UK Health Security Agency

Cheshire and Merseyside (C&M) integrated contact tracing programme evaluation

Ipsos UK

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Executive summary

Introduction

In July 2021, Ipsos UK was appointed to scope an evaluation of the Cheshire and Merseyside (C&M) Test and Trace programme, which is described locally as the Integrated Contact Tracing (ICT) programme. This programme was one of several pilots funded by the UK Health Security Agency (UKHSA) as part of a wider initiative for trialling innovative approaches in areas of enduring transmission and variants of concern.

The ICT programme was formally launched on 4 August 2021, approximately 17 months after the start of the COVID-19 pandemic and almost one year after the original bid was submitted. The programme was originally planned to run for 12 months, in order to fully pilot the ICT capability across C&M and enable local authorities to use system surveillance and reporting to give timely and meaningful indications of cases, clusters, and outbreaks, as well as to quickly respond. Key programme activities have continued beyond this date, with the aim of leaving a legacy for the local area.

The aims and objectives of the evaluation are as follows:

Aim 1: To describe and gather learning about the implementation of the ICT programme locally

- what is the programme planning on doing? How does the programme think this will improve the relevant outcomes (that is, what is the programme's theory of change)?
- what progress has been made towards objectives?
- what factors have been enablers to progress? What factors have been barriers to progress?
- what has the experience of the team leading, managing, and delivering the programme locally been? what have they learned?

Aim 2: To evaluate the impact of the programme, and its individual elements, on key programme outcomes

- has the programme contributed to a reduction in the amount of time it takes to spot clusters of positive cases and local outbreaks in C&M?
- has the programme contributed to an increase in compliance with self-isolation, an increase in testing, and higher engagement with T&T?
- has the programme adopted a proportionate response to the threat posed by SARS-CoV-2 in C&M?
- has the programme increased public recognition and approval of contact tracing?

- what have the C&M team learned about the rollout of the new case management system including from local authority implementation?
- has the programme led to an increase in engagement levels amongst staff? (Higher efficiency, less burn out, less turnover and so on)
- is contact tracing guidance being delivered by the most appropriate geographic level?
- has the programme led to the development of a system which is sustainable and flexible, able to respond to the dynamic and unpredictable nature of the public health situation?

The evaluation methodology includes an interview programme running from summer 2021 to June 2022. A total of 49 interviews have been completed with people from across the sub-region. This includes staff from the programme team and senior public health roles, users of some of the main programme activities (such as the case management system) and people who have received training. An analysis of secondary data sources was also conducted to examine programme impact on the 2 main outcome measures (agreed at the outset): the level of PCR testing, and the time between cases getting symptoms and taking a PCR test. Robust econometric methods were used to estimate impacts. This methodology allows us to address the objectives of the evaluation, although it should be noted that uptake of interviews has been challenging throughout, some interviewees had a limited knowledge of the programme and the analysis period for the impact evaluation ended earlier than originally planned.

This report is prepared for readers within UKHSA, the ICT programme team, and wider stakeholders across the C&M public health system.

Background and context

The ICT programme was funded as part of a national programme developed at the height of the COVID-19 pandemic in 2020. Funding was made available to pilots which would contribute to the following outcomes: improved identification of transmission, preventing onward transmission, and delivering a personalised and exception service. Local areas were invited to respond with expressions of interest for programmes that could achieve these outcomes.

C&M stakeholders put together a bid in Autumn 2020 to access this funding. The intention of the programme at this time was to support “the establishment of a scaled and robust contact tracing model within a wider approach to community engagement [which] will be fundamental as part of our exit strategy from higher local alert levels”. A set of activities to achieve these aims were agreed which included: developing a ‘One Team’ model for outbreak Identification and Rapid Response across C&M, embedding the case management system further, developing and delivering a certificated training programme.

There is a consistent set of views from interviewees on the rationale for the programme. At the time of bidding, it was noted that parts of C&M have deep and long-standing health and social

challenges, exacerbated by the pandemic. At points in the pandemic, the region has faced higher restrictions than much of the rest of the country.

There is a broadly supportive context in C&M for the aims of the programme, with sub-regional structures already being in place. However, the programme has faced a challenging set of external contexts. For example, the policy context (which itself was determined by the evolving challenge of the pandemic) had significantly altered between bidding and programme kick off. Many legal limits on social contact had been removed, and the vaccination programme had increased the population immunity. This reduced the importance placed on non-pharmaceutical interventions. Ultimately the programme was brought to a close early, through the government's 'Living with COVID' plan which removed the remaining legal limits. Added to these changes were the delivery challenges posed by the rapid increase in Omicron cases from November 2021 which diverted resource from the programme for a period.

Main workstreams

The programme was constituted of several working groups, bringing together staff from across C&M to design and implement a variety of activities. These groups set stretching objectives, with a set of activities funded or delivered which, together, were designed to contribute to the primary programme outcomes of improving compliance with self-isolation regulations, a reduction in the amount of time taken to spot positive cases, clusters, and local outbreaks, and an increase in testing.

Design working group

This working group was responsible for delivering a strategy and oversight function for the other working groups. The primary objective of the group was to develop a vision and operating model for a One Team Integrated Contact Tracing capability for C&M. This strategic aim was intended to set the overarching framework for many of the other programme activities.

This group faced significant delivery challenges. Meetings and progress with developing the new operating model was impacted by the emergence of the omicron variant which took senior time away from the group. The delivery challenges meant the group did not achieve what it set out to originally. Barriers to achieving this included the closure of Public Health England replaced by UK Health Security Agency. This created uncertainty in terms of the powers of the new organisation, and the people who would be working there. This translated into local authorities preferring to hold off on agreeing to the new operating model until the new structure was clear.

Despite these challenges, the group produced a set of agreed-upon processes and standard operating procedures for the various responsibilities of local, sub-regional and national actors under different circumstances. This work, it was reported, will underpin greater collaboration in future.

IM&T working group

This group set out to develop the case management system (CMS), supporting the development of the one team model with IT improvements, and support the outbreak management approaches. In principle, the objectives are supported by interviewees; the case for the CMS, for example, was seen as useful in pandemic response.

The group is reported to have linked well with the workforce working group and the design working group. It's also seen as having made good progress in integrating other data sources. Delivery issues were reported on rollout of the CMS. These include the challenges with integrating a new system with existing tools and ways of working, workforce challenges (short-term contracts of staff), the inability to fully test the system prior to uptake, and some technical barriers. Some local authorities reported not seeing the value proposition of the new CMS, although as the programme progressed, and pivoted to focusing on challenges beyond COVID-19, this barrier lessened

While the objective of converging all contact tracing activity across the 9 local authorities onto a single platform was not achieved, interviewees have described that the potential has been shown, and applied in a number of areas.

Workforce development working group

This workstream aimed to develop, implement and evaluate a high-quality programme of learning and development over 12 months that met the necessary standards for good public health practice and provide the opportunity for professional development among the contact tracing workforce. The aims of the training provision were to enhance the knowledge and skills for prevention and control of communicable disease, particularly for the COVID-19 pandemic and other infections, and to provide a basis for future public health training.

The delivery of the training was viewed positively by training participants; participants would, and have, recommended the training programme to their peers. They felt the content and delivery mechanisms were appropriate for course. The participants understood that the training had to be delivered virtually, but in the absence of the pandemic most would have preferred the training to be delivered face to face, to enhance networking opportunities and increase levels of interactions during the training. Most of the training participants would have preferred more live taught content (above video content) and more group discussions or scenario work to enhance their learning experience. The training could have potentially been better targeted so that staff with more experience in public health were not invited to the course, as they reported getting less benefit from attending the training.

The outcomes of the training programme were that participants reported an enhanced understanding of infections and outbreaks of diseases, and how and why control measures have been and will continue to be put in place to address pandemics, in line with the learning objectives of the course. The training course did not have a large impact on how participants

were undertaking their job role, however interviewees did report that the training had increased their level of confidence in responding to queries. The training had also contributed to some participants wanting to pursue further development opportunities and a career in the public health field.

Communications and engagement working group

This working group was established to develop a communications and engagement plan as part of the ICT programme. It was reasoned that raising awareness of the contact tracing structures in C&M, communicating clear and positive messages about the steps to take in case of contracting COVID-19 (to improve public knowledge), improving public sentiment towards contact tracing, and communicating the message of the 'one team' approach to contact tracing across C&M would contribute to the longer-term aims of reducing transmission of COVID-19. The plan was for this workstream to be delivered largely through an external organisation, commissioned by the Champs Public Health Collaborative (referred to as 'the Collaborative'), and tasked with developing, delivering and evaluating a large-scale public communications campaign.

Delivery of the original plan was delayed by more than 6 months. In that period, the changed context and alterations to the programme plan have significantly altered the plan for this workstream. There was also an initial delay in the procurement of the contract. resulting from the need to work through a local authority's procurement processes. Capacity limitations within the responsible team were also noted to have caused delays.

Responding to the changed context, the workstream has amended the requirement of the successful agency, asking them to design a campaign focused on an 'all hazards' approach focused on all infectious diseases (such as winter flu) instead of the COVID-only focus. This is considered a more straightforward brief (a COVID-only campaign would have required subtle messaging).

Given the magnitude of the changes, assessing the workstream against its original logic model is not suitable. The messaging, audiences and outcomes are different. However, the high-level aims remain the same: to communicate messages aimed at contributing to healthier behaviours among the public. Given the significant barriers placed before this workstream by the wider changes to context, the fact that they have been able to refocus the workstream in this way is notable. The scale of what is planned is significant and beyond what would be possible without the external resources and programme structure.

