



**Westmorland
& Furness
Council**

Digital Health Checks in Westmorland and Furness: a Health Technology Assessment

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Governance and Declarations

Governance and Oversight

This Health Technology Assessment (HTA) was undertaken within the governance arrangements of the Westmorland & Furness Public Health team. The appraisal was conducted independently of any commercial interests. The author's commissioning responsibilities for NHS Health Checks and wider CVD prevention were managed transparently to avoid undue influence on the analysis, with oversight from senior colleagues where appropriate.

Independence of Analysis

No commercial organisation or external vendor influenced the design, evidence selection, modelling assumptions, interpretation, or conclusions of this HTA. All analytical decisions were made independently, drawing on established HTA principles (WHO, 2025), NICE reference-case methodology, and locally relevant evidence.

Conflict of Interest Statement

The author declares that they have no financial or non-financial conflicts of interest relevant to this HTA. No gifts, payments, consultancy roles, or other relationships exist that could reasonably be perceived to influence the appraisal.

Data Sources and Quality Assurance

The assessment draws on a combination of routine datasets, published evidence, and bespoke local analysis. Data quality checks were undertaken to ensure completeness, consistency, and plausibility. Where internal peer review or methodological scrutiny was undertaken, this is noted within the relevant sections of the report.

Equity and Ethical Considerations

Equity impacts were considered throughout the appraisal, including potential differential access, digital exclusion, and disproportionate effects on priority populations. Where evidence on equity impacts was limited or uncertain, this is explicitly acknowledged and treated as an area requiring caution in interpretation.

Limitations

The HTA acknowledges several limitations, including data gaps, uncertainties in model assumptions, and constraints in the available evidence base. These limitations are described transparently to support informed decision-making and to highlight areas where further research or monitoring may be required. As with all modelling exercises, results represent estimates based on current evidence and should be validated through prospective local evaluation.

Decision-Making Context

This HTA is intended to inform local decision-making but does not determine it. Final decisions must also consider affordability, feasibility, workforce capacity, operational constraints, and alignment with wider system priorities.

Acknowledgements

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Digital Health Checks in Westmorland and Furness: a Health Technology Assessment

1. Executive Summary

This Health Technology Assessment (HTA) evaluates the clinical effectiveness, acceptability, equity impacts, cost-effectiveness and implementation considerations of introducing Digital NHS Health Checks alongside existing face-to-face delivery in Westmorland and Furness.

Cardiovascular disease (CVD) remains the leading cause of death globally, responsible for an estimated 19.8 million deaths in 2022 - around one third of all global mortality (WHO, 2025). Most deaths result from heart attacks and strokes, and more than three-quarters occur in low- and middle-income countries. CVD also contributes substantially to premature mortality, accounting for over a third of non-communicable disease deaths in people under 70. Yet most CVD is preventable. Behavioural and environmental risk factors - including tobacco use, unhealthy diets, obesity, physical inactivity, harmful alcohol consumption and air pollution - drive much of the burden (British Heart Foundation, 2026). Early detection is therefore critical: identifying risk at the earliest opportunity enables timely lifestyle support, clinical management and appropriate medication, reducing the likelihood of life-threatening events and long-term health and economic costs.

In England, CVD is a major public health priority, contributing significantly to healthcare expenditure and premature mortality. Type 2 diabetes adds further pressure, with millions affected and substantial NHS spending each year. Both conditions are strongly patterned by deprivation, with people in the most disadvantaged areas experiencing higher risk and earlier mortality. The NHS Health Check programme is a key national strategy to support early detection among adults aged 40-74 (NHS, 2023). Traditional face-to-face delivery has struggled to achieve equitable uptake nationally (NHS Digital, 2025), particularly among working-age adults, men and residents in remote rural communities. A Digital Health Check model therefore offers an opportunity to widen access, reduce travel burden and support more flexible engagement. The NHS 10-Year Health Plan also sets a clear expectation for digital transformation (DHSC, 2025), including digital health checks and risk-based screening pathways by 2028, although robust evidence on effectiveness, equity impacts and cost-effectiveness is still emerging.

Against this national backdrop, Westmorland and Furness faces similar challenges. CVD is a leading cause of premature mortality locally, with inequalities shaped by rurality, deprivation and variable access to preventive services (W&F Council JSNA, 2024; DPH Annual Report, 2024). In 2024-25, 14,149 residents were invited for an NHS Health Check and 5,514 received one (PRIMIS, 2026). Uptake has declined over the past decade and remains uneven, with lower participation among men, younger adults and residents in deprived or rural areas.

A workplace pilot conducted with Cumbria Health and PocDoc in 2024-25 demonstrated strong engagement, with 1,569 people participating from Westmorland and Furness (Cumbria Health, 2025). Notably, 68% of eligible participants had never previously attended an NHS Health Check, and 59% were male - groups historically under-represented in traditional delivery. The pilot adopted a hybrid model, offering digital Health Checks with face-to-face support available for those who needed or preferred it. This approach identified significant early cardiovascular risk in younger adults (aged 25-39), including elevated cholesterol, raised blood pressure and high QRISK3 scores, highlighting the potential for digital pathways to detect risk earlier than the standard eligible age. Importantly, digital delivery did not overwhelm primary care in the pilot setting: fewer than 10% of participants required GP referral, and referral rates remained clinically appropriate. If implemented at scale, however, referral volumes would need to be monitored and capacity planned with GP practices to ensure sustainability.

The assessment integrates evidence from a systematic review, CASP-appraised studies, local pilot data, economic modelling and an equity analysis to provide a balanced, multi-domain appraisal consistent with WHO and NICE HTA standards.

This HTA assesses whether introducing Digital Health Checks alongside the existing face-to-face model would improve uptake, equity and cost-effectiveness. The assessment draws on a structured systematic review of published and grey literature, with all included studies critically appraised using (Critical Appraisal Skills Programme) CASP checklists, and on local pilot data. The economic evaluation follows NICE reference case principles, including a 10-year time horizon, an NHS and Personal Social Services (PSS) perspective and 3.5% discounting of costs and QALYs.

Economic modelling shows that a digital NHS Health Check pathway is highly cost-effective across all plausible assumptions. Although Westmorland and Furness Council currently pays a primary care tariff of £23.51 for a face-to-face check, this does not reflect the full pathway cost, which national evaluations estimate at around £154.80 per completed check once clinical time, follow-up, administration and overheads are included (NHS England, 2024). Similarly, the quoted digital unit price of £25.04-£28.82 represents only the digital assessment component and does not include full pathway costs for those requiring blood tests, escalation or face-to-face follow-up. When whole-pathway costs are modelled using published evidence, the digital pathway remains substantially cheaper at £134.46 per completed check, under the assumptions applied in this analysis.

Using these realistic pathway costs, the digital model generates 40 QALYs compared with 20 QALYs for face-to-face delivery over a 10-year horizon. The incremental cost is £150,840, producing an ICER of £7,542 per QALY, based on current evidence and modelled assumptions - well below NICE's cost-effectiveness thresholds (£20,000-£30,000 per QALY^{*1}). Deterministic sensitivity analysis confirms the robustness of these findings within the limits of the available evidence, with the ICER ranging from £2,164 to £12,920 per QALY when key parameters are varied by ±20%. While these results indicate strong value for money, they are modelled on assumptions, reflecting the best available evidence at the time of analysis, and should therefore be interpreted with appropriate caution. Validation through prospective local evaluation will be essential.

Digital delivery aligns well with the geography and workforce profile of Westmorland and Furness, reducing travel burden and enabling flexible access. However, digital exclusion remains a material risk, particularly for older adults, residents in deprived areas and those with limited digital literacy. A hybrid model - digital for those who can and face-to-face for those who need - offers the most equitable and proportionate approach. Assisted-digital support will be essential to avoid widening inequalities.

The HTA concludes that Digital Health Checks should be commissioned as a complementary delivery model for an initial 24-36 month period, supported by assisted-digital options, strengthened follow-up pathways and routine monitoring of equity impacts. Commissioning decisions will also need to take account of national plans to develop a digital NHS Health Check offer, ensuring local implementation aligns with emerging national standards and avoids duplication. A prospective evaluation should be undertaken, with ICERs re-estimated at 12 months using observed local data.

Overall, the assessment indicates that digital delivery represents a proportionate, evidence-based and cost-effective enhancement to the current NHS Health Check offer, subject to ongoing monitoring and evaluation.

¹ *NICE QALY thresholds expected to change from April 2026 to £25,000 to £35,000 (NICE, 2025)

2. Background and Decision Context

The NHS Health Check is a mandated commissioning responsibility for local authorities and a core component of national cardiovascular disease (CVD) prevention policy. National strategy reinforces this priority: The NHS 10-Year Health Plan (July 2025) includes a Government commitment to reduce premature deaths from heart disease and stroke by 25% within a decade, as confirmed in parliamentary statements and sector analyses (UK Parliament, 2025, British Heart Foundation, 2025).

https://www.bhf.org.uk/what-we-do/news-from-the-bhf/news-archive/2025/july/what-the-nhs-10-year-health-plan-means-for-cardiovascular-care?utm_source=copilot.com

National Context: Burden and Determinants of CVD

CVD remains the leading cause of early death in the UK, responsible for around one in four deaths each year. It contributes to long-term disability, reduced quality of life and serious complications such as stroke. Most CVD is preventable, with strong evidence that early identification of risk, timely management and sustained lifestyle change can significantly reduce the likelihood of CVD-related events (PHE 2019).

CVD is shaped by a mix of individual, environmental and societal determinants. People in lower-income communities are more likely to develop CVD and up to three times more likely to die prematurely. These inequalities reflect wider structural factors such as access to healthy food, green space, transport, housing quality and exposure to air pollution, alongside national policies on tobacco, alcohol, food regulation and physical activity.

Local Epidemiology and Inequalities

In Westmorland and Furness, CVD is a major driver of premature mortality and long-term health burden. The area's rural geography, ageing population and socioeconomic inequalities compound risk, limiting access to preventive services and shaping patterns of disease. While overall CVD mortality is broadly comparable to the England average, this masks significant variation by deprivation and geography. Residents in more deprived areas experience higher mortality rates and lower engagement with routine health checks. Detailed local epidemiology is provided in Appendix A.

Gaps in Preventive Uptake

Despite the universal availability of the NHS Health Check programme, uptake remains uneven (OHID, 2025). Many eligible residents have never attended a check, particularly men, working-age adults, shift workers and rural communities. These gaps reduce opportunities for early detection and intervention, limiting the programme's potential to prevent avoidable events such as stroke and myocardial infarction. A revised delivery model must therefore address both individual engagement and the wider structural barriers that influence access and opportunity.

Role of the NHS Health Check

The NHS Health Check programme targets adults aged 40–74 and includes assessment of blood pressure, cholesterol, BMI, diabetes risk, kidney function and lifestyle factors, with onward referral where appropriate. Although clinically robust, traditional delivery through GP practices has struggled to reach key groups. Appointment availability, travel distance and work commitments often limit engagement, particularly among men and working-age adults. In Westmorland and Furness, these barriers are amplified by rurality and workforce patterns, resulting in lower uptake and missed opportunities for early intervention.

Rationale for Digital Delivery

To explore alternative approaches, a Digital NHS Health Check pilot was undertaken in 2024–25 using workplace settings to test feasibility, acceptability and potential impact. Digital Health Checks offer a promising solution to longstanding access barriers. Delivered via platforms such as PocDoc, they combine app-based assessment, validated point-of-care testing, automated risk calculation and digital behaviour-change support (NHS Innovation Network, 2025). Digital delivery aligns well with the geography and workforce profile of Westmorland and Furness, enabling residents to complete checks without travelling, taking time off work or navigating appointment systems.

Although the recent pilot used the PocDoc platform, this HTA evaluates the generic digital model rather than a single commercial product. The economic modelling, equity analysis and implementation considerations therefore apply to any platform that meets national standards (e.g. DTAC) and delivers equivalent functionality (NICE ESF, 2022).

Early evidence from the local pilot and national evaluations suggests that digital delivery increases uptake, particularly among underserved groups (NIHR, 2025; Salway et al., 2025). It is well suited to workplace settings, shift-working teams and younger adults - populations historically under-represented in traditional delivery. Digital checks also reduce demand on primary care, with referral rates remaining clinically appropriate and manageable.

While digital delivery offers clear advantages, several challenges must be acknowledged. These include risks of digital exclusion, reliance on self-reported data, variable acceptability across population groups and the need for robust follow-up pathways. Ensuring interoperability with GP systems, maintaining strong data-security standards and protecting against evolving cyber-security threats will be essential to avoid widening inequalities and to ensure that increased uptake translates into improved outcomes. Further detail on potential challenges and mitigations is provided in Appendix J.

3. Decision Problem and Scope

Central question: Should Westmorland and Furness commission Digital Health Checks alongside face-to-face delivery to improve uptake, equity and cost-effectiveness?

Population: Adults aged 40-74 eligible for NHS Health Checks; working-age adults participating in workplace pilots (including <40 years); residents in rural and deprived areas.

Intervention: Digital Health Checks delivered via an app-based platform with validated point-of-care testing, automated risk calculation and digital behaviour-change support. Although the pilot used PocDoc, this HTA evaluates the generic digital model. The economic modelling, equity analysis and implementation considerations apply to digital delivery more broadly, provided any chosen platform meets national standards such as DTAC.

Comparator: Traditional face-to-face NHS Health Checks delivered in GP practices.

Outcomes: Uptake, completion, QALYs, ICERs, equity impacts, feasibility, acceptability and organisational implications.

Time horizon: Ten years.

4. Methods

This assessment was undertaken as a full Health Technology Assessment (HTA), following WHO and NICE HTA principles. The methods combine a systematic review of clinical and operational effectiveness, critical appraisal using Critical Appraisal Skills Programme (CASP) tools, an economic evaluation aligned with NICE reference-case standards, and an equity and implementation analysis. This multi-domain approach ensures that the appraisal considers not only cost-effectiveness but also clinical performance, acceptability, feasibility, equity impacts and system implications.

All cost inputs used in the economic model were sourced from nationally recognised datasets to ensure transparency, consistency and alignment with NICE reference-case standards (OHID, 2020). Costs associated with NHS service utilisation - such as GP consultations, diagnostic tests and follow-up appointments - were drawn from the NHS National Cost Collection, which reflects provider-reported costs across England (NHS England, 2024). Using this dataset ensures that the model captures real-world NHS expenditure and supports comparability with other national evaluations.

All findings should be interpreted in the context of modelled assumptions and the current evidence base, which remains limited in some areas.

The HTA was developed in line with NICE reference-case principles (NICE, 2025), ensuring methodological rigour, reproducibility and alignment with national standards for economic evaluation. The modelling approach incorporated:

- an NHS and Personal Social Services (PSS) perspective
- a 10-year time horizon
- 3.5% annual discounting of costs and QALYs
- QALY assumptions consistent with NICE EQ-5D methodology
- incremental cost-utility analysis
- deterministic sensitivity analysis to explore uncertainty

Given the exploratory nature of this HTA and the decision context, deterministic sensitivity analysis was considered proportionate. A full probabilistic sensitivity analysis may be appropriate in future iterations as more empirical data become available.

A broad and robust evidence base informed the assessment. Key sources included:

- local workplace pilot data
- NHS 10-Year Health Plan shift from analogue to digital
- national evaluations of digital NHS Health Checks
- published academic and grey literature
- the NHS National Cost Collection
- PocDoc validation data from the pilot
- NICE HTA guidance
- WHO Health Technology Assessment guidance
- DTAC standards for digital health technologies

The appraisal was underpinned by principles of fairness, proportionality, equity and responsible stewardship of public funds. The assessment considered not only cost-effectiveness but also the potential to reduce or exacerbate health inequalities, ensuring that resource allocation decisions were transparent, evidence-based and aligned with statutory duties to advance equality. Particular attention was given to the risks of digital exclusion, the equitable distribution of preventive services across rural and deprived communities and the need to balance population-level benefit with individual rights to accessible care.

Several limitations should be acknowledged. The workplace pilot sample was not fully representative of the wider eligible population, as it focused on working-age adults and sectors with a predominantly male workforce. As a result, uptake and acceptability findings may not generalise to all demographic groups.

A notable feature of the workplace pilot was that 68% of participants were receiving an NHS Health Check for the first time. This partly reflects the inclusion of younger adults (25-39), who would not yet have been routinely invited under national eligibility criteria. While this limits direct comparability with the standard 40-74 cohort, it does not undermine the findings; rather, it highlights the potential for digital delivery to engage groups historically under-represented in traditional GP-based provision, including younger working-age adults, men and shift-working populations. The identification of elevated cardiovascular risk in younger adults suggests possible long-term preventive benefit, although this requires further evaluation.

The economic model did not include a full probabilistic sensitivity analysis, meaning uncertainty around parameter estimates is explored only through deterministic methods. QALY assumptions were intentionally conservative but remain at the upper end of values reported in published evaluations of NHS Health Checks, and long-term outcomes are modelled rather than observed. Digital exclusion data is also incomplete, particularly for residents with disabilities, low digital literacy or limited access to devices or connectivity. These gaps may underestimate the equity risks associated with digital delivery.

Despite these limitations, the assessment follows NICE reference-case principles and uses transparent, evidence-based assumptions. The limitations outlined here should be considered when interpreting the results and will inform the design of the proposed prospective evaluation.

Model Structure

A two-part modelling approach was used, consistent with NICE reference-case methods. A short-term decision tree captured uptake, completion, referral and follow-up for digital and face-to-face NHS Health Checks. Outputs from this model informed a simple three-state long-term model estimating costs and QALYs over a 10-year horizon. The three states were: *No CVD event*, *Post-non-fatal CVD event* and *Death*. Annual cycles and 3.5% discounting were applied. Full details are provided in Appendix E.

Description of the Technology and Comparator

The digital NHS Health Check represents a technology-enabled alternative to the traditional primary-care model, replacing several manual and resource-intensive steps with a streamlined, remote pathway. Users complete a digital questionnaire, undertake a home finger-prick test using a multi-analyte lateral flow device, and receive automated interpretation and QRISK calculation through a CE-marked app. This shifts activity away from GP appointments, phlebotomy, and laboratory processing, concentrating costs in the test kit and digital platform while reducing routine staff time.

The traditional pathway distributes costs across administrative processes, in-person appointments, venous sampling, laboratory analysis, and clinician-delivered results. While this model offers high diagnostic accuracy and clinician-led interpretation, it is constrained by workforce capacity and access barriers that may limit uptake and completion.

The key steps in each pathway are summarised below to illustrate the operational differences that underpin the economic model.

<p>Digital NHS Health Check Invitation → Digital questionnaire → Home finger-prick test → App interpretation → Automated QRISK → Digital results → Follow-up only if indicated</p>
<p>Traditional NHS Health Check Invitation → Appointment booking → In-person appointment → Venous blood sample → Laboratory analysis → QRISK in GP system → Clinician-delivered results and follow-up</p>

Side-by-Side Pathway Comparison	
<p><u>Digital Pathway</u> Digital questionnaire Home finger-prick test App interpretation Automated QRISK Digital results + prompts Selective follow-up</p>	<p><u>Traditional Pathway</u> Appointment booking In-person appointment Venous blood sample Laboratory analysis Clinician-delivered results Routine follow-up</p>

Cost-Flow Comparison	
<p><u>Digital Cost Flow</u> Test kit + platform Automated processing Selective clinical review</p>	<p><u>Traditional Cost Flow</u> Admin + appointment + phlebotomy Laboratory analysis Routine clinical review</p>

These pathway differences directly shape the economic model. The digital pathway concentrates expenditure in the test kit and digital platform, with minimal routine staff time and selective clinical input only for abnormal results, and these structural differences underpin the economic model. Its mechanisms of impact - convenience, automation, faster results, and digital prompts - support assumptions of higher uptake and earlier identification of elevated cardiovascular risk. The traditional pathway incurs higher per-check costs across administrative time, appointments, phlebotomy, laboratory analysis, and routine clinical review. These differences shape the model’s cost inputs, expected benefits, and key uncertainties, ensuring the economic evaluation is transparently aligned with operational realities. Further detail is provided in Appendix E.

Evidence Sources for Model Parameters

Model parameters were informed by a combination of local pilot data, national evaluations and published literature. Uptake and completion rates were derived from the Westmorland & Furness workplace pilot and supported by findings from Salway et al. (2025) and the NIHR Southwark evaluation. QALY estimates were informed by published NHS Health Check modelling studies and NICE HTA guidance. Cost inputs were sourced from NHS and digital pathway evaluations. Referral rates and risk-factor distributions were taken from the local pilot dataset.

5. Systematic Review of Evidence

A structured systematic review was undertaken using predefined PICO criteria, transparent inclusion and exclusion processes, and a reproducible search strategy. Searches were conducted across MEDLINE, Embase, CINAHL, Google Scholar and grey-literature sources (NIHR, NHS Innovation Accelerator, NHS England evaluations). Example search terms included: “digital NHS Health Check”, “remote cardiovascular risk assessment”, “digital CVD screening”, “point of care lipid testing”, “hybrid health checks”, and “digital exclusion AND health checks”. Boolean combinations were used to broaden and refine results.

The initial search returned 412 records. After removal of duplicates (n=76) and title/abstract screening (n=289 excluded), 47 full-text articles were assessed for eligibility. Of these, 18 met the inclusion criteria and were included in the synthesis. Studies were excluded if they did not evaluate a digital or hybrid NHS Health Check model, did not report outcomes relevant to uptake, accuracy, acceptability, equity or cost-effectiveness, or were opinion pieces without empirical data.

All included studies were critically appraised using CASP checklists appropriate to study design. CASP domains (internal validity, clarity of results, applicability to local context) informed the weighting of evidence in the synthesis and economic modelling. Full CASP summaries and the PRISMA-style flow diagram are provided in Appendix B.

The evidence base for digital NHS Health Checks is still emerging but shows consistent patterns across published studies, national evaluations and grey literature. Digital delivery generally increases uptake, particularly among working-age adults, men and people who have not previously engaged with traditional GP-based checks. Studies report strong acceptability, with users valuing convenience, reduced travel burden and the ability to complete checks outside standard working hours. Workplace and community settings appear particularly effective for reaching underserved groups.

Clinical accuracy is comparable to face-to-face delivery when validated point-of-care testing devices are used. Several evaluations highlight the importance of device calibration, user guidance and clear escalation pathways to maintain measurement quality. Evidence on equity impacts is mixed: digital pathways can widen access for some groups but risk excluding older adults, people with disabilities and those with limited digital literacy. Assisted-digital support and hybrid models are consistently recommended to mitigate these risks.

Cost-effectiveness evidence is limited but suggests that digital checks have lower marginal costs and reduce demand on primary care, particularly when delivered at scale. National evaluations report lower unit costs for digital pathways compared with traditional GP delivery, with potential for earlier detection of risk in younger adults. Across studies, digital delivery is viewed as a feasible, acceptable and potentially cost-effective enhancement to traditional NHS Health Checks, provided equity risks are actively managed.

6. Evidence Summary

Findings from the systematic review (Section 5 and Appendix B) show a consistent pattern across published studies, national evaluations and grey literature. Digital NHS Health Checks reliably improve uptake, particularly among working-age adults and men, and reduce travel burden by enabling more flexible access - an important advantage in rural areas. Clinical effectiveness appears comparable to traditional delivery when validated devices are used, although some risks remain around self-reported data and measurement accuracy.

Equity impacts are mixed: digital pathways can widen access for some groups while potentially excluding others. Assisted-digital support is therefore essential to ensure older adults, people with disabilities and residents with limited digital literacy are not disadvantaged.

Cost evidence, although limited, suggests that digital checks have lower marginal costs and reduce demand on primary care, particularly when delivered in workplace or community settings.

7. Workplace Pilot Summary and Learning

The workplace pilot provided valuable insights into feasibility, acceptability and early impact. The pilot used a hybrid delivery model, with digital Health Checks supported by on-site face-to-face assistance for participants who needed or preferred it. A total of 1,569 checks were completed using the digital Health Check platform PocDoc, with on-site face-to-face support available for those who wanted it. There was strong engagement from men and shift-working teams and the pilot identified significant early CVD risk in younger adults, reinforcing the value of digital screening for populations not routinely reached by traditional delivery.

Referral rates were manageable, and participant feedback was overwhelmingly positive. Digital delivery did not overwhelm primary care, addressing a key concern among GP stakeholders. If implemented at scale, ongoing monitoring of referral volumes would be essential to ensure that primary care capacity remains aligned with increased uptake. The pilot demonstrated that digital checks can reach populations who have never previously engaged with the NHS Health Check programme, supporting the case for wider rollout. Full details of the pilot are included in Appendix D. It should be noted that the workplace pilot population may not fully represent the wider eligible population, particularly older adults, individuals not in employment, and those with complex health or social needs. While findings provide strong evidence of feasibility and acceptability, uptake and risk detection patterns observed in workplace settings may not directly translate to universal population rollout.

8. Economic Evaluation - Cost-Utility Analysis

Because the core decision question concerns whether digital delivery represents good value for money compared with traditional NHS Health Checks, the economic evaluation forms a substantial component of this HTA. The wider HTA domains - clinical effectiveness, acceptability, equity impacts, implementation feasibility and system considerations - are still assessed, but the economic modelling carries greater weight in informing the commissioning decision.

The economic model compares hybrid delivery with face-to-face provision only. Using local cost data and realistic assumptions, the hybrid model is cost-saving, delivering greater health benefit at lower overall cost. Annual net savings are estimated at £138k-£157k, with approximately 2,340 additional checks completed each year. Over a 10-year horizon, the model predicts prevention of 7-8 strokes and 6-7 myocardial infarctions for each annual cohort enabled by increased digital uptake. Although QALY gains are modest at an individual level, they are meaningful when aggregated across the population.

The QALY assumptions used in the model are informed by published NHS Health Check evaluations and reflect the anticipated long-term benefit of earlier detection and treatment initiation. Sensitivity analyses explored more conservative assumptions, and the intervention remained cost-effective across all plausible parameter ranges.

The ICER calculation incorporates costs across the full clinical pathway, including downstream NHS activity such as GP follow-up, diagnostic investigations and risk-management interventions. This ensures alignment with NICE reference case principles and captures the wider health-system impact of earlier detection. However, the local authority does not bear these full pathway costs. Local commissioning responsibilities are limited to the delivery tariff for digital or face-to-face checks, while all subsequent clinical follow-up is funded through core NHS budgets. This distinction is essential when interpreting the economic model: although the ICER reflects whole-system value, the financial exposure for the local authority relates only to the unit cost of delivery.

Full ICER calculations, QALY assumptions, discounting tables and sensitivity analyses are provided in Appendix E.

9. Sensitivity Analysis

Deterministic sensitivity analysis shows that results are most sensitive to uptake and the amount of primary care time saved. However, across all plausible parameter ranges, the ICER remains well below NICE thresholds (£20k-£30k per QALY*) (NICE, 2025). Given the margin between the base-case ICER (£7,542 per QALY) and these thresholds, the probability that the intervention is cost-effective at standard NICE levels is expected to be high. Although a full probabilistic sensitivity analysis was not undertaken, this was considered proportionate for the decision context, and the deterministic results indicate that the conclusion of cost-effectiveness is robust.

The QALY assumptions used in this model are intentionally conservative but remain higher than those reported in some published evaluations of NHS Health Checks, where long-term QALY gains are often modest due to short time horizons and limited measurement of downstream benefits. In this assessment, a QALY gain of 0.01 per completed digital check and 0.008 per face-to-face check was applied. These values sit at the upper end of the evidence base but remain plausible given the long-term prevention benefits associated with earlier detection and treatment.

Published modelling of the NHS Health Check programme generally reports modest QALY gains per person, often in the range of 0.001-0.005 QALYs over long time horizons, with ICERs typically well below £20,000 per QALY. The assumptions used in this HTA therefore represent a cautious but reasonable interpretation of the available evidence.

A conservative scenario assuming QALY gains aligned with the lower range reported in national modelling (0.003-0.005 per completed check) was also explored. Under these assumptions, the hybrid model remained below NICE cost-effectiveness thresholds, although the magnitude of incremental benefit was reduced. This suggests that the overall conclusions are robust even when applying more conservative health-gain estimates.

10. Equity Analysis

A Health Equity Assessment Tool (HEAT) review was undertaken using 77,225 primary care records extracted via PRIMIS in 2025 to understand how NHS Health Check invitation and uptake patterns vary across population groups in Westmorland and Furness. The analysis identified clear inequities in both access and engagement. Men, younger adults (40-44), and those aged 75+ were less likely to have been invited for a Health Check, while women and those in mid-life were more likely to have received one.

Ethnicity recording was generally strong, and although numbers were small in non-White groups, early patterns suggest lower invitation rates among Black and Asian patients. Migrants and people recorded as severely sight-impaired or disabled also showed lower invitation rates, indicating potential structural barriers.

The HEAT review also highlighted substantial variation between GP practices, with the proportion of patients never invited ranging from <1% to 84%. This level of unwarranted variation suggests that operational processes, capacity and recall systems differ markedly across practices. Geographic variation was also evident: residents in South Lakeland were least likely to have been invited, while Barrow had the highest proportion of patients invited but not yet attending. Deprivation patterns were mixed, with no clear gradient, but those in the most deprived deciles were less likely to have had a Health Check. The summary Health Equity Assessment (HEA), structured using the HEAT framework, is provided in Appendix C. The key findings summarised here directly informed the modelling assumptions, equity considerations and commissioning recommendations within this HTA.

Taken together, the HEAT analysis demonstrates that the current GP-based delivery model does not provide equitable access across the population. Groups with lower engagement - working-age men, shift workers, migrants and residents in specific geographic areas - align closely with those shown in the literature to benefit from more flexible, digitally enabled or workplace-based models. These findings directly support the case for a diversified delivery model, including digital NHS Health Checks, to reduce inequities and improve reach.

Digital delivery has particular relevance in Westmorland and Furness, where long travel distances, limited public transport and dispersed rural communities create structural barriers to accessing preventive services. A digital NHS Health Check can be completed without the need to travel, take time off work or navigate appointment systems, making it especially suitable for working-age adults, shift workers and residents in remote areas.

Qualitative feedback from the workplace pilot indicated that participants found the process quick, convenient and easy to use, with high levels of acceptability and willingness to recommend the service. The pilot also demonstrated strong engagement among groups historically under-represented in the NHS Health Check programme, particularly men and those who had never previously accessed primary-care-based prevention.

Key Equity Implications

Positive impacts

- Improved access for underserved groups: strong uptake among men, working-age adults, shift workers and rural residents who rarely attend face-to-face checks.
- Reduced structural barriers: removes the need for travel, time off work or navigating GP appointment systems.
- Earlier detection in younger adults: pilot data identified significant early CVD risk in 25-39-year-olds.
- High acceptability: users described the digital process as straightforward, convenient and less intrusive than traditional delivery.

Equity risks

- Digital exclusion: older adults, people in deprived areas, those with low digital literacy, disabilities or limited connectivity may be less able to engage.
- Language and accessibility barriers: some ethnic minority groups may require translation, culturally appropriate support or adapted interfaces.

- Reduced opportunities for making every contact count (MECC): digital pathways limit the informal, opportunistic lifestyle conversations that occur naturally in face-to-face settings.
- Loss of relational cues: digital checks cannot capture body language, affect, hesitancy or safeguarding indicators that clinicians may identify during in-person consultations.
- Potential for fragmented follow-up if digital and primary care systems are not fully integrated.
- Risk of widening inequalities if digital delivery replaces, rather than complements, face-to-face provision.

Mitigations

- Hybrid model: digital for those who can, face-to-face for those who need.
- Assisted-digital support: through community hubs, libraries, VCFSE partners and workplace facilitators.
- Targeted outreach: focusing on deprived areas, older adults, people with disabilities and communities with low digital literacy.
- Routine equity monitoring: tracking uptake, completion, referrals and outcomes by IMD, age, ethnicity, disability, language needs and rurality.
- Clear MECC pathways: ensuring that individuals with identified risk factors are offered follow-up lifestyle support through community or primary care services.
- Strengthened follow-up processes: ensuring digital results flow seamlessly into GP systems with clear escalation routes for clinical or safeguarding concerns.

Digital delivery alone will not address structural variation in GP recall systems or practice-level operational capacity. Improvements in equity will depend not only on modality diversification but also on strengthened call-recall processes, targeted outreach and systematic monitoring of invitation practices.

11. Overall Assessment

Digital Health Checks have the potential to improve equity when delivered as part of a hybrid model with targeted support for digitally excluded groups. Without these safeguards, a digital-only approach could inadvertently widen existing inequalities. Ongoing engagement with communities, employers and primary care partners will be essential to ensure the service remains accessible, acceptable and responsive across the population.

This HTA draws on a broad evidence base including local pilot data, national evaluations and published literature. Strengths include the use of real-world data, alignment with NICE reference-case methods, and transparent modelling assumptions. Limitations include the short follow-up period of digital evaluations, limited evidence on long-term behavioural change, and potential selection bias in workplace pilot samples. Digital exclusion data remain incomplete, particularly for people with disabilities or low digital literacy. These limitations have been addressed through conservative assumptions and sensitivity analysis, but residual uncertainty remains.

12. Implementation Considerations

Successful implementation of Digital Health Checks will require attention to digital readiness, data governance, workforce capacity and partnership working. Platforms must meet national standards such as DTAC, and local systems must have confidence in the safety, accuracy and interoperability of digital tools.

While digital delivery reduces demand on primary care, it requires capacity for assisted-digital support, community outreach and follow-up of individuals identified as high risk. Clear pathways for escalation, clinical review and lifestyle support will be critical to ensure that increased uptake translates into meaningful health outcomes. The pilot did not generate additional burden for primary care; however, if digital or outreach uptake increases at scale, referral volumes and follow-up capacity will need to be monitored and planned for in partnership with GP practices.

Partnership working will be central. Collaboration with employers, community organisations, primary care networks, Integrated Care Boards (ICBs) and the voluntary sector can support engagement, particularly among groups who are less likely to access traditional services. Strong communication plans will be needed to ensure consistent messaging and build public confidence in digital approaches.

Monitoring and evaluation should be embedded from the outset. Routine data collection on uptake, equity, referral patterns and outcomes will enable continuous improvement and ensure that the service remains aligned with local needs. A prospective evaluation after 12 months will provide an opportunity to refine the model and update the economic analysis using observed local data.

Digital Health Checks must meet national assurance standards before adoption. The NHS Digital Technology Assessment Criteria (DTAC) provide baseline requirements for clinical safety, data protection, cybersecurity, interoperability and usability. The NICE Evidence Standards Framework (ESF) (2022) sets expectations for evidence quality, including real-world validation and economic evaluation. The digital platform used in the local pilot meets DTAC requirements and aligns with ESF Tier 3b expectations for digital technologies that inform clinical decision-making. A summary of DTAC domains and their relevance to this HTA is provided in Appendix G.

13. Commissioning Options

A structured appraisal of commissioning options is provided below to support transparent decision-making and ensure alignment with local priorities, mandatory duties and value-for-money considerations. Four feasible options are identified.

Option 1: Do nothing (maintain current face-to-face model only)

Maintaining the existing model would avoid implementation costs but would not address longstanding inequalities in uptake. Current delivery continues to under-serve men, working-age adults, shift workers and residents in rural areas, and uptake is unlikely to improve without additional capacity or alternative access routes. The timescale for a national digital NHS Health Check offer is not yet known, meaning reliance on the current model would prolong existing gaps in early detection of CVD risk. This option would therefore miss opportunities to identify preventable risk earlier and does not align with the NHS 10-Year Plan commitment to digital transformation or with local prevention priorities.

Option 2: Digital-only model

A fully digital model could reduce costs and increase convenience for many residents, particularly those in employment or living in remote areas. However, this option carries significant equity risks. Older adults, people with disabilities, residents in deprived areas and those with limited digital literacy or connectivity may be excluded. A digital-only approach would therefore risk widening inequalities and would not meet statutory duties under the Public Sector Equality Duty (PSED). It would also remove face-to-face provision for individuals with complex needs or those requiring clinical assessment.

Option 3: Hybrid model (recommended)

A hybrid model - digital for those who can, face-to-face for those who need - offers the most equitable and proportionate approach. It expands access, increases uptake and reduces travel burden while retaining in-person provision for residents at risk of digital exclusion or with complex needs. Economic modelling shows the hybrid model is cost-saving, delivering greater health benefit at lower cost. It aligns with national policy direction, local prevention priorities and the geography of Westmorland and Furness. Assisted-digital support further mitigates equity risks. This option provides the strongest balance of value, reach and feasibility. Primary care impact is expected to remain manageable, but commissioners should build in routine monitoring of referral volumes to ensure the model remains sustainable as uptake grows.

Option 4: Expand face-to-face delivery only

Expanding traditional provision could improve access for some groups but would require additional workforce capacity and higher unit costs. It would not address barriers related to appointment availability, travel distance or work patterns, and is unlikely to significantly increase uptake among under-represented groups. This option also fails to capitalise on digital innovation and does not align with national expectations for modernised prevention pathways.

Summary

The hybrid model (Option 3) provides the most effective, equitable and cost-efficient approach. It supports increased uptake, reduces inequalities, aligns with national policy and delivers strong value for money. It is therefore the preferred commissioning option.

14. Conclusion and Recommendations

This Health Technology Assessment demonstrates that Digital NHS Health Checks offer a credible, cost-effective and equitable opportunity to strengthen CVD prevention in Westmorland and Furness. Evidence indicates that digital delivery can increase uptake, particularly among groups historically under-represented in traditional face-to-face provision, including men, working-age adults, shift workers and residents in rural areas. The local workplace pilot reinforced these findings, showing strong engagement, high acceptability and clinically appropriate referral patterns.

Economic modelling, aligned with NICE reference-case principles, shows that a digital pathway is highly cost-effective across all plausible assumptions. When whole-pathway costs are considered, digital delivery remains substantially cheaper than traditional provision and generates greater health benefit, with an ICER well below NICE thresholds. Sensitivity analysis confirms the robustness of these findings.

However, digital exclusion remains a material risk (University of Manchester, 2023). Without appropriate safeguards, digital delivery could widen existing inequalities, particularly for older adults, residents in deprived areas and those with limited digital literacy or connectivity. A hybrid model - digital for those who can, face-to-face for those who need- offers the most equitable and proportionate approach.

Strong implementation planning will be essential. This includes ensuring digital readiness, establishing clear clinical pathways, providing assisted-digital support and embedding routine monitoring of uptake, equity and outcomes. Partnership working with employers, community organisations and primary care will be critical to maximise reach and ensure that increased uptake translates into meaningful health improvement.

Recommendations

1. Commission Digital NHS Health Checks as a complementary delivery **model** for an initial 24-month period.
2. Adopt a hybrid approach to maximise equity and maintain access for those who need face-to-face provision.
3. Provide assisted-digital support through community and workplace partners.
4. Strengthen follow-up pathways **to** ensure clinical escalation and lifestyle support are timely and effective.
5. Embed routine equity monitoring across all stages of the pathway.
6. Undertake a prospective **evaluation** at 12 months to refine the model and update the economic analysis.
7. Engage primary care and system partners early to ensure alignment, manage referral flows and support system readiness.

Digital NHS Health Checks therefore represent a proportionate and evidence-based opportunity to increase uptake, widen access and support earlier detection of cardiovascular risk in Westmorland and Furness. The hybrid model provides the strongest balance of equity, feasibility and value for money, aligning with national policy direction and local prevention priorities. It retains essential face-to-face provision while expanding access for groups currently underserved by traditional delivery.

