integrated care academy

SiSU Health Stations™ placed in Suffolk and North East Essex Integrated Care System: using a population health management approach

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December 2025

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Acknowledgements

This report compiled by the Integrated Care Academy (ICA) has been made possible by contributions from the project team, including SiSU colleagues Lauren Bolton and Jez Styles, and those working at SNEE ICB including Boena Zeneli and Peter Broughton.

We would like to extend our thanks for the time and insights the project team shared with us throughout the evaluation.

About the Integrated Care Academy

Integrated care is essential to improve outcomes for people requiring coordinated health and care services. To address the key challenges in the wider health and social care system, it is crucial that we enable working across multi-organisational boundaries to bring together all the components of care and support that a person needs. The Integrated Care Academy (ICA) brings together the four pillars of higher education, integrated care board, local authority, and the voluntary and community sector, from which our team of experts and programme leads are drawn.

Our goal at the ICA is to enable the best possible person-centred and integrated care, responsive to the needs of individuals in the context of the people who care for them and the community they live in. We do this through coproduction, education and learning, leadership transformation, workforce development, research and innovation. We strive to make our work practical, useful and useable, grounded in the realities of the challenges faced by our people, communities and workforce on a day-to-day basis.

For more information about the ICA please visit our website.

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Abbreviations

AHP	Allied Health Professionals
BMI	Body Mass Index
BP	Blood Pressure
CVD	Cardiovascular Disease
DSA	Data Sharing Agreement
GP	General Practitioner
HRA	Health Research Authority
ICA	Integrated Care Academy
ICB	Integrated Care Board
IMD	Index of Multiple Deprivation
LSOA	Lower Layer Super Output Area
NHS	National Health Service
NPS	Net Promoter Score
PHM	Population Health Management
ROI	Return on Investment
SNEE	Suffolk and North East Essex
UoS	University of Suffolk

Executive summary

Suffolk and North East Essex (SNEE) Integrated Care Board (ICB) June 2024 – May 2025

SiSU Health Stations™ provide self-service health checks measuring a range of health measures, including blood pressure (BP). Twenty locations across SNEE ICB had SiSU stations deployed using a Population Health Management (PHM) approach to target areas with high hypertension risk and health inequalities. Deployment included two SiSU Mini devices on mobile buses and nineteen static stations across 7 community spaces, 5 libraries, 2 clinical environments, 2 charity services, 1 academic setting, and 1 workplace. Stations were deployed for varying durations.

Overall

- 9,979 individuals completed initial health checks.
- 44.3% of users were from most deprived areas (IMD deciles 1-4).
- 58.1% of users were within the PHM priority group (aged 40+, SNEE residents).

Blood Pressure (BP)

- 1 in 5 users with a BP reading (20.4%) had high-risk BP (≥140–180/≥90–110 mmHg) and 15.4% had at-risk BP (130–139/85–89 mmHg).
- 48.3% of high-risk BP cases (895 of 1,851) were newly identified (no BP check in past 12 months); 56.8% of at-risk BP cases (792 of 1,394) were newly identified.
- Clinical sites detected the highest number of individuals with high-risk BP overall due to highest uptake, however these sites had longer deployment of machines.
- Buses and workplace settings also showed highest detection rates (30-33% high-risk BP).

Locations

- Five locations demonstrated high proportions of both users with high BP (≥25%) and elevated (at-risk) BP (≥15%): Ipswich & East Suffolk Alliance Be Well Bus, North East Essex Open Road Bus, Port of Felixstowe, Newbury Community, and The Stevenson Centre, Sudbury.
- Gainsborough Library, GP Primary Choice in Clacton Hospital, Allied Health Professionals Suffolk CIC (AHP Suffolk) clinics, and Ipswich Community Media engaged users from some of the most deprived areas (IMD 1–2).
- University of Suffolk and Ipswich Community Media reached a higher proportion of users from global majority ethnic groups. Buses and libraries reached older populations, while the Port of Felixstowe and Beacon House reached predominantly male and deprived groups.

Monitoring

- Only 9.5% of users returned for repeat checks (947 individuals). Of these, approximately 31% had high or at-risk BP readings at their first check.
- The highest follow-up rates were at Brandon Library (24.3%), Port of Felixstowe (24.2%), and Gainsborough Library (23.7%).
- Among repeat users, high blood pressure readings decreased from 16.1% to 13.1% between their initial and second SiSU Health check™.

Call to action (suggesting further action needed to be taken)

- Over 1 in 4 (27.6%) users triggered a call to action (elevated BP, BMI, or both).
- The Port of Felixstowe (36.7%) and bus locations (36.6%) had highest call to action rates.

Challenges

- Low repeat usage limits the ability to assess monitoring effectiveness.
- Varied deployment periods across sites complicates comparisons.
- Lack of a comparison group within or outside of SNEE ICS.
- Cannot track post-check actions or pathway engagement from current data.

Recommendations

1. **Deploy based on evidence:** Use evaluation insights to prioritise station deployment based on objective focus, for example: high proportions of newly identified raised BP, strong repeat usage, or engagement with underserved populations.
2. **Increase follow-up:** Implement reminders, incentives, and targeted outreach to boost repeat check rates if monitoring is a target, especially for elevated/high BP users.
3. **Track beyond the check:** Link data on pathway engagement, GP follow-up, and behaviour change to assess long-term health impact.
4. **Standardise evaluation:** Ensure consistent deployment periods and include comparator sites or evidence-based targets to rigorously assess effectiveness.

Conclusion

PHM-informed deployment shows promise for identifying undiagnosed high-risk BP and prompting those with at-risk BP to take preventative action in underserved communities. Follow-up data indicates a slight reduction in BP over time following a SiSU Health station™; however low follow-up rates limit assessment of monitoring effectiveness. Future deployments should focus on locations demonstrating high detection rates, if high detection is the objective, and implement strategies to improve repeat engagement while capturing pathway-level outcomes.

Background

SiSU Health stations™

What are the stations?

SiSU Health provides a digital, preventative health platform built around the SiSU Health Station™, supported by a practitioner portal and a user app. The SiSU Health Station™ is a medically certified, self-service health assessment device that delivers a comprehensive five-minute check requiring no appointment or supervision. Individuals can use the station independently in workplace or community settings to measure and monitor a broad range of health indicators. Two models are available: the SiSU Health Station™ for long-term use in high-footfall locations, and the SiSU Mini™ for portable and remote deployment. Further information is available via the SiSU website.

Findings from the SiSU Health Station™ can trigger signposting to health and wellbeing pathways, configured on the location of the devices. Where appropriate, users can provide consent during the check for a direct referral to a practitioner via the online portal, enabling timely follow-up where clinical support is co-located.

Health checks are recognised as an effective mechanism for detecting undiagnosed conditions and preventing diseases, such as cardiovascular disease (CVD). By enabling earlier identification of conditions such as hypertension, the stations support proactive management and extend access to health checks beyond traditional clinical settings, improving reach within communities.

What do the stations measure?

From improving health outcomes to quantifying return on investment (ROI), SiSU Health provides insights that drive informed decisions and measurable impact.

SiSU Health stations™ collect a wide range of anonymised health, demographic, and engagement data to help organisations understand the wellbeing of their populations and, where relevant, evaluate return on investment. Each standard and mobile health station incorporates class IIa medical devices capable of delivering over 30 health metrics, including blood pressure, BMI, body composition, smoking and alcohol consumption, physical activity, stress levels, and cardiovascular risk. These measures can be tracked over time and are combined with demographic information such as age, sex, ethnicity, and deprivation level, as well as participation patterns, referral rates, and Net Promoter Score (NPS).

Organisations may also include tailored survey questions to gather additional insights. All data is de-identified, aggregated where necessary to prevent re-identification, and

handled in line with strict security and privacy standards. SiSU provides benchmarking against national and industry indicators, longitudinal reporting of risk prevalence, and economic modelling to estimate potential productivity gains and cost savings arising from improved health outcomes.

For this project, the stations collected demographic data (age, sex, ethnicity, outcode (the first part of a UK postcode-outward code), smoking status); health-related data (including height, body , BMI, blood pressure, heart age, QRisk3 score, smoking and vaping status, alcohol consumption, physical activity levels, perceived stress, body composition, medication use, and-where disclosed- pregnancy status); and usage data, such as the date and location of each check, the type of device used, frequency of repeat visits, and engagement with digital tools.

SiSU provides a glossary of its measures which provide definitions and refer to reference range data. This has been included in Appendix 1.

Evidence

There is a wealth of international evidence which demonstrates the safety, accuracy, and real-world acceptability of the SiSU Health stations™, further details of which can be found on the SISU Health website. Recently, a 3-year observational study of SiSU Health stations™ across Australian pharmacies showed the value of community-based, stations in the early detection and ongoing monitoring of hypertension (O'Hagan, 2024). The study also highlighted the need for strategic placement of stations to better serve vulnerable populations, particularly adults over 70 and those living in rural areas.

Stations in Suffolk and North East Essex (SNEE) Integrated Care System (ICS)

Traditional health checks often only reach people who are already engaged with health services (Eberhardt et al., 2025). As a result, they can inadvertently widen health disparities by limiting preventive care for those who may need it most.

In Suffolk and North East Essex (SNEE), a Population Health Management (PHM) approach was used to focus on areas with known health inequalities. This approach aimed to help individuals in these communities, particularly those with previously undiagnosed high blood pressure or elevated BMI, access health checks and receive early intervention.

The PHM approach, derived by the Suffolk County Council Public Health Data Analytics team, analysed linked, person-level data from across health and care services in SNEE ICS. They focused on people aged 40 and over who were registered with a SNEE GP that were not living in care homes. The approach looked at small geographic areas (LSOAs)

to find neighbourhoods with high levels of risk factors for hypertension. The risk factors used are listed below:

Socioeconomic Indicators:

- Living in more deprived areas

Health Indicators:

- Low uptake of Blood Pressure (BP) assessments
- Low uptake of NHS Health Checks
- High prevalence of Hypertension
- High prevalence of Obesity
- High prevalence of Smoking
- History of smoking within the last 15 years

These indicators helped identify the areas with the greatest number of people at risk, where placing a SiSU machine would have the largest impact. To support practical deployment, the team also mapped the locations of libraries and large supermarkets in Suffolk as potential sites for the machines. Each of the three alliances was consulted to validate the approach. A risk stratification process was used to identify priority areas, with the Port of Felixstowe highlighted as a key focus. This was the only community intervention specifically targeting a workforce group rather than the wider public.

SiSU stations collected data that could be used to inform further action. However, there were limitations in the risk factors that could be captured. Areas such as gambling-related harm, were recognised as important, and although could not be included in this model, could be considered in the future.

Aim of the project

Hypertension has risen in SNEE ICS since 2015. The prevalence in SNEE ICS (15.9%) has remained consistently higher than both the regional average (14.3%) and the average for England (14.0%).

The SNEE Integrated Care Board (ICB) Joint Forward Plan 2024–2029 emphasises the need to improve both identification and management of high blood pressure. It states that only around four in ten adults with hypertension are aware of their condition and managing it effectively. A key target in the plan is to ensure that 80% of people with high blood pressure are identified and treated by 2028, with a strong focus on reducing health inequalities in line with the Core20Plus5 approach.

The key aims of the project were:

- Provide more awareness of CVD and risk factors particularly in communities at highest risk of CVD.
- Improve the occurrence and effectiveness of physical Health Checks. People will know their level of risk of developing CVD and if necessary, can access early treatment to prevent developing CVD.
- Improve opportunities for people to check their health provided by the voluntary sector, community pharmacists and GPs.
- Increase the detection of patients with hypertension through case finding interventions including home blood pressure monitoring and PHM tools.

Evaluation

The Integrated Care Academy (ICA) undertook an evaluation of the SiSU Health stations™ deployed across SNEE. The primary focus was to assess how effectively the PHM approach supported the placement of stations to increase uptake of health checks among individuals at highest risk of CVD. The evaluation also examined whether this approach successfully engaged people experiencing health inequalities, particularly those with elevated blood pressure and other CVD-related indicators.

Evaluation questions, framework and design

This service-development evaluation is contextual and not intended to be generalisable beyond the local service setting. In line with Health Research Authority (HRA) guidance, the evaluation was designed to establish the standard of delivery achieved through this intervention and approach. The evaluation also seeks to provide learning to inform future scale and spread and offer locally relevant insights into delivery within SNEE.

The evaluation period spans **1 June 2024 to 31 May 2025**, representing 12 months of high deployment across SNEE.

Data sources

Pseudonymised, individual-level quantitative data collected from the health stations, including demographic variables, biometric, lifestyle factors, usage information and, where available, anonymised follow-up data, was securely shared under the formalised DSA from the data controllers (SiSU Health) to the ICA. This data covered the SiSU health stations™ in SNEE over a year period from June 2024. No additional prospective data was collected by the ICA.

Data parameters

The following data points were excluded from the dataset:

- Data linked to children (individuals under 18 years of age at the time of the checks)
- Single user accounts used by multiple people
- Pregnant users (self-disclosed)
- Repeated checks within an 8-day period

To further reduce the risk of deductive identification, SiSU Health Station™ reports apply in-built thresholds that automatically suppress any breakdowns where the number of health checks falls below ten. Consistent with this approach, all data points falling under this minimum threshold during the evaluation period were excluded from the datasets used in this report.

Evaluation objectives and questions were designed with the project team.

Evaluation objectives

1. Analyse anonymised individual-level data collected by SiSU Health Stations in SNEE
2. Provide an overview of the delivery model in SNEE, giving information on settings, deployment duration, and engagement levels.
3. Identify patterns related to health inequalities, especially uptake and outcomes in deprived areas.
4. Generate recommendations for scaling and targeting future health station deployments.
5. Support economic analysis with the health economist (if appropriate) to assess cost-effectiveness and NHS spend comparison.

Evaluation questions

1. How did uptake and repeat usage vary by location type and user demographics across locations?
2. Which locations were most effective in reaching priority groups identified through PHM?
3. What proportion of users had high BP detected, and among these, how many had undergone a blood pressure check in the previous 12 months (newly identified vs previously known)? Were there any differences between locations?
4. What are the demographic characteristics and CVD risk factors for new and known cases of high BP?
5. Among users with raised BP (elevated and high), how many had multiple visits? Did these differ across station locations?
6. What changes in health indicators were observed across repeat visits?
7. Was the PHM approach effective in supporting hypertension identification and monitoring?
8. Did PHM-informed station deployment contribute towards reducing inequalities in hypertension detection and monitoring? Which locations were most effective?
9. What are the key recommendations for optimising future SiSU station deployment to maximise reach, impact, and health equity?

Evaluation findings

Context for interpretation

During the evaluation period, 21 SiSU health stations™ were deployed across Suffolk and North East Essex (SNEE) Integrated Care System (ICS) using a Population Health Management (PHM) approach. Deployment focused on reducing health inequalities and improving hypertension detection and management, with stations placed in community setting selected to reach underserved groups at highest risk of poor outcomes from hypertension.

Uptake refers to the *number of unique individuals who completed a SiSU health check*™ on a station during the evaluation period, excluding those removed under the data parameters.

Repeat usage refers to the *number of individuals who completed more than one SiSU health check*™ on any station within SNEE ICS during the evaluation period. The count of repeat visits does not include the initial check unless disclosed otherwise.

Nineteen of the 21 stations were static locations, most of which were situated across SNEE ICS. These included seven community spaces, five libraries, three clinical environments, two dedicated charity services, one academic setting and one workplace. One of the charity sites was Beacon House Ministries in Colchester, which provides support for people experiencing homelessness, enabling the project to reach individuals who are often underrepresented in preventive health initiatives. In addition to the static sites, two mobile health buses, the Ipswich and East Suffolk Alliance Be Well Bus and the North East Essex Open Road Bus, were equipped with SiSU Mini™ devices to provide flexible outreach.

Direct comparisons between location types and levels of uptake should be interpreted with caution. Some devices remained in place for the full duration of the evaluation period, whereas others were deployed for shorter timeframes, influencing the opportunity for user engagement (Table 1). Although locations have been grouped into categories for analysis, these categories vary in size; for example, community settings are far more numerous than industrial or academic sites. As a result, differences in uptake may reflect variation in deployment volume and duration as much as differences in user behaviour and should therefore be considered in context.

Note that this report summarises key points for each question, and further data can be explored through the dashboard. Opening the dashboard will allow you to explore the data yourself in more detail.

Table 1: SNEE ICS station locations and deployment duration. ***Month count****

Location type	Location	Start date	Finish date	Month count*
Academic	**University of Suffolk**	07 November 2024	11 April 2025	5
Bus	**Ipswich and East Suffolk Alliance, Be Well Bus**	22 May 2024	05 April 2025	10.5
	North East Essex Open Road Bus	30 October 2024	10 April 2025	5.5
Charity service	**Beacon House, Colchester**	Entire period		12
	The Befriending Scheme	22 January 2025	17 April 2025	3
Clinical	**AHP Suffolk, Ipswich**	Entire period		12
	GP Primary Choice, Clacton Hospital	Entire period		12
	West Suffolk Hospital**	18 July 2024	05 February 2025	7.5**
Community	**The Racing Centre, Newmarket**	23 May 2024	16 April 2025	11
	Newbury Community Centre, Bury St Edmunds	23 May 2024	16 April 2025	11
	Sudbury Art Centre	25 June 2024	16 February 2025	7.5
	Unity Centre, Ipswich	29 May 2024	17 January 2025	7.5
	The Stevenson Centre, Sudbury	21 October 2024	18 April 2025	6
	Community 360, Colchester	25 June 2024	27 February 2025	8
	Ipswich Community Media	22 January 2025	23 April 2025	3
Workplace	**Port of Felixstowe**	29 May 2024	18 October 2024	4.5
Library	**Gainsborough Library, Ipswich**	29 May 2024	09 April 2025	10
	Felixstowe library	24 October 2024	16 April 2025	5.5
	Haverhill Library	23 May 2024	20 October 2024	5
	Brandon Library	21 October 2024	16 April 2025	6
	Sudbury Library	25 February 2025	17 April 2025	1.5

reflects only the time the station was deployed during the evaluation period (1 June 2024 to 31 May 2025), rounded to the nearest whole or half month. West Suffolk Hospital was deployed on two separate occasions; the first is detailed here. An additional period between 31 March 2024 and 16 April 2025 has been included to approximate the total month count.**

Q1: How did uptake and repeat usage vary by location type and user demographics across locations?

User summary

After applying exclusion criteria, across 21 SNEE ICS locations (June 2024–May 2025):

- 11,664 health checks were completed for 9,979 individual users, whose initial checks form the basis of the uptake analysis.
- 1,685 were repeat tests undertaken by 947 individuals, meaning 9.5% of users completed at least one follow-up check during the evaluation period. These 947 users represent repeat usage.
- Repeat users completed between 2 and 15 visits, although the majority (68.6%) returned only once.

Uptake by location

Of the 9,979 individuals completing initial health checks (uptake):

- Clinical locations, Clacton Hospital, AHP Suffolk and West Suffolk Hospital had the highest uptake of users (22.3%, 21.5% and 16.8%, respectively), followed by the Ipswich and East Suffolk Alliance, Be Well Bus (8.2%).
  60.6% of initial checks took place in clinical locations, 11.3% occurred in community settings, 10.8% in libraries, and 9.1% on the mobile bus units.
- Workplace, academic, and charity sites contributed smaller proportions due to fewer deployed stations. Further exploration of categories and uptake can be carried out through the dashboard.

Repeat usage by location

Of the 947 individuals with a repeat check (repeat usage):

- 51.1% of repeat users were in clinical locations.
- Libraries and community spaces had a high proportion of repeat users (20.1% and 14.5%). Considering their comparatively lower footfall and the limited periods during which some stations were available, these figures indicate that

these settings may offer accessible ways individuals can return and monitor their health over time.

Demographic profile of initial users (uptake)

Note: IMD values reflect 2019 data, relevant at the time of deployment.

Of the 9,979 individuals completing initial health checks (uptake):

- Uptake was fairly evenly split by sex (47.3% male; 52.7% female).
- The median age was 45 years.
- The median IMD (indices of deprivation) decile was 5 (IMD 2019).
- 44.3% of initial users (4,422) were from more deprived areas (IMD deciles 1-4).
- 75.3% of users identified as British/English/Northern Irish/Scottish/Welsh. Additionally, 5.6% identified as another White background.
- Uptake from global majority ethnic groups was lower: African 3.6%; Indian 3.2%.
- Among these groups, African, Caribbean, Bangladeshi, and Pakistani users appear to have lower median IMD deciles (3–4) compared with the overall median.

Demographic profile of repeat users

Of the 947 individuals with a repeat check (repeat usage):

- Females accounted for 56% of repeat users.
- Repeat users had a median age of 44 years.
- The median IMD decile was 5, with 48.9% of repeat users (463) from more deprived areas (IMD deciles 1-4).
- African users represented 5% of repeat usage, and Indian users 3%

Demographics across locations

Uptake by location

Across all locations, uptake patterns showed clear demographic distinctions:

- The University of Suffolk (UoS) engaged a young cohort (median age 29, 56% female, 63.2% aged under 35) compared to the average user.
- Buses served an older population (median age 51, 24% aged 65+). Several community and library locations also had older age profiles including The Stevenson Centre, The Unity Centre and Felixstowe Library, with between 19.7% and 30% of users aged over 65.
- As expected, Beacon House reached one of the most deprived and male-dominated groups (median IMD 3, 58.9% in IMD 3, and 73% male). Users at the Port of Felixstowe were also predominantly male (91%).
- High-deprivation groups were also strongly represented in Gainsborough Library (median IMD 3, with 28.0% of users in IMD 1), GP Primary Choice, Clacton

Hospital (23.1% in IMD 1 and 15% in IMD 2) AHP clinics (11.2% in IMD 1 and 14.1% in IMD 2), and Ipswich Community Media (median IMD 2, with over half of users in IMD 1 or 2 (52.3%).

- Ethnically diverse populations were reached particularly at University of Suffolk (10.8% African, 9.4% Pakistani, 6.6% another White background, 5.5% Indian), and Ipswich Community Media. However, this was a very small cohort (n=42) (20.5% Indian, 17% another White background, 15.9% African users and 15.9% British).

Repeat usage by location

Repeat usage varied considerably by location type.

- The highest rates of repeat users were observed in workplace settings (21.4%) and libraries (17.6%), both of which offered stable access points that supported continued engagement, particularly among deprived groups.
- Repeat users at AHP clinics (clinical) and Gainsborough Library were notably more deprived than those at initial checks, with 39% and 43.7% respectively in IMD deciles 1–2.
- Younger individuals demonstrated good follow-up at UoS, where 12.5% of users returned and 36% of these follow-up users were aged 16–24, and Sudbury Library, where the follow-up median age dropped from 52 years at first check to 35 years at follow-up. Younger individuals demonstrated good follow-up at University of Suffolk, where 12.5% of users returned and 36% of these follow-up users were aged 16–24, and Sudbury Library, where the follow-up median age dropped from 52 years at first check to 35 years at follow-up.
- Mobile locations demonstrated the lowest follow-up (4.7% on buses).

These findings highlight that clinical sites, libraries, and community settings are key in reaching diverse populations, including younger users, older adults, and those from more deprived areas. Mobile services engage older users but offer limited opportunities for repeat monitoring. Repeat checks were most common in fixed locations such as workplace sites and libraries, suggesting that accessible, consistent settings support ongoing health monitoring, particularly for younger and more deprived groups.

Q2: Which locations were most effective in reaching priority groups identified through PHM?

The PHM approach aimed to reach priority group of people aged 40 and over who were registered with a SNEE GP that were not living in care homes. The data collected includes age and outcode, which can be mapped to understand the proportion of users who disclosed an address in SNEE, and thus it is assumed that they are registered, or have the option to register with a SNEE GP. The 'priority group' includes those with a SNEE outcode and who are 40 years or over at the time of the test and can be used as a filter on the dashboard.

From the 9,979 individuals who had an initial check:

- 9,286 (93%) had a SNEE address
- 5,802 (58.1%) were within the 'priority group'.

Comparisons between locations should be interpreted with caution due to substantial variation in sample sizes (ranging from 23 to 2,226). Locations with the highest proportion of users within the priority group at the initial health check included:

- Clinical: GP Primary Choice, Clacton Hospital (74.2%), AHP Suffolk, Ipswich (58.7%)
- Buses: Ipswich & East Suffolk Alliance, Be Well Bus (65.5%); North East Essex Open Road Bus (65.9%)
- Workplace: Port of Felixstowe (64.8%)
- Community: Unity Centre, Ipswich (63.3%); The Stevenson Centre, Sudbury (69.3%); Community 360, Colchester (60.0%)
- Libraries: Felixstowe Library (63.2%); Sudbury Library (61.7%)(Table 2).

Table 2: Number of individuals completing an initial check at each location and the number and percentage who fell within the priority group (defined as users aged 40+ and reporting a postcode within SNEE). Percentages represent the proportion of priority-group users out of total uptake for each location. Locations with % uptake in priority group higher than the overall average (53.5%) are highlighted in blue.

Location type	Location	Uptake No.	Uptake No. within priority group	% of uptake in priority group
Academic	**University of Suffolk**	288	65	22.6%
Bus	**Ipswich and East Suffolk Alliance, Be Well Bus**	823	539	65.5%
Bus	**North East Essex Open Road Bus**	88	58	65.9%
Charity service	**Beacon House, Colchester**	311	147	47.3%
Charity service	**The Befriending Scheme**	23	8	34.8%
Clinical	**AHP Suffolk, Ipswich**	2144	1258	58.7%
Clinical	**GP Primary Choice, Clacton Hospital**	2226	1,651	74.2%
	West Suffolk Hospital	1674	787	47.0%
Community	**The Racing Centre, Newmarket**	396	184	46.5%
Community	**Newbury Community Centre, Bury St Edmunds**	266	121	45.5%
Community	**Sudbury Art Centre**	160	83	51.9%
Community	**Unity Centre, Ipswich**	98	62	63.3 %
Community	**The Stevenson Centre, Sudbury**	88	61	69.3 %
Community	**Community 360, Colchester**	75	45	60.0 %
Community	**Ipswich Community Media**	44	23	52.3%
Workplace	**Port of Felixstowe**	196	127	64.8%
Library	**Gainsborough Library, Ipswich**	357	180	50.4%
Library	**Felixstowe library**	285	180	63.2 %
Library	**Haverhill Library**	225	105	46.7%
Library	**Brandon Library**	120	56	46.7%
Library	**Sudbury Library**	94	58	61.7%

Q3: What proportion of users had high blood pressure (BP) detected, and among these, how many had undergone a BP check in the previous 12 months (newly identified vs previously known)?

Were there any differences between locations?

Blood pressure (BP) measurements were recorded for 9,064 of the 9,979 individuals attending an initial health check (90.8% of the cohort). This analysis focuses on this uptake data only, rather than repeat usage, which will be addressed in later questions. Using SiSU risk thresholds (see Appendix A), BP readings were categorised into three risk threshold groups for this report:

- **Normal (low-risk)**: 90–129/60–84 mmHg
- **Elevated (at-risk):** 130–139/85–89 mmHg
- **High (high-risk)**: ≥140–180/≥90–110 mmHg

It is estimated that 34% of the SNEE ICS population have undiagnosed hypertension (SNEE Joint Forward Plan). Of those with a recorded BP measure (9,064):

- 64.2% (5,819) had normal (low-risk) BP
- 15.4% (1,394) were in the elevated (at-risk) range
- 20.4% (1,851) had high (high-risk) BP

New and known high and elevated BP
For this report, individuals with elevated or high BP who reported a BP check within the previous 12 months were classified as 'known' cases, while those without a recent check were 'new' cases. This categorisation was created for this evaluation and was not part of SiSU standard reporting. It assumes that individuals with a recent BP check would likely have been aware of any elevated readings, though this may not apply to all.

- Of the 1,851 users with high BP, 51.6% (956) were 'known' and 48.4% (895) were 'new'.

- Of the 1,394 users with elevated (at-risk) BP, 43.2% (602) were 'known' and 56.8% (792) were 'new'. (Appendix B, Table 1)

High and elevated (at-risk) BP by location

- Five locations demonstrated high proportions of high BP (≥25% of all users), suggesting effective targeting and allocative efficiency. These locations were: Ipswich & East Suffolk Alliance Be Well Bus (32.9%), North East Essex Open Road Bus (30.7%), Port of Felixstowe (30.6%), Newbury Community Centre (25.9%), and The Stevenson Centre, Sudbury (25.0%). Note that the proportions of high and elevated (at-risk) users, taken from the number of users at each location with a BP reading, are detailed in Figure 1.

- In contrast, some high-volume clinical sites, such as AHP Suffolk (18.6%) and West Suffolk Hospital (11.8%), while identifying more absolute cases, represented a lower proportion of high BP users, suggesting that smaller, strategically placed sites may provide greater efficiency per user for detecting high-risk individuals.

- Uniquely, GP Primary Choice, Clacton Hospital demonstrated fairly high proportion of high BP (23.9% of total users), and high volume of overall users.

- By location type, buses and workplace had the greatest high BP rates (32.7% and 30.6%, respectively). The mobile units on bus services identified notable proportions of raised BP, with 32.7% of bus users with high BP and 20.7% having an elevated BP.

- Out of the users identified to have a high BP, the highest proportions which were 'known' were seen in academic, bus and charity locations (57.4-66.7%) while 'new' cases were most frequent in clinical, community spaces, libraries, and were highest at the Port of Felixstowe (60%). (see Appendix B, Table 2)

- Seven individual locations had ≥15% of all users with elevated (at-risk) BP. These locations were similar to the sites of greatest high BP rate, with the addition of the Befriending scheme which should be interpreted cautiously due to the small number of users (n=19). These locations mirrored the sites of greatest high BP rate, with the addition of GP Primary Choice Clacton Hospital, and the Befriending scheme, which should be interpreted cautiously due to the small number of users (n=19). These locations were: North East Essex Open Road Bus (29.5%), The Stevenson Centre, Sudbury (22.7%), Ipswich & East Suffolk Alliance Be Well Bus (19.8%), The Befriending Scheme (17.4%), Port of Felixstowe (19.9%), and GP Primary Choice Clacton Hospital (15.6%).

- Identifying elevated blood pressure (BP) in users provides a valuable preventative opportunity through the SiSU Health Check™, particularly for newly detected

cases. At all locations except University of Suffolk, over 50% of elevated BP cases were new (see Appendix B, Table B3).

- At the Port of Felixstowe, a high proportion of cases were newly identified: 60% for high BP and 64% for elevated BP (see Appendix B, Tables B2 and B3).
- Overall, 68.4% (1,266) of high BP users and 79.6% (1,110) of users with elevated BP were not on BP medication.

These findings highlight the burden of undiagnosed or unmanaged hypertension and highlight the value of identifying both high and elevated BP through community-based screening, enabling early intervention to prevent progression.

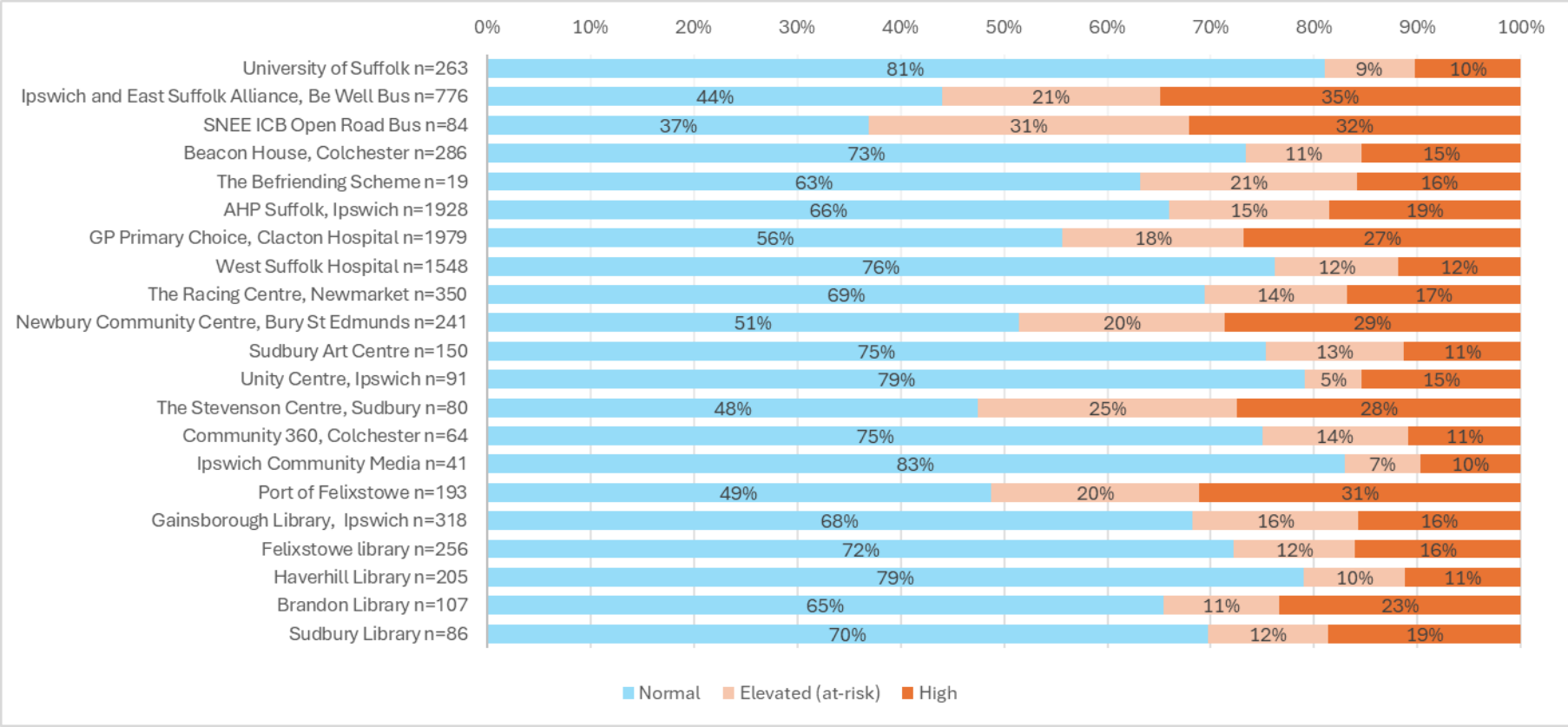


Figure 1: Proportion of users at each SiSU Health Station™ location with normal (90–129/60–84 mmHg, blue), elevated (130–139/85–89 mmHg, light orange), or high (≥140–180/≥90–110 mmHg, dark orange) blood pressure readings. N= total users with a recorded BP measure at each location

Q4: What are the demographic characteristics and CVD risk factors for new and known cases of high risk blood pressure?

Of the 1,851 individuals with a high BP measure at their initial check, 51.6% (956) were 'known' and 48.4% (895) were 'new', as defined in question 3. 1,394 individuals had a BP reading falling into the elevated (at-risk) category, with 43.2% (602) 'known' and 56.8% (792) 'new'.

Demographics and CVD risk factors for users with elevated, high, and normal BP are shown in Table 3. An overview of findings is outlined below, but further data can be explored on the dashboard.

Demographics and BP categories

- Male proportion was lower in normal BP groups (43.4-46.2%) compared to elevated and high BP groups (51-53.3%).
- Median age generally rose with BP severity, indicating an age-related gradient in BP risk. Individuals with known cases of elevated and high BP were older than those with new cases.
- The proportion of individuals from more deprived areas (IMD 1–4) increased with BP severity, rising from 42.5% in those with normal BP with no check, to 47.2% for known high BP.
- Ethnicity profile was broadly consistent across all groups, with the proportion of British individuals highest for known high BP (79.5%).
- The median IMD decile of 5 was consistent throughout these groups.
- The highest proportion of people living in SNEE ICS and in the priority group were within known elevated and known high BP groups.

Risk factors and BP categories

Limited completion and measures to reduce deductive identification meant that the analysis of alcohol risk and physical activity level would not be reflective. At the time of writing, only 3.5% data points for alcohol level and 44.7% for physical activity level were recorded. These points therefore have been excluded from this report.

Smoking status:

- Proportions of current and former smoking rates between those with normal BP and high BP users were similar, with current smokers lowest in known high smokers (12%).

BMI:

- The proportion of very high and high BMI was highest in new and known high BP users (44.0-48.9%).
- Users with normal BP had high levels of elevated BMI (36.6-39.9%).

BP medication:

- As expected, BP medication was highest in known cases of high BP (47%) and elevated BP (35.4%) compared to new cases (9.3-16.3%).

Locations:

Further breakdown of users with high, elevated and normal BP readings for each location, and for each location type can be found in the dashboard. Further breakdown of users with high, elevated and normal BP readings for each location, and for each location type can be found in the dashboard.

Table 3: Demographic characteristics and risk factors by blood pressure category at initial SNEE ICS SiSU checks (uptake). Categories are defined as "known" (BP check in past 12 months) or "new" (no prior check). N values indicate the number of individuals in each category, although not all individuals provided a measure.

Characteristic or Risk Factor	Normal BP no BP check (n=3,912)	Normal BP with BP check (n=2,178)	New Elevated BP (n=807)	Known Elevated BP (n=642)	New High BP (n=909)	Known High BP (n=1,005)
Sex (% male)	46.2%	43.4%	52.7%	53.3%	53.0%	51.0%
Median age	39	47	45	56	52	58
% within IMD 1-4	42.5%	42.9%	45.4%	42.4%	46.2%	47.2%
Ethnicity (% British)	74.3%	76.4%	77.9%	76.9%	77.9%	79.5%
% within SNEE	91.3%	93.4%	93.3%	94.7%	94.6%	96.9%
Priority group (% SNEE + 40+)	43.8%	62.7%	58.5%	79.2%	72.1%	85.2%
Smoking – former (%)	25.2%	30.4%	31.6%	33.7%	27.5%	28.8%
Smoking – current (%)	19.0%	16.2%	16.0%	13.6%	16.2%	12.0%
BMI – high or very high (%)	26.5 %	31.1%	47.5%	44.0%	48.9%	48.8%
BMI - elevated (%)	36.6%	39.9%	34.6%	34.9%	31.3%	37.0%
On BP medication (%)	3.6%	18.0%	9.3%	35.4%	16.3%	47.0%

Q5: Among users with raised BP (elevated and high), how many had multiple visits?

3,245 users were classified as having raised BP (elevated or high) at their initial health check, with 9% (293) returning for at least one further health check. Only 3% of these users returned for 2 or more health checks after their initial visit.

Follow-up engagement (at least one further check) was slightly higher for those with elevated BP (10%) and normal BP (10%) than those who were high BP (8%).

Did these differ across station locations?

In this section, data is combined for individuals with 'known' and 'new' high or elevated BP for each station, due to the small sample sizes. Repeat usage for individuals within each BP category at each location are shown in Table 4.

The highest rate of repeat users were recorded at:

- Stations situated at Workplace (24%), Library (17%) and Academic (16%) locations.
- Brandon Library (24.3%), Port of Felixstowe (24.2%), and Gainsborough Library (23.7%).

Several locations demonstrated consistently strong follow-up engagement for both elevated BP and high BP users:

- Brandon Library had the highest return rate overall, with 33.3% of elevated BP users and 20.0% of high BP users returning.
- Port of Felixstowe (Workplace) also showed strong engagement (elevated BP 20.5%, high BP 26.7%).
- Gainsborough Library and Felixstowe Library similarly recorded high return rates for elevated BP users (~17-20%), with strong repeat use among high BP users at Gainsborough (28%) and less so at Felixstowe (9.8%).
- Community sites such as The Racing Centre and The Stevenson Centre also showed above-average repeat engagement for both groups (~14-17%).
- Clinical sites provided high footfall locations for initial health checks, detecting a large number of users (1903) with high or elevated BP. However, repeat usage was lower at these locations for both elevated and high BP users (5-9%).

Table 4: Return rates (%) by location and initial BP category. Percentages show the proportion of individuals within each BP category (at their first check) who completed a follow-up visit during the evaluation period. Dashes denote categories where no percentage is applicable.

Location type	Location	Normal BP	Elevated BP	High BP
Academic	University of Suffolk	13.1%	13.0%	18.5%
Bus	Ipswich and East Suffolk Alliance, Be Well Bus	6.1%	2.5%	3.0%
	North East Essex Open Road Bus	3.2%	15.4%	3.7%
Charity service	Beacon House, Colchester	10.0%	25.0%	9.1%
	The Befriending Scheme	–	–	–
Clinical	AHP Suffolk, Ipswich	7.8%	8.1%	7.0%
	West Suffolk Hospital	8.2%	7.0%	5.5%
	GP Primary Choice, Clacton Hospital	10.9%	7.8%	9.0%
Community	The Racing Centre, Newmarket	12.3%	20.8%	13.6%
	Newbury Community Centre, Bury St Edmunds	8.1%	20.8%	10.1%
	Sudbury Art Centre	6.2%	10.0%	–
	Unity Centre, Ipswich	16.7%	20.0%	–
	The Stevenson Centre, Sudbury	26.3%	10.0%	18.2%
	Community 360, Colchester	12.5%	11.1%	14.3%
	Ipswich Community Media	8.8%	33.3%	–
Workplace	Port of Felixstowe	18.1%	20.5%	26.7%
Library	Gainsborough Library, Ipswich	20.3%	19.6%	28.0%
	Felixstowe library	20.5%	16.7%	9.8%
	Haverhill Library	9.3%	5.0%	13.0%
	Brandon Library	31.4%	33.3%	20.0%
	Sudbury Library	16.7%	20.0%	–

Q6: What changes in health indicators were observed across repeat visits?

This section provides an overview of users with at least one repeat visit and a BP measure at both initial and repeat check time points (n=815). Although this subgroup represents the majority of repeat users (86.1%) it remains substantially smaller than the total user population; therefore, findings should be interpreted cautiously. Only health measures with sufficient completion rates were included in the analysis.

Increasing the proportion of users who return for a repeat check would substantially enhance the analytical value of the dataset by expanding the sample size and improving confidence in any observed trends. It is also important to recognise that these measures were evaluated over a one-year period, which may limit the extent of measurable change and should be considered when interpreting results.

BP

A slight overall improvement in BP profiles was noted at follow-up.

- The proportion of users with high readings decreased from 18.2% at the initial check to 15.1% at repeat check, while the proportion with readings in the normal range increased from 67.2% to 69.6%. No statistical analysis has been carried out on these data; however these changes are small and unlikely to be statistically significant given the limited sample size.
- Increased uptake of repeat checks would enhance the robustness of future analyses and support clearer interpretation of trends.

Smoking status

Patterns in smoking status was similar across initial and repeat visits.

- The proportion of current smokers declined marginally (14.1% to 13.6%), accompanied by a slight increase in former smokers (27.9% to 29.1%) and a small decrease in non-smokers (58.0% to 57.3%).
- These variations are minimal and unlikely to represent meaningful change.

Q7: Was the PHM approach effective in supporting hypertension identification and monitoring?

Assessing the effectiveness of the PHM approach in supporting hypertension identification and monitoring is challenging due to several limitations. These include varied deployment periods across locations, uneven distribution of sites across alliances and setting types, the absence of predefined targets or a comparison group of non-PHM SiSU stations within SNEE ICS, and a low proportion of follow-up users- likely influenced by the one-year evaluation window.

Identification

During the evaluation period, 9,979 adults across SNEE ICS undertook an initial SiSU Health check™. 5,802 of these individuals (58.1%) were within the 'priority group' identified through the PHM approach. Of those with a recorded BP measure at the initial check (9,064), the SiSU Health Checks™ identified that 15.4% of users (1,394) had BP in the elevated (at-risk) range and 20.4% (1,851) were in the high range. Many of these at-risk and high users had not had a BP check in the previous 12 months, 56.8% (792) and 48.4% (895), respectively.

As a broad comparator, SiSU's snapshot of leisure-based users in SNEE ICS (n=4,338) showed only 7.4% with high BP, compared with 20.4% in the PHM-aligned cohort. This suggests that PHM-informed deployment may have successfully reached individuals with higher need for hypertension detection.

Locations with the highest proportions of users with elevated and high BP were buses and workplace (Port of Felixstowe) settings. 'New' cases were notable across settings other than academic, indicating these locations may be particularly effective for community-based detection of both high BP and elevated BP, supporting a preventative approach aligned with the NHS Fit for the Future: 10 Year Health Plan for England.

Furthermore, 26.6% of individuals completing an initial SiSU Health Check™ triggered a 'call to action', signalling either elevated blood pressure, elevated BMI, or both.

A call to action is when a user records a high BP (140+/90+) or BMI (35+), prompting the health station to recommend they see their doctor or pharmacist, with that recommendation logged in the dataset but not triggering any clinical pathway.

Certain locations demonstrated particularly strong performance and value for identification: workplace (36.7%) and bus locations (36.6%) had the highest proportion of users triggering a call to action (Table 5).

Table 5: % of individuals from each location which triggered a 'GP call to action' following their initial health check. N values indicate the number of individuals at each location for the initial checks, uptake (total n=7,755).

		Call to action trigger			
Location type	**Uptake**	**Blood pressure only**	**BMI only**	**Blood pressure and BMI**	**Combined all GP call to action**
Academic	288	7.6%	8.7%	1.7%	18.1%
Bus	911	28.8%	3.8%	4.0%	36.6%
Charity service	334	12.0%	6.9%	2.1%	21.0%
Clinical	6044	13.1%	10.4%	4.6%	28.1%
Community	1127	14.3%	7.8%	2.8%	24.8%
Workplace	196	20.9%	6.1%	9.7%	36.7%
Library	1081	11.4%	9.2%	3.0%	23.5%

Monitoring

Effectiveness of repeat BP monitoring is difficult to assess. Across the full cohort, only 947 of 9,979 users (9.5%) returned for a repeat check within the evaluation period. Libraries and community spaces demonstrated higher proportions of returning users (20.1% and 14.5%), highlighting their potential as accessible locations for community-based monitoring. However, their user demographics tended to skew to an older population, which may limit the impact of monitoring compared with sites attracting younger populations (e.g., Port of Felixstowe, University of Suffolk).

Overall, of those with a high or elevated BP, only 9.1% returned for at least one further check. Within the subset of repeat users with BP readings at both time points, the proportion with high BP decreased from 18.2% at baseline to 15.1% at follow-up. However, the small sample size limit analysis of this change. Additionally, SiSU data does not capture any post-check actions taken by users, meaning that behaviour change, clinical follow-up, or pathway engagement cannot be assessed.

To determine the PHM approach's impact on hypertension monitoring more robustly, longer deployment periods, larger proportion of returning users, consistent implementation across sites, clearer success metrics, and the inclusion of a comparison group would be recommended. In addition, future evaluation should incorporate pathway-level or behaviour-change measures, allowing assessment of how initial detection impacts users.

In summary, while the PHM-informed placement of SiSU stations appears promising for identification of those with high BP and at-risk, particularly in workplace and bus settings, the current evidence base is insufficient to judge effectiveness in ongoing monitoring. Standardised implementation periods, clearer success measures, comparative groups, and longitudinal tracking including pathways or behaviour change measures could meaningfully assess the contribution of the PHM approach to hypertension detection and management.

Q8: Did PHM-informed station deployment contribute towards reducing inequalities in high BP detection and monitoring? Which locations were most effective?

It is also challenging to assess whether PHM-informed station deployment reduced inequalities, due to the limited evaluation period and low follow-up rates. The data provides useful insights into how deployment targeted areas of need and reached diverse communities.

To optimise deployment, future stations could be sited in locations with the highest proportion of users with elevated or high BP. In this evaluation, these included the North East Essex Open Road Bus, The Stevenson Centre, Ipswich & East Suffolk Alliance Be Well Bus, and the Port of Felixstowe. The Befriending Scheme also captured a high proportion of elevated BP users, although total user numbers were small.

Stations with long-standing presence in high-footfall clinical settings such as GP Primary Choice Clacton Hospital, AHP clinics and West Suffolk Hospital identified the highest absolute numbers of high BP and at-risk users, though these sites primarily reach populations already connected to healthcare with previous BP checks within the past 12 months (lower proportion of 'new' cases).

PHM deployment also supported engagement with diverse or underserved communities, though uptake was sometimes limited. It is difficult to assess without direct comparisons with non-PHM locations, or specific targets for engagement. Certain locations in this project reached groups that may not access health checks within clinical services, for example:

- High deprivation groups: Gainsborough Library, GP Primary Choice Clacton Hospital, AHP clinics, and Ipswich Community Media engaged users from some of the most deprived areas (IMD 1–2).
- Global majority ethnic groups: The University of Suffolk and Ipswich Community Media reached a higher proportion of users from global majority ethnic groups.
- Age and gender: Buses and libraries reached older populations, while the Port of Felixstowe and Beacon House reached predominantly male and deprived groups; the University of Suffolk reached younger adults.

Repeat usage within these groups was encouraging, suggesting potential ongoing engagement. User engagement at these locations may also have impacts beyond measurable repeat checks, including through longitudinal pathways or qualitative feedback.

SiSU's national follow-up survey, while not SNEE-specific, indicates perceived value, such as increased motivation to manage health and awareness of prior NHS Health Checks. Linking these insights with demographic and deployment data in future evaluations could provide further understanding of reach into underserved communities.

Going forward, station deployment should be guided by identified need, with clear impact measures, to maximise reach and support equitable hypertension detection.

Q9: What are the key recommendations for optimising future SiSU station deployment to maximise reach, impact, and health equity?

To ensure future projects are effective and measurable, it is essential to define clear objectives and success indicators from the outset. This will aid future evaluation and research. The recommendations from this evaluation are summarised below:

1. **Deploy stations based on data-driven need**
   Depending on future objectives and targets of the PHM approach, use evaluation findings to prioritise locations with high initial uptake, high numbers of newly identified raised BP, strong repeat usage, or engagement with diverse or underserved populations. Examples include clinical and bus settings for high uptake, workplace settings such as the Port of Felixstowe for new hypertension cases, and Beacon House for reaching diverse communities. Consider extending deployment duration in areas with lower current uptake to improve reach.

2. **Increase follow-up engagement**
   The data suggests slight improvements in BP among users who return for repeat checks, but overall repeat usage is low, limiting statistical analysis of these findings. Implement targeted strategies such as reminders, incentives, or outreach to encourage follow-up visits, particularly for users with elevated or high BP. Encouraging follow-up in elevated BP users could boost preventative impact. This will enable more robust tracking of health outcomes over time, and validation of any improvement.

3. **Monitor impact beyond the health check**
   Collect and link data on pathway engagement, behaviour change, or follow-up actions to station locations. This will provide insights into long-term health impact, particularly when repeat usage is low, and allow assessment of whether initial detection leads to meaningful changes in health management. This is especially important to give insights on diagnosis, optimisation of BP and treatment.

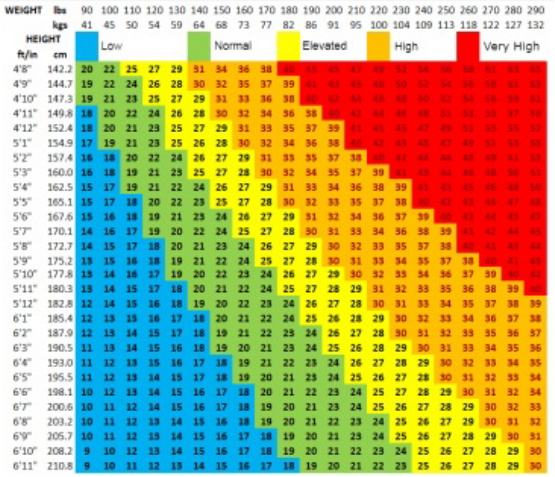
4. **Standardise deployment and incorporate comparators**
   Ensure consistent deployment periods and a balanced distribution of sites to facilitate meaningful comparisons. Include alternative deployment strategies as comparators to accurately assess the impact of PHM-informed placement on health outcomes.

Appendix A

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
Age	The age of the participant in years. Participants must be a minimum of 16 years of age.	**Measurement Method:** Self-reported - calculated from Date of Birth as supplied by the user. **Output Metric:** Integer (years)	**Output Metric Range:** 16+ years	The lower age limit has been implemented to comply with regulation regarding age of consent for individuals to generate and store personal and sensitive information. Additionally, the Health Check results may not be physiologically relevant to individuals under the age of 16 years.
AUDIT-C	The AUDIT-C is a 3-item alcohol screen that can help identify persons who are hazardous drinkers or have active alcohol use disorders (including alcohol abuse or dependence). The AUDIT-C is a modified version of the 10 question AUDIT instrument.	**Measurement Method**: Self-reported answers to the following questions: 1. How often do you have a drink containing alcohol? 2. How many units of alcohol do you have on a typical day? 3. How often do you have 6+ units of alcohol if female, or 8+ units if male, on one occasion?	**Risk Thresholds:** No Risk: 0 Low Risk: 1-4 Elevated Risk: 5-7 High Risk: 8-10 Very high Risk: 11-12 **Questions** / **Scoring system** 0 / 1 / 2 / 3 / 4 How often do you have a drink containing alcohol? — Never / Monthly or less / 2 to 4 times per month / 2 to 3 times per week / 4 or more times per week How many units of alcohol do you drink on a typical day when you are drinking? — 0 to 2 / 3 to 4 / 5 to 6 / 7 to 9 / 10 or more How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year? — Never / Less than monthly / Monthly / Weekly / Daily or almost daily	**Range:** 0-12
Body Fat %	Refers to the percentage of an individual's body mass which comprises adipose tissue, or fat.	**Measurement Method:** Machine generated - Bio-electrical impedence provides a prediction of body fat % by running a light electrical current through the body. It is considered to be the quickest, easiest and most practical method for a user on a self-service device. **Output Metric:** % (to single decimal place)	A high body fat percentage is associated with an increased risk of stroke, high blood pressure, heart disease, type 2 diabetes and certain types of cancer. **Body Fat Ranges for Standard Adults** Gender / Age / Low (BMI < 18.5) / Normal (BMI 18.5-24.9) / High (BMI 25.0-29.9) / Very High (BMI 30) Female / 20-39 / < 21.0 / 21.0-32.9 / 33.0-38.9 / 39.0 Female / 40-59 / < 23.0 / 23.0-33.9 / 34.0-39.9 / 40.0 Female / 60-79 / < 24.0 / 24.0-35.9 / 36.0-41.9 / 42.0 Male / 20-39 / < 8.0 / 8.0-19.9 / 20.0-24.9 / 25.0 Male / 40-59 / < 11.0 / 11.0-21.9 / 22.0-27.9 / 28.0 Male / 60-79 / < 13.0 / 13.0-24.9 / 25.0-29.9 / 30.0 * Based on NIH/WHO guidelines for BMI * Based on gallagher et al., American Journal of Clinical Nutrition, Vol.72, Sept. 2000	**Range:** 4 - 50% **Risk Thresholds:** Refer to table below

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
Blood Pressure (BP)	Blood pressure (BP) refers to how much pressure there is inside arteries as they pump blood around the body. BP is recorded as two figures: **Systolic Pressure**: The pressure of the blood when the heart beats to pump blood out. **Diastolic Pressure**: The pressure of the blood when the heart rests in between beats.	**Measurement Method:** Machine generated - SunTech Blood Pressure Cuff. **Accuracy:** Meets AAMI SP10-2002, EN 1060-4, ISO 81060-2. Clinically validated oscillometric measurement technique. **Output Metric:** Millimetres of Mercury (mmHg)	**BP Range:** Systolic: 40-260mmHg Diastolic: 20-200mmHg, +/-3mmHg **Risk Thresholds:** Ideal: 90-119/60-79mmHg Normal: 120-129/80-84mmHg At Risk: 130-139/85-89mmHg High: 140-159/90-99mmHg Very high: 160-179/100-109mmHg Severe: ≥180/≥110mmHg	Blood Pressure Association UK http://www.bloodpressureuk.org/BloodPressureandyou/Thebasics/Bloodpressurechart
Body Mass Index (BMI)	BMI compares an individual's weight to their height in order to determine whether the individual is in a healthy weight range for their height.	**Measurement Method**: Calculation from Body weight (kg) / height (cm), squared (2) **Output Metric:** Kilograms per meter (kg/m^2) to single decimal point	**Risk Thresholds:** Low: <18.5 kg/m^2 Normal: 18.5 - 24.9 kg/m^2 Elevated: 25 - 29.9 kg/m^2 High: 30-34.9 kg/m^2 Very High: ≥35 kg/m^2	
Deductive Identification	SiSU Health Group only produces reports using deidentified, aggregated data from its Members. In some cases, where there is a low number of employees/health checks at a given location, and/or where there is a significant gender skew, there is a potential risk that the identity of individuals could be deduced by the employer from the health profile presented in the report.	SiSU Health Group has determined that if the total number of Health Checks per gender, per location in a report is less than 10*, then that cohort shall be supressed in the rating breakdown analyses for **Blood Pressure Risk Ratings**, **BMI Risk Ratings**, **Smoking Risk Ratings** and **Body Fat % Risk Ratings.** *threshold can be adjusted on request	A cohort of males / females at a given organisation location must have recorded at least 10 health checks in order for SiSU Health Group to report the "At Risk" prevalence figure, and rating breakdowns for each health risk.	For example, if **Office A** had recorded only 5 blood pressure checks from females, the prevalence of high blood pressure and the breakdown of blood pressure ratings for females at Office A would not be presented in the report. This avoids the situation where if all 5 health checks recorded high BP, the company could then deduce those inividuals' blood pressure status.

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
GICS	**Global Industry Classification Standard** GICS is an industry taxonomy for classifying companies. The structure consists of 11 sectors, 24 industry groups, 68 industries and 157 sub-industries. SiSU Global Industry Benchmarking™ uses the GICS as a basis, with an additional branch for classifying federal, state and local government employers.			https://en.wikipedia.org/wiki/Global_Industry_Classification_Standard
Health Check	A Health Check is a record of engagement by an individual with the SiSU Health Station, where a minimum of one machine-generated measurement (blood pressure/heart rate/height/weight) has been completed.	**Measurement Method:** Distinct Count of Health Check ID **Output Metric:** Integer ..	N/A	SiSU Health Group's key measure of engagement and utilisation of its SiSU Health Stations.
Health Outcome Analysis	Health Outcome Analysis is an analysis of all registered participants who have completed a minimum of two (2) SiSU Station health checksin their history with SiSU Health Group. It calculates the difference (delta) in measures between an individual's first and last health check. Depending on the metric being analysed, up to 6 separate filters are applied to exclude noise (pregnant women, shared user accounts etc) It is calculated from initial and most recent health check across participants' entire SiSU Health Group history, regardless of any specific date range or SiSU Station location.	**Measurement Method:** The initial and current measurement per health metric are compared for the qualifying cohort of repeat Members for each health metric (e.g weight, BP risk, total risks). Cohort qualifying criteria vary for each metric (for example, Members who have ever declared pregnancy in any Health Check are excluded from all analysis except smoking). **Output Metric:** **Blood pressure**: initial and current prevalence of At Risk BP; and BP category distribution **Body Fat %**: initial and current prevalence of At Risk BF%; and BF% category distribution **Smoking:** initial and current prevalence of smoking **BMI:** initial and current prevalence of At Risk BMI; and BMI category distribution **Weight:** overall net change in weight for the cohort; average weight change per user (weight gainers vs weight losers)	**Output Metric Range:** For an individual: unlimited - within the range of human physiology. For a population: unlimited - based on the *n* of the cohort.	Provides definitive measurement of change in a number of health measures over time, for a qualifying cohort.
Health-related Productivity Cost Analysis	SiSU Health Group applies findings from multiple researches to caculate lost productivity costs from absenteeism and presenteeism associated with high blood pressure, obesity, smoking and diabetes respectively.	**Output Metric:** Interger (£)	N/A	

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
Height	The height of the individual using the SiSU Health Station while in a standing position.	**Measurement Method:** Machine generated - HRLV-MaxSonar®- EZ™ Series Ultrasonic Range Finder **Accuracy:** 1mm **Output Metric:** Centimetres (cm) to single decimal point	**Height Range:** 80-200cm **Risk Thresholds:** N/A - Refer to Body Mass Index	Height is relevant to the calculation of the Body Mass Index (BMI).
Index of Multiple Deprivation (IMD) Quintile	The Index of Multiple Deprivation (IMD) is the official measure of relative deprivation for small areas in England. SiSU Health Group look up the IMD of participants' postcodes. A quintile of 1 means the postcode is in the bottom 20% of of the deprivation index. The lower the decile, the more deprived the area.	**Ouput Metic:** Integer	**Output range:** 1-5	ONS Postcode Directory (ONSPD): https://www.ons.gov.uk/methodology/geography/geographicalproducts/postcodeproducts English Index of Multiple Deprivation 2019 (IMD): https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019
Net Promoter Score (NPS)	NPS is a globally recognized method for measuring customer satisfaction and loyalty. The metric was developed by Fred Reichheld of Bain & Co. At its core, the Net Promoter Score tracks how customers represent a company to their friends, families and associates.	**Measurement Method**: Self-reported answer to the following question: "How likely would you be to recommend a health check via a SiSU Health Station to family members, friends or colleagues? Please give your answer on a scale where 0 means you are "not at all likely" and 10 means "extremely likely" The NPS is calculated by subtracting the total % of Detractors (scores 0-6) from the total % of Promoters (scores 9-10). Passives (scores 7-8) are excluded from the calculation **Output Metric:** Integer	**Output Metric Range:** -100 to +100 **Sample size (*n*):** This is always presented. A low (n) of <100 entries tend to provide NPS scores of higher volatility. 	http://www.netpromotersystem.com/about/measuring-your-net-promoter-score.aspx
Participants	An individual engaging with the SiSU Health Station who has provided their email address to receive their Health Results email. Provision of an email address creates a Member account with a unique UserID.	**Measurement Method**: Distinct Count of UserID **Output Metric:** Integer	N/A	The benefits to an individual of providing their email address include access to their Health Check history online, and access to the SiSU Portal (including programs and meal/activity planners) for eligible employees.

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
Perceived Stress Scale (PSS-4)	It measures the degree to which situations in one's life over the past month are appraised as stressful. Items were designed to detect how unpredictable, uncontrollable, and overloaded respondents find their lives. The PSS-4 poses general queries about relatively current levels of stress experienced.	**Measurement Method**: Self-reported answers to the following questions: 1. In the last month, how often have you felt that you were unable to control the important things in your life? 2. In the last month, how often have you felt confident about your ability to handle your personal problems? 3. In the last month, how often have you felt that things were going your way? 4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	**Output Metric Range:** 0-16 **Questions 1 and 4** 0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often **Questions 2 and 3** 4 = Never 3 = Almost Never 2 = Sometimes 1 = Fairly Often 0 = Very Often **Risk Thresholds:** Low: 0-5 Medium: 6-10 High: 11-16	Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.
Physical Activity Index (PAI)	It is used to assess adult (16 – 74 years) physical activity levels. It provides a simple, 4-level Physical Activity Index (PAI) categorising patients as: Active, Moderately Active, Moderately Inactive, and Inactive. That is correlated to CVD risk.	**Measurement Method**: Self-reported answers to the following questions: 1. In the last 7 days, how many days did you do vigorous activity? 2. On these days with vigorous activity, how many minutes did you usually spend doing vigorous activities on one day? 3. In the last 7 days, how many days did you do moderate activity? 4. On these days with moderate activity, how many minutes did you usually spend doing moderate activities on one day? 5. Please select the level of physical activity in your work	<table><tr><td></td><td colspan="4">Occupation</td></tr><tr><td>Physical exercise and / or cycling (hr/wk)</td><td>Sedentary</td><td>Standing</td><td>Physical</td><td>Heavy Manual</td></tr><tr><td>0</td><td>Inactive</td><td>Moderately Inactive</td><td>Moderately Active</td><td>Active</td></tr><tr><td>Some but < 1</td><td>Moderately Inactive</td><td>Moderately Active</td><td>Active</td><td>Active</td></tr><tr><td>1-2.9</td><td>Moderately Active</td><td>Active</td><td>Active</td><td>Active</td></tr><tr><td>≥ 3</td><td>Active</td><td>Active</td><td>Active</td><td>Active</td></tr></table>	
QRISK3	QRISK is an algorithm for predicting cardiovascular risk.	**Measurement Method:** Self-reported answers to the QRISK3 questionnaire	**Risk Thresholds:** Low Risk: <10% Elevated Risk: ≥10%	https://www.qrisk.org/
Resting Heart Rate	Refers to the number of times the heart beats per minute while the individual is in a sitting position.	**Measurement Method:** **Accuracy:** (+/-2%) **Output Metric:** Beats per minute (bpm)	**Heart Rate Range:** 30-220 bpm **Risk Thresholds:** Low: <40 bpm Normal: 40 - 79 bpm Elevated: 80 - 99 bpm High: 100 - 119 bpm Very High: 120+ bpm	Generally, a lower resting heart rate is an indicator of physical fitness, as the heart is more efficient at pumping blood around the body. *American Heart Association (All About Heart Rate (Pulse)), Mayo Clinic (Heart rate: What's normal)*

Glossary of Key Terms and Calculations

Item	Description & Data	Measurement Method & Output Metric	Metric Range & Risk Thresholds	Source & Context
Sex	Sex refers to sex assigned at birth and is typically based upon a person's reproductive system and other physical characteristics. Sex at birth may also be understood as the sex recorded at a person's birth (for example, what was recorded on their birth certificate).	**Measurement Method:** Self-reported **Output Metric:** "Male" or "Female"	**Output Metric Range:** "Male" or "Female"	Sex is relevant to the Health Check, as is factored into the calculation of Body Fat %.
SiSU Global Benchmarking	Provides a comparitive dataset against which the client's health profile can be compared for a number of health risk metrics.	The client's demographic and health profile is benchmarked at the GICS Industry Group level and with Health Survey of England (HSE) 2019. While the client's data is included in the respective benchmark, the proportion of the data pool the client represents can be deducted in the report.	SiSU Global Benchmarking™ features comparisons for: • Blood pressure - % At Risk • Smoking Prevalence • BMI - % At Risk • Body fat % - % At Risk	The SiSU Global Benchmarking pool is automatically refreshed on a daily basis, as data is pulled in from across the global SiSU Health Station network. Health Survey of England 2019: https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019
Weight	The weight of the individual using the SiSU Health Station while in a standing position.	**Measurement Method:** Machine generated: NCI Technology Weight Scale **Accuracy:** -0.1kg to +0.1kg **Output Metric:** Kilograms (kg) to single decimal point	**Weight Range:** 5-250kg **Risk Thresholds:** N/A - Refer to Body Mass Index	Weight is relevant to the calculation of the Body Mass Index (BMI).

Appendix B

Supporting tables and figures

Table B1: Blood pressure (BP) categories showing the number of users reporting recent BP checks and BP medication use from all users undertaking a SiSU Health check™ in SNEE over the evaluation period with a BP reading (n=7,086). BP measures were obtained directly through the SiSU health checks™, while BP check history and medication use were self-disclosed by users.

BP category definition (mmHg)	No. of users	% of cohort with a BP measure (n=9,086)	BP Check in Past 12 Months (Known)	No BP Check in Past 12 Months (New)	On BP medication	Not on BP medication
Normal 90–129 / 60–84	5819	64.2%	1955 (33.6%)	3864 (66.4%)	527 (9%)	5292 (91%)
Elevated 130–139 / 85–89	1394	15.4%	602 (43.2%)	792 (56.8%)	297 21.3%)	1110 (79.7%)
High ≥140–180 / ≥90–110	1851	20.4%	956 (51.6%)	895 (48.4%)	604 (32.6%)	1266 (68.4%)

Table B2: SiSU Health Station™ location uptake and proportion of users with high blood pressure (BP) (≥140–180/≥90–110 mmHg) for each location type. Showing total uptake of users with a BP measure, number and percentage of high users, and the distribution of high users with and without a BP check in the past 12 months, as disclosed by individuals.

Location type	Uptake	High BP		BP Check in Past 12 Months (known)		No BP Check in Past 12 Months (new)	
Academic	291	27	9.4%	18	66.7%	12	44.4%
Bus	911	298	32.7%	171	57.4%	127	42.6%
Charity service	334	47	14.1%	27	57.4%	20	42.6%
Clinical	6044	1072	17.7%	562	52.4%	510	47.6%
Community	1127	192	17.0%	90	46.9%	102	53.1%
Workplace	196	60	30.6%	24	40.0%	36	60.0%
Library	1081	155	14.3%	64	41.3%	91	58.7%

Table B3: SiSU Health Station™ location uptake and proportion of users with elevated blood pressure (BP) (130–139/85–89 mmHg) for each location type. Showing total uptake of users with a BP measure, number and percentage of users with elevated BP, and the distribution of those users with and without a BP check in the past 12 months, as disclosed by individuals.

Location type	Uptake	Elevated BP		BP Check in Past 12 Months (known)		No BP Check in Past 12 Months (new)	
Academic	291	29	10.0%	13	44.8%	16	55.2%
Bus	911	189	20.7%	78	41.3%	111	58.7%
Charity service	334	36	10.8%	18	50.0%	18	50.0%
Clinical	6044	831	13.7%	363	43.7%	468	56.3%
Community	1127	153	13.6%	68	44.4%	85	55.6%
Workplace	196	39	19.9%	14	35.9%	25	64.1%
Library	1081	123	11.4%	48	39.0%	75	61.0%