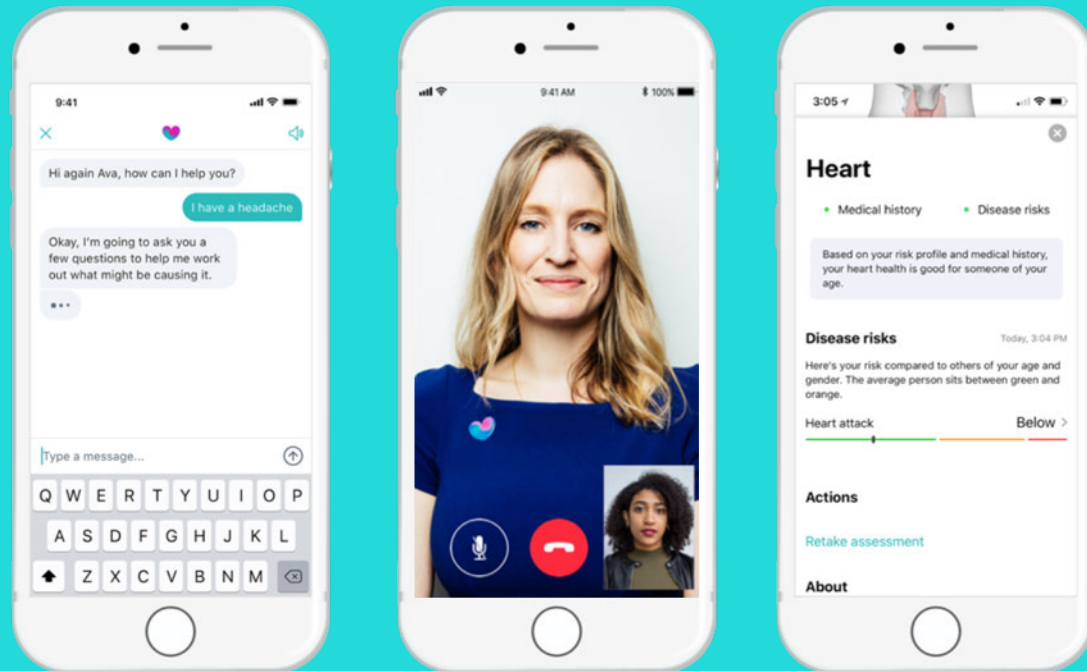
- **AI Triage and Symptom Checker**
  Asks questions and interprets symptoms via a chatbot interface to recommend the most appropriate service

- **GP Consultations**
  Video appointments – fast and convenient with full ability to diagnose, prescribe and refer for NHS tests or specialist care. In-person consultations available at clinics across London

- **Health Assessment**
  Accurately assesses a person's current health and predicts future risk for 20 of the most common diseases

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Effective: Digital-first approach significantly reduces the cost to serve

- AI triage reduces unnecessary consultations

- Operating at scale increases clinical and support team productivity

- Healthcheck feature encourages healthy behaviours to improve long-term health

- Continuous development of technology e.g., automated, coded note-taking through natural language processing

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# Caring: Feedback is extremely positive, and acted on quickly to improve the service

- Regular, comprehensive feedback after every interaction enables us to continually improve the service