Self-isolation support

This strand of the programme aimed to deliver a pilot model of self-isolation support which, if successful, would demonstrate improvements in compliance with isolation advice and support from cases and contacts. It was part of national work to overcome barriers to compliance, including people needing to continue to attend work for financial reasons.

Halton and Warrington were selected as sites for the pilot. The intervention was to include enhanced communications with positive cases, including details of the support offer, links with the benefits team to identify and target those residents who were unsuccessful in accessing the government's Test and Trace support payment, and then relaxing these criteria to allow more people to access the funding. There was also support to help pupils with school transport. Interviewees reported there was learning transferred between the local authrorities. A review of the data gathered, supported by interivews, suggests that the key early outcomes of more positive cases being contacted and receiving support, and the time between first contact and the offer of support being reduced. But the pilot ultimately had to finish early due to the changes in government regulations.

Impact analysis

The impact analysis explored the effect the programme has had on 2 indicators, which were agreed as part of the analytical plan for the evaluation. These were:

1. The proportions of PCR tests over total population.
2. The average time from symptoms to tests.

The impact analysis was undertaken using 2 methodologies:

1. Interrupted Time Series (ITS) was used to analyse changes in the level and trends in the outcomes of interest before and after the introduction of the pilot in each local authority in Cheshire and Merseyside.
2. Synthetic Control Method (SCM) was used to estimate the impact of the pilot on the levels and trends in the outcomes of interest in each local authority in Cheshire and Merseyside. The SCM involves constructing a comparator from a weighted combination of potential control units (called 'the donor pool', which in this case are all other local authorities across England, outside of Cheshire and Merseyside).

Overall, the analysis concluded that there is no statistically significant difference in the number of tests completed or in the number of days between symptoms and testing between the Cheshire and Merseyside local authorities and the synthetic control groups, suggesting the programme has not had an impact on these outcomes in the intervention period.

Conclusions

The programme has been affected by 2 main areas of external challenge. First, the difficulties associated with delivering a large transformation project during the pandemic, which meant staff had to reprioritise. Second, the fact that the pandemic and government response evolved throughout the life of the programme meant that objectives and planned activities had to be reprioritised more than once. There was also a significant time lag between the bid and funding, meaning that original plans had to be significantly altered.

Given the challenges of delivery, it is notable that every workstream that was initiated has made progress towards its goals. But there is a wide degree of variation in progress across workstream and local authorities.

Partly as a result of these challenges, the evaluation is unable to show a clear, statistically significant impact of programme activities on the outcomes of interest (either positively or negatively). The complexity and variety of actions commenced as part of the programme may be a factor in this; such programmes typically take some time to demonstrate outcomes. Despite this challenging finding, interviews collected ample testimony which was supportive of the goals, underpinning logic and evidence, and early progress of most aspects of the programme. Across interviews, the significant contribution the programme has made to a series of beneficial changes locally was noted. This included the focus the programme placed (and capacity it created) on a local response; the importance of extra capacity (including people able to continue working on the transformation-type activities) during a challenging period; and the opportunity to share good practice across the sub-region when quick answers to challenges were particularly valuable.

The programme, reacting to changing contexts, has successfully refocused much of its work on the future. This is seen across all workstreams, which have evolved in line with the challenge faced, and developed products or plans for continuing after the programme closes.

Introduction

Programme background and purpose of report

In July 2021, Ipsos UK was appointed to scope an evaluation of the Cheshire and Merseyside (C&M) Test and Trace programme (which is described locally as the Integrated Contact Tracing – ICT – programme). This programme was one of several pilots funded by the UK Health Security Agency (UKHSA) as part of a wider initiative for trialling innovative approaches in areas of enduring transmission and variants of concern. The need for innovation and learning in this area is clear; an effective, affordable, and sustainable model of public health protection is a core element of the UK's longer-term resilience to COVID-19 and other emerging public health challenges.

The ICT programme was formally launched on 4 August 2021, approximately 17 months after the start of the COVID-19 pandemic and almost one year after the original bid was submitted. At this point, England had completed the government's 4-step roadmap for lifting the lockdown, with most legal limits on social contact removed and the remaining closed sectors of the economy reopened (for example, nightclubs).

The programme was originally planned to run for 12 months, in order to fully pilot the ICT capability across C&M and enable local authorities to use system surveillance and reporting to give timely and meaningful indications of cases, clusters, and outbreaks, as well as to quickly respond. A range of other programme activities were planned to last for the 12-month duration. In March 2022, it was decided to bring the pilot to an early close in line with the government's decision to relax COVID-19 rules. This included an end to free testing for the general public and positive cases were no longer legally required to self-isolate. Key programme activities have continued beyond this date, with the aim of leaving a legacy for the local area.

This is the final report for this evaluation. It includes analysis of all quantitative and qualitative data collected as part of this evaluation, synthesis of the data to provide conclusions and suggested next steps. The report is prepared both for policy and analytical teams at UKHSA (which has funded the evaluation), and the ICT programme team and wider C&M public health community.

Evaluation objectives

The objectives of the evaluation have been informed by the national evaluation framework developed by the Department of Health and Social Care (DHSC), the draft and high-level programme theory set out in Chapter 2 of the evaluation plan[1], and a set of local objectives provided by the team at C&M. A full list of evaluation objectives follows:

[1] Ipsos UK. September 2021. 'Integrated contact tracing programme evaluation Cheshire and Merseyside, evaluation plan'

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- what is the programme planning on doing? how does the programme think this will improve the relevant outcomes (that is, what is the programme's theory of change)?
- what progress has been made towards objectives?
- what factors have been enablers to progress? What factors have been barriers to progress?
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Aim 2: To evaluate the impact of the programme, and its individual elements, on key programme outcomes

- has the programme contributed to a reduction in the amount of time it takes to spot clusters of positive cases and local outbreaks in C&M?
- has the programme contributed to an increase in compliance with self-isolation, an increase in testing, and higher engagement with T&T?
- has the programme adopted a proportionate response to the threat posed by SARS-CoV-2 in C&M?
- has the programme increased public recognition and approval of contact tracing?
- what have the C&M team learned about the rollout of the new case management system including from local authority implementation?
- has the programme led to an increase in engagement levels amongst staff – higher efficiency, less burn out, less turnover and so on?
- is contact tracing guidance being delivered by the most appropriate geographic level?
- has the programme led to the development of a system which is sustainable and flexible, able to respond to the dynamic and unpredictable nature of the public health situation?

Methodology

The method adopted for this study had 2 strands:

1. A programme of semi-structure qualitative interviews with programme stakeholders, beneficiaries and observers.
2. An impact analysis of a secondary dataset provided by UKHSA, describing key programme outcomes.

Interview programme

Findings from this report draw on interviews conducted between the beginning of the evaluation in September 2021 and June 2022. The sample of interviewees is summarised in the table below.

Table1.1. Interview sample

Stage of evaluation	Sub-group	Number completed
Scoping (December 2021)	Principally programme stakeholders	11
Interim stage (April 2022)	Senior public health stakeholders, programme team, case management system (CMS) user group	18
Final stage (June 22)	Senior public health stakeholders and programme team, CMS users, workforce development or training beneficiaries, communications workstream	20
		49[2]

Semi-structured interview topic guides, reflecting the programme Theory of Change and overall evaluation objectives, were developed for each stakeholder group (senior strategic stakeholders, CMS users, and members of the working groups).

Thematic analysis of interview findings has been undertaken within each of the programme working groups.

Secondary data analysis

The report also presents results from an impact analysis conducted using secondary data provided by the UKHSA on metrics which capture key programme outcomes (primary outcomes):

- level of PCR testing
- time between cases getting symptoms and taking PCR tests

The analysis presented in the interim report was descriptive and focused on trends of the above primary outcomes as well as some secondary outcomes of the programme. The impact analysis uses robust econometric methods (Interrupted Time Series and Synthetic Control Method) to detect the impact of the pilot.

The interim analysis produced results for these outcome measures for C&M as a whole compared to all other upper tier local authorities (UTLAs) in England, in order to give a preliminary overview as to whether levels and trends of the outcomes of interest in the intervention areas behave differently than in the rest of England. The analysis presented in this final report estimates separate impacts by local authority, to better understand whether the pilot impacted individual local authorities in different ways.

[2] Across interim and final, the following sample has been achieved: Senior public health stakeholders, programme team, people involved in working groups (23); CMS users (13); self-isolation support (2); workforce development and training beneficiaries (9); communications workstream (2). Several additional discussions were held throughout, with intelligence gathered through these, but they have not been counted in this sample.

Limitations of the method

There are 4 main limitations to the fieldwork and analysis contained in the report which readers should be aware of:

1. Uptake of interviews has been variable and required extra prompts from the programme team. A sufficient number has been completed in order to address the evaluation objectives (although in some cases, an evaluation objective has become less relevant due to the changes in the programme following its early closure). All original interview target groups have been reached and included in the analysis. The target for workforce development interviews has not been achieved, although the consistency of the responses to questions posed in the interviews suggest that saturation has been reached meaning readers can have confidence in the findings.
2. Some of the interviews to date have been limited in their depth or the breadth of what could be covered, given the knowledge of the interviewee, or the extent to which they have been involved in the programme so far. This is illustrative of the fact that the programme has struggled to gain traction in some local authority areas (in relation to some of its planned activities) and so remains peripheral to some of those we spoke to.
3. The data provided for the statistical analysis has been collected up until March 2022, limiting our ability to track key outcomes for a longer time period.
4. The programme has officially finished early than planned, which may reduce its possible impacts and the extent to which they can be evidenced.

