

Innovation Summary Report - The Flame Lily Healthcare-CheckUp Health Innovate UK Project 92765

Summary

CheckUp Health (CheckUp) is a remote monitoring app that facilitates regular monitoring of health at home. Our original target market was sufferers of High Blood Pressure (HBP) and Type 2 Diabetes in the United Kingdom's Black, Asian and Minority Ethnic (BAME) population, who are at high risk if Covid-19 is contracted. Black, Asian and Minority Ethnic people are much more likely to suffer from HBP/T2D. T2D/HBP increase the risk of severe Covid-19 infection in BAME patients and increase risk of death by 10%-50% (PHE, 2020). Access to the NHS by this patient group during the pandemic has been 20% lower.

Through a highly competitive national process, CheckUp Health obtained £43139 of UK Government support through Innovate UK's Sustainable Innovation Fund. The financial award facilitated the design and build of the remote monitoring modules required for the CheckUp app. It also supported the collaboration of a diverse team of healthcare professionals from clinical practice, software engineering and project delivery.

During a trial from January to March 2021 though the project only targeted 70 patients, 545 patients from different UK locations used the CheckUp app and remote monitoring equipment. BAME HBP/T2D patients successfully self-monitored their HBP/T2D symptoms, reporting digitally to their designated healthcare professional throughout the pandemic. CheckUp Health Clinician monitored the data as it came through the dashboard. If patient data uploaded was abnormal or indicated a problem, it triggered an alert action taken by CheckUp health clinician who would contact the patient to offer support and or sign post them to their GP for intervention.

The trial indicated a number of impacts:

- Reduction in the number of GP appointments required by 60 % for BAME HBP/T2D patients that were monitored.
- An estimated saving of £90 per patient assuming the patient would need to visit GP once a month at a cost of £30 per appointment over 3 months
- Reduction in exposure of BAME HBP/T2D sufferers to the risks associated with Covid-19.

The Flame Lily has now opened the CheckUp health FREE monitor health at home services to a wider population who may desire to remotely monitor their HBP/T2D.

The Flame Lily Healthcare Ltd. commissioned an end of project evaluation, with emphasis on a realistic evaluation approach, for Innovate UK to assess its overall impact. Further

this evaluation focused on five specific themes. This report uses those themes to group findings. The themes are:

1. Relevance
2. Effectiveness
3. Efficiency
4. Results and Impact
5. Sustainability

Under each theme we examined the areas of strength and areas of learning and further improvement. From this, recommendations for the future were identified.

Project Description

The project was led by CheckUp CEO, Ms. Fungai Ndemera, who oversaw contributions from the technical, regulatory and project management team. The project activity consisted of the following work streams.

Designing & Development of Application Architecture

CheckUp was fully aligned to Android application for smartphones and tablets. Modules were developed covering visual design and interaction, functionality, compatibility and security. The app was aligned with NHS Digital compliance requirements, commenced the NHS Login integration and PDS access journey. Necessary API work was carried out to enhance the application and platform for NHS Digital. **Regulation and Compatibility**

The NHS Digital assessment was prepared and completed during the process of designing the application. PDS FHIR API Supplier Conformance Assessment (SCAL) was completed. The outcome was that the CheckUp Health platform was approved to go through the integration process. The integration was completed. Alongside this work of compliance was the onboarding process for Digital First online consultation and video consultation framework. The NHS Login integration journey was commenced resulting in successful kick off call approval with NHS Login team. Currently undergoing integration protocols, the initial digital health reviewer and analysis was commenced by the Orcha team. A complete analysis report was obtained which identified areas which required further development.

Intellectual Property

Work surrounding IP included recruiting experts to assess our innovation for elements that could be protected. Our first patent, focusing on the remote monitoring algorithm was submitted in March 2021, in an effort to further de-risk our innovation.

Environmental Impact Assessment

A baseline for a full environmental impact assessment was established to ensure that CheckUp has the lowest impact possible, and this was considered as part of the project design process.

Equality and Diversity

A training workshop on equality, diversity and inclusion was completed by all members of the team. Equality and diversity policies implemented and woven within the service delivery. Equality and Diversity train the trainer course was purchased and implemented to ensure continuity of staff training within the organisation and continued risk assessment and implementation to be sustained

Small Scale Trial

After development of CheckUP Health monitor at home modules, a small-scale trial of the app was prepared and executed with 70 BAME HBP/T2D sufferers in the UK. This work package was supported by ACCMUK a UK based charity for BAME based in Bedford. A final virtual meeting was held to discuss the learning and experience of patients participating in trials over the course of the project towards final delivery of the app.

Progress Against Objectives

The success of the team in achieving the project's original objectives is discussed here.

Objective 1: Changes in the commercial environment can be monitored and accounted for. We successfully completed the activity according to the project plan. It was planned that the grantee will develop remote monitoring modules within an already existing application for monitoring of HBP/T2D patients. The project team efficiently designed application architecture and processed towards trial.

Objective 2: Adequate resources are committed to exploitation

The awardee successfully and punctually completed all of the deliverables including the hiring of experts for delivery of Equality and Diversity training, development of application, and conducting environmental assessment during the project. Overall, the grantee reached 545 patients of HBP/T2D in the UK and monitored upto 70 patients using the provided devices. A clear algorithm was finalised and remote monitoring modules completed resulting in a successful submission of a patent application.

Objective 3: Exploitation can be monitored by the stakeholders

Moreover, The Flame Lily Healthcare Ltd has planned to closely work with NHS, other private organisations and other charities to encourage patients to monitor their health at home and share their review of application. The Flame Lily was also fortunate to work with a UK based charity ACCM who supported the implementation of patient reach and recruitment. The enhanced app was shared with other departments' organisations to incorporate their comments and feedback which was integrated in the improvement of

the design of the monitor health at home modules for High blood Pressure and diabetes within the application. Orcha review team provided the initial app assessment and report against the NHS App standards which provided a baseline and a standard to work towards.

Engaging Stakeholders

ACCM Charity supported patient recruitment and engagement. Supported with ideas on how to reach racially diverse communities which resulted in production of content in other languages.

The Flame Lily continues to engage with NHS and local commissioning groups in identifying where the services are needed the most.

Was the Pilot Effective?

The interventions made by The Flame Lily Healthcare Ltd. were largely effective in terms of achieving the objectives and outcomes of the project. The CheckUp Health project and the feedback was found to be effective enough to improve the application remote monitoring modules and will be used to further address the remote health monitoring problems of wider people in UK.

Wider dissemination

We continue our efforts to raise the profile of CheckUp and increase awareness across stakeholders. Two main stakeholder groups were targeted.

The major objectives with Group 1 were to create awareness of the app and to determine whether they were interested in long term partnership with the project.

Figure 1 - Summary of stakeholder groups contacted

Stakeholders from Group 1 suggested that the overall concept of the project was very relevant, appropriate and need-based and particularly focused on the prevailing social, cultural and health care context of the BAME community and the marginalization, vulnerability and exclusion of those communities in UK. The project design matched the priorities and needs to a large extent, particularly related to community awareness and participation in planning, implementing, monitoring and tracking of current HBP/T2D facilities services and entitlements among the BAME community.

Our approach to stakeholders in Group 2 was to engage them via a press release and follow up contact via email. In addition to promoting CheckUp, our objectives included encouraging new participants to sign up for free devices to monitor their HBP/T2D.



Figure 2 - Summary of number of stakeholders contacted

Stakeholder Feedback

ACCM (UK): A UK based charity and an international non-governmental organisation (NGO)

"Since 2008 ACCM (UK) has been raising awareness on various health issues that affect BAME communities and high blood pressure and diabetes are some of the issues that we raise awareness about. We will be happy to help raise awareness on HBP/T2D on our websites, around community centres and everywhere where we can reach BAME people"

Abalon Trust:

"Improving education and healthcare for marginalised communities" Abalon Trust committed to sharing CheckUp Health articles and information on their social media platforms.

Where are we now?

CheckUp Health has delivered encouraging outputs to-date and continues its objective to provide market-leading remote monitoring of HBP/T2D across affected populations.

- Through our Government funded project we engineered significant improvements to the basic CheckUp application, so it meets appropriate standards. A further testing phase of the app is in progress, allowing for completion of clinical risk management ready for go live in a controlled fashion.
- NHS Digital's assessment of CheckUp is now complete and CheckUp Health solutions have been added onto the Digital First online consultation and video consultation framework.
- It was ruled out that the CheckUp Health platform currently was not a device to be regulated by The Medical Device Directive and the Medical Healthcare products Regulatory Agency. However, CheckUp Health as a service is regulated by CQC and this service has since been added as a regulated activity "Treatment of disease, disorder or injury"
- The UK trial of application has been achieved efficiently
- We are engaging with stakeholders and applying for funding which can continue to support this work.

Competitors

Established competitors in the health care sector the focus is to offer pooling of multiple services, reducing waiting times to see a GP or circumventing GPs by recommending visiting a pharmacy based on user inputted data. The pooled services include e-triage, GP video consultations and repeat prescription services, either privately or through the NHS. Competitors within this now crowded space include Push Doctor, Doctorlink, MyGP, Babylon Health, Livi and GoGoDoc. None of these competitors uses remote monitoring for HBP/T2D. US competitor Roche introduced a remote patient monitoring solution for diabetes in September 2020. However, their focus is Type 1 diabetes only and they do not

Use artificial intelligence and machine learning. This makes their solution less attractive than CheckUp health as we aim to make our solution a one stop for monitoring both Diabetes and Hypertension with access to clinician's support within the platform with addition of automated AI driven interventions.

Emerging outfit Medicspot uses off-the- shelf technology (e.g., contactless thermometer, a camera) to examine patients via a video link. This allows them to listen to heart and lung sounds, look into the throat, and measure blood oxygen levels. In a response to customer desire for healthcare on demand, Medicspot partnered with supermarket chain, Asda to trial the remote monitoring technology via in-supermarket GP video consultations. However, Medicspot does not use an app for its remote monitoring, it not listed on the NHS Apps Library nor does it offer remote monitoring for HBP/T2D.

Figure 3 - Competitor comparison table

	CheckUp Health	Medicspot	Roche	Push Doctor	GoGoDoc	Babylon Health	MyGP
Automation	✓	✗	✗	✗	✗	✗	✗
Remote monitoring	✓	✓	✗	✗	✗	✗	✗
Smartphone App	✓	✗		✓	✓	✓	✓
Program Dashboard	✓		✓				
E-triage	✓			✓	✓	✓	✓
Prescription Services	✓	✗	✗	✓	✓	✓	✓
GP video consultation	✓	✓	✗	✓	✓	✓	✓
ORCHA review	✓	✗	✗	✗	✗	✗	✗
NHS login	✓						
PDS access	✓						
NHS digital framework	✓	✗	✗	✗	✗	✗	✗

Media Coverage

Multiple press articles were published on following platforms.

- <https://eminetra.co.uk/remote-monitoring-save-the-lives-of-blacks-asians-and-ethnic-minorities-since-covid-19/238433/?amp=1>
- <https://healthcare-newsdesk.co.uk/remote-monitoring-saving-black-asian-and-minority-ethnic-lives-during-covid-19-and-beyond/>
- <https://mashupmd.com/remote-monitoring-saving-black-asian-and-minority-ethnic-lives/>
- <https://www.healthtechdigital.com/remote-monitoring-saving-black-asian-and-minority-ethnic-lives/>
- <https://thejournalofmhealth.com/remote-monitoring-saving-black-asian-and-minority-ethnic-lives-during-covid-19-and-beyond/>
- <https://publicpolicyprojects.com/newsdit-article/5016cb8679568f5567bf8132325040d0/>
- Digital Healthcare Council- Link on FB
https://pressroom.journolink.com/the-flame-lily-health/release/remote_monitoring_saving_black_asian_and_minority_ethnic_lives_during_covid19_and_beyond_8449

Some Patient Testimonials are found here :
heckuphealth.co.uk/monitor-health-at-home-uk/

Further engagements since completion of the funded project period

Completed ORCHA Review Report is available [here](#)

Completed the Digital First online consultation and video consultation framework.
Reports of solution catalogues can be found [here](#).

Completed the NHS Personal Demographics Service integration acceptance process

NHS login process is now 90% complete as we are awaiting the align agreements only

Exploitation plan and commercialisation

Finding an NHS organisation to run a bigger scale pilot to complete further work on the project remains our biggest challenge. We are currently collaborating with the WMG Institute for Digital Healthcare team, to support the development of strategic partnerships, explore funding opportunities and the rolling out of larger scale trials. The SME Group is supporting the manufacturing process, potentially including peer review, electronic testing, data analysis and implications of AI.

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We have met with Medlink East Midlands Project Lead innovation who are supporting us with introductions and links into Leicestershire NHS Trust, academia support and access to Universities for collaboration.

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We have continued to pursue Bedfordshire University NHS Trust diabetic teams whose patients were part of our pilot for us to engage and plan how we can continue to support this patient group. The most recent communication has been a success as we have now been passed to the right contact who supports this patient group.

We have engaged with our local CCGs and are seeking an opportunity to work with them.

We have received an invitation to add our innovation on the Meridian Innovation Exchange through expression of interest for organisations who are seeking support in this area.