- 95% of Babylon appointments are rated as 4 or 5 stars out of 5

- Independently validated feedback from Trustpilot

11
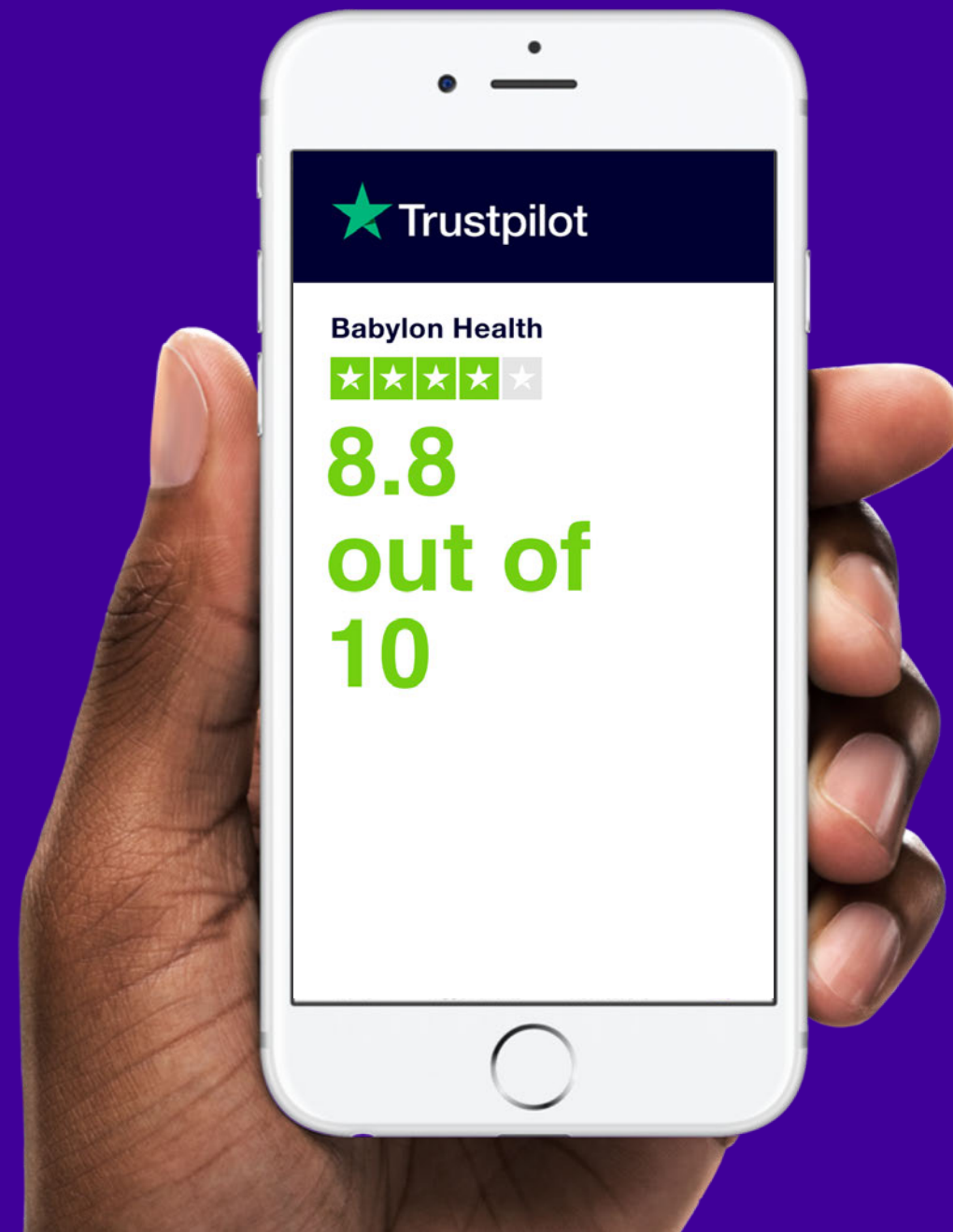
Responsive: The service is highly accessible as well as inclusive

- **Quick access:** GP appointments are usually available within 2 hours

- **Exceptional availability:** The service is available 24 hours a day, 365 days a year

- **Accessible for all:** A recent equalities assessment concluded that GP at hand better addresses GP access barriers for groups with protected characteristics than traditional practices

40% of virtual consultations are conducted outside of traditional opening hours

16%
Weekend

24%
Monday to Friday out-of-hours

**60%**
Monday to Friday in-hours
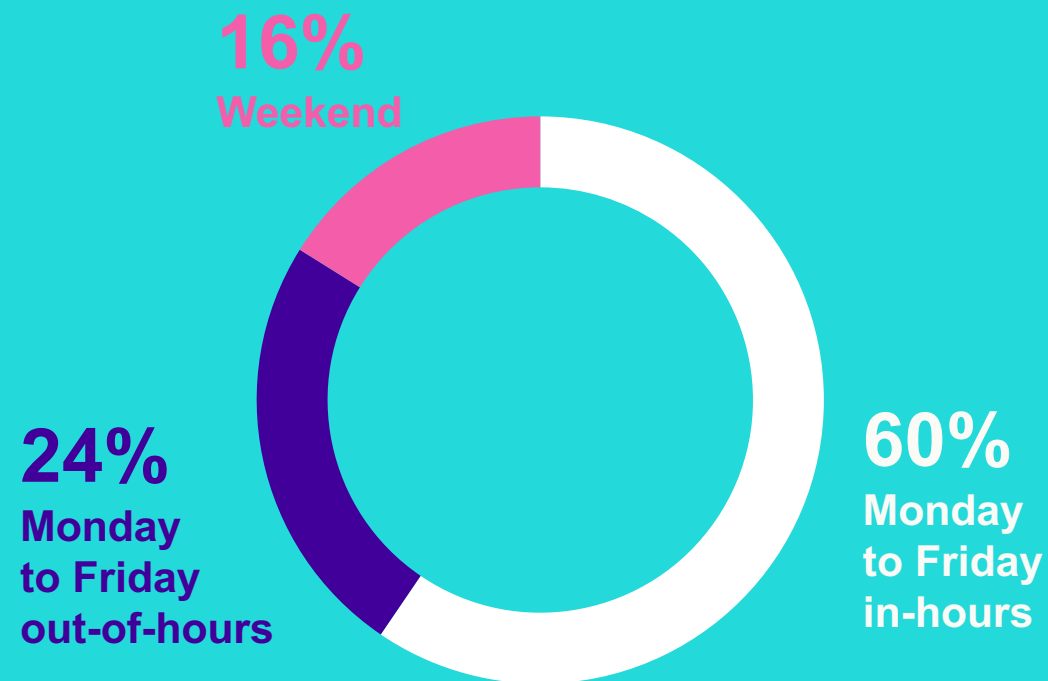
Well-led: Our doctors report much greater ability to manage workloads than other NHS GPs

- **Manageable workload:**

  - 95% of Babylon doctors say that they can manage the amount of work well

  - Compared with a BMA survey that showed that 84% of NHS GPs reported "unmanageable" or "excessive" workloads

- **Clear ambition:** Our >200 doctors and clinical support staff are united behind a common ambition to provide safe, effective, digital-first healthcare to the NHS

"Usually, I can manage my amount of work well"

95%
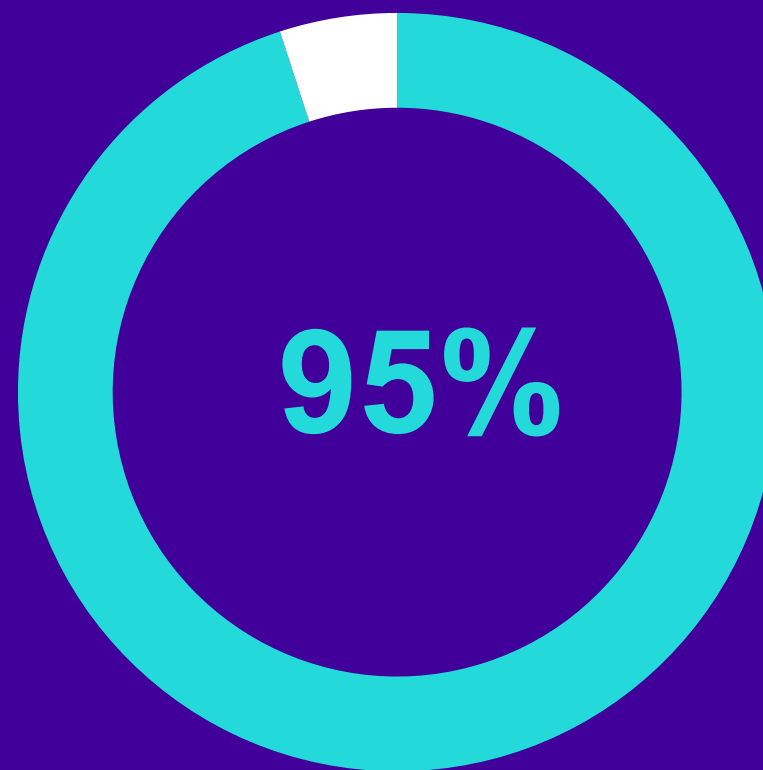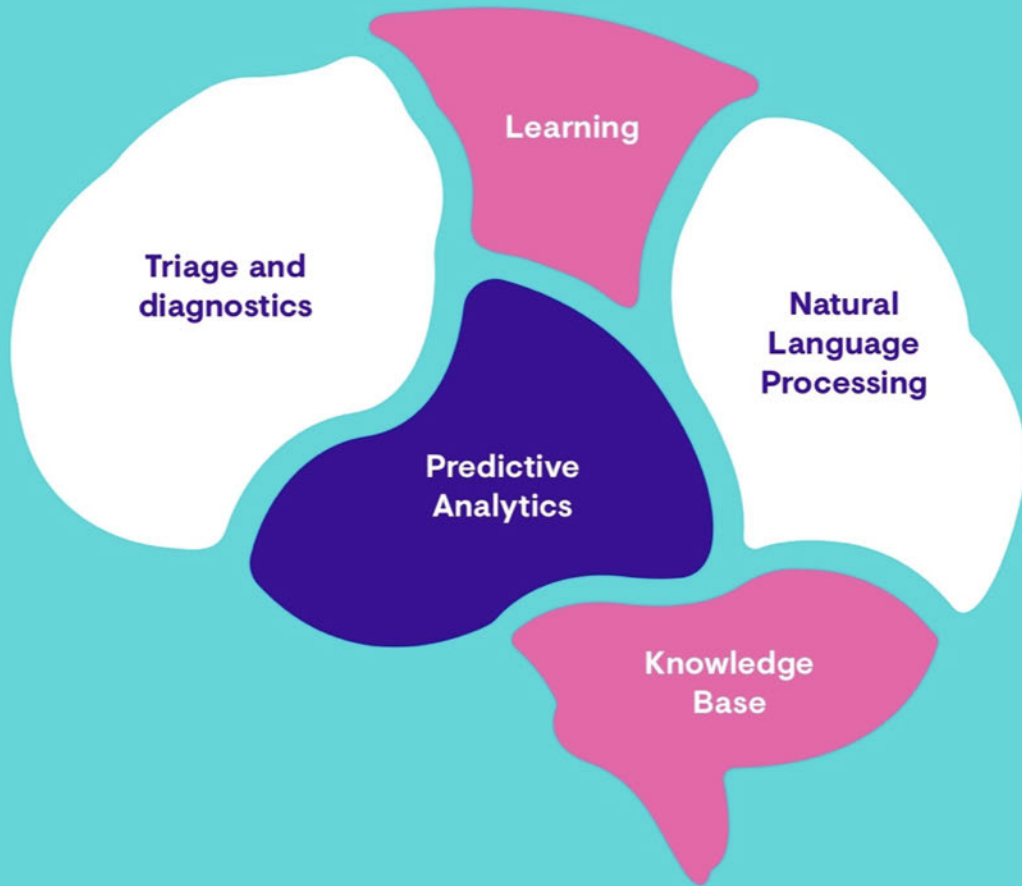
Babylon provides AI that is built to mimic a doctor's brain. It has software equivalent to 10 years of medical training, and decades of practical experience, all accessible in seconds

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Symptoms

Treatments

Breast Cancer

Risk Factors

Related Diseases
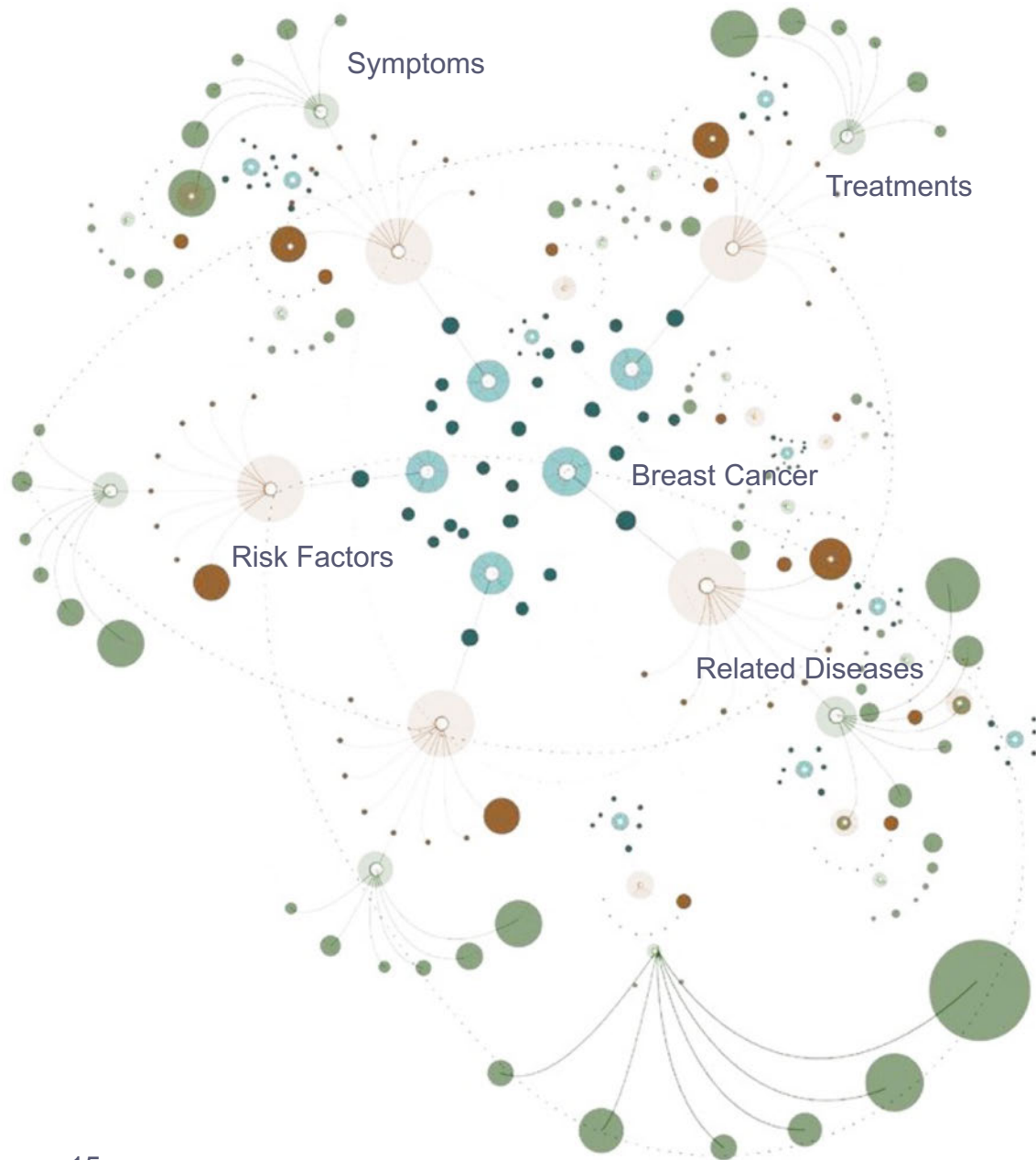
One of the world's largest machine readable medical knowledge bases

- The foundation of the Babylon brain is the vast pool of knowledge in our knowledge graph, drawn from multiple sources and continuously updated

- Built through advances in semantic web, knowledge representation, NLP and deep learning technologies, it empowers the rest of our AI platform to deliver accurate medical decisions

- Our medical knowledge base, encompassing 530+ million medical facts which continues to evolve

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Precise medical natural language processing

- Babylon has built from the ground up natural language understanding and natural language generation capabilities, unparalleled in the healthcare domain

- Babylon NLU and NLG services are based on a unique combination of traditional linguistic and the more modern statistical/deep learning methods

- They are significantly faster, and more accurate than existing best-of-breed systems

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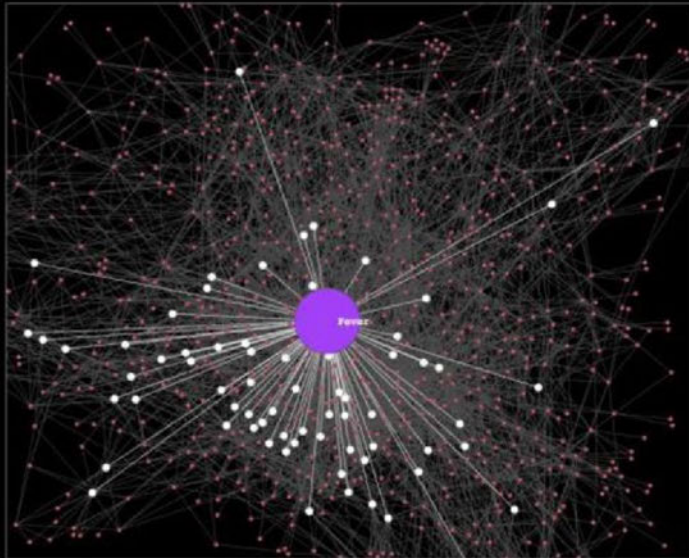# One of the world's largest probabilistic inference models

- Our probabilistic inference model can triage and diagnose patients based on personalised knowledge of diseases, symptoms and risk factors

- This technology forms the basis of our triage system used by the UK NHS in a population of 2mn, in what we believe to be the largest deployment of AI in medicine worldwide

- The AI brain can already diagnose the most common conditions in primary care and will soon be available publicly as a powerful aid to consumers and professionals alike

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Predictive analytics
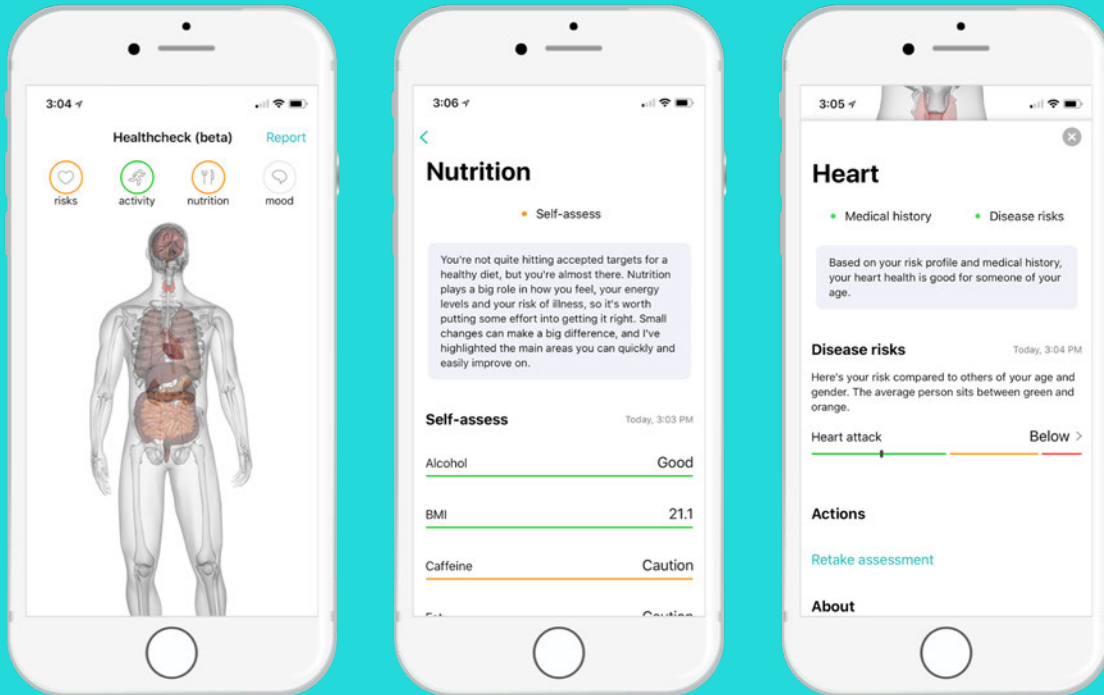
- In addition to diagnosis, doctors learn to make a prognosis. Similarly, the Babylon brain learns to predict a patient's individual disease risk based on the data in our knowledge base, in combination with their medical history, lifestyle data, test results and genetic profile

- In the case of cardiovascular disease, our predictive engine has demonstrated over 90% accuracy when tested against the longitudinal records of over 60,000 patients

- This forecasting capability allows for early intervention, preventing disease progression well in advance of the need for treatment

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# Sophisticated deep learning capabilities
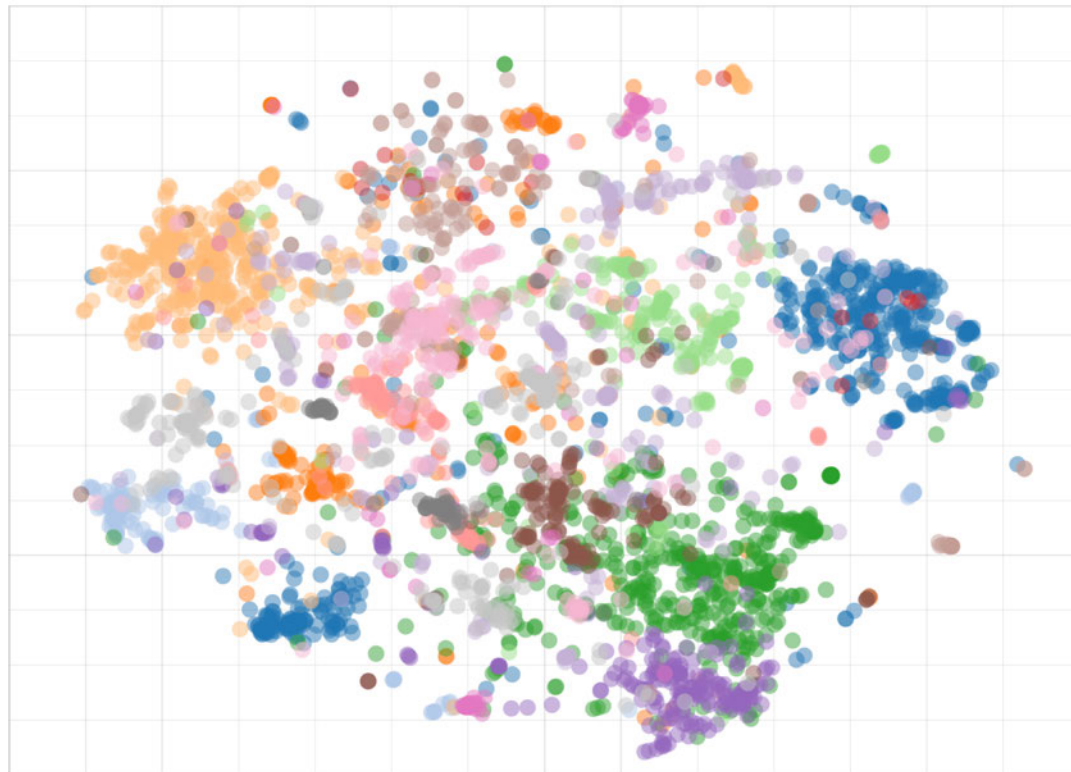
Legend:
- Injury, poisoning
- Neoplasms
- Endocrine, nutritional, metabolic
- Congenital malformations
- Infectious and parasitic D.
- D. of the circulatory system
- External causes of morbidity and mortality
- D. of the eye and adnexa
- D. of the skin
- D. of the digestive system
- D. of the respiratory system
- Mental / behavioural Dis.
- D. of the blood and blood-forming organs
- D. of the nervous system
- D. or the ear and mastoid process
- D. of the genitourinary system

- We use deep machine learning to train our AI, just like doctors learn through experience and recognise when a new case is similar to previous cases that they have encountered

- We use deep-learning techniques to capture a doctor's intuition and improve our models, based on data from our knowledge base and anonymised patient encounters

- Our GPU-based, cloud-based learning and inference platform allows us to process vast volumes of data to ensure our conclusions are clinically valid

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Babylon provides technology to improve the experience for members…

- Users can easily check their symptoms in our AI chatbot

- Our Probabilistic Graphical Model (PGM) is built from over 500M medical facts

- Click here to see it in action
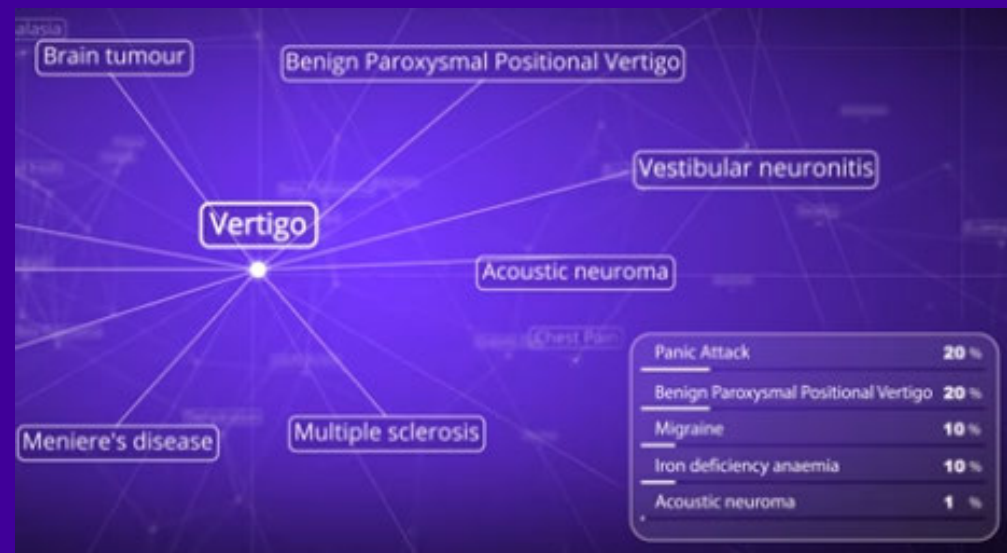
…and streamlines consultations for clinicians

- Clinicians can see the outcome of the AI symptom checking in-consultation

- Voice interface removes the need for typing during consultation

- Click here to see it in action
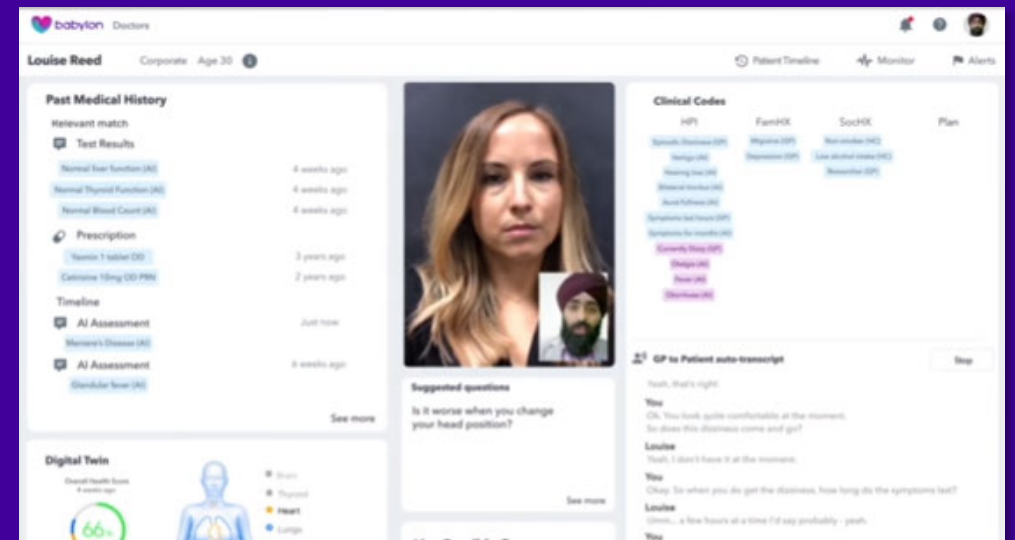
Through our operations in Rwanda, as well as the NHS, we have clear evidence demonstrating the benefits of digital-first care

We are the sole provider of digital health in Rwanda

15%

Of adults in Rwanda have registered with Babylon

153%

Growth in Rwandan users in the last 12 months

2,000

Patients a day

Get well ~~soon~~ now

Free NHS GP appointments in minutes on mobile 24/7, and at our clinics in London*

Download the Babylon app

*To register you will need to switch from your current GP practice. A registration period will apply before you are able to access the service. Available for people living or working within 40 minutes of one of our clinic locations. Download app or see website for details.

NHS
Providing NHS services

GP at hand
powered by babylon

23