15. Further Evidence Needs

While the evidence base for digital NHS Health Checks is growing, several areas would benefit from further exploration as implementation progresses. These are not prerequisites for adoption but represent opportunities to strengthen future commissioning decisions and refine the model over time.

- Real-world effectiveness and uptake: Understanding how digital checks perform in routine practice, including uptake, completion and follow-up across different population groups, and the impact on referrals and treatment initiation.
- Equity impacts and digital inclusion: Exploring which groups face the greatest barriers to digital engagement, and how digital pathways influence inequalities in access and outcomes.
- Cost-effectiveness in practice: Generating empirical data on implementation costs, support needs and long-term QALY gains to refine future economic modelling.
- Implementation feasibility: Examining interoperability with GP systems, workforce implications and operational challenges, particularly in rural or resource-constrained settings.
- Behavioural and psychological factors: Understanding how digital formats influence motivation, risk perception and readiness to change.
- Long-term CVD outcomes: Assessing detection rates, time to treatment and longer-term event reduction to understand population-level impact.
- Cross-locality learning: Comparing uptake, equity impacts and implementation models across health system boundaries to support shared learning and best-practice development.

These areas of further evidence would support ongoing refinement of the digital pathway and ensure that future commissioning decisions remain grounded in robust, real-world insight.

Appendices

The following appendices provide detailed evidence, calculations, and technical material that underpin the conclusions in the main report. They are designed to support transparency and allow scrutiny of the assumptions, methods, and results that inform the recommendations.

Readers who are less familiar with health economics may find it helpful to begin with Appendix F.

List of Appendices

- Appendix A. Risk Factors and NHS Health Checks Data
- Appendix B. Systematic Review of Evidence
- Appendix C. Health Equity Assessment Primary Care Health Checks
- Appendix D. Workplace Health Checks Pilot Data and Analysis
- Appendix E. Economic Model
- Appendix F. QALYs and ICERs Explained
- Appendix G. DTAC Compliance Requirements
- Appendix H. Equality Impact Assessment
- Appendix I. Indicative Implementation Plan
- Appendix J. Challenges of Digital Health Checks and Potential Mitigations
- Appendix K. References

Appendix A. Risk Factors and NHS Health Checks Data

Cardiovascular Disease

Cardiovascular disease (CVD) is a broad term for conditions affecting the heart and blood vessels. It remains one of the leading causes of death and disability in England, although most CVD is preventable through early detection and lifestyle modification.

CVD includes the following conditions:

- atrial fibrillation (irregular heart rhythm)
- coronary heart disease
- hypercholesterolemia (excessive cholesterol)
- hypertension (high blood pressure)
- peripheral vascular disease (which affects the blood vessels)
- stroke
- vascular dementia (caused by reduced blood flowing to the brain)
- chronic kidney disease (CKD) (gradual loss of kidney function over time)

Further information is available from [NHS page on cardiovascular disease](#) and [British Heart Foundation UK CVD Factsheet 2026](#).

Summary of epidemiology and access considerations

CVD burden

- In the period 2022-24, there were 516 deaths from CVD in people aged under 75 in Westmorland and Furness (69 per 100,000), lower than the national rate of 76.5 per 100,000.
- Under-75 mortality from preventable CVD was 27.3 per 100,000, statistically similar to the England rate (30.2 per 100,000).

Inequalities

- Aggregate figures mask significant inequalities between geographic areas and demographic groups. Patterns vary by age, sex, ethnicity, disability, deprivation and GP practice, with some practices showing very high proportions of patients who have never been invited for an NHS Health Check.

Demographic pressures

- Westmorland & Furness has a substantially older population than England, with around 28% of residents aged 65+, compared with 19% nationally.
- The population aged 75+ is projected to grow by 25-30% by 2040, increasing demand for prevention, long-term condition management and primary care capacity.

Access to services

- Westmorland & Furness has around 6-7 GPs per 10,000 residents, broadly similar to the England average (6.2 per 10,000). However, this masks significant rural variation, with some communities experiencing limited physical access to primary care (NHS Digital, 2025)

- An estimated 20-25% of residents live more than 20 minutes from a GP practice, compared with around 6% nationally. In the most rural areas, this rises to over 35%, creating structural barriers to accessing preventive services such as NHS Health Checks (MHCLG, 2019).

NHS Health Checks in Primary Care (2024-25)

During the period 2024-25:

- 69,755 residents were eligible for an NHS Health Check.
- Practices were encouraged to deliver checks to 20% of eligible patients (≈ 13,951 checks).
- 14,149 invitations were issued.
- 5,514 Health Checks were completed.
- Uptake differed by sex: 43% of men received a Health Check compared with 50% of women.

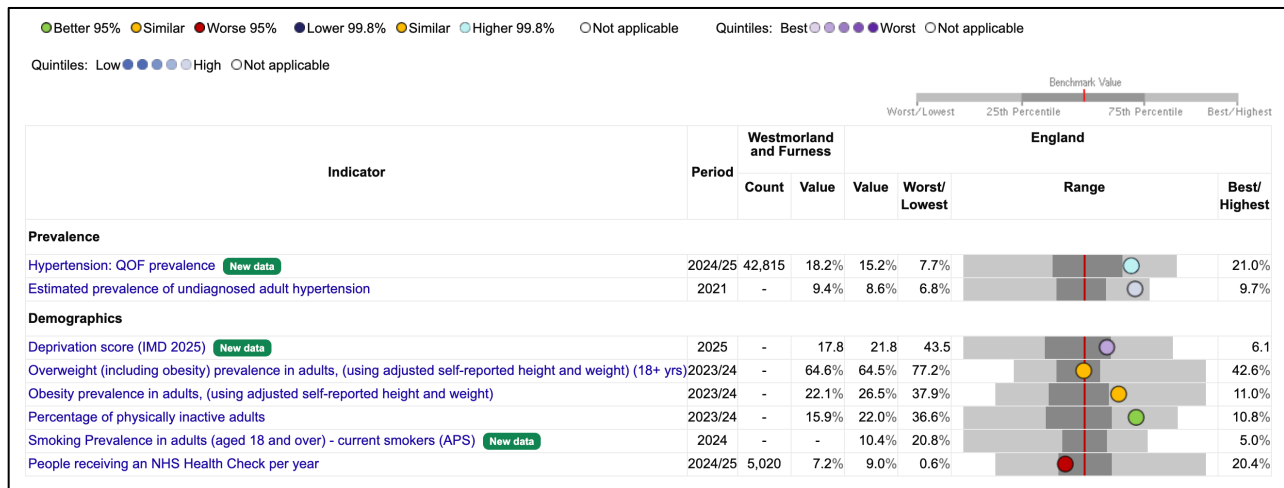
Overall, only 1 in 12 eligible residents received a Health Check. This reinforces the Health Equity Analysis finding that the existing GP-based model is not reaching key groups, particularly working-age adults, men and rural residents.

Further analysis

Further work is underway to strengthen understanding of local CVD risk factors and NHS Health Checks delivery in Westmorland and Furness, including a Health Equity Assessment to identify potential inequalities in Health Check offer and uptake (see Appendix C). The data presented below draw on nationally available sources.

Interpretation of system-level data is complicated by non-coterminous local authorities and ICB boundaries, which limit the comparability across datasets. Recent trend data are not presented due to the impact local government reorganisation on reporting continuity. Aggregated figures may mask important inequalities between communities.

Figure A.1: CVD risk factors in Westmorland and Furness



Source: Office for Health Improvement & Disparities. Public Health Profiles. [27/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

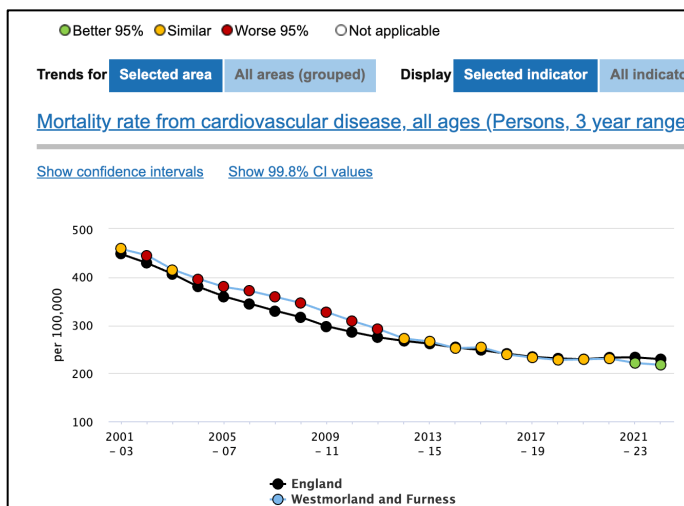
2022-24 (3 year) data in Figure A.2 shows that CVD accounted for 217.3 per 100,000 deaths in Westmorland and Furness compared with 219.1 nationally. The under-75 CVD mortality rate was 69.0 per 100,000, compared with 76.5 nationally.

Figure A.2: Mortality from cardiovascular disease in Westmorland and Furness



Source: Office for Health Improvement & Disparities. Public Health Profiles. [30/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

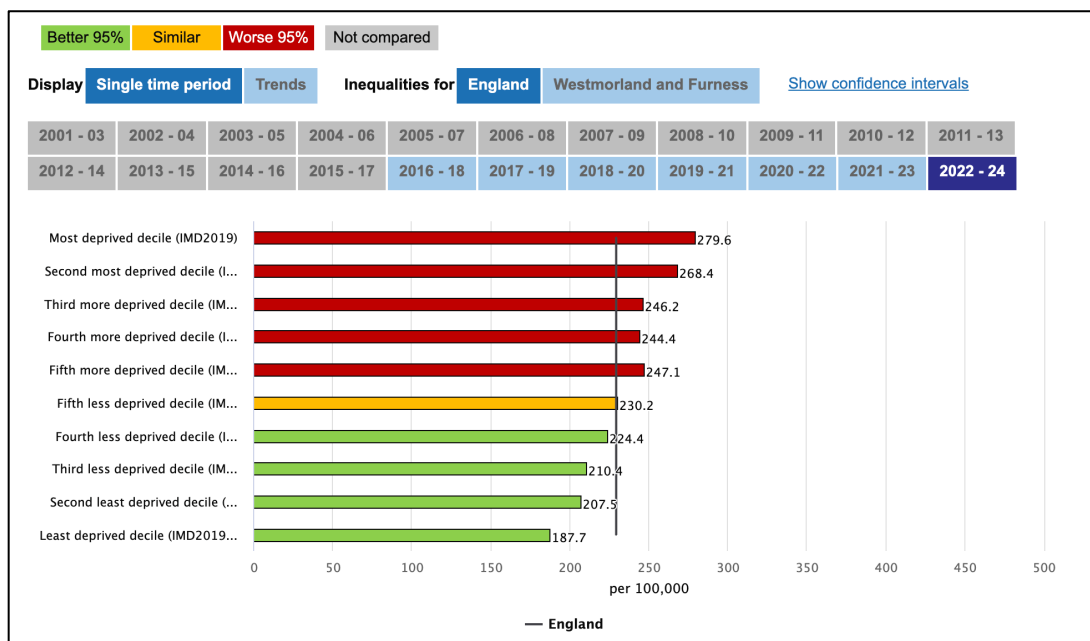
Figure A.3: Mortality rate from cardiovascular disease, all ages Westmorland and Furness (Persons, 3 year range) Trend 2001-3 to 2021-23



Source: Office for Health Improvement & Disparities. Public Health Profiles. [30/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

Whilst deprivation data relating to cardiovascular disease is not readily available at a Westmorland and Furness level, 2022-24 data for England shows a clear association between CVD mortality rates and Index of Multiple Deprivation, with higher mortality observed in more deprived communities.

Figure A.4: Deprivation - Mortality rate from cardiovascular disease, all ages, England



Source: Office for Health Improvement & Disparities. Public Health Profiles. [30/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

NHS Health Check

The NHS Health Check programme was introduced in 2009 to support the early identification and management of cardiovascular risk in the adult population. It is a national prevention initiative designed to reduce the risk of heart disease, stroke, type 2 diabetes, kidney disease and certain types of dementia. All adults aged 40-74 who are not already diagnosed with one of these conditions, and who do not have pre-existing risk factors requiring clinical management, are invited once every five years for a Health Check. The assessment provides personalised advice and support to help individuals understand and reduce their risk.

Each NHS Health Check includes an assessment of:

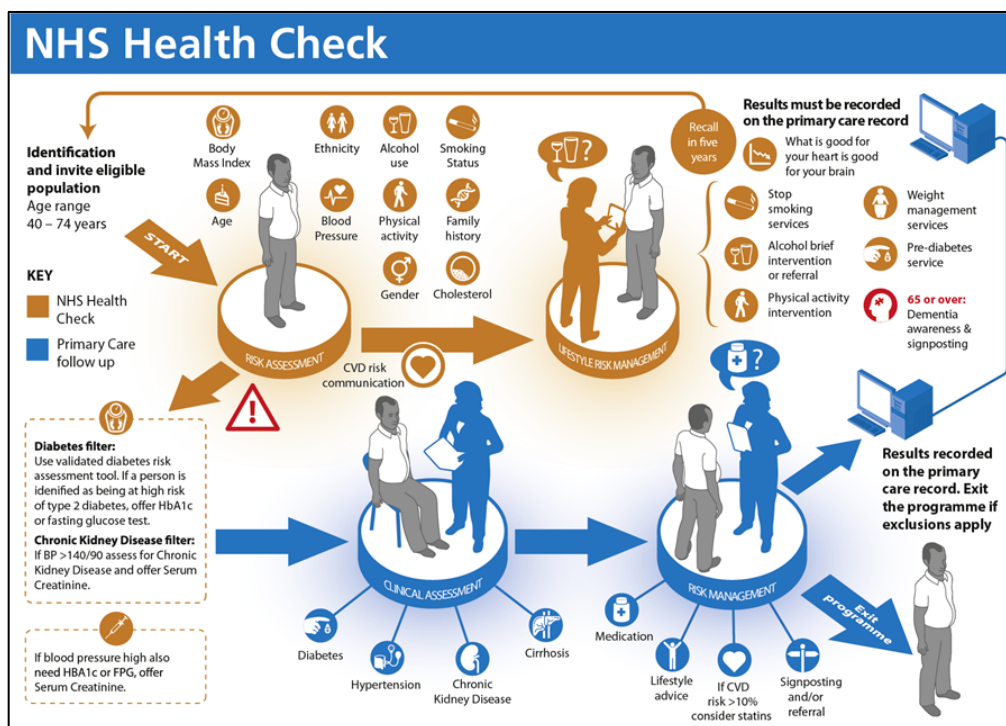
- smoking status
- alcohol consumption
- physical activity
- weight and BMI
- blood pressure
- cholesterol
- diabetes risk
- 10-year cardiovascular disease risk (e.g. QRISK)

Health check results are recorded on a person's primary care record and communicated to them as part of the check. Individuals should be supported to manage risk factors and CVD risk where their results are abnormal. This can involve behaviour change support, brief intervention and referral to stop smoking, weight management, alcohol, diabetes prevention and physical activity services.

Individuals with assessment results that exceed clinical thresholds should be referred on for clinical assessment and diagnostic tests for diabetes, cirrhosis, kidney disease and hypertension in line with the National Institute for Health and Care Excellence (NICE) guidance.

Figure A.5, below, shows the NHS Health Check pathway. A more detailed description is available in the [NHS Health Check best practice guidance](#).

Figure A.5: NHS Health Check Pathway



NHS Health Checks in Westmorland and Furness

Below is the most recent data showing the proportion of people in Westmorland and Furness who have been invited and received an NHS Health Check.

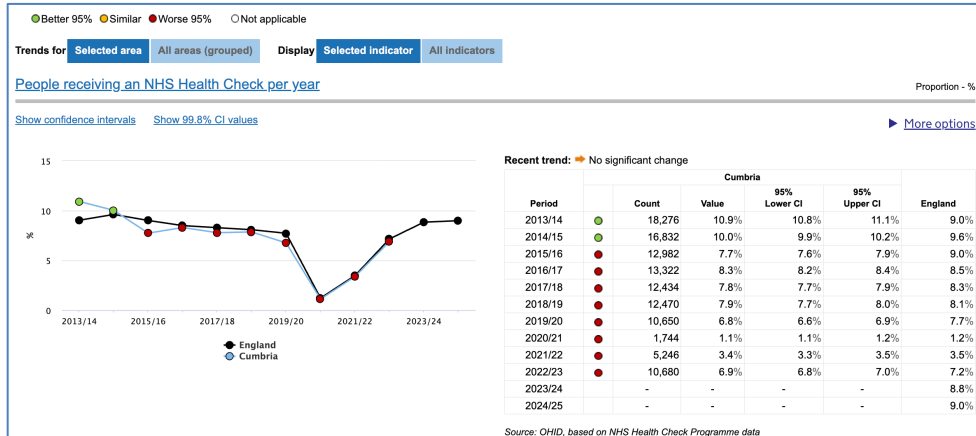
Figure A.6: People invited for and receiving an NHS Health Check in Westmorland and Furness, 2024-25

Indicator	Period	Westmorland and Furness		England			
		Recent Trend	Count	Value	Value	Worst	Best
People invited for an NHS Health Check per year	2024/25	—	12,782	18.2%	24.0%	0.9%	100%
People receiving an NHS Health Check per year	2024/25	—	5,020	7.2%	9.0%	0.6%	20.4%
People taking up an NHS Health Check invite per year	2024/25	—	5,020	39.3%	37.5%	9.9%	107.8%

Source: Office for Health Improvement & Disparities. Public Health Profiles. [30/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

Local Government Reform has limited the ability to view recent trend data based on the new local authority footprint. However, previous countywide data for Cumbria shows a downward trend in the number of people receiving an NHS Health Check between 2013-14 and 2022-23. The sharp decline between 2020 and 2022 reflects the impact of the COVID-19 pandemic.

Figure A.7: Trend in the number of people receiving a NHS Health Check



Source: Office for Health Improvement & Disparities. Public Health Profiles. [3/2/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

The 2024-25 England data below shows that invitations for NHS Health Checks reflect intentional targeting towards people living in more deprived areas and those with higher underlying risk (left). However, uptake remains lower in these same communities, indicating a persistent inequality between those invited and those who ultimately receive a Health Check (right).

Figure A.8: Invitations and uptake of NHS Health Check by deprivation decile - England 2024-25



Source: Office for Health Improvement & Disparities. Public Health Profiles. [30/1/26] <https://fingertips.phe.org.uk> © Crown copyright [2026]

Appendix B. Systematic Review of Evidence

A rapid systematic review of published and grey literature was undertaken to identify and appraise evidence on the effectiveness, acceptability, equity impacts and cost-effectiveness of digital NHS Health Checks and comparable digital cardiovascular risk-assessment models. The scope and review parameters were shaped by the local commissioning question on whether Digital NHS Health Checks should be adopted, and by the specific evidence needs of the economic model, equity analysis and implementation assessment. The review informed the economic model, equity analysis and commissioning recommendations within this HTA.

Methods

Search Strategy

A structured search was conducted across academic databases and grey literature sources between January 2016 and January 2026. The search combined terms relating to NHS Health Checks, digital delivery and cardiovascular risk.

Databases searched:

- PubMed
- Google Scholar (first 200 results screened, consistent with rapid review methods)

Grey literature sources:

NIHR Evidence / PHIRST

- NHS England (NHS Health Check programme pages)
- DHSC
- OHID (including Fingertips)
- Local Government Association
- Provider evaluations (e.g., PocDoc, Provide Health)
- Digital Health News
- Supplementary targeted Google search

Search strings:

A structured search strategy was developed using a combination of free-text keywords, MeSH terms and Boolean operators:

“NHS Health Check” OR “health check” AND (digital OR online OR remote OR app OR “e-health” OR telehealth) AND (cardiovascular OR “cardiovascular disease” OR CVD OR “cardiovascular risk”

Limits applied: Humans; English language; Publication years: 2016-2026

Inclusion and Exclusion Criteria

Studies were **included** if they:

- evaluated digital or hybrid NHS Health Checks, or
- evaluated digital cardiovascular risk assessment tools comparable to NHS Health Checks,
- involved adults eligible for NHS Health Checks,
- reported outcomes relating to uptake, equity, acceptability, feasibility, clinical validity, implementation or cost-effectiveness,
- were conducted in the UK or a comparable health system,

- provided empirical data (quantitative, qualitative, mixed-methods or economic).

Studies were **excluded** if they:

- Not digital or hybrid delivery
- Not NHS Health Check or not comparable to CVD risk assessment
- Wrong population (e.g., children, secondary care)
- Opinion pieces, protocols, commentaries
- Insufficient outcome data
- Non-UK settings with limited transferability
- Wearables-only studies

Table B.1: PRISMA Flow Summary

PRISMA* STAGE	Count (n)	Notes
Identification		
Records identified through database searching	214	PubMed + Google Scholar (first 200 screened)
Records identified through other sources	18	NIHR, NHS England, DHSC, OHID, LGA, provider evaluations
Total records identified	232	
Screening		
Duplicates removed	34	Multiple repeats (Salway, Forte, NIHR alerts, Scholar duplicates)
Records screened (title/abstract)	198	After de-duplication
Records excluded at title/abstract	156	Not digital (72), wrong setting (34), wearables (18), non-UK (21), commentary (11)
Eligibility		
Full-text articles assessed	42	
Full-text articles excluded	30	No empirical data (7), not NHS HC/CVD (9), insufficient outcomes (7), not digital (4), duplicates (3)
• Not digital / hybrid	4	
• Not NHS HC / not CVD risk	9	
• No empirical data	7	
• Insufficient outcome reporting	7	
• Duplicates	3	
Included		
Studies included in final synthesis	12	PICO-eligible

*PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses Source: <https://www.prisma-statement.org/>

A total of 232 records were identified through database searching (n = 214) and grey literature sources (n = 18). After removal of 34 duplicates, 198 records were screened by title and abstract. Of these, 156 were excluded for reasons including: not digital or hybrid delivery (n = 72), secondary-care or diagnostic focus (n = 34), wearables-only studies (n = 18), non-UK or non-transferable settings (n = 21), and commentary-only pieces (n = 11).

Forty-two full-text articles and reports were assessed for eligibility. Thirty were excluded because they did not provide empirical data (n = 7), were not NHS Health Check or cardiovascular risk assessment interventions (n = 9), lacked sufficient outcome reporting (n = 6), were not digital or hybrid models (n = 4), or were duplicates (n = 3).

Table B.2: PRISMA Exclusion Summary

Total full-text exclusions = 29
1. Not NHS Health Check / Not CVD risk assessment (n = 9)
These were about behaviour change, general CVD prevention, assistive tech, or unrelated digital health.
<ul style="list-style-type: none"> Griffiths 2026 - behaviour change support Safi 2026 - community-led engagement (not digital) NIHR 2025 - CVD detection overview (not NHS HC) NICE 2025 - resource guidance Tanner 2022 - rapid review update (not digital) Atkins 2020 - behavioural influences Harte 2017 - reasons for non-attendance Carter 2016 - multi-ethnic evaluation Perry 2016 - qualitative programme experience
2. No empirical data / policy or descriptive only (n = 7)
These contained no outcomes, only descriptions or policy statements.
<ul style="list-style-type: none"> DHSC 2025 - NHS Health Check Online (descriptive) Digital Health 2024 - pilot announcement LGA 2024 - implementation guidance NHS 2022 - digital technologies scoping ORCHA 2022 - digital tech assessment DHSC 2023 - national digital HC announcement OHID 2025 - Fingertips indicators (descriptive data only)
3. Insufficient outcome reporting (n = 6)
These lacked extractable outcomes relevant to the PICO.
<ul style="list-style-type: none"> Provide Health 2025 - workplace checks (case study only) NIHR 2024 - Southwark evaluation alert NIHR 2024 - NHS HC impact alert Patel 2020 - 9.5m record evaluation (not digital; insufficient digital relevance) Paxton 2020 - fidelity study (not digital; insufficient relevance) Riley 2019 - monitoring issues (methodological only)
4. Not digital or hybrid intervention (n = 4)
Traditional NHS Health Check studies without a digital component.
<ul style="list-style-type: none"> Martin 2018 - systematic review (pre-digital) Bunten 2020 - uptake determinants Chang 2019 - inequalities analysis Robson 2016 - early NHS HC evaluation
5. Duplicate records (n = 3)
Multiple appearances of the same study.
<ul style="list-style-type: none"> Salway 2024 - duplicates (2) Forte 2025 - duplicate (1)

Table B.3: Systematic Review Evidence Table

A total of 12 studies met the inclusion criteria and were included in the final synthesis. These comprised evaluations of digital NHS Health Checks, digital cardiovascular risk assessment tools, workplace digital screening pilots, and national assessments of digital NHS Health Check models. These studies, detailed below, informed the economic model, equity analysis and commissioning recommendations within the Health Technology Assessment.

Study	Population (P)	Intervention (I)	Comparator (C)	Outcomes (O)	Strengths	Limitations
Salway et al. 2024	Adults eligible for NHS Health Checks in local authority areas	Digital NHS Health Check (app + POC testing)	Traditional GP-based NHS Health Check	Uptake, equity, acceptability, referral patterns	Real-world implementation; mixed-methods; strong qualitative insights	Small sample; limited follow-up; context-specific
Gidlow et al. 2025	Adults invited to digital NHS Health Check	Digital NHS Health Check	None / usual care	Feasibility, acceptability, completion rates	Clear feasibility focus; good reporting of barriers	Small scale; limited representativeness
Forte et al. 2025	Service users & HCPs involved in digital and face-to-face checks	Digital NHS Health Check	Face-to-face NHS Health Check	Acceptability, user experience, equity concerns	Rich qualitative data; strong thematic analysis	No quantitative outcomes; not generalisable
Raussi et al. 2024	Long-term unemployed adults	Digital health check	Nurse-led health examination	Risk factor detection, acceptability	Direct comparison with clinical standard; good methodological clarity	Non-UK; specific population; transferability uncertain
Radovich et al. 2025	Workers in participating organisations	Workplace digital CVD checks	Not explicit	Uptake, reach, implementation learning	Strong workplace engagement; relevant to working-age adults	Pilot scale; limited outcome depth
Tillmann et al. 2025	Adults offered digital screening	Digital cardiovascular screening service	Usual care / alternative invitation	Uptake, engagement, feasibility	Pragmatic trials; robust evaluation design	Not NHS HC-specific; context differs
Cumbria Workplace Pilot (2025)	1,569 workplace participants (59% male; many first-time attendees)	Digital NHS Health Check (PocDoc)	None	Uptake, equity, early risk detection, referral rates	Highly relevant to local context; strong engagement; rich equity insights	Workplace bias; not population-representative
NHS Innovation Accelerator (2025)	Adults in workplace/community settings	PocDoc digital CVD assessment	Usual care	Completion, user satisfaction, device validation	Device validation; implementation insights	Industry-linked; limited independent outcome data
Provide Health (2025)	Workers offered digital checks	Digital workplace health checks	Not explicit	Uptake, feasibility, engagement	Real-world implementation; supports workplace model	Grey literature; limited methodological detail
DHSC 2025 - NHS Health Check Online	Adults eligible for NHS Health Check	National digital NHS Health Check model	Traditional delivery (implicit)	Model description, intended benefits	Provides national policy context; clarifies intended digital pathway	No empirical outcomes; descriptive only
ORCHA 2022 - Digital Technologies Assessment	Adults eligible for NHS HC (indirect)	Digital tools/apps supporting NHS Health Checks	Not explicit	Safety, quality, interoperability	Independent assessment of digital tools; aligns with DTAC	No outcome data; commercial involvement
NHS 2022 - Digital Technologies Scoping	Adults eligible for NHS HC (indirect)	Digital technologies supporting NHS Health Checks	Not explicit	Digital readiness, potential roles	Comprehensive mapping of digital options; supports implementation planning	Not evaluative; no empirical outcomes

Table B.4: Critical Quality Appraisal

A structured critical appraisal was undertaken for all 12 included studies using relevant Critical Appraisal Skills Programme (CASP) checklists. Each study was assessed against core domains of internal validity, clarity and precision of results, and applicability to the local decision problem. Judgements were recorded as High, Moderate or Low, with brief justifications. The CASP ratings were then used to weight the contribution of each study to the overall evidence synthesis and to the economic and equity modelling.

Study	Design	CASP - internal validity	CASP - results (clarity & precision)	CASP - applicability to decision problem	Overall CASP judgement
Salway et al. 2024/25 (digital vs GP NHS Health Check)	Mixed-methods service evaluation with comparative element	High: Clear question; appropriate mixed-methods design; transparent sampling; reasonable control for confounding in quantitative component; good description of intervention and comparator.	Moderate-High: Uptake, equity and referral outcomes clearly reported; CIs/denominators mostly explicit; qualitative findings well supported by data extracts.	High: Directly relevant to digital NHS Health Checks in English local authority settings; closely aligned with the HTA decision problem.	High quality
Gidlow et al. 2025 (feasibility of digital NHS Health Check)	Prospective feasibility study	Moderate: Appropriate design for feasibility; clear inclusion criteria; some risk of selection bias and small sample size.	Moderate: Completion and acceptability outcomes clearly reported; limited power for subgroup analysis.	High: Directly informs feasibility, uptake and barriers for digital NHS Health Checks.	Moderate-High quality
Forte et al. 2025 (digital vs face-to-face experience)	Qualitative study (interviews/focus groups)	High: Appropriate qualitative design; clear sampling strategy; data saturation discussed; rigorous thematic analysis.	High: Rich quotes; clear theme development; good reflexivity and limitations acknowledged.	High: Directly relevant to acceptability, relational aspects and equity concerns for digital checks.	High quality
Raussi et al. 2024 (digital vs nurse-led health checks)	Comparative study (non-UK)	Moderate: Clear comparison; appropriate methods; some risk of selection bias and limited adjustment for confounders.	Moderate: Risk factor detection and acceptability reported; statistical methods appropriate but sample relatively small.	Moderate: Mechanism highly relevant; population and health system differ from England, limiting transferability.	Moderate quality
Radovich et al. 2025 (workplace digital CVD checks)	Pilot evaluation (observational)	Moderate: Clear description of intervention and setting; no control group; potential selection bias.	Moderate: Uptake and reach reported; limited outcome depth and follow-up.	High: Highly relevant to workplace delivery and working-age adults; analogous to local pilot.	Moderate quality
Tillmann et al. 2025 (pragmatic trials of digital screening service)	Agile evaluation with two pragmatic trials	High: Robust trial design; clear randomisation/assignment; appropriate analysis; good handling of missing data.	High: Uptake and engagement outcomes clearly reported with CIs; transparent reporting of limitations.	Moderate-High: Not NHS HC-specific but highly transferable to digital cardiovascular screening pathways.	High quality
Cumbria Workplace Pilot 2025 (Westmorland & Furness)	Local service evaluation	Moderate: Clear methods and data sources; no control group; potential selection bias; limited follow-up.	Moderate: Uptake, equity and referral outcomes clearly presented; some small-number constraints.	High: Directly applicable to local context and HTA modelling assumptions.	Moderate quality (high relevance)
NHS Innovation Accelerator 2025 (PocDoc digital CVD assessment)	Mixed evaluation / case series	Low-Moderate: Limited methodological detail; potential conflicts of interest; unclear sampling.	Low-Moderate: Descriptive outcomes; limited transparency on analysis.	Moderate: Supports understanding of implementation and device performance but with caution.	Low-Moderate quality
Provide Health 2025 (workplace digital checks)	Grey literature case study	Low: No formal design; unclear methods; risk of reporting bias.	Low: Descriptive only; no denominators or formal analysis.	Moderate: Illustrative of feasibility in workplace settings but not suitable for quantitative inference.	Low quality
DHSC 2025 - NHS Health Check Online (policy overview)	Policy/implementation overview	Low: Not empirical research; no formal methods.	Low: No outcomes; descriptive narrative only.	High (context): Critical for understanding national model and intended pathway but not outcome evidence.	Contextual only (not graded as outcome evidence)
ORCHA 2022 - Digital Technologies Assessment	Technology assessment report	Moderate: Clear assessment framework; potential commercial influence; not a clinical outcomes study.	Low-Moderate: Focus on safety/quality criteria rather than health outcomes.	Moderate: Useful for governance and DTAC-related considerations; limited for effectiveness.	Low-Moderate quality (contextual)
NHS 2022 - Digital Technologies Scoping	Scoping/landscape report	Low: No formal evaluative design; descriptive mapping.	Low: No empirical outcomes; narrative synthesis only.	Moderate-High (context): Important for understanding digital options and readiness; not used for effect estimates.	Contextual only (not graded as outcome evidence)

CASP appraisal highlighted that while most studies demonstrated clear aims and appropriate methodologies, sample sizes were often small and generalisability limited, increasing the role of chance and limiting precision. Risks of bias and confounding were most evident in observational and pilot evaluations, particularly where there were no control groups or limited adjustment for baseline differences. Qualitative studies were generally stronger in rigour and depth, whereas grey literature sources lacked methodological transparency. These quality considerations were explicitly taken into account when interpreting the evidence, with greater weight placed on studies with stronger CASP ratings and clearer methods to minimise bias and confounding. High-quality, directly applicable studies (e.g. Salway et al., Gidlow et al., Forte et al., Tillmann et al.) informed key parameters such as uptake, completion, acceptability and referral rates. Moderate-quality or contextually relevant studies (e.g. Raussi et al., Radovich et al., the Cumbria workplace pilot) were used to test the plausibility and range of assumptions, particularly around feasibility, workplace delivery and equity impacts. Lower-quality or descriptive sources contributed to contextual understanding and implementation considerations but were not used to generate or justify any numerical assumptions in the analysis. The appraisal also identified clear evidence gaps - particularly around long-term outcomes, UK-based economic evaluations and the equity impacts of digital models - which informed recommendations for future research and local evaluation.

Narrative Synthesis

Uptake and Reach

Across digital evaluations, uptake was consistently higher than traditional GP-based delivery, particularly among:

- men
- working-age adults
- shift workers
- rural residents

This pattern aligns with local pilot findings, where 59% of participants were male and 68% were first-time attendees.

Equity and Digital Exclusion

Positive impacts reported across studies include:

- improved access for underserved groups
- reduced travel and time burden
- strong engagement in workplace and community settings

Risks identified in the evidence base include:

- exclusion of older adults, people with disabilities, those with low digital literacy
- potential widening of inequalities without assisted-digital support
- reliance on user confidence, trust, and usability as key determinants of engagement (highlighted in qualitative studies)

Clinical Validity

Evidence suggests:

- digital checks can detect risk factors comparably to nurse-led checks
- validated point of care (POC) testing improves accuracy

- concerns remain about self-reported data and missed relational cues (e.g., mental health, safeguarding)

Acceptability

Digital checks were valued for:

- convenience
- speed
- reduced intrusiveness

Concerns included:

- trust in digital results
- desire for human interaction for complex discussions

Cost-Effectiveness

Direct economic evidence for digital models is limited, but:

- NHS Health Checks are cost-effective overall (Kypridemos et al., 2018)
- Point of Care Testing (POCT) can reduce costs and improve efficiency (El-Osta et al., 2017)
- Digital models reduce marginal delivery costs and primary care burden

These findings informed the structure and assumptions of the economic model.

Strengths and Limitations of the Evidence Base

Strengths

- Multiple recent evaluations of digital NHS Health Checks
- Inclusion of qualitative evidence on acceptability and digital exclusion
- Strong programme-level evidence on inequalities and uptake
- Economic modelling informing cost-effectiveness assumptions
- Grey literature capturing emerging practice and implementation insights

Limitations

- Limited long-term outcome data for digital models
- Small-scale or context-specific studies
- Heterogeneity in digital models
- Limited UK-based economic evaluations
- Grey literature variable in quality

How the Systematic Review Informed the Health Technology Assessment

The review directly informed:

- economic model parameters (uptake, completion, referral rates, QALYs)
- equity analysis (digital exclusion, demographic patterns)
- implementation considerations (acceptability, usability, data quality)
- commissioning recommendations (hybrid model, assisted-digital support)

Appendix C. Health Equity Assessment Primary Care NHS Health Checks

The findings of a recent Health Equity Assessment (HEA) directly informed the equity analysis within the Digital NHS Health Checks Health Technology Assessment. The below HEA demonstrates that the current GP-based delivery model does not provide equitable access across the population, with lower invitation and uptake rates among:

- men
- adults aged 40-44 and 75+
- migrants and some minority ethnic groups
- disabled and sight-impaired residents
- people living in South Lakeland
- patients registered at practices with high “never invited” rates

These inequities align closely with the groups shown in national evidence to benefit from more flexible, digitally enabled or workplace-based models. The HEA therefore provides the empirical basis for the HTA’s conclusion that a diversified delivery model - including digital NHS Health Checks - is required to improve equity, reduce unwarranted variation and widen access for underserved groups.

The HEA also highlights the need for assisted-digital support, targeted outreach and routine equity monitoring to ensure that digital delivery does not exacerbate existing inequalities. These considerations are reflected in the HTA’s implementation recommendations and proposed mitigations.

OHID Health Equity Assessment Tool (HEAT)

The Office for health Improvement and Disparities (OHID) Health Equity Assessment Tool (HEAT) consists of a series of questions and prompts designed to help systematically assess health inequalities related to work programmes and identify what can be done to help reduce inequalities. The purpose of the tool is to help with:

- consideration of equity issues to be addressed for a population in the planning or preparatory stages of programme or service development
- consideration of the requirements of the [Equality Act 2010](#)
- demonstrating compliance with the public sector equality duty (PSED)

HEAT provides a systematic framework for assessing and driving action to reduce health inequalities across a variety of settings and contexts inside and outside of the health sector. The framework includes prompts to ensure consideration of multiple dimensions of health inequalities and provides an opportunity to understand how structural discrimination may be operating in the environment in which we work and to identify what specific steps may be taken to address as part of the work programme.

Table C.1: OHID Health Equity Analysis Tool - NHS Health Check in Westmorland and Furness Primary Care

Source: <https://www.gov.uk/government/publications/health-equity-assessment-tool-heat/health-equity-assessment-tool-heat-executive-summary>

Programme, project or policy details	NHS Health Checks - current GP-based delivery model Inequities in invitation and uptake identified through PRIMIS dataset (77,225 records)
Date assessment started	July 2025
Date assessment completed	January 2026
Contact person (name, directorate, email, phone)	Cathryn Beckett, Public Health Senior Manager Cathryn.beckett@westmorlandandfurness.gov.uk Tel:07900 666203
Name of strategic leader (senior responsible officer)	Katrina Stephens, Director of Public Health
Lead organisation	Westmorland & Furness Council - Public Health
Other organisations engaged	PRIMIS, GP practices, PCNs, ICS CVD Prevention Partnership
Community engagement methods used. Best practice shows that engaging communities is an effective way of identifying, gaining insight and understanding how health inequalities are experienced by communities. So, consider methods of engagement (for example specific questions, focus groups, surveys, Place Standard) which are inclusive, involving a range of affected communities and stakeholders; and an assessment of whether, how and with what impact community engagement can assist with the programme, project or policy and its implementation.	Not undertaken for this dataset review; insights drawn from routine primary care data
Agreed review date	12 months from completion

1. Prepare

Questions and steps to take	Your response - remember to consider multiple dimensions of inequalities, including protected characteristics and socio-economic differences
Describe your programme of work. Things you may want to consider include: <ul style="list-style-type: none"> • what are the main aims of your programme, project or policy? • what is the justification, reason or driver for this programme, project or policy? • how do you expect your programme, project or policy to impact (positively or negatively) health inequalities? • is it a programme, project, service, product, policy or strategy? 	The NHS Health Check programme aims to identify cardiovascular risk among adults aged 40-74. The HEA was undertaken to understand whether the current GP-based delivery model provides equitable access. The analysis shows clear inequities in invitation and uptake across age, sex, ethnicity, disability, geography and practice-level processes.
What data do you need to gain a greater understanding of need and assess the impact of this programme, project or policy? You should consider relevant data, evidence, indicators and intelligence you are aware of, for example: <ul style="list-style-type: none"> • nationally available data such as: <ul style="list-style-type: none"> ◦ Fingertips health profiles, ◦ Public Health Outcomes Framework ◦ Hospital Outcomes Statistics ◦ Office for National Statistics ◦ RightCare • local data such as that available in Joint Strategic Needs Assessment, contract performance data, school attainment and qualitative data from local research, voluntary, community and social enterprise (VCSE) intelligence and community voice • insights gained from community voices with lived experiences in relation to discrimination, racism, access and multiple disadvantage and displacement 	The HEA used: <ul style="list-style-type: none"> • PRIMIS dataset (77,225 records) • GP practice coding (invited / not invited / received) • Demographics: age, sex, ethnicity, disability, migrant status • IMD 2025 • Former district geography • Practice-level variation No additional data was required for this HEA.
Have you considered the interplay of multiple contributors to inequalities influencing personal experiences?	Yes - inequalities arise from intersecting factors: <ul style="list-style-type: none"> • age • sex • ethnicity • disability • rurality • deprivation • practice-level variation • migrant status These interact to shape access and engagement.

2. Assess

Questions and steps to take	Your response
Based on evidence collected above, which populations face the biggest health inequalities for your topic or service area? Think about the 4 health inequality domains (socio-economic deprived population; geographic deprivation; inclusion health and vulnerable groups; protected characteristics).	Based solely on the HEA: <ul style="list-style-type: none"> Men - lower invitation and uptake Younger adults (40-44) - lowest invitation rates Older adults (75+) - higher non-invitation Migrants - 6 in 10 not invited Black and Asian patients - lower invitation rates (small numbers) Disabled / sight-impaired patients - high non-invitation (41%) Residents in South Lakeland - lowest uptake, highest non-invitation Patients at practices with high "never invited" rates (0.4%-84%)
Consider your programme, project or policy against the socio-economic status domain and how it interacts with the domain, and the impact that has or may have.	<ul style="list-style-type: none"> Lower uptake in the most deprived deciles (39-44%). No clear gradient, but deprived groups still under-represented.
Consider your programme, project or policy against the geographic deprivation domain and how it interacts with the domain, and the impact that has or may have.	<ul style="list-style-type: none"> South Lakeland residents least likely to be invited or to have received a check. Barrow: high proportion invited but not attending.
Consider your programme, project or policy against the inclusion health and vulnerable groups domain and how it interacts with the domain, and the impact that has or may have.	<ul style="list-style-type: none"> Migrants: 60% not invited. Disabled/sight-impaired: high non-invitation. Homeless and sex workers: numbers too small for reliable interpretation.
Consider your programme, project or policy against experience related to protected characteristics domain and how it interacts with the domain, and the impact that has/may have.	<ul style="list-style-type: none"> Sex: men under-invited and under-engaged. Age: youngest and oldest groups under-invited. Ethnicity: minority groups under-invited (small numbers). Disability: high non-invitation.

Causes of inequalities

Questions and steps to take	Your response
Recognising that there are inequalities experienced by the population groups identified, considering the data and evidence, what are the wider determinants and structural discriminatory drivers? Consider the diverse range of social economic factors which influence people's health and wellbeing.	<ul style="list-style-type: none"> GP practice variation in recall systems Limited capacity in some practices Rurality and distance to GP practices Work patterns (shift work) Digital literacy not directly measured but likely relevant Cultural and language barriers (inferred from migrant data) Inconsistent coding of demographic variables (religion, disability, sexual orientation)
<p>What does the data and evidence tell you are the potential drivers for these inequalities? It may be helpful to consider the following questions:</p> <ul style="list-style-type: none"> which wider determinants are influential, for example, income, education, employment, housing, community life, racism and discrimination, cultural, environmental? are there any factors which indicate structural discrimination or racism will impact upon your programme, project or policy, for example mandatory use of digital access to health advice preventing access for less IT literate individuals and communities? which health behaviours play a role? does service quality, access and take up increase the chance of health inequalities in your work area? does climate change have an impact on health inequalities in relation to your programme, project or policy? which of these can you directly control? which can you influence? which are out of your control? 	<ul style="list-style-type: none"> Traditional GP-based model not suited to working-age adults Limited culturally tailored engagement for minority groups Barriers for disabled residents (e.g., sensory impairment) Structural variation between practices Transport and access barriers in rural areas Lack of systematic outreach to underserved groups
Consider if any of the following aspects influence or are influenced	<ul style="list-style-type: none"> CVD: programme directly relates to CVD prevention

<p>by your programme, project or policy - if yes, refer to the topic specific-prompts in the appendix, below, and respond here:</p> <ul style="list-style-type: none"> poverty and cost of living community engagement COVID-19 or incident recovery violence prevention Core20PLUS5 major health conditions substance misuse mental health service commissioning rural and coastal health policy or strategy healthy weight children and young people cardiovascular disease (CVD) 	<ul style="list-style-type: none"> Rural health: clear geographic inequities Core20PLUS5: CVD is a priority condition Community engagement: limited in current model Digital exclusion: not measured but relevant to future models
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3. Refine and apply

Questions and steps to take	Your response
Considering the above, how is your programme, project or policy likely to reduce health inequalities?	<p>The HEA identifies opportunities to:</p> <ul style="list-style-type: none"> Standardise recall systems Target outreach to underserved groups Improve data quality Expand delivery models (e.g., digital, workplace, community settings)
Does your programme, project or policy have the potential unintended consequence of widening inequalities by, for example: <ul style="list-style-type: none"> requiring self-directed action which is more likely to be done by affluent groups? not tackling the wider and full spectrum of causes? not being designed with communities? relying on professional-led interventions? not tackling the root causes of health inequalities? relying upon digital access? relying upon high level of literacy? 	<ul style="list-style-type: none"> Continuing with GP-only delivery will maintain or worsen inequities Lack of culturally tailored engagement may exclude migrants Poor coding limits ability to monitor inequalities Rural residents remain disadvantaged due to travel/time barriers
What aspects of mental wellbeing are affected? Consider risk and protective factors.	<ul style="list-style-type: none"> Reduced access may increase stress or missed prevention opportunities Improved access could support empowerment and early intervention

Action planning

Questions and steps to take	Your response
What specific actions will you take to maximise the potential for positive impacts and/or to mitigate the negative impacts on health inequalities? Provide a list of actions and targets.	<ul style="list-style-type: none"> Standardise invitation and recall processes across practices Provide targeted support to practices with high "never invited" rates Improve coding of ethnicity, disability, religion, sexual orientation Use HEA findings to prioritise outreach to underserved groups Expand delivery models (digital, workplace, community) to reduce structural barriers
How can you act on the specific causes of inequalities identified above?	<ul style="list-style-type: none"> Reduce reliance on GP appointments alone Provide alternative access routes for working-age adults Improve accessibility for disabled residents Use community assets to reach migrants and minority groups
What activities will you put in place which will adapt and enhance your programme, project or policy in relation to cultural competencies? For example, consideration of cultures, languages, formats, images, digital, written, spoken, translation services.	<ul style="list-style-type: none"> Improve coding and understanding of ethnicity and religion Engage minority communities to understand barriers Provide culturally appropriate communication
What specific steps and action will you take to address the identified structural racism and discrimination?	<ul style="list-style-type: none"> Monitor ethnicity-specific invitation and uptake Ensure equitable recall processes Address practice-level variation that disproportionately affects minority groups
How will you mitigate against the negative impact of when multiple	<ul style="list-style-type: none"> Prioritise groups facing multiple disadvantages (e.g.,

harmful factors interact and result in compounding poor health outcomes for effected communities?	<ul style="list-style-type: none"> older adults in rural deprivation) Use targeted outreach and alternative delivery models
Which populations face the biggest inequalities for your targeted action?	<ul style="list-style-type: none"> Men Younger adults (40-44) Older adults (75+) Migrants Disabled/sight-impaired residents South Lakeland residents Patients at practices with high non-invitation rates
Could you design the programme, project or policy with communities who face the biggest health inequalities to maximise the chance of it working for them? What will you need to enable this?	Not undertaken for this HEA but recommended for future work.
Could you seek to increase people's control over their health and lives (if appropriate)? What would this look like?	<ul style="list-style-type: none"> Provide clear information on eligibility and benefits Offer flexible access routes (digital, workplace, community)
Which community groups and consultation methods will you engage to tackle the problem, to maximise the chance of reaching large populations at scale (see Community-centred public health: taking a whole system approach).	<ul style="list-style-type: none"> Migrant support organisations Disability advocacy groups Rural community networks Employers VCFSE partners
Who else can help?	<ul style="list-style-type: none"> CVD Prevention Partnership PCNs ICS x 2 Community organisations Local employers

4. Review - Evaluation and monitoring

Questions and steps to take	Your response
How will you quantitatively or qualitatively monitor and evaluate the impact of your programme, project or policy on different population groups at risk of health inequalities? Consider what output or process measures you could use.	<ul style="list-style-type: none"> Repeat HEA annually Integrate equity metrics into provider contracts Track invitation and uptake by IMD, age, sex, ethnicity, disability, geography and practice Use findings to inform commissioning and resource allocation
Set a health equity assessment review date, recommended for between 6 and 12 months from initial completion.	12 months after implementation.

Health Equity Analysis of Primary Care NHS Health Checks Data

Authors: Cathryn Beckett, Public Health Senior Manager
Des Cooper, Public Health Manager, Epidemiology

Date: December 2025

Overview

An Health Equity Assessment was undertaken using 77,225 primary care records extracted via PRIMIS in 2025 to understand how NHS Health Check invitation and uptake patterns vary across population groups in Westmorland and Furness.

The analysis identified clear inequities in both access and engagement. Men, younger adults (40-44), and those aged 75+ were less likely to have been invited for a Health Check, while women and those in mid-life were more likely to have received one. Ethnicity recording was generally strong, and although numbers were small in non-White groups, early patterns suggest lower invitation rates among Black and Asian patients. Migrants and people recorded as severely sight impaired or disabled also showed lower invitation rates, indicating potential structural barriers.

The review also highlighted significant variation between GP practices, with the proportion of patients never invited ranging from <1% to 84%. This level of unwarranted variation suggests that operational processes, capacity, and recall systems differ markedly across practices. Geographic variation was also evident: residents in South Lakeland were least likely to have been invited, while Barrow had the highest proportion of patients invited but not yet attending. Deprivation patterns were mixed, with no clear gradient, but those in the most deprived deciles were less likely to have had a Health Check.

Taken together, the HEAT analysis demonstrates that the current GP-based delivery model does not provide equitable access across the population. Groups with lower engagement - working-age men, shift workers, migrants, and those in certain geographic areas - align closely with the groups shown in the literature to benefit from more flexible, digitally enabled or workplace-based models. These findings directly inform the HTA's case for a diversified delivery model, including digital NHS Health Checks, to reduce inequities and improve reach.

About the Data

The following analysis draws on NHS Health Check records extracted via PRIMIS in 2025. A total of 80,669 records were available. A cohort of 3,444 patients was excluded because their records contained only partial information relating to the alcohol audit, or with no accompanying demographic or patient characteristics data. This left 77,225 records for analysis.

Patients were categorised into three groups:

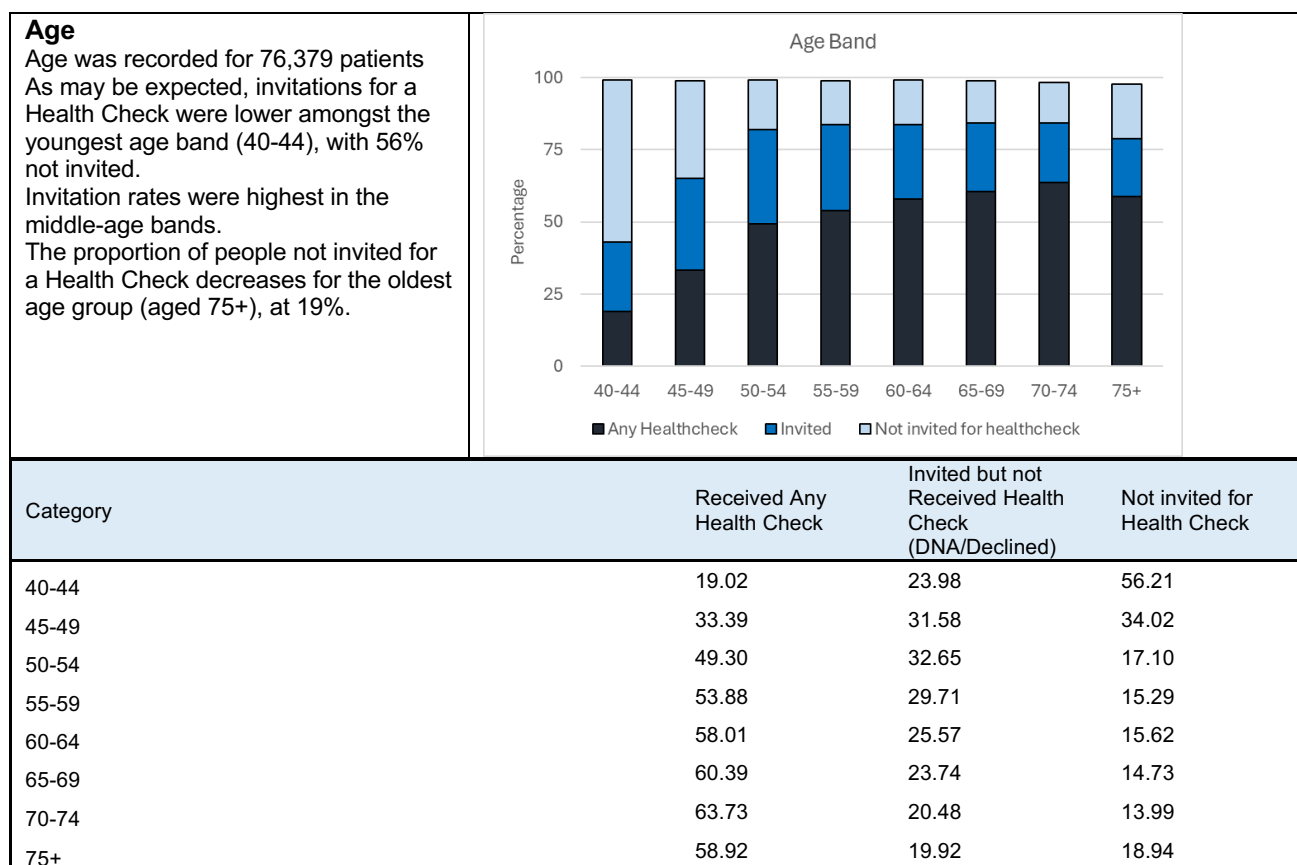
- Health Check received: 35,890
- Invited for a Health Check but not yet received one: 21,981
 - This group includes individuals who have been invited but have not taken up the offer, including a small proportion (4%) who declined or did not attend (DNA).
- Not invited for a Health Check: 19,354

Important notes:

- Some patients had previously received an NHS Health Check between 2009 and 2020 and have since been invited again. These individuals are included in the 'Health Check received' category.
- Data are based on GP practice registration and therefore include a proportion of patients who live outside the Westmorland and Furness area (approximately 7% of the sample).

Definitions used in the analysis:

- Any Health Check: Patients who have received an NHS Health Check at any point (pre- or post-2022).
- Invited: Patients who have received at least one invitation for a Health Check and have no record of a completed check. This group includes a small proportion who declined or DNA'd (3.5% of those invited). These can be separated out if required.
- Not invited: Patients with no recorded invitation for an NHS Health Check.

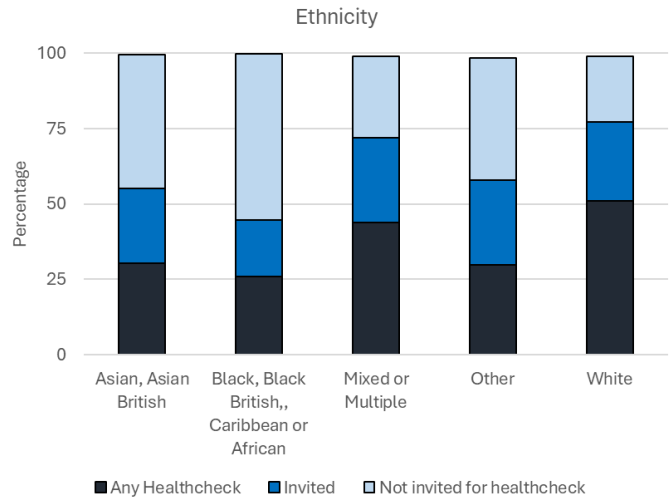


Ethnicity

Ethnicity overall was well recorded in the records, with a total of 68,316 records having ethnicity recorded.

However ethnic categorization was broad and had to be recoded using best fit to standard NHS ethnic groups. Numbers were small in all non-White categories, with those coded as 'White' accounting for 96% of records with ethnicity coded.

Just over 1 in 2 White patients had ever had a Health Check. Of those in a non-White category, over half of Black / Black British / Caribbean / African patients had not been invited for a Health Check, and around 45% of Asian /Asian British patients had never been invited, though numbers are small.



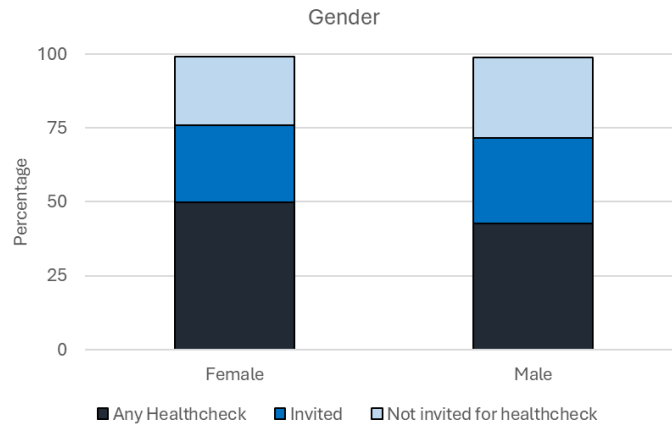
Category	Received Any Health Check	Invited but not Received Health Check (DNA/Declined)	Not invited for Health Check
Asian, Asian British	30.22	24.77	44.60
Black, Black British, Caribbean or African	25.85	18.71	55.10
Mixed or Multiple	43.74	28.13	27.10
Other	29.85	28.16	40.30
White	51.09	26.06	21.78

Gender

Gender was recorded for 76,377 patients.

There were more female (40,974) than male (35,403) records

Men were more likely to have not been invited for a Health Check (27% v 23%), whilst women were more likely to have received a Health Check (50% v 42.5%)



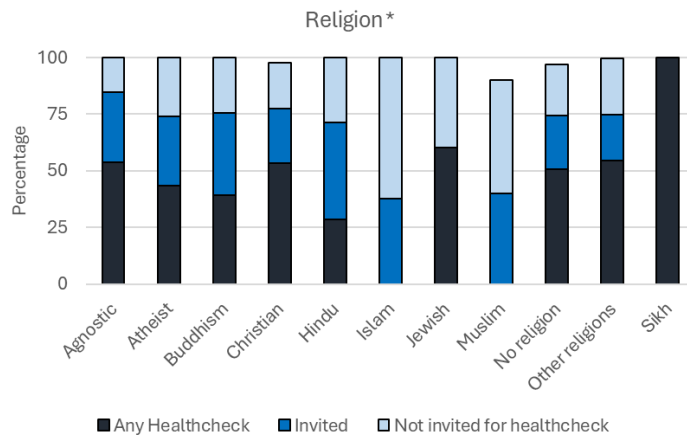
Category	Received Any Health Check	Invited but not Received Health Check (DNA/Declined)	Not invited for Health Check
Female	49.89	26.06	23.07
Male	42.58	29.03	27.28

Religion

Religion was poorly coded, with only 2,115 records (3%) having a description of the patient's religion.

This section should therefore be viewed with caution as the numbers in each sub-category are low.

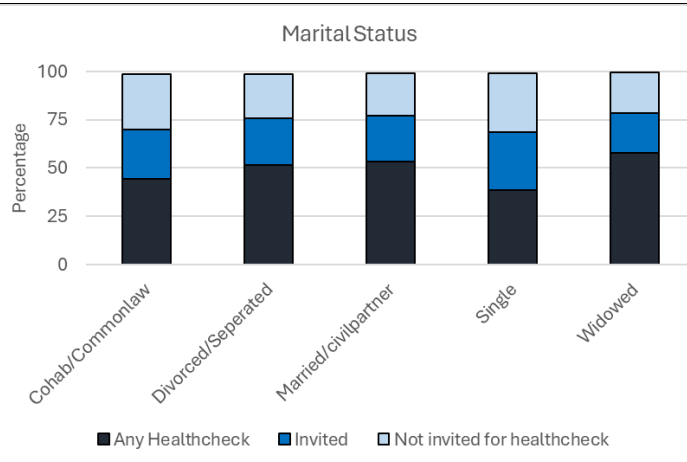
*Of note is that those recorded as being Muslim and Islam had not had a Health Check (although these patients accounted for <15 records). However, this may be a pattern worth investigating further to understand how Health Checks are viewed across different faiths.



Category	Received Any Health Check	Invited but not Received Health Check (DNA/Declined)	Not invited for Health Check
Agnostic	53.85	30.77	15.38
Atheist	43.48	30.43	26.09
Buddhism	39.02	36.59	24.39
Christian	53.42	24.09	19.98
Hindu	28.57	42.86	28.57
Islam *	0.00	37.50	62.50
Jewish	60.00	0.00	40.00
Muslim *	0.00	40.00	50.00
No religion	50.70	23.66	22.54
Other religions	54.39	20.47	24.56
Sikh *	100.00	0.00	0.00

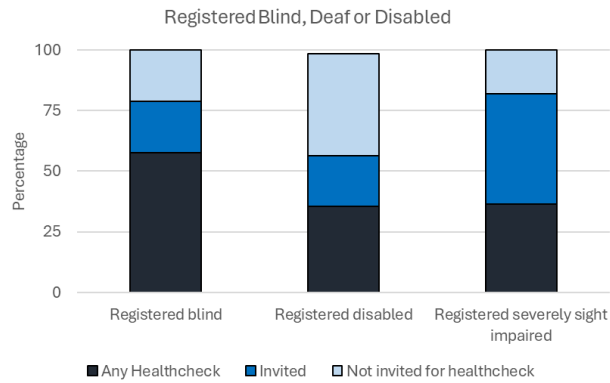
Marital Status

Marital status was recorded for 13,909 patients. However, this appears to be coded in a free text format therefore there was a broad range of categories which have been summarised further. Those categorised as single were least likely to have received a Health Check (38.7%) and least likely to have been invited for a Health Check (30.5%) Patients who were widowed were most likely to have received a Health Check (58%) although this may be related to patient age and so likelihood of having received a Health Check.



Registered Severely Blind

Only 124 patients were recorded as being registered severely sight impaired, blind or disabled, therefore the results for this section must be viewed with caution due to small numbers. A high proportion (41%) of those registered disabled had not been invited for a Health Check. Around 3 in 5 of those registered blind had received a Health Check.



Category	Received Any Health Check	Invited but not Received Health Check (DNA/Declined)	Not invited for Health Check
Registered blind	57.69	21.15	21.15
Registered disabled	35.48	20.97	41.94
Registered severely sight impaired	36.36	45.45	18.18

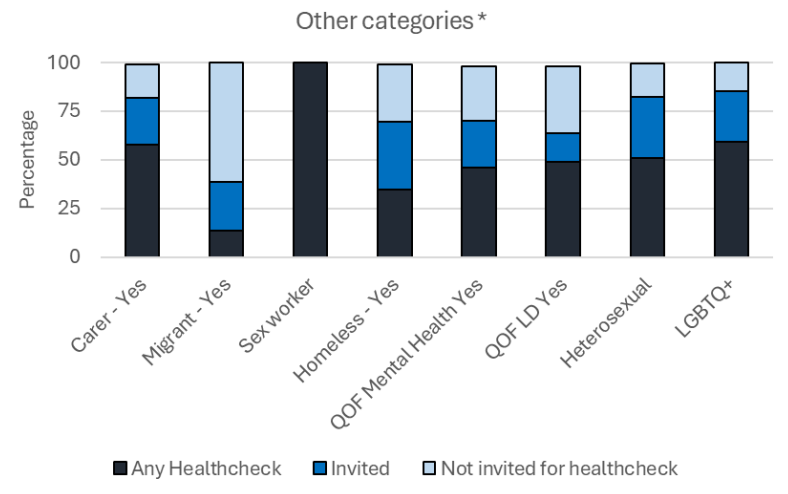
Other Categories

Other categories were made up of very low numbers therefore this data should be viewed with caution. Totals coded:

- Sexual orientation: 865
- Migrant: 469
- Homeless: 88
- Sex workers: <5
- QOF mental health: 823
- QOF learning disability: 259
- Carer: 4,109

Sexual orientation data needed to be re-coded to reduce the broad range of reported data.

Of note, carers had a high rate of having received a Health Check (57%) as did those identifying as LGBTQ+ (59%). 6 in 10 migrants had not been invited for a Health Check.



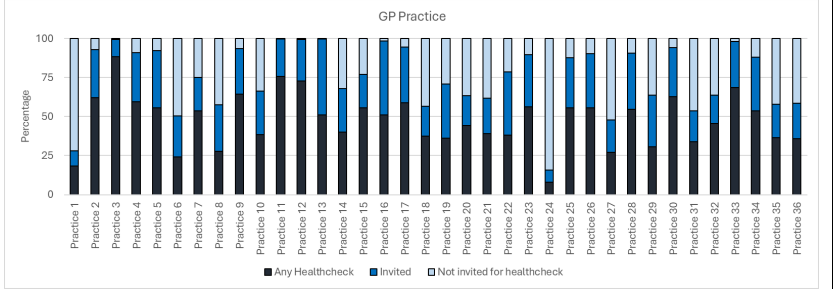
Category	Received Any Health Check	Invited but not Received Health Check (DNA/Declined)	Not invited for Health Check
Carer - Yes	57.67	24.23	17.16
Migrant - Yes	13.43	24.95	61.62
Sex worker *	100.00	0.00	0.00
Homeless - Yes *	34.83	34.83	29.21
QOF Mental Health Yes	45.78	24.02	28.06
QOF LD Yes	49.06	14.72	33.96
Heterosexual	50.83	31.59	17.10
LGBTQ+	59.26	25.93	14.81

GP Practice

GP Practice was recorded for all (100%) patients in this analysis. There were significant differences in those who had never been invited for a Health Check at GP Practice level, ranging from 0.4% to 84%. List size and/or age structure of the practice population may be a contributing factor.

The range of those who had received a Health Check was also wide ranging, from 8% to 88%.

Practice name has been anonymised for this report but can be re-identified to inform future engagement with practices.

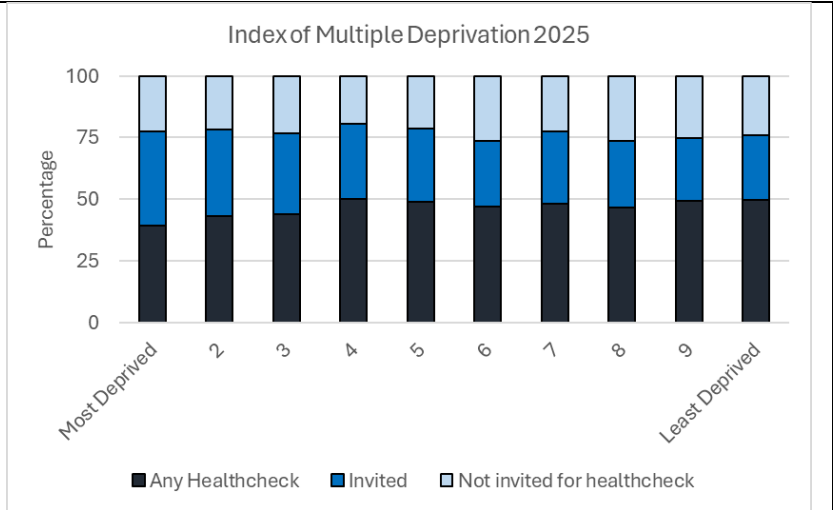


Index of Multiple Deprivation (IMD)

IMD 2025 was assigned to 71,815 patient records, as this was narrowed down to those patients who reside in Westmorland and Furness.

Of this cohort, patients living in the 3 most deprived deciles were least likely to have had a Health Check (39% - 44%), this was not a clear inequality slope as those in decile 4 were most likely to have had a Health Check (50%), similar to those in the 2 least deprived deciles.

The greatest proportions of patients not to have been invited for a Health Check were generally found in the least deprived half of deciles though, again, not a clear slope of inequality from most deprived to least deprived.

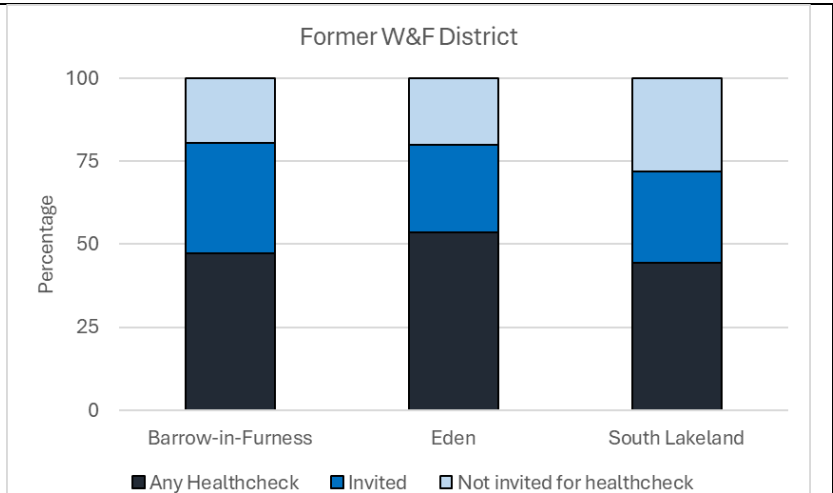


Former District

71,815 records were identifiable to be for residents of Westmorland and Furness.

Across the 3 former district council areas, those in South Lakeland were least likely to have received a Health Check (44%), whilst also having the greatest proportion to have not been invited for a Health Check (28%).

1 in 3 patients in Barrow had been invited for, but not received, a Health Check.



Key Findings and Recommendations from the Health Equity Assessment

Who is most affected?

The HEA identified the following groups as experiencing lower access or engagement:

Working-age men

- Adults aged 40-44 and 75+
- Migrants
- People recorded as severely sight impaired or disabled
- Residents in South Lakeland
- Patients registered at practices with high “never invited” rates
- Black and Asian patients (small numbers but consistent pattern)

What inequalities exist?

- Lower invitation rates among men and younger adults
- Higher non-invitation rates in the oldest age group
- Lower invitation rates among minority ethnic groups
- Marked variation between GP practices (0.4%-84% never invited)
- Geographic variation across former district areas
- Lower uptake in the most deprived deciles
- Lower invitation rates among migrants and disabled patients

What are the drivers?

Likely contributing factors include:

- Variation in practice recall systems
- Limited capacity in some practices
- Traditional delivery model not suited to working-age or mobile populations
- Barriers to access for migrants and disabled people
- Limited culturally tailored engagement
- Inconsistent coding of demographic variables (religion, disability, sexual orientation)

Recommended Actions

1. Standardise and strengthen invitation processes

- Implement a consistent recall system across all practices
- Provide targeted support to practices with high “never invited” rates
- Monitor invitation and uptake quarterly

2. Target outreach to underserved groups

- Working-age men, migrants, and younger adults (40-44)
- Residents in South Lakeland
- People with disabilities or sensory impairment

3. Improve data quality

- Strengthen coding of ethnicity, disability, religion, sexual orientation
- Reduce free-text entries
- Use improved data to refine equity monitoring

4. Expand delivery models to reduce inequities

- Explore offer of digital NHS Health Checks to reach working-age adults and non-attenders
- Use workplace and community settings to reach shift workers and mobile populations
- Ensure digital pathways are inclusive and supported

How can progress be monitored?

- Repeat the HEA every two years
- Integrate equity metrics into provider contracts
- Track invitation and uptake by IMD, age, sex, ethnicity, and practice and risk factors
- Use findings to inform commissioning and resource allocation

Appendix D. Workplace Health Checks Pilot Data and Analysis

Pilot Overview

The workplace pilot was conducted between November 2024 and May 2025, using funding from a joint bid with Cumberland Council to the Department of Health and Social Care. In Westmorland and Furness, the pilot was delivered with a large local employer, BAE Systems, alongside Highways and Waste teams within the Council. These settings were selected due to their predominantly male, shift-working workforce and historically low uptake of NHS Health Checks. A total of 1,569 digital Health Checks were completed, of which 1,496 (95%) took place in workplace settings.

The pilot tested a hybrid delivery model, offering digital Health Checks from PocDoc through Cumbria Health, with face-to-face support available on site for those who needed or preferred it. Although both options were available, most employees chose the digital-only pathway, particularly younger adults and shift-working staff. Eligibility was intentionally widened beyond the standard 40-74 age range, reflecting both the employer's preference for a universal wellbeing offer and a deliberate decision by the Public Health team to maximise learning from the pilot. This approach avoided singling out specific age groups and enabled the identification of meaningful early CVD risk in younger adults, many of whom would not ordinarily be reached through the national NHS Health Check programme. The hybrid offer therefore provided valuable insight into both delivery preferences and unmet prevention needs across the workforce.

Participant Characteristics

- 59% male, 41% female
- 68% of eligible adults (40+) had never previously attended an NHS Health Check
- High representation from shift-working and manual occupations
- Strong engagement from younger adults (25-39), despite not being eligible for the national NHS Health Check programme

Key Clinical Findings

Heart Age - Heart age compares an individual's cardiovascular health to their actual age, indicating how their risk factors affect their likelihood of heart attack or stroke. A higher heart age reflects a greater estimated risk. It is calculated using factors such as blood pressure, smoking status, BMI, and cholesterol.

- One-third of all participants had a heart age older than their actual age
- 40% of men had an older heart age vs <20% of women

Cholesterol - High cholesterol is a major risk factor for cardiovascular disease, caused by fatty deposits building up in the arteries and increasing with age. It can also result from genetic conditions such as familial hypercholesterolaemia. Although lipid-lowering treatments are effective, many people with inherited high cholesterol remain undiagnosed.

- Elevated cholesterol was common across all age groups
- Cholesterol levels in the 25 to 39 age group were unexpectedly close to those in the 40-49 group
- Among those referred:
 - Most had elevated cholesterol
 - All had raised blood pressure

QRISK3 - QRISK estimates a person's likelihood of developing cardiovascular disease in the next 10 years based on their health information. It does not predict that someone *will* get CVD but gives a probability that helps identify whether action is needed to reduce risk.

- Nearly one-third of referred participants had a QRISK3 >10%, indicating high 10-year CVD risk
- Several younger adults (under 40) had risk profiles comparable to older adults

BMI - Higher Body Mass Index (BMI) is strongly associated with an increased risk of Cardiovascular Disease.

- 70% of all participants were overweight or obese
- 74% of men were overweight vs 64% of women
- Obesity was present across all age groups, including younger adults

Referral Rates and Primary Care Impact

- <10% of participants required GP referral
- 13.5% of men required referral vs 2.5% of women
- Referral rates were clinically appropriate and did not overwhelm primary care
- This addresses a key concern from GP practices regarding potential workload increases

Acceptability and User Feedback

As shown in Figure D.1, feedback on the digital Health Check was largely positive. Participants particularly valued:

- Convenience
- Speed
- Clarity of results
- Workplace accessibility
- Reduced need to travel or book GP appointments

Figure D.1: Word cloud representing some of the key themes from pilot feedback



Summary Interpretation

The pilot demonstrated that a hybrid delivery model - offering both digital and face-to-face NHS Health Checks in workplace settings - can successfully reach groups who are typically under-represented in traditional GP-based provision. Although both options were available, most employees chose the digital pathway, particularly younger adults and shift-working staff, highlighting strong demand for flexible, low-burden models of delivery.

Eligibility was intentionally widened beyond the standard 40-74 age range. This reflected both the employer's preference to offer a universal wellbeing intervention to all staff, and a deliberate decision by the Public Health team to maximise learning from the pilot. This approach avoided singling out specific age groups and enabled the identification of meaningful early CVD risk in younger adults, many of whom would not ordinarily be reached through the national NHS Health Check programme. The presence of elevated cholesterol, raised blood pressure and high QRISK3 scores in adults aged 25-39 provides important insight into unmet prevention needs across the workforce.

Referral rates remained clinically appropriate (<10%) and did not overwhelm GP practices, addressing a key concern from primary care colleagues. Participant feedback was overwhelmingly positive, with employees valuing convenience, speed, clarity of results and the ability to complete checks at work without needing to arrange GP appointments.

Taken together, the pilot provides strong evidence that hybrid delivery - anchored in digital pathways but supported by face-to-face options - offers a feasible, acceptable and scalable approach. It widens access, engages underserved groups and identifies early risk that may otherwise remain undetected. These findings support the case for wider rollout of Digital NHS Health Checks as part of a hybrid model across Westmorland & Furness.

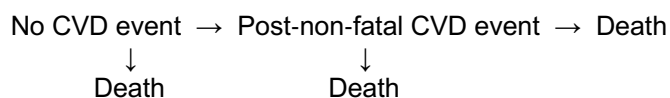
Appendix E. Economic Model

Overview

This appendix provides technical detail that underpins Section 8 of the main report. It sets out the model structure, assumptions, input parameters, discounting approach, base-case results, and sensitivity analyses. All calculations, including incremental cost-effectiveness ratio (ICER) and quality adjusted life years (QALY) derivations, are presented transparently to support reproducibility and scrutiny. Readers who are less familiar with health economics may find it helpful to begin with Appendix F.

Model Structure

A two-part modelling approach was used, consistent with NICE reference-case methods. A short-term decision tree captured uptake, completion, referral and follow-up for digital and face-to-face NHS Health Checks. Outputs from this model informed a simple three-state long-term model estimating costs and QALYs over a 10-year horizon. The three states were: *No CVD event*, *Post-non-fatal CVD event* and *Death*. Annual cycles and 3.5% discounting were applied.



The model adopts an NHS and Personal Social Services (PSS) perspective, in line with NICE reference-case requirements. It assumes a constant annual effect, with QALY gains arising from earlier detection and management of cardiovascular risk factors. The QALY values used reflect the upper range reported in published NHS Health Check modelling studies. A full probabilistic sensitivity analysis (PSA) was not undertaken, which was considered proportionate for this decision context; however, deterministic and scenario analyses demonstrate that the model is robust to plausible variation in key parameters. The model simulates a single annual cohort of 10,000 eligible individuals over a 10-year time horizon to estimate long-term cost-effectiveness. Given the exploratory nature of this assessment, deterministic sensitivity analysis was judged appropriate, and future iterations may incorporate probabilistic methods as further empirical data become available.

Pathway, Cost Flow and Logic Model

Technical Description

The digital NHS Health Check uses a technology-enabled pathway that combines remote data collection, home-based biomarker testing, automated interpretation and digital results delivery. Users complete an online questionnaire and perform a finger-prick test using a multi-analyte lateral flow device, with results interpreted via a CE-marked smartphone application. The platform integrates questionnaire data, biometric measures and test results to generate a validated QRISK score and personalised risk information. Results are delivered digitally, supported by automated prompts for follow-up, referral or lifestyle advice where indicated. This pathway shifts several resource-intensive steps away from primary care - such as phlebotomy, laboratory processing, manual data entry and in-person risk communication - into a digitally mediated workflow. As a result, costs are concentrated in the test kit and digital platform, with minimal routine staff time and selective clinical oversight only where follow-up is required.

In contrast, the traditional NHS Health Check follows a clinic-based model involving appointment booking, in-person attendance, venous blood sampling, laboratory analysis, QRISK calculation within the GP system and clinician-delivered results. Costs are distributed across administrative time, workforce capacity, phlebotomy, laboratory services and routine clinical review. While this pathway offers high diagnostic accuracy and clinician-led interpretation, it is constrained by appointment availability, travel requirements and other access barriers that may limit uptake and completion. The shift from this clinic-based model to a digitally enabled pathway therefore changes both the operational characteristics and the cost structure of the NHS Health Check, introducing new dependencies (e.g., smartphone access, digital literacy, correct test execution) alongside potential efficiencies (e.g., reduced staff time, improved convenience, increased reach). These features directly inform the economic model by determining which costs are incurred, which benefits may arise and where uncertainty remains, including diagnostic performance, user adherence, failure rates and equity impacts.

The pathway differences are summarised in the tables below, which illustrate the operational, cost and workflow contrasts that underpin the economic model.

Table E.1: Operational Comparison - Digital vs Traditional NHS Health Check

Domain	Digital Health Check (e.g., PocDoc-enabled)	Traditional NHS Health Check (Primary Care)
Setting	Home or community; no appointment required	GP practice or clinic; scheduled appointment
Biomarker testing method	Finger-prick multi-analyte lateral flow test; app-based interpretation	Venous blood sample; laboratory-based assays
Analytical process	Automated optical reading and algorithmic interpretation; embedded QC checks	Laboratory analysis with established QC systems
Data integration	Automated integration of questionnaire, biometrics, and test results	Manual or semi-manual data entry into clinical systems
Risk calculation	Automated QRISK calculation within digital platform	QRISK calculated within GP clinical system
Staff time requirement	Minimal; clinical input only for abnormal results or follow-up	Significant; appointment time, phlebotomy, admin, risk discussion
User convenience	High; flexible timing and location	Moderate; requires travel and appointment availability
Diagnostic performance	Dependent on test accuracy, user technique, and device compatibility	High; laboratory-based assays with controlled conditions
Failure points	User error, insufficient sample, connectivity issues, device incompatibility	Appointment non-attendance, sample handling issues
Equity considerations	May improve access for underserved groups; risk of excluding digitally limited users	Familiar pathway; may disadvantage those with access barriers (e.g., transport, working hours)
Cost structure	Test kit + digital platform + follow-up	Staff time + phlebotomy + lab processing + admin
Data flow and timeliness	Real-time digital transmission and automated reporting	Dependent on clinic workflow and lab turnaround
Scalability	High; limited by kit supply and digital access	Moderate; limited by workforce and clinic capacity
Implementation requirements	User training materials, device compatibility, digital support	Clinic capacity, workforce availability, phlebotomy services
Environmental considerations	Increased use of single-use test kits; reduced travel	Lower consumables; higher travel and facility use

Table E.2: Pathways

Digital Health Check Pathway	Traditional NHS Health Check Pathway
Invitation ↓ Digital questionnaire completed ↓ Home finger-prick test performed ↓ App reads and interprets test (automated QC) ↓ Biomarker + questionnaire data integrated ↓ QRISK score generated digitally ↓ Digital results + tailored advice delivered ↓ Automated prompts for follow-up ↓ Clinical review only where indicated	Invitation ↓ Appointment booked at GP practice ↓ In-person appointment attended ↓ Venous blood sample taken ↓ Sample transported to laboratory ↓ Laboratory analysis completed ↓ QRISK calculated in GP clinical system ↓ Clinician provides results + lifestyle advice ↓ Follow-up or referral arranged as standard

Table E.3: Cost-Flows

Digital Health Check Cost Flow	Traditional NHS Health Check Cost Flow
Invitation + onboarding ↓ Digital platform licence / per-use fee ↓ Home test kit (multi-analyte) + distribution ↓ Automated processing + QC ↓ Digital results + messaging ↓ Selective clinical review (abnormal results only)	Invitation + admin ↓ Appointment time (clinician + room) ↓ Phlebotomy + consumables ↓ Sample transport ↓ Laboratory analysis + reporting ↓ Clinician time for results + follow-up

Table E.4: Dual-Pathway Logic Model

DIGITAL HEALTH CHECK	TRADITIONAL NHS HEALTH CHECK
INPUTS <ul style="list-style-type: none"> • Digital platform • Multi-analyte test kit • User time • Minimal clinical oversight 	INPUTS <ul style="list-style-type: none"> • GP capacity • Phlebotomy + consumables • Laboratory services • Admin + clinical time
ACTIVITIES <ul style="list-style-type: none"> • Remote questionnaire + home testing • Automated interpretation (app) • Digital QRISK calculation 	ACTIVITIES <ul style="list-style-type: none"> • Appointment booking + attendance • Venous blood sampling • Laboratory analysis • Clinician-led interpretation
OUTPUTS <ul style="list-style-type: none"> • Digital results + tailored advice • Automated prompts 	OUTPUTS <ul style="list-style-type: none"> • Clinician-delivered results • Standard follow-up
MECHANISMS <ul style="list-style-type: none"> • Convenience + flexibility • Faster results • Automation 	MECHANISMS <ul style="list-style-type: none"> • Familiarity + diagnostic accuracy • Clinician-led reassurance • Established workflow
OUTCOMES <ul style="list-style-type: none"> • Higher uptake • Earlier identification of risk 	OUTCOMES <ul style="list-style-type: none"> • Lower uptake (access barriers) • Later identification of risk
COST CONSEQUENCES <ul style="list-style-type: none"> • Upfront kit/platform costs • Reduced staff/lab time • Selective clinical review 	COST CONSEQUENCES <ul style="list-style-type: none"> • Distributed workforce + lab costs • Higher per-check cost • Routine clinical review

Interpretation and implications for the Economic Model

The dual pathway logic model illustrates how the digital and traditional NHS Health Check pathways generate different patterns of costs and outcomes. The digital pathway introduces upfront costs for test kits and platform use but reduces downstream expenditure on staff time, phlebotomy and laboratory analysis. Its mechanisms of impact - convenience, automation, faster results and digital prompts - support assumptions of higher uptake and earlier identification of cardiovascular risk. In contrast, the traditional pathway incurs higher per-check costs due to administrative time, appointments, venous sampling, laboratory analysis and routine clinical review, although it benefits from established diagnostic processes and clinician-led interpretation. These structural contrasts explain why the two pathways generate different patterns of cost and health impact.

These differences directly shape the economic model's cost inputs, expected benefits and key uncertainties. The digital pathway introduces new costs (test kits and platform use) while reducing others (staff time, phlebotomy and laboratory processing). Potential improvements in uptake and completion may increase early identification of cardiovascular risk, influencing long-term QALY gains. At the same time, diagnostic performance, user adherence and digital exclusion introduce uncertainty that must be explored through sensitivity analysis. Equity considerations are also relevant, as digital delivery may reduce access barriers for some groups while creating new challenges for others, with implications for population-level impact. Together, these factors ensure that the economic evaluation is grounded in a transparent and coherent understanding of how each pathway operates and where costs and benefits arise.

Base-Case Input Parameters

The following parameters were used in the base-case analysis, reflecting local assumptions and published evidence.

Table E.5: QALY Calculation Assumptions and Summary

Parameter	Value
Cost per digital health check (£)	134.46
Cost per face-to-face health check (£)	154.8
Fixed annual implementation cost for digital model (£)	0
Number of eligible people	10000
Uptake rate for digital checks	0.4
Uptake rate for face-to-face checks	0.25
QALYs gained per completed digital check	0.01
QALYs gained per completed face-to-face check	0.008
Time horizon long-term (years)	10
Discount rate (%)	0.035

QALY Calculation Method

QALYs were calculated using the standard formula: $QALY = Utility \times Time$

In this model, QALY gains represent the long-term health benefit associated with earlier detection and management, rather than utilities assigned to health states.

Discounting and Annuity Factor

Costs and QALYs were discounted at **3.5% per annum**, consistent with NICE guidance. A 10-year annuity factor was applied to reflect the long-term nature of prevention benefits.

Table E.6: Discount Factors (Years 1-10)

Years	Discount Factor
1	0.966183574879
2	0.933510700366
3	0.901942705668
4	0.871442227699
5	0.841973166859
6	0.813500644308
7	0.785990960684
8	0.759411556216
9	0.733730972190
10	0.708918813710
SUM	8.316605322578

Base-Case Results

The base-case results compare total costs and QALYs for digital and face-to-face delivery.

Table E.7: Base-Case Cost and QALY Totals

Metric	1 YEAR	10 YEARS
Completed digital checks	4000	40000
Completed face-to-face checks	2500	25000
Total cost - Digital	537840	5378400
Total cost - face-to-face	387000	3870000
Total QALYs - Digital	40	400
Total QALYs - face-to-face	20	200
Incremental cost (Digital - F2F)	150840	1508400
Incremental QALYs (Digital - F2F)	20	200
ICER (Incremental Cost-Effectiveness Ratio)	7542	7542

From these values:

$$\Delta\text{Cost} = \text{Cost}_{\text{DHC}} - \text{Cost}_{\text{F2F}}$$

$$\Delta\text{QALYs} = \text{QALYs}_{\text{DHC}} - \text{QALYs}_{\text{F2F}}$$

The ICER is calculated as:

$$\text{ICER} = \frac{\text{Incremental Cost}}{\text{Incremental QALYs}}$$

Table E.8: ICER Calculation

Annuity (discount) factor:	8.316605322578
Metric	Formula
Discounted cost digital	4473003.007
Discounted cost F2F	3218526.26
Discounted QALYs digital	332.6642129
Discounted QALYs F2F	166.3321065
Incremental cost	1254476.747
Incremental QALYs	166.3321065
ICER	7542

Deterministic Sensitivity Analysis

A deterministic sensitivity analysis (DSA) was conducted by varying key parameters by $\pm 20\%$ to assess the robustness of the ICER. Parameters tested included:

- Cost per digital check
- Cost per face-to-face check
- QALY gain per digital check

QALY gain per face-to-face check

Table E.9: DSA Parameter Ranges and ICER Outputs

Deterministic Sensitivity Analysis (20%+/-)					
Parameter	Base	Low	High	ICER Low	ICER High
Cost digital	537840	430272	645408	2163.6	12920.4
Cost F2F	387000	309600	464400	11412	3672
QALY digital	40	32	48	12570	5387.14286
QALY F2F	20	16	24	6285	9427.5

Base values represent total annual costs for the modelled cohort, not unit costs.

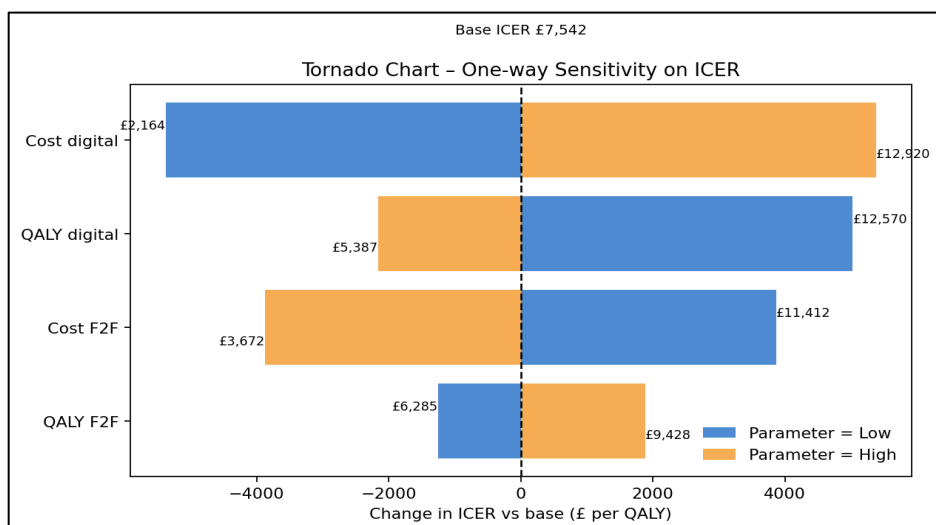
A full probabilistic sensitivity analysis was not undertaken, but the deterministic results indicate that the conclusion of cost-effectiveness is robust.

ICER Sensitivity: Tornado Chart Summary

The tornado chart at Figure E.1 ranks model parameters by the extent to which they influence the ICER. As shown in Table E.6, the cost per digital check is the single largest driver of variation, followed closely by the QALY gain from digital delivery. These two parameters produce the widest swings around the base-case ICER, indicating that they have the greatest leverage over cost-effectiveness outcomes. The cost of face-to-face delivery and the QALY gain from face-to-face checks have a smaller impact, reflecting their more limited influence on the incremental comparison.

Despite these variations, all parameter ranges tested keep the ICER well below NICE's (£20k-£30k/QALY*), demonstrating that the hybrid model remains cost-effective even under pessimistic assumptions. The ranking therefore reinforces the robustness of the model and highlights where future data collection would most meaningfully reduce uncertainty.

Figure E.1: Tornado Chart



The tornado analysis shows that the ICER is most sensitive to the cost per digital check and the QALY gain per digital check. Even under pessimistic assumptions, the ICER remains well below NICE thresholds, indicating that the model is robust to parameter uncertainty.

Table E.10: Ranked drivers of ICER (from greatest to least impact)

Parameter	ICER Low	ICER High	Impact on ICER*
Cost digital	£2,164	£12,920	£5,378
QALY digital	£12,570	£5,387	£5,028
Cost F2F	£11,412	£3,672	£3,870
QALY F2F	£6,285	£9,428	£1,886

*Impact = max(|ICER_low - base|, |ICER_high - base|); base = £7,542/QALY

Scenario Analysis

Scenario analyses were conducted to test the robustness of the economic model under alternative assumptions. These included:

- Lower digital uptake, simulating reduced engagement with the digital offer
- Higher non-completion rates, reflecting potential drop-off during the digital pathway
- Reduced QALY persistence, assuming a shorter duration of health benefit
- Alternative discount rates, including 0% and 6% to test sensitivity to time preference

Across all scenarios, the hybrid model remained cost-effective. Even under pessimistic assumptions, the ICER stayed well below NICE thresholds (£20k-£30k/QALY*), confirming that the model is resilient to uncertainty in uptake, completion, benefit duration and discounting. These findings provide strong reassurance that the case for Digital Health Checks is not dependent on optimistic modelling assumptions. Scenario results mirror the deterministic sensitivity analysis because the same parameter ranges were applied.

Table E.11: Scenario Analysis Results

Scenario	Low ICER (£/QALY)	High ICER (£/QALY)	Base ICER	Impact vs Base
Cost - Digital	2,164	12,920	7,542	5,378
QALYs - Digital	12,570	5,387	7,542	5,028
Cost - F2F	11,412	3,672	7,542	3,870
QALYs - F2F	6,285	9,428	7,542	1,886

Interpretation

The economic model indicates that Digital Health Checks are cost-effective compared with face-to-face delivery, with a base-case ICER substantially below NICE thresholds. Sensitivity analyses confirm that the conclusion is robust, with the model remaining cost-effective even under conservative assumptions.

The key drivers of cost-effectiveness are:

- Unit cost of digital delivery
- QALY gain associated with earlier detection
- Uptake rates

Overall, the economic model demonstrates that digital delivery represents strong value for money and that the conclusions are robust across a wide range of assumptions. Given the local commissioning context and the exploratory nature of this assessment, deterministic sensitivity analysis was considered proportionate to the decision. The substantial margin between the base-case ICER and NICE thresholds suggests a low probability of cost-ineffectiveness; however, future refinement of the model could incorporate probabilistic sensitivity analysis as further empirical data become available.

Appendix F. QALYs and ICERs Explained

This appendix provides an accessible overview of the key health economic concepts used in this Health Technology Assessment (HTA). It is designed to support transparency and understanding for readers without a background in health economics.

Quality-Adjusted Life Years (QALYs)

QALYs are a standard metric used to quantify the health benefits of an intervention by combining both length of life and quality of life into a single value.

- A QALY of 1 represents one year in perfect health.
- A QALY of 0 represents a health state equivalent to death.
- Values between 0 and 1 reflect reduced quality of life due to illness, symptoms or disability.

QALYs enable consistent comparison across different health interventions, regardless of the condition being treated.

EQ-5D Utility Measurement

EQ-5D is the most widely used tool for measuring health-related quality of life in economic evaluations. It assesses five dimensions:

- Mobility
- Self-care
- Usual activities
- Pain/discomfort
- Anxiety/depression

Each dimension is rated by severity. Responses are converted into a single utility score between 0 and 1 using a UK-specific value set. These utility scores are used to calculate QALYs.

Discounting

Discounting reflects the principle that future costs and health benefits are valued less than those occurring today. NICE recommends applying a 3.5% annual discount rate to both costs and QALYs in base-case analyses.

- This ensures consistency across evaluations.
- It prevents overvaluation of long-term benefits relative to short-term costs.

In this HTA, all future costs and QALYs were discounted in line with NICE guidance.

Incremental Cost-Effectiveness Ratio (ICER)

The ICER is a key metric used to assess whether one intervention offers good value for money compared with another. It is calculated as:

$$\text{ICER} = \frac{\Delta\text{Cost}}{\Delta\text{QALYs}}$$

Where:

- ΔCost = difference in cost between the two options
- ΔQALYs = difference in QALYs between the two options

A lower ICER indicates better value for money. ICERs are used to compare new interventions (often more expensive) against standard alternatives to determine whether the additional benefit justifies the additional cost.

Explaining Δ (Delta):

Δ means “the difference between two things.”

- ΔCost = how much more or less one option costs
- ΔQALYs = how many more or fewer QALYs it produces

Δ as shorthand for “change in” or “difference between”

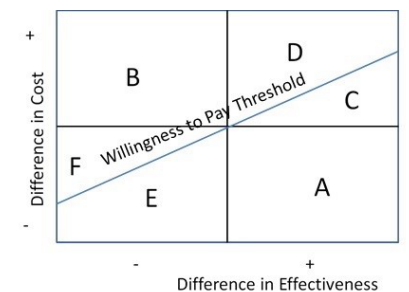
Willingness-to-Pay Thresholds

The willingness-to-pay (WTP) threshold represents the maximum amount the NHS is prepared to pay for one additional QALY. It is used to judge whether an intervention is considered cost-effective.

- NICE currently uses a threshold range of £20,000-£30,000 per QALY gained*.
- From April 2026, this will increase to £25,000-£35,000 per QALY.
- Interventions with ICERs below the threshold are generally considered cost-effective.
- Those above the threshold require strong justification or are unlikely to be recommended.

This threshold is not a fixed budget limit, but a benchmark for determining value for money. It reflects opportunity cost: spending above the threshold may displace more cost-effective care elsewhere in the system.

Figure F.1: Willingness to Pay Threshold



Interpreting Results

When interpreting ICERs and QALYs, it is important to consider:

- Magnitude of health gain: even small QALY gains can be meaningful at population scale.
- Equity impacts: who benefits, and whether inequalities are reduced or widened.
- Uncertainty: sensitivity and scenario analyses help assess how robust the findings are.

In this HTA, the hybrid model consistently produced ICERs far below NICE thresholds, indicating that Digital Health Checks represent a cost-effective use of NHS resources under a wide range of assumptions.

Appendix G. DTAC Compliance Requirements

The Digital Technology Assessment Criteria (DTAC) is the national baseline assurance standard for digital health technologies used within the NHS. It provides a consistent framework for assessing whether a product is safe, secure, interoperable and accessible, and represents the minimum requirement for NHS adoption. This section summarises the DTAC domains. Any provider commissioned to deliver Digital NHS Health Checks in Westmorland and Furness must demonstrate full DTAC compliance, and this document does not replace a formal assessment. Commissioned providers will be required to supply verified evidence of DTAC compliance prior to deployment.

DTAC comprises five core domains:

1. Clinical Safety (DCB0129)

Suppliers must evidence a robust clinical safety process, including a Clinical Safety Case Report, a maintained hazard log and a named Clinical Safety Officer. These requirements ensure that risks associated with digital clinical workflows are identified, mitigated and monitored.

2. Data Protection (GDPR)

Technologies must comply with UK GDPR and the Data Protection Act 2018. This includes a Data Protection Impact Assessment (DPIA), clear privacy notices, data-minimisation practices and secure handling of personal and special-category data.

3. Technical Security

Suppliers must meet NHS cyber-security expectations, including Cyber Essentials certification, regular penetration testing, encryption of data in transit and at rest, and documented vulnerability-management processes.

4. Interoperability

Digital Health Check platforms must integrate effectively with NHS systems. This includes the use of FHIR-compliant APIs, SNOMED CT coding and compatibility with GP clinical systems such as EMIS. NHS Identity and other national services should be used where appropriate.

5. Usability and Accessibility

Suppliers must demonstrate compliance with accessibility and usability standards, including WCAG 2.1 AA, alongside evidence of usability testing and inclusive design. This ensures the digital pathway is accessible to users with varying levels of digital confidence and to those with disabilities.

Conclusion

DTAC provides a nationally recognised assurance framework for digital health technologies. Any provider commissioned to deliver Digital NHS Health Checks in Westmorland and Furness will be required to evidence full DTAC compliance across all domains prior to implementation, ensuring that the chosen platform is clinically safe, secure, interoperable and accessible.

Appendix H. Equality Impact Assessment

This appendix provides a detailed Equality Impact Assessment to ensure the proposed model advances equity and meets statutory duties.

The following overview summarises the key equity considerations identified through the HTA and provides context for the detailed Equality Impact Assessment that follows.

Introducing a digital Health Check model offers clear opportunities to widen access and improve convenience, particularly for working-age adults, shift workers and residents in remote rural areas. However, it also carries important equity risks that must be recognised and actively managed. Digital exclusion remains the most significant concern, affecting people without access to devices or data, those with lower digital confidence, and residents living in areas with poor broadband connectivity. Older adults, people with disabilities, and individuals with language or literacy needs may face additional barriers when engaging with digital content or automated instructions. Without appropriate safeguards, these factors could widen existing inequalities in access to preventive care.

A range of mitigations can reduce these risks and support equitable access. Assisted-digital support delivered through community hubs, libraries, voluntary-sector partners and workplace settings can help residents complete digital checks with guidance where needed. Community outreach provides opportunities to engage groups who are less likely to access services independently, including older adults, ethnic minority communities and those living in deprived areas. Maintaining face-to-face options ensures that individuals with complex needs or limited digital access are not disadvantaged. Routine equity monitoring by deprivation, ethnicity, age, disability and rurality will enable early identification of disparities in uptake, completion and referral outcomes, allowing the system to adapt delivery in real time.

Taken together, the assessment indicates that a hybrid model - digital for those who can engage digitally, and face-to-face for those who need additional support - offers the most equitable and proportionate approach. This model maximises reach while ensuring that no group is disadvantaged by the shift toward digital delivery. Ongoing monitoring and targeted mitigation will be essential to ensure that Digital Health Checks contribute to reducing, rather than reinforcing, health inequalities across Westmorland and Furness.

Equality Impact Assessment - Digital Health Checks in Westmorland and Furness

This Equality Impact Assessment (EIA) for a Digital Health Check programme has been developed in parallel with a Health Technology Assessment (HTA) to ensure a coherent, system-wide understanding of how digital delivery will affect access, outcomes, and inequalities across Westmorland and Furness. As with the HTA, this EIA is grounded in a detailed analysis of local population health needs, digital inclusion data, and the wider determinants of health, with a particular focus on rurality, deprivation, and groups at risk of exclusion.

Westmorland and Furness is characterised by a dispersed rural population, an older age profile, and significant variation in digital connectivity and digital confidence. These factors shape both the opportunities and risks associated with a digital-first Health Check model. The HTA identified digital delivery as a potentially cost-effective and scalable approach but also highlighted the risk of widening inequalities if digital exclusion is not explicitly addressed. This EIA therefore builds on the HTA's findings by systematically assessing the impact of digital delivery across all protected characteristics and identifying the mitigations required to ensure equitable access.

Consistent with the HTA, the EIA recognises that digital delivery may improve convenience and uptake for some groups - particularly working-age adults, people with mobility limitations, and those living in remote areas where travel is a barrier. However, it also identifies groups who may be disadvantaged by a digital-only model, including older adults, people with disabilities, residents with limited digital literacy, and those living in areas with poor broadband connectivity. These risks align with the HTA's analysis of digital exclusion as a key driver of inequality in preventive health programmes.

To address these risks, the EIA adopts the same principles that underpin the HTA recommendations: a hybrid delivery model, targeted outreach, compliance with the [Accessible Information Standard](#), and the use of community assets to support digital engagement. This ensures that digital delivery enhances, rather than restricts, access to preventive care. The mitigations outlined in the EIA directly reflect the HTA's emphasis on equity, population insight, and proportionate universalism.

The EIA also aligns with the HTA's focus on quality, user experience, and behaviour change. Digital platforms must provide clear, accessible communication of CVD risk, tailored advice, and seamless signposting to lifestyle services. This mirrors the HTA's findings on the importance of user-centred design and the need for digital tools to support informed decision-making.

Finally, the EIA reinforces the HTA's recommendation for ongoing monitoring and evaluation. Providers will be required to collect demographic data, monitor uptake by protected characteristic and deprivation level, and undertake annual quality improvement projects focused on reducing inequalities. This ensures that the digital Health Check programme remains responsive to emerging evidence and continues to advance equity across the system.

Together, the HTA and EIA provide a comprehensive, aligned, and evidence-informed framework for commissioning a digital Health Check service that is clinically effective, cost-effective, and equitable for the diverse population of Westmorland and Furness.

1. Assessor details

Assessor(s) Name and Job Title	Cathryn Beckett, Public Health Senior Manager
Team and Directorate	Public Health, Thriving Communities, Westmorland and Furness Council

2. Programme details

Aim	To reduce morbidity and mortality from cardiovascular disease (CVD) through a digital-first Health Check model, supported by hybrid and in-person options where appropriate.
Objectives	<ol style="list-style-type: none"> 1. Improve health outcomes: early detection of CVD, CKD, diabetes; dementia awareness. 2. Reduce inequalities: increase uptake among deprived communities, ethnic minorities, smokers, people with obesity, and those at risk of digital exclusion. 3. Improve quality: accessible communication of risk, evidence-based behaviour change, holistic signposting, improved data quality.
Expected Outcomes	Increased early detection, reduced inequalities, improved access, enhanced user experience, better data for population health management.
Reason for EIA	Proposed change to the NHS Health Check service using a hybrid delivery model.

3. Equality and Diversity Impact Assessment (digital delivery)

Protected Characteristic	Potential Impact (Before Mitigation)	Risk of Unlawful Discrimination?	Advancing Equality / Fostering Good Relations	Concerns Raised / Evidence Base	Gaps in Evidence?	Communication & Accessibility Requirements	Adjustments / Mitigation (Aligned with HTA)
Age	Positive for 40-74 age group. Risk of digital exclusion for older adults due to lower digital confidence and rural broadband issues.	No	Hybrid model increases choice; digital reminders may improve uptake; targeted outreach to older adults.	Local digital inclusion data; rural broadband mapping; JSNA.	Limited local data on digital literacy by age band.	Plain-language content; telephone support; step-by-step digital instructions.	Hybrid model; community digital support; outreach via Age UK, libraries, PCNs; non-digital pathways.
Disability	Digital interfaces may disadvantage people with visual impairment, cognitive impairment, autism, or severe mental illness.	No	Accessible Information Standard compliance; inclusive design; digital tools can support autonomy.	JSNA disability data; national evidence on digital barriers.	Need more local insight on digital accessibility barriers.	Screen-reader compatibility; easy-read formats; BSL videos; telephone options.	Non-digital pathways; in-person support; reasonable adjustments; co-design with disability groups.
Race / Ethnicity	Positive impact due to higher CVD risk in Black and South Asian groups. Risk of language barriers and lower digital confidence.	No	Multi-language content; culturally tailored messaging; engagement with community leaders.	Kings Fund CVD data; local ethnicity data; digital inclusion evidence.	Limited local data on digital literacy by ethnicity.	Translated materials; culturally appropriate examples; simple navigation.	Targeted outreach in Barrow, Penrith, Kendal; work with mosques, churches, community groups.
Religion or Belief	No direct negative impact. Digital access may increase convenience.	No	Neutral; digital access may reduce barriers linked to religious observance.	None identified.	None.	Ensure content is culturally neutral and respectful.	Hybrid access; avoid scheduling digital sessions during major religious festivals.
Sex / Gender	No direct negative impact. Digital access may be more convenient for working-age men (lower uptake group).	No	Inclusive language; digital tools may help engage men who traditionally underuse preventive services.	Local uptake data.	None.	Gender-inclusive communication; neutral imagery.	Targeted messaging for men; workplace outreach.
Sexual Orientation	No direct impact.	No	Inclusive language and imagery.	None.	None.	Avoid heteronormative assumptions.	None required.
Pregnancy & Maternity	Digital access may be more convenient for pregnant women or new parents.	No	Hybrid model supports choice.	None.	None.	Accessible digital content; flexible appointment options.	Offer in-person options; ensure risk communication is sensitive to pregnancy.
Marriage & Civil Partnership	No foreseeable impact.	No	Neutral.	None.	None.	Neutral content.	None required.
Gender Reassignment	Risk if digital systems do not allow self-identification; risk calculators may not reflect physiology.	No	Inclusive digital design; sensitive handling of gender identity.	NHS guidance on CVD risk for trans individuals.	None.	Allow self-identification; explain risk calculation options clearly.	Provide both male/female CVD risk calculations; offer GP follow-up.
Care Experience	Digital access may reduce barriers; risk of digital exclusion for those with unstable housing or limited device access.	No	Trauma-informed communication; targeted outreach.	Local care leaver data; national digital exclusion evidence.	Limited local insight.	Clear, accessible digital content.	Non-digital pathways; VCFSE support; targeted outreach.

4. Intersectionality

Issue	Impact	Mitigation
Overlapping characteristics (e.g., older + rural + low income)	Higher risk of digital exclusion and poorer outcomes.	Monitor combined characteristics; targeted outreach; hybrid access.
Disability + ethnicity	Higher risk of communication barriers.	Co-design with community groups; translated accessible formats.
Care experience + deprivation	Higher risk of unstable digital access.	VCFSE support; in-person options; trauma-informed approach.

5. Digital Exclusion

Digital Exclusion Factor	Impact	Mitigation
Rural connectivity	Broadband blackspots may prevent digital completion.	Hybrid model; community hubs; telephone options.
Device affordability	Low-income households may lack devices/data.	Library access; free Wi-Fi hubs; in-person alternatives.
Digital confidence	Older adults, disabled residents, some minority groups may struggle.	Digital support sessions; simple interface; VCFSE partnerships.
Accessibility	Visual/cognitive impairments may limit digital use.	Accessible Information Standard; screen-reader compatibility; easy-read formats.
Trust & privacy concerns	Some groups may distrust digital tools.	Clear privacy information; reassurance; non-digital pathway.

6. Data collection and monitoring requirements

Data Required	Purpose
Age, sex, ethnicity, disability, postcode	Monitor inequalities in uptake and outcomes.
Mode of completion (digital/hybrid/in-person)	Identify digital exclusion patterns.
Need for digital support	Target improvement actions.
Referral outcomes	Monitor equity in follow-up services.
CVD risk distribution	Identify population-level inequalities.

7. Risks if mitigations are not implemented

Risk	Consequence
Widening inequalities	Lower uptake among older, disabled, deprived, and minority groups.
Reduced programme effectiveness	Missed early detection opportunities.
Reputational risk	Failure to meet Public Sector Equality Duty.
Lower engagement	Reduced trust in digital health services.

8. Co-production and community voice

Approach	Purpose
Engagement with digitally excluded groups	Improve usability and accessibility.
VCFSE partnerships	Reach seldom-heard communities.
User testing of digital tools	Ensure clarity, accessibility, and cultural relevance.

9. Strategic alignment

Strategy	Alignment
Council Plan	Prevention, digital innovation, reducing inequalities.
ICS Prevention Strategy	Early detection and risk reduction.
Digital Inclusion Strategy	Tackling digital exclusion.
HTA Recommendations	Hybrid model, equity focus, data-driven improvement.

10. Provider competency expectations

Competency	Requirement
Accessibility	Compliance with Accessible Information Standard.
Digital inclusion	Ability to support digitally excluded groups.
Data quality	Accurate demographic and outcomes reporting.
Equity leadership	Ability to identify and address inequalities.

11. Mitigation ownership

Owner	Responsibility
Public Health	Strategic oversight, monitoring, evaluation.
Providers	Delivery of mitigations, accessibility compliance.
VCFSE partners	Digital support, community engagement.
PCNs	Clinical follow-up for high-risk individuals.

12. Evaluation measures

Measure	Purpose
Uptake by deprivation quintile	Monitor inequalities.
Uptake by ethnicity	Identify disparities.
Completion rates (digital vs hybrid)	Assess digital exclusion.
Referral conversion	Monitor access to lifestyle services.
User satisfaction	Improve experience and accessibility.

16. Engagement and review

Engagement Approach	Review of JSNA, digital inclusion data, inequalities data, and service user feedback. Engagement with PCNs, VCFSE partners, community groups, and residents across rural and urban areas.
Provider Responsibilities	Gather feedback on digital and non-digital pathways; monitor uptake by protected characteristic; undertake annual QI projects (first focusing on digital inequalities).
Review Date	April 2027

17. Sign-off

Name	Katrina Stephens
Position	Director of Public Health
Directorate	Thriving Communities
Date	March 2026

Appendix I. Indicative Implementation Plan

This plan outlines the core components required to mobilise a hybrid Digital NHS Health Check model. Detailed operational arrangements will be developed collaboratively with the selected provider and system partners.

Consideration will be needed around contract structure (activity-based versus block), interoperability and data ownership, and the approach to managing under-performance, including a clear exit strategy if provider delivery does not meet agreed standards.

Phase 1: Mobilisation (Months 0-3)

Data Flows

- Agree data-flow maps for point of care testing (POCT) results, risk scores, referrals and reporting.
- Configure secure transfer into GP clinical systems using FHIR APIs and SNOMED CT.
- Test data quality, reconciliation and error-handling processes.

Information Governance

- Complete DPIA and confirm controller/processor roles.
- Review supplier DTAC evidence and IG documentation.
- Finalise data-processing agreements and encryption/retention standards.

Workforce Training

- Train staff on digital platform use, POCT procedures, data entry and escalation.
- Provide primary care teams with guidance on interpreting digital results.
- Issue SOPs and quick-reference guides.

Point of Care Testing (POCT) Logistics

- Procure and set up POCT equipment.
- Complete competency assessments and quality-control checks.
- Establish consumables management and clinical waste arrangements.

Phase 2: Go-Live and Early Delivery (Months 3-6)

Safety-Netting and Escalation

- Implement automated alerts for high-risk results.
- Activate manual safety-netting for incomplete or abandoned checks.
- Confirm escalation pathways for hypertension, high cholesterol, high QRISK3 and suspected diabetes.

Monitoring and Early Evaluation

- Begin routine monitoring of uptake, demographics, referral patterns and follow-up times.
- Collect early user-experience feedback from residents and staff.
- Review operational issues weekly during the first month, then monthly.

Phase 3: Full Delivery and Continuous Improvement (Months 6-24)

Evaluation Framework

- Monitor uptake, completion, equity impacts and primary care workload.
- Track outcomes by IMD, age, ethnicity, disability and rurality.
- Re-estimate ICERs at 12 months using observed local data.
- Incorporate qualitative insights from residents, employers and primary care.

KPIs and Dashboards

- Maintain a dashboard tracking:
 - number of checks completed (digital and face-to-face)
 - uptake by demographic group
 - first-ever Health Checks
 - referral rates and follow-up times
 - assisted-digital completion
 - user satisfaction
 - cost per completed check
- Review KPIs monthly with primary care and system partners, adjusting delivery as needed.

Appendix J. Challenges of Digital Health Checks and Potential Mitigations

Digital Health Checks offer clear opportunities to widen access and improve uptake, but they also introduce a set of operational, equity and system-readiness challenges that must be carefully managed. The table below summarises the key risks associated with digital delivery and outlines suggested practical mitigations to ensure the model remains safe, equitable and effective across the population.

Challenge	Description	Potential Mitigations
Digital exclusion	Older adults, people with disabilities, deprived communities and those with low digital literacy may struggle to access or complete digital checks.	<ul style="list-style-type: none"> Hybrid model (digital + face-to-face) Assisted-digital support in community hubs, libraries, workplaces Outreach to deprived and rural areas Simple, accessible user interface
Limited access to devices or connectivity	Some residents lack smartphones, data, or reliable broadband, particularly in rural areas.	<ul style="list-style-type: none"> Provide tablets/kiosks in community settings Offline or low-data modes Partner with employers and VCFSE organisations to host supported sessions
Accuracy of self-reported data	Self-reported height, weight, lifestyle factors and medical history may be inaccurate.	<ul style="list-style-type: none"> Use validated point-of-care testing Clear instructions and prompts Automated data quality checks Clinical review for high-risk results
Variable acceptability and trust	Some residents prefer face-to-face interaction or have concerns about digital tools.	<ul style="list-style-type: none"> Offer choice of delivery model Clear communication about safety, accuracy and data use Culturally appropriate materials
Interoperability with GP systems	Poor integration can lead to duplication, missed follow-up or administrative burden.	<ul style="list-style-type: none"> Ensure DTAC compliance Early engagement with PCNs and IT leads Automated coding and data transfer
Follow-up and escalation capacity	Increased uptake may generate additional referrals to primary care.	<ul style="list-style-type: none"> Clear escalation pathways Triage protocols Workforce planning with PCNs Monitoring referral volumes
Workforce and operational demands	Digital delivery reduces GP workload but increases need for assisted-digital support and admin oversight	<ul style="list-style-type: none"> Train community staff and VCFSE partners Dedicated digital support roles Clear SOPs for troubleshooting
Data governance and cyber security	Public confidence varies; concerns may deter participation.	<ul style="list-style-type: none"> DTAC-compliant platform Transparent communication about data handling Strong local IG oversight
Risk of widening inequalities	If digital replaces face-to-face, disadvantaged groups may be left behind	<ul style="list-style-type: none"> Hybrid model as default Equity monitoring by IMD, age, ethnicity, disability, rurality Targeted engagement with high-risk groups
Technical failures or usability issues	App faults, device errors or poor usability can disrupt delivery.	<ul style="list-style-type: none"> User-tested design Technical support Contingency plans (e.g., switch to face-to-face)

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