Structure of this report

This report is structured as follows:

- chapter 2 sets out findings related to the rationales for the programme, the context in which it was delivered (and how this impacted delivery) and the resourcing set aside for the programme
- chapters 3 to 7 describes the findings related to each of the main strands of work mapped (broadly) the pilot programme workstreams: the design, information management and technology (IM&T), workforce development, communications, and self-isolation support working groups/ strands of the programme – in a couple of cases, chapters are quite short, reflecting the depth of findings available
- chapter 8 presents the results of the impact analysis for the primary outcomes of the pilot on tests and cases
- chapter 9 provides the final conclusions from the evaluation and lessons learned for national policy makers and analysts, and stakeholders across the public health community in C&M

The report is supported by 2 appendices:

- programme theory of change and outcomes framework
- a technical annex detailing the analytical approach taken to the impact evaluation

Background and context to the programme

This chapter first sets out the programme origins, rationale, and any relevant context. It then sets out how the programme was structured, its governance arrangements, and the resourcing made available to it.

Programme background

C&M as part of a national programme

The ICT programme was funded through a DHSC (latterly UKHSA) funding programme developed at the height of the coronavirus crisis in the UK in spring and summer 2020. Funding was made available to local areas to establish pilots which were to contribute to the following outcomes (through the specified activities):

- identifying sources of transmission (through enhanced contact tracing)
- preventing onward transmission (through tracing cases and contacts sooner in local areas, and isolation support)
- delivering a personalised and exceptional service (through regional lighthouses, developing behavioural insights to promote isolation, use of national resource at a local level, and the formation of a COVID-19 hub)[3]

The stated desired outcomes, together with the suggested activities to achieve these in the bullets above, demonstrate a national view on how these goals were to be achieved (or, in other words, a national programme theory of change). Local areas were invited to respond with suggestions for how this could be applied in their area.

Programme objectives

In the autumn of 2020, public health leaders from C&M put together an application to access this national funding. Interviewees involved noted that the application was put together very rapidly, in line with the urgent and evolving situation at the time. The programme intention, set out in the EOI, was: “the establishment of a scaled and robust contact tracing model within a wider approach to community engagement [which] will be fundamental as part of our exit strategy from higher local alert levels”.[4]

Despite this being a short bid, developed at a relatively early stage of the pandemic, it is possible to discern the longer-term vision for the programme as being more than a single intervention (for example, the reference to a community engagement strand as well as several other planned activities).

[3] Expressions of interest form from the DHSC.
[4] C&M response to the Expression of interest form.

ICT programme objectives were developed further in later documents which have been shared with the evaluation team. The overarching aim of the programme was set out in a June 2021 report (that is, at the point funding was provided) to DHSC. The programme at this time was seen as developing:

"A responsive and resilient integrated contact tracing system that utilises its surveillance and reporting systems to give timely and meaningful indications of cases, clusters and outbreaks, to respond quickly to effectively address the threats from SARS-CoV-2."[5]

Digging deeper to review the intended programme outputs at this time demonstrates the breadth of intention of the emergent programme (and certainly broader than a focus only on support for self-isolation). By 30 June 2022, the programme was to have:

- advanced the development of the integrated system to case finding and contact tracing with local places, Public Health England (as was) and the National Test Trace Team
- delivered phase one of a 'One Team' model for Outbreak Identification and Rapid Response (OIRR) across CM that encompasses data extraction, data screening and risk assessment of settings
- refreshed local governance arrangements to provide assurance and accountability for the integrated contact tracing system to the CM Directors of Public Health, wider health protection system, other partners and the public
- embedded the Case Management System with additional functionality for engaging with cases and contacts
- established a robust and accurate reporting system for contact tracing
- established a recognised branding for contact tracing services with associated information materials
- completed a certificated training programme for all CM contact tracers
- completed and evaluated a pilot programme of support for contacts or cases for those that need it
- worked with partners, locally, regionally and nationally to establish the early stages of the new health protection system
- delivered an evaluation of this programme and established an evaluative culture in a system that seeks to learn and improve from its activities

This longer list demonstrates the development of the programme vision since completion of the EOI. It shows that C&M which was not planning only to 'pilot' a tightly defined set of activities to encourage adherence to regulations, but rather a multi-faceted programme of activities to upgrade the public health and health protection systems in light of the challenge posed by the pandemic.

[5] 'Integrated One Team Contact Tracing or OIRR: focus on DHSC' (PowerPoint document shared with the evaluation team.)

Programme rationale

Having traced the early evolution of the programme's objectives, this section sets out findings on stakeholders' understanding of the rationale for action. Setting out a clear case for intervention (or rationale) is a necessary step to accessing additional public support from the HM Treasury for addressing local challenges. Programmes supported by public funding should establish clear objectives which are a coherent response to this case for intervention.

Throughout each stage of the evaluation, when discussing the programme rationale, senior level interviewees have provided a consistent set of responses, suggesting broad support. They have noted that, at the time the bid was submitted, in C&M specifically, there was a strong case for extra support; in autumn 2020 parts of the sub-region were put into 'tier 3' in terms of the risk posed by the virus to public health. This took place soon after the original EOI (referred to above) was submitted. This was a higher risk status than much of the rest of the country at the time implying a greater challenge.

The sub-region also faces challenges with health inequalities. Interviewees commonly flagged the deep and long-standing public health, economic and social challenges facing some local authorities in the area (which were exacerbated by the pandemic).

Interviewees have reported other underlying challenges to infection control in the area, implying a need for an enhanced contact tracing offer. This includes the relatively high prevalence of employment models or premises which are associated with a higher risk of contracting and transmitting virus (for example, relatively high levels of employment in food distribution, factories, schools, and public services). This set of drivers came together, with broad support across the sub-region, to form a strong case for a programme of this sort in autumn 2020. However, interviewees have frequently reported on the delays between submitting the bid and receiving funding – around 9 months.

As with much else of the government's pandemic response, the case for the programme at the national level had to be swiftly prepared. It was subject to the rapidly changing context as the challenge posed by the virus evolved during winter 2020 to 2021 and into the first part of 2021. This meant that the 9-month delay between bidding and receiving funding impacted the extent to which the original case for intervention still held.

As one senior stakeholder reported: "We'd moved on from thinking only about self-isolation"; another noted the delay between bidding and the programme beginning was, "Far too long… and the pandemic was an evolving challenge".

This delay was particularly challenging for a programme which had several varied activities planned (rather than a focus only on self-isolation support). This variety is demonstrated by interviewees' numerous descriptions of what they see as the programme objectives, which included:

- providing extra support for local areas and having greater surge capacity
- being able to deliver enhanced support to the public than they otherwise would (for example, door knocking to support people isolating)
- bringing aspects of the pandemic response to the regional and local level (as opposed to national) where it was considered that this would be beneficial (for example, providing more localised, tailored and supportive follow-up calls to people isolating)

When asked to reflect on the programme's aims over the longer term, interviewees have also reported their hopes that it will stand the sub-region's health protection system in a good position to respond to future waves of the COVID-19 pandemic and other health protection challenges that will emerge. Another regular reference has been the need for the system to step up and step down their teams' capacity as the pandemic challenge evolves, and to make sure they are able to support with other related public health activities such as vaccine rollout.

Context in which the programme was delivered

The context in which the programme was delivered has acted as a barrier to progress and a supportive factor. The local area was widely considered to provide a supportive setting for a programme with these objectives. The sub-regional level (as opposed to the local authority, or regional and national levels) was already comparatively well-equipped in C&M, with support and resources set aside for the collaborative, and working relationships already established across local authorities; the ICT programme's objectives were in line with the existing direction of travel in the area. The support from university, and the existence of the CIPHA dataset was also reported to be beneficial context.

However, the programme also had to be delivered within in a continuously changing COVID-19 context which had positive and negative implications for both the programme and its evaluation. At the time the pilot began, the legal requirement for self-isolation (if you had been in contact with someone who tested positive) had changed. This weakened the case for the programme, in its original design, from the outset.

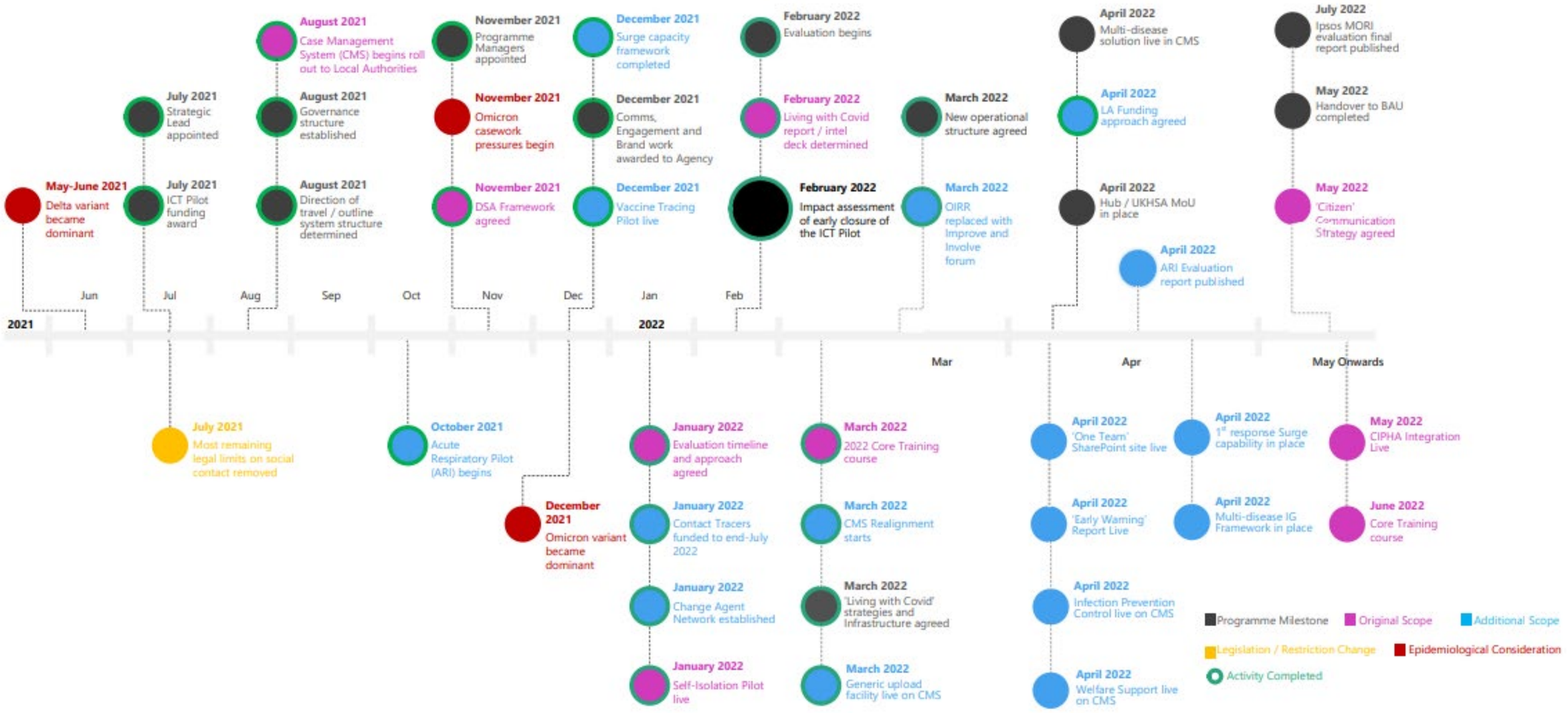
This change, noted one senior stakeholder, was very influential on the programme development: "Almost right from the get-go, a big assumption from the policy perspective had changed". Figure 1 below presents a chart tracking the milestones of both COVID-19 rules and restrictions in the UK and for the programme.

In addition, a large number of the UK adult population (38.4 million, or around 54% of the adult population) had received 2 doses of the COVID-19 vaccinations at this point. The apparent success of vaccine deployment, and the effectiveness of the vaccine itself, was starting to signal a move away from the non-pharmaceutical interventions, which the programme was focused on.

In November 2021, the Omicron variant was recognised as a newly established and potentially dominant variant in the UK. This caused a very steep increase in number of cases, with the necessary tracing and follow-up. Stakeholders have reported it had competing effects on the programme's direction. In terms of delivery, the crisis response that was necessary diverted resource and attention from programme activities. Combined with the Christmas period, there were implications for the progress of the programme. But it did keep the programme's focus on solely on the COVID-19 response for longer than would have otherwise been the case.

Into 2022, the government released its 'Living with COVID' plan. The end date for the programme was brought forward and plans for closing the programme were to be made. Since that announcement, negotiations with UKHSA have meant that rather than full early closure, the programme was to shift its remaining activities to a broader set of health protection challenges and more generally future proofing the system. This has influenced the focus of nearly all remaining activities which are documented in the following chapters.

Figure 1. COVID-19 and programme milestone chart
(Source: Diagram provided to the evaluation team by the Collaborative)



Text summary of Figure 1

Figure 2 is a chart tracking the milestones of both COVID-19 rules and restrictions in the UK and for the programme from May 2021 to June 2022.
There's a total of 43 milestones divided into 6 categories, being: programme milestone; original scope; additional scope; legislation or restriction change; epidemiological consideration; and activity completed.

End of text summary of Figure 1

Programme description

Having reviewed the programme's origins and objectives, and charted its evolution as the external context changed, the report now sets out how the programme was resourced and structured.

Programme inputs

The ICT programme is forecast to spend approx. £3 million across the course of the programme period. The largest cost drivers are those which were established at the outset: the programme team, extra workforce capacity across C&M, and the IM&T, communications and engagement, and workforce development workstreams. The smaller costs demonstrate the programme's evolution in 2022 to respond to the changing context and challenges. For example, to support the ambition of future proofing the area, it launched pilots on acute respiratory infection, and vaccine tracing (together accounting for 7% of the forecast spending).

Table 2. Forecast ICT programme spend (information provided by the ICT programme team)

Purpose	Forecast spend	Forecast %
Programme	£555,914	19%
Workforce development	£250,828	9%
Comms and engagement	£344,236	12%
Evaluation	£96,646	3%
Workforce capacity	£872,100	30%
IM&T	£562,459	19%
ARI pilot	£136,817	5%
Vaccine pilot	£61,000	2%
Self-isolation pilot	£70,000	2%
Total	£2,950,000	100%

Programme structure and governance

Given the programme evolution, it was necessary to develop a programme structure which could allow the programme to evolve, and a governance approach which ensured these changes were made in a transparent way. As part of a wider programme, in which learnings were needed at the national level to influence a rapidly changing policy agenda (reflecting the challenge in question), involving DHSC/ UKHSA stakeholders in an appropriate fashion was also necessary. The breadth of planned programme activities, combined with the specialist nature of these, required focused working groups to develop the detail. Finally, the large footprint, covering 9 local authority areas, each with specific challenges and interests, mean this factor had to be considered in the planning too.

To develop a programme and governance structure which tackled these varied issues, the programme team established the following structures:

- working groups on 4 broad categories of programme activity (as well as a group for evaluation, and the self-isolation pilot) – these covered design, information management and technology, communications and engagement, and workforce development – detailed work took place in these groups
- ICT programme steering group which has been responsible for supporting the programme to evolve as the context has changed – this group specified objectives for the working groups
- overall system level ownership was designed in through reporting lines to the contact tracing strategic programme board, and ultimately to the Directors of Public Health to allow them to offer effective oversight and ownership

The governance of the programme was infrequently raised in interviews, despite prompting. However the following themes are evident in the feedback received:

- involvement in the programme groups varied over time, and in response to the challenges of people's 'day jobs'
- senior level interviewees generally offered supportive feedback on the programme governance. One noted that really effective decision making and accountability processes were required for this large programme which has had to change course, and these were built into the governance which was established
- at times, involvement in some of the working groups has been labour intensive; this was seen as being reflective of the technical subjects being tackled – one interviewee noted that they had stayed involved by splitting their involvement with a colleague to make continued involvement viable

Current status of the programme

At the time of writing, the programme is entering its final phase of closing down, ensuring that the artefacts created have been stored and can be used, and directing final activities to areas of importance outside of COVID-19. The following bullets summarise status as per June 2022:

- all local authorities have had the opportunity to implement the CMS. The contact tracing system has now been closed, but some local authorities have found ways to repurpose their learning
- the communications and brand agency work has continued, but the focus has been adapted to an 'all hazards' approach, as opposed to COVID-19 and contact tracing
- the contact tracing training course has been delivered to 3 cohorts of contact tracers with more training planned
- the design working group is no longer meeting
- the self-isolation support pilot has now stopped

The report now provides an appraisal of progress of each of the main strands of the programme adding detail to these bullets.

Design working group

This chapter brings together findings about the design working group. Findings on this working group are limited by the fact that the group stopped meeting at a relatively early stage, and a minority of interviewees had direct knowledge of its activities.

Background and initial plan

This working group was responsible for delivering a strategy and oversight function for the other working groups. It was implemented as a 'task and finish' group to support the ICT steering group's agenda, as not everyone in the steering group was able to be involved in the detail of the responsibilities of design. The primary objective of the group was to develop a vision and operating model for a One Team Integrated Contact Tracing capability for C&M. Developing and 'landing' this with the local authorities would have set the overarching framework for many of the other programme activities. For example, the operating model would have made the case for the single platform for managing cases.

Delivery

This group was reported to have operated differently from the other working groups, with a more fluid structure and less regularity of meetings (likely a result of the relative seniority of its membership). Meetings and progress with developing the new OOM was impacted by the emergence of the omicron variant which took senior time away from the group.

The robustness of the governance within and surrounding the group were also reported. They have helped to document and support the several changes to plan (provided changes aligned to the original principles for why the project was funded) and allowed the working group to achieve some of its aims.

Progress

Interviewees had a clear understanding of the objectives of this group, as the most strategic workstream of the programme, and the aim of designing an optimal model for sub-regional working (the optimal operating model, or OOM) was reported. This model would have set out a clear and shared understanding across local authorities for what the roles and responsibilities were at agency, regional, sub-regional and local levels.

The group did not achieve its original objective for this to be adopted across all relevant organisations. It was not seen to have overcome areas of resistance from local authorities to the sub-regional model. Developing and implementing this within a year, even with less challenging external conditions, was considered to be ambitious given the different cultures and structure within local authorities. The closure of Public Health England and its replacement with the UK

Health Security Agency was also seen as a barrier. It created uncertainty in terms of the powers of the new organisation, and the people who would be working there. This translated into local authorities preferring to hold off on agreeing to the OOM until the new structure was clear. As with other workstreams, the changing context meant that by the time clarity on this issue emerged, there was less demand among senior stakeholders to implement the new model.

Despite these challenges, the group produced a set of agreed-upon processes and standard operating procedures that will underpin greater collaboration in future. One example cited was the co-development of a memorandum of understanding agreeing what will happen now the contact tracing hub has been closed down.

IM&T working group

This chapter brings together findings about the IM&T working group. Much of the fieldwork for this workstream was completed at the point of the interim report although some additional analysis has informed this chapter.

Background and initial plan

The original objectives of the IM&T working group were to:

- develop the CMS, including delivering an efficient flow of data between different systems and, where possible achieving automation so that duplication of data is avoided
- support the operating model of the One Team Integrated Contact tracing capability, including identifying IT improvements needed across C&M
- support the outbreak management approach across all local authorities in C&M

One of the main objectives for the IM&T working group was to develop the CMS and support its future state across the local authorities in C&M. Interviewees involved in this described the group as being focused on the IT support for the rollout of the case management system, including tackling the myriad logistical challenges associated with the move over to a new system (for example, how to avoid duplications when data flows come into the system through different national systems).

There was some support from interviewees at different levels for the objectives of the CMS in particular. It was seen as potentially filling a gap in data sharing across geographies. Findings revealed that the CMS implementation was first communicated in the early days of the pandemic response, when it was apparent that data would need to work at both the local authority level and at the C&M level. At the time there was no single system which everyone had access to. “Intelligence teams don’t have bird’s eye view of things normally; they weren’t getting data nationally and had to fight for it on a local level”.

The CMS could enable teams to see outbreaks within the pandemic crossing into geographies, and to transfer cases and information easily and robustly. Interviewees discussed the benefits of being able to work within a shared system, including sharing contact information with PHE / UKHSA colleagues, and both having the necessary permissions to enter information.

Delivery

Information Management and Technology group

The interim report captured some of the challenges associated with the delivery of the group’s workplan. This initial analysis is built on here with findings from further interviews.

Integrating with other working groups

The group has been a key driver of activity in the programme with the link to the design group and the workforce training group noted. IM&T were heavily involved in developing these capabilities, such as considering the skills needed for contact tracers or team leaders in terms of using the CMS, and ways to develop these skills, for example, developing training packs or videos. Similarly, working with the design working group, IM&T were involved with problem solving and solutions when implementing and using the system.

Integration of data sources to improve data flow

One of the objectives of the group was to facilitate the integration between the CMS data and data from the CIPHA (Combined Intelligence Public Health Action) platform. CIPHA is a population health management platform, established in 3 months across Cheshire and Merseyside to help the health and care system manage COVID-19 and support recovery.

Examples of data collected includes individual health records and number of vaccinations. An interviewee revealed it had been difficult to access for some local authorities. A subgroup of the IM&T group (the data sub-group), has brought together analysts from different local authorities to design an ‘early warning’ status (of potential outbreaks of other possible diseases) report drawing on CIPHA and CMS data and that can be accessed by all local authorities.

The IM&T working group also worked towards inter-operability between the CMS and the new Safety Information Monitoring System (SIMS), the public health clinically recognised system for managing outbreaks nationally. Local authorities in C&M do not currently have access to SIMS, so information sharing between national public health consultants and local authorities is done via email. The interoperability between CMS and SIMS would allow for data requests to be raised and data to be uploaded and reviewed with ease. There is further scope for integration with other systems too, for example data on whether people are on benefit schemes.

Case management system

The rollout of a new operating system during a busy operational period is likely to face challenges. Interviewees described several, which have been grouped below.

Several logistical issues were reported. Several interviewees described that local authorities were working with varied IT systems and therefore the transition to using the CMS required local authorities to first shift their internal systems to MS Dynamics, and then to move the legacy data from their old system. This was a difficult process for some to achieve. Related to this, resource constraints have made the transition challenging.

It was noted that many staff were on temporary contracts, and this disincentivised longer-term investments. Added to this, some interviewees felt the initial training and the time available to train could have been better.

Interviewees mentioned that a new system, without prior knowledge or the ability to test the system, was a significant barrier to progress. One interviewee mentioned being given a CTAS screenshot and little support in training before going live. Interviewees also described the challenges of moving to a new operating system during very busy periods.

The interoperability between the CMS and other data platforms was not fully achieved. A system which would integrate with other systems, such as CIPHA, the power BI national dashboard and CTAS was considered to be very important. Some interviewees suggested that there is currently no interoperability between CMS and CTAS and HP zone.

Other technical problems with the system were also noted. These included:

- duplication of system elements, which resulted in an inefficient use of time
- challenges with feeding back problems with the system
- time required to understand who within other local authorities was the right person to contact to discuss issues
- lack of a dummy system (trial and error was flagged as an issue)

Outdated guidance (due to time lags) resulted in disputes. For example, i) people were told to stay home and isolate even if they tested positive because of an incorrect test, and they were not actually a positive case, (ii) the guidance by the national team was not consistent with the advice given by the local team.

Leaving these technical and skills barriers aside, another barrier flagged in interviews related to organisations not being able to see the value proposition of the new CMS (at least in the early stages). Some local authorities are not using it as they perceive it does not fit their business needs. Given this, it has been challenging to agree a specification that works for everyone. It was also flagged that it was preferable, in some areas, to remain using their own systems, which were working well and had already been paid for. In these cases, it was felt that value for money could not be demonstrated longer-term (for example licenses). It was therefore difficult to sell the benefits of the CMS when local authorities were already immersed in outbreak response systems which had been used for years.

Finally, some users have found the timing of the implementation frustrating. Interviewees have found the closure of the contact tracing system frustrating as they had just begun to use it. Although the system can still be used for complex cases, it cannot for routine cases, which an interviewee suggested was its primary purpose.

There is some evidence that these initial barriers reduced over time, strategies to achieve progress developed, and successes were reported in several areas. These are documented in the next section.

Progress

Testimony gathered through the evaluation, particularly in senior level interviews, suggests there were improvements in the flow of information through the course of the pandemic response, which the programme – and this group – is seen to have contributed to.

With regard to the CMS, the programme ultimately did not achieve its objective of converging all contact tracing activity across the 9 local authorities onto a single platform. However, across interviews, the progress that was made has been described, along with early outcomes through use of the new system.

The progress achieved is seen by some as having shown the potential value of a single flexible platform; its potential began to be recognised as the programme progressed, even where interviewees who had an issue with its use (provided it would be funded in the longer term and issues with interoperability with other systems could be overcome).

The working group has also been progressing towards making the CMS useful for different reporting requirements. Currently, 80% of the data in the CMS are used for operational reporting, that is, reports that are used to monitor the implementation of the CMS (for examplefor example number of cases allocated to each member of staff, timeline of cases coming through the system), with the remaining 20% for strategic reporting. Strategic reports are used by local authorities, by public health consultants, OORR (operational outbreak public response) team leads, to plan against future outbreaks of infections. These typically use CMS data combined with CIPHA data, as well as global public health data. Some interviewees suggested that combining data from CMS and other data sources has been relatively straight forward and is probably the most powerful part of CMS, given the flexibility of the MS Dynamics system. Other interviewees revealed suggested it was more difficult.

Factors which seem to have driven success include**:**

Pivoting the usage of the CMS to specific challenges facing local authorities

The programme team has recognised a transition to a whole new and common system was a big ask in some cases. They have developed 3 ‘modules’ which local authorities could apply in their day-to-day work: 1) vaccine tracing 2) Infection protection and control and 3) welfare support – which built on the self-isolation support module. Developing these 3 ‘modules’ has resulted in a significant boost in uptake. A fourth module is in development which will help local authorities to manage their commitments to support Ukrainian refugees. The new approach was described as moving from a ‘push’ model to a ‘pull’ model (with the local authorities themselves developing modules based on challenges they face).

Despite challenges, some interviewees believed the CMS provided an improved solution to outbreak management

Interviewees revealed that there was no system used before the CMS, and that generally public health outbreaks were managed through a standard agenda and meetings rather than through

an online system. With the scale of the challenge posed by COVID-19, it showed a way to facilitate data collection and progress towards integrated data sharing systems.

The leadership offered by the programme was vital to implementing the CMS

The infrastructure put in place (that is, the group of people which oversaw the programme) was very effective in keeping everyone updated. As with much of the feedback received on the programme governance, interviewees have noted that at busy periods, there were too many meetings, but overall, the value of these was noted. For example, an interviewee mentioned the benefit of having the CMS user group, the highly applied nature of those meetings and their support and responsiveness.

One local authority who was heavily involved revealed that they were able to collect a lot of data

One interviewee revealed that the system enabled them to collect data on how many cases were converted to being fully traced and vaccination calls, which showed positive outcomes, but these were not widespread at this stage.

Local authorities who were heavily involved shared best practice

This included shared protocols or approaches for managing outbreaks. Interviewees mentioned how effective this level of communication was. Senior interviewees corroborated this, noting that these best practice exchange mechanisms were a really beneficial feature of the programme.

The longer-term future of the CMS was less clear. Some interviewees were not certain that the CMS could be repurposed for other health protection challenges and felt that a very clear case definition for an outbreak would be required.

“Had the development work continued, these are the sorts of the thing that they might have looked at: seasonal flu and care home outbreaks. These are areas where local authorities have a clear line of sight”.

There is a desire to preserve staff skills gained as a result of using the CMS. Skills and competencies gained as a result of the programme, as well as specifically from the technical enablers such as the CMS, were viewed positively. It was felt that these should be maintained so that local authority could scale back up again when required.

Workforce development (training)

This section presents an assessment of the training course developed and delivered through the ICT programme. The assessment of the effectiveness is based on findings from a review of programme MI and interviews with 9 participants who undertook the training course.

Background and initial plan

The overall aim for the Workforce Development group was to develop, implement and evaluate a high-quality programme of learning and development over 12 months that met the necessary standards for good public health practice and provided the opportunity for professional development among the contact tracing workforce. For the training programme specifically, the aim was to:

- maximise capability in the general public health workforce through development of knowledge and skills for prevention and control of communicable disease, applied to the COVID-19 pandemic and other infections spread through the respiratory tract
- provide a foundation for any future public health training

This was to be delivered through the achievement of the following objectives:

- to understand how infections spread from single cases to clusters, outbreaks, epidemics and pandemics
- to understand and apply general infection prevention and control principles to COVID-19 and other infections spread through the respiratory tract
- to recognise the importance of sound professional practice underpinned with reflection and supervision

The training aimed to achieve these aims through the following outcomes for participants:

- improved knowledge and awareness of relevant hazards to health protection applied to COVID-19 and other infections spread through the respiratory tract
- enhanced ability to identify, advise on and implement public health actions with reference to COVID-19 and other policies and guidance to prevent, control and manage identified health protection hazards
- improved understanding of the steps involved in cluster/outbreak/incident investigation and management and be able to contribute to the health protection response
- enhanced ability to apply the principles of prevention in health protection work
- improved understanding ability to act within one's own level of competence and understanding and know when and how to seek expert advice and support

Delivery

The delivery of training was initially piloted with 2 cohorts of contact tracing staff, taking place in early 2021.[6] Subsequently a further 2 cohorts have been enrolled onto the course, with the first completing training in March 2022 and the second in June 2022. Each cohort took one month to deliver. Cohort 1 included 15 contact tracers, and cohort 2 had 12; the third cohort had 24 participants. All local authorities were involved, as well as the C&M hub.

Enrolment

The registration form for enrolment onto this course required relatively standard information beginning with whether the individuals had attended the University of Liverpool before and if so what their student registration number was/is. The form then asked for further enrolment details such as standard personal question regarding names, email address, home address, phone number and so on. Section 2 then asks for personal details required solely for statistical analysis by HESA such as date of birth, gender, nationality, ethnicity, and so on.

The recruitment and enrolment onto the course were described by most participants as being relatively straightforward. Most stakeholders reported finding out about the training course from the clinical lead within their contact tracing team or from their line manager. The clinical lead or line manager would either email potential participants about the training or tell participants about it verbally. One participant reported that the training was announced in the team meeting, so all potential participants found out about the training at the same time.

At this stage, all participants described the information they received about the training course as not providing a detailed description of what the training would entail. Participants described being provided with information that the course would cover infectious diseases and the management of these diseases, but no further information at this stage. The information did cover the duration of the course and that it would include taught content and self-study.

Despite only having high level detail about the training, most participants stated that they were eager to attend the training. The process all the participants interviewed described was that they had to respond to their clinical lead or line manager expressing their interest in the course. The clinical lead or line manager would then have to decide of who would attend the training – and factors which were included in this selection process were availability at the time the course was to be delivered (for example, no annual leave plans) and the balance of the teams (for example, not selecting too many people from one team to ensure contact tracing shifts could still be covered).

Most participants stated that seniority was not a consideration for selection. The training was open to staff at all levels. This meant that there was a high level of demand for the training, with

[6] Cohort 1 began in January 2021, and cohort 2 began in March 2021.

many expressing an interest in participating (and where they were not selected being placed onto subsequent cohorts for the training).

Most participants felt that the enrolment process was quite straightforward once they had been selected by their clinical lead / line manager. They recalled having to complete an application form (described above) and submit this alongside a CV. None of the participants described having difficulties with this or having their application queried.

Once they had submitted the application form, the next step was the University emailed out their details (university email address and login details for the learning portal or library and so on). All participants reported receiving these without any issues.

Most participants were able to log into the learning portal without any issues – however, 3 participants did report that they could not log into the portal initially. The reasons for this included that the portal could not be opened in the web browser they were using (the default browser on their computer) and one was due to the IT security measures in place on their work laptop (an issue which had been experienced on previous training). The first 2 participants reported that they contacted an individual at the university, who gave them immediate advice and they were then able to log into the portal – whereas the third used their own computer as they felt it would be too time consuming to approach their own IT department to resolve the issue.[7]

Course content

The syllabus of this project revolved around several learning outcomes shared between taught and self-study methods of learning. The syllabus began with an introduction to health protection and the basic concepts of infection. The basic concepts of infection examined the ‘Host, Environment, Agent (including virus versus bacterium)’ and the basic health protection issues looked at ‘risk assessment’ and ‘surveillance’. Participants were also encouraged to participate in further reading on ‘key players’ and ‘risk assessment’ as well as some multiple-choice questions involving these topics. Later the syllabus goes on to focus on the key players and legal background of health protection as well as an overall summary of local authority health protection. ‘Clusters, outbreaks and control’ was also a focus, including examining what clusters and outbreaks are, examples of how outbreaks occur and how they should be investigated. Participants were taught to apply the concepts of risk assessment, communication and management in tackling these issues.

The syllabus included several days examining specific diseases and the settings that have the most impact. This began by examining *C. Difficile* and iGAS, looking at how vaccines and immunisation combat these infections as well as how diseases impact care homes and different risk groups such as homeless and deprived individuals. Other disease days looked at *E. Coli*, influenza, measles, norovirus, salmonella, varicella and various other health issues, examining

[7] It should be noted that this issue is a legacy issue from the local authority IT systems, and is out of the control of the ICT training course and University of Liverpool.

these problems in a variety of different settings such as schools, workplaces, prisons, and so on. Teaching then moved on to communication within a pandemic or health crisis, examining how contact tracing works and who is involved in facilitating it. The syllabus then went through a process of recapping the past teachings and encouraging reflective learning, leading up to a final assessment and evaluation on the final day of the course.

Most of the participants described being satisfied with the content included in the course. They felt that it covered the topics that they expected (given the broad description provided initially), and that it was relevant to their job roles. They described the course content as providing the background information that underpinned the contact tracing for COVID-19 (and for some participants their subsequent work in other contact tracing).

Some of the participants reported that they initially felt that the balance of the course would be more focussed on COVID-19 and contact tracing and be more closely aligned to their job role. But in practice, the course was much broader than this, and did not have a lot of content on contact tracing. Reflecting on this though, the participants described that the content as delivered was probably more useful, since it provided a more rounded knowledge of public health and infectious diseases (the history and the how and why public health measures like contact tracing were required).

The participants that were interviewed that had a lot of professional experience in public health described the course content as being a bit basic for their needs. They already knew the information that was being presented to them – although they found some of the discussions with other members of the cohort useful and these provided new information.

Course delivery

The delivery of the training course was flexible and used a variety of delivery methods: on Canvas Platform (an online learning platform), as a repository for materials and communication; online live taught and pre-recorded lectures or webinars; video or film material followed by group discussion; case reviews and group discussion; case study analysis or audit; directed personal and self-learning study, including self-directed learning utilising slide sets (narrated and non-narrated).

At the end of learning sessions and the overall course, a variety of assessment mechanisms were used to help embed learning. These included: online quizzes, tests and multiple-choice questions; written reflection on response to a contact tracing case, cluster, outbreak or situation; one-to-one discussion with course leaders.

Successful completion of these assessment tasks led to the awarding of a certificate of completion.

The participants interviewed were generally satisfied with the way in which the course was delivered. All the participants felt that delivering the course over a 4-week period was an

appropriate timeframe. They felt it was challenging to fit the training in alongside their work in this period, but this would have been the same if the course had been delivered over a longer period. All participants felt it was helpful to have a full day training (with the taught material followed by an afternoon of self-directed learning) as it was easier to block out than one or 2 hours spread across a week.

Most of the interviewees stated that they would have preferred at least part of the training to be delivered face-to-face, although all appreciated why this was not possible during the pandemic. Four of the interviewees saw benefits in having the training delivered online (above the COVID-19 requirements) in that it would allow more people to attend than having to travel to a central location and it enabled them to undertake some work during breaks in the training. However, others felt that the distance training made it difficult to disengage from work (as the training was being completed on work computers, meaning instant messages and emails could still be accessed). The reasons the participants gave for preferring face to face training were:

- better interaction between the group and course leader during taught materials
- more opportunities for networking
- feeling more comfortable asking questions

The parts of the course delivery that participants reported as being most beneficial for their learning were the group discussions and scenario or case study elements. This was considered to be particularly beneficial because they collected views from people from other local authority areas and those with different backgrounds about how they would handle a case.

Most participants felt that the self-directed learning elements of the course were appropriate, and that the duration of time allocated to complete the reading and learning was appropriate. Where participants felt that the content of the self-directed learning (for example papers to be read) was too complicated, they reported that there were channels for them to ask questions about the content (using the chat and discussion function on the learning platform). However, using these channels was described as being more difficult in a remote setting than they would have been in a face-to-face setting where they could have approached the course leader, in part because the discussion function was not generally used by participants and there was no confidentiality. There were some challenges with the self-directed learning though. Several participants reported difficulties in accessing materials from the library, and occasionally there were notes missing from the portal when participants started to do their self-directed learning.

Although the participants described being satisfied with the way in which the course was delivered, there were some areas in which they thought the course delivery could have been improved. The first of these was that the pre-recorded video materials were less well received than the live content, and participants would have preferred the course to be delivered through live content. The reasons for this were that the live content was more engaging, allowed the participants to question the person delivering the session to clarify content, and for some participants that were in the third cohort of the training the video content felt dated, as it related to issues earlier in the pandemic.

The second area where there was consensus among the participants was that they would have preferred more group discussion work. In particular, they would have liked more scenarios to discuss.

Course feedback

Following the completion of the course, participants were invited to provided written feedback about the course and make suggestions for how it could be improved in the future. These were a standard form and completed forms were provided to the course leader.

Participants described providing feedback about the course via a form completed at the end of their 4-week course. Nearly all of the participants interviewed reported providing positive feedback about the course. However, one participant reported providing feedback about the course to help improve further provision. This feedback was that there were areas of the course that the course leader did not seem to have an appropriate level of experience in, and was providing the course from notes rather than from their experience – which limited the quality of the teaching.

Following this feedback, the participant noted that for a subsequent cohort the areas of the course where they felt the course leader did not have appropriate experience were now being taught by other practitioners that did have knowledge and experience of the area. This shows that the learning provided was taken on board with the course improved for subsequent cohorts.

Participants also described being able to provide feedback to the course leader as the course was progressing as required, for example around the content of the reading materials or access to materials from the library (some interviewees reported not being able to access materials from the university library). Where this was the case, it was reported that the course leader was responsive and provided instructions or solutions to problems (although one interviewee that could not access the reading materials bought the book instead of trying to access the library).

However, one interviewee reported providing feedback about some of the questions being used in the quizzes at the end of sessions not being correct, and they reported that the answers to the questions were not updated during their cohort, and they noticed that in subsequent cohorts (as colleagues were on the course) the answers had still not been updated.

Training outcomes and impacts

Most training participants were very positive about the training they had received. They felt the training was of a high quality and they would, and have, subsequently recommended the training to their colleagues who had not been on the training course.

The interviews with training participants suggest that the training has been largely successful in achieving the stated learning objectives. Participants described having a better understanding of

infections and outbreaks of diseases, and how and why control measures have been and will continue to be put in place to address pandemics.

However, most participants described that the course had not had a significant effect on their behaviours and how they carry out their contact tracing job role. They described that the training had enhanced their underlying knowledge around infectious diseases and how these are managed. But the main drivers of how they were undertaking their role was the Government legislation and advice at the time and how the changes to legislation should be interpreted.

Additionally, the impact of the training programme has been hampered by the ending of contact tracing and the contact tracing units were disbanded in the local authorities. Some of the participants had found new jobs in the arc, so were still able to apply the things they had learned. However others have needed to take other jobs outside infectious disease control, and therefore can no longer apply the training outcomes directly.

Despite these limitations, participants did describe ways in which they were using the training and the content they had been provided with through the course, and how participating in the training had affected them at work. These were:

Using the content provided and in particular the SIM cards

Four participants described using the materials that were provided as part of the course in their day-to-day work, drawing on the materials to ensure that their knowledge was accurate. This meant that they were more confident in their knowledge. One particular resource which was described as being very useful by multiple participants were the SIM cards, which provide a summary of infectious diseases that can be drawn upon rapidly.

Confidence in knowledge

Around half of the training participants reported that the training had meant they felt more confident when providing advice to clients, and to colleagues. One interviewee described how after the training they felt more confident in providing advice to clients directly, as they were more confident that their answer was correct, rather than hanging up the call, asking their supervisor and calling the client back (along with the administration involved with this). This would mean that the training participant (and the team more widely) were more efficient. Additionally, other team members would be more willing to ask the training participants for their advice, rather than having to wait and always consult with the clinical lead.

Inspired further learning

Four participants described how the training had inspired them to pursue further training in public health. These participants did not come from a public health background prior to the COVID-19 pandemic. They described that the training had been interesting and opened their mind to the possibility of continuing to work in public health after their contact tracing contracts finished, and that they would like to pursue further training in this field to ensure this could happen. Two participants described wanting to take their public health practitioner certificate, with another participant stating that they wanted to pursue a Master’s degree in public health.

Although none of the participants would say that the training itself had directly led to this change in outlook, they all said that the training had contributed towards it. A further participant reported that they had tried to support their colleagues to attend further training in public health after taking part in the course, as they saw that it was valuable. This involved attempting to secure funding for their colleagues to take part in training alongside encouraging them to do so.

Communications and engagement

This section provides a summary of findings on the communications and engagement workstream. Its delivery was heavily impacted by the programme changes. The section describes how the aims have evolved, based on discussions held with the workstream team throughout the evaluation.

Background and initial plan

A working group was established at outset to develop a communications and engagement plan as part of the ICT programme. Programme stakeholders reasoned that raising awareness of the contact tracing structures in C&M, communicating clear and positive messages about the steps to take in case of contracting COVID-19 (to improve public knowledge), improving public sentiment towards contact tracing, and communicating the message of the 'one team' approach to contact tracing across C&M would contribute to the longer-term aims of reducing transmission of COVID-19. The original target groups for the communication activities were the public (including specific focuses on areas of higher deprivation, and ethnic minorities), senior public health stakeholders in C&M, and the contact tracing workforce.

The plan was for this workstream to be delivered largely through an external organisation, commissioned by the Collaborative. This agency was to be tasked with developing, delivering and evaluating a large-scale public communications campaign focused on the above aims.

Delivery

Two sources of delays affected this workstream. First, the delay between submission of the overall programme bid and funding being distributed was consequential; second, there was a delay in commissioning the external agency once funding was transferred. This was reported to have resulted from the need to work through a local authority's procurement processes to ensure regulations were followed. Capacity constraints within the responsible team were also noted to have caused delays, although it was seen as a priority piece of work given its scale. In that period, the changed context and alterations to the programme plan have significantly altered the plan for this workstream.

In response, the workstream has changed the brief given to the successful agency, asking them to design a campaign focused on an 'all hazards' approach focused on all infectious diseases (such as winter flu) instead of the COVID-only focus. Many of the principles are the same, so a wholesale change to the contract was not necessary.

Key messages in this forthcoming campaign include staying at home if you have a cough or cold and staying away from people that might be vulnerable. In terms of prevention, they will communicate messages such as the importance of getting vaccinated if offered. The target

audiences for the campaign have broadened too. There will be messaging targeted at the public, businesses and schools, each of which faces different challenges in this respect. This is considered likely to fill potential gaps in public communications. For example, the messaging to schools that will be delivered through this campaign, may augment those messages sent by directors of public health to schools in the area.

This new brief was considered slightly more straightforward, and closer to the team's core skillset and experience. The original COVID-focused campaign aimed to influence quite subtle public behaviours (which were already impacted by the extraordinary circumstances of the pandemic), such as how to engage with contact tracers (an entirely new workforce for most people).

Under the new workplan, the agency will develop a public communications campaign launching in September 2022, based on an insight phase taking place over the summer. This will be delivered in 2 waves and evaluated with results made available in quarter one 2023.

Progress

Given the magnitude of the changes, assessing the workstream against its original logic model is not suitable. The messaging, audiences and outcomes are different. However, the high-level aims remain the same: to communicate messages aimed at contributing to healthier behaviours among the public. Given the significant barriers placed before this workstream by the wider changes to context, the fact that they have been able to refocus the workstream in this way is notable.

The scale of what is planned is significant and beyond what would be possible without the external resources and programme structure. Under normal circumstances, small scale research and insights are possible, but these typically take place at local authority level. This demonstrates the high added value of drawing on being able to draw on national resources. Launching a campaign of this sort at the C&M level is also seen as a sensible step, assuming that engagement with the local authorities is undertaken.

Self isolation (SI) support pilot

Overview

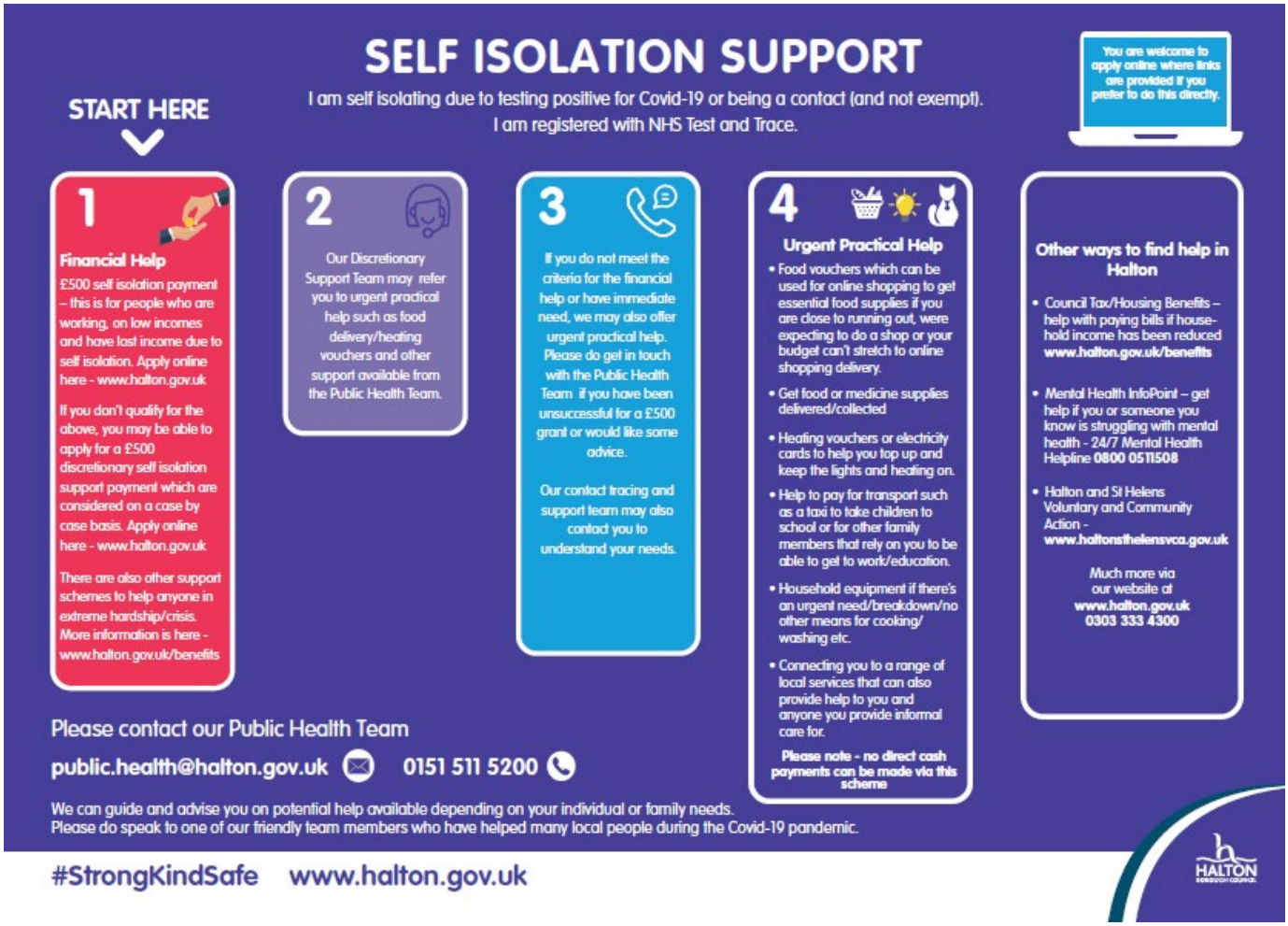
The primary objective of the Self-isolation Support Pilot was to achieve higher levels of engagement and compliance with isolation advice and support from cases and contacts. Key reasons behind low self-isolation levels included: financial burden as a result of having to take time off work, caring responsibilities, for example, food shopping and childcare, and perceived difficulties in accessing SI support.

The self-isolation component of the programme was first discussed in September 2021 in C&M and began with a workshop to understand how each local authority was addressing self-isolation requirements and support offers to residents. The workshop was attended by 6 local authorities (Wirral, Sefton, Cheshire East, Halton, Liverpool, and Cheshire West and Cheshire) and provided an opportunity for each to share their approach to offering self-isolation support to residents.

Work being conducted in Halton was thought to be different than other local authorities. An interviewee revealed that Halton were offering a non-cash offer for residents who did not meet the eligibility criteria of the government funding pots. They were also keen to deliver the pilot and share ideas. It was decided to pilot the concept as a shared service model with Warrington. The 2 local authorities agreed to work together to deliver Halton's processes to Warrington residents. This included:

- sending texts to all positive cases on day 1 with links of who to contact
- self-isolation texts sent on day 4 – these were texts sent to residents with detail about the support offers available
- leaflets (see Figure 2) distributed via email daily to all positive cases regarding SI and where to go for support (for example, mental health, hardship fund, discretionary fund)
- using links with the benefits team to know which residents were unsuccessful for the government's Test and Trace support payment of £500 due to not meeting eligibility criteria – an example provided was an individual paying rent at a property but not being on the council tax; in this case, they would not be funded by the Government, however Halton would still support, for example paying bills directly to the landlord
- using a relaxed criterion (for example, simply being a resident of Halton) for financial support to offer alternative help ('third pot')
- supporting pupils with transport to get to school when parents are self-isolating
- using a contact tracing script which followed the national script but was also tailored specifically for Halton
- contacting all positive cases (due to being a smaller authority) even if they had been contacted by the national team

Figure 2. Example self-isolation support map developed by Halton



The collaboration between Halton and Warrington was the primary activity of the SI Pilot. As a result, there were a number of follow-on activities planned. These were:

Improving existing SI support offer through reducing time from test to self-isolation offer

Shortening the amount of time between the first time a positive case is contacted and when self-isolation support is offered, for example having SIS leaflets at testing sites.

Understanding local level data to better target SI support

Accessing local level data sources to better understand local needs to target where SI support can be offered, for example, hotspot or outbreak areas.

Development of a best practice library

Collating resources and guidance for local authorities in C&M to deliver self-isolation support including best practice tools.

Development of public-facing self-isolation support library

Implementing an online one stop shop for members of the public to learn more about how to self-isolate and what resources are available.

Engaging community and faith groups

Working with voluntary groups to understand harder-to-reach profiles of residents, their needs and how to best support them.

Review of activities

The primary activity of taking learning from Halton and collaborating with Warrington was considered to have been achieved. Interviewee findings revealed that Halton has supported Warrington to set up a self-isolation support offer. This included setting up the initial process – such as a mailbox, developing the right communications to the public, and how to improve flows of information (including support from social and transport partners). In practice, Warrington had a smaller team than Halton to conduct self-isolation support, and they therefore relied on Halton for more practical support. The data flows between the 2 local authorities worked well, with daily case reporting occurring.

In February 2022, the government announced its aim to end legal controls on self-isolation. In line with this, UKHSA announced the need to stop self-isolation element of the programme in March 2022. Any residents who had tested positive 48 days prior to this announcement were still able to apply for support so the pilot continued for a short while after, but all new Self-Isolation Support offers were ceased on 6 April 2022. As a result, the remaining activities were not achieved. Interview findings revealed that additional reasons why the other activities did not come to fruition include time constraints and lack of engagement by local authorities. Unfortunately, at the point at which local authorities showed greater interest, the pilot was closed.

Evidence to support the outcomes

Collaboration between Halton and Warrington, and the improved SI support offer, aimed to achieve:

- more people who test positive are being contacted and receiving support
- the time between first contact and the offer is support is reduced
- greater support and guidance available to local authorities for implementing self-isolation support
- more local authorities expressing an interest in implementing self-isolation support

Interview data provides some supportive evidence of progress with the first 2 outcomes, although this has not yet been corroborated with management information.

The collaboration between Halton and Warrington was reported to have worked well, and they were able to offer support to more residents and achieve a shortened timeframe between first contact of a positive case and an SI offer. Monitoring information collected was limited, however some key statistics were recorded:

- 169 calls made to those who had specified they need local authority support via the national team
- 109 calls answered by cases
- 33 people requested support from the pilot via those calls or emails into inbox
- 19 people were supported financially – others were referrals to other support teams or did not respond to requests for information in support of their claim

Interviewees were not aware of any targets set for this workstream. Interviews also revealed some challenges when implementing the self-isolation support pilot:

- the collaboration between Warrington and Halton took a while to implement due to staff and resource constraint – it did not have sufficient resource until February 2022
- there was a noticeable time constraint and competing priorities which prevented local authorities from fully engaging with the pilot – launching the pilot around the festive period also meant people's annual leave slowed down the process
- it was difficult to reach community and voluntary groups via communication leads within the local authorities – attempts to do so received limited responses
- changes to the government's legal rules and restrictions had significant implications on the delivery of the pilot
- there was a significant requirement to find staff with the right skills and interests
- delays in recruitment and training had a knock-on effect on delivery timelines
- shared learning was not achieved easily – there were many ideas or innovations in place across local authorities which would have benefitted the other activities of the programme, for example a pre-established online system in Wirral which is used to deliver information to the public; this only came to light recently and therefore could not be used to inform the programme's objectives

Impact analysis

This section provides the key findings from the impact analysis, exploring the impact of the programme on the level of PCR testing and the time between getting symptoms and taking a PCR test. It also provides a descriptive overview of the secondary outcomes of the programme, related to testing and cases.

The results from the impact analysis should be viewed in light of the changes in government guidance and restrictions, noted in Chapter 1. The impact analysis is based on an analysis of secondary data sources provided by UKHSA.

Summary of approach

In line with the analytical plan, the outcomes of interest were split into primary and secondary groups.

Primary outcomes were considered the most relevant for indicating the success of the programme; secondary outcomes support the findings of the primary analysis. Primary outcomes were analysed both descriptively and through the robust impact analysis techniques. Secondary outcomes were analysed only descriptively. Some basic descriptive analysis on primary and secondary outcomes are presented in this report, while the full descriptive results (which were presented in the interim report) are included in the technical annex. The 2 primary outcomes measures were:

- the proportions of PCR tests over total population
- the average time from symptoms to tests

The first primary outcome measure indicates whether the activities of the ICT pilot have contributed to an increase in the population's propensity to test in Cheshire and Merseyside.

The second primary outcome measure is a proxy measure for the ability of the system to detect outbreaks and clusters of infections, as, the shorter the time it takes for cases to get tested, the quicker a potential outbreak can be identified and contained.

Secondary outcomes were the following:

Average time (in days) between cases being tested and being reached

This is the time elapsed between cases taking a test and completing their CTAS profile. Effectively, this proxies how long it takes for cases to engage with the Test and Trace system. The exact date and time when cases receive a text message inviting them to complete their CTAS profile is included in the DHSC dashboard, however UKHSA analysts were not entirely confident in the quality of this variable. It was therefore not been used within this analysis.

Average time (in days) between cases having symptoms and being reached

This indicator is similar to the above and indicates the overall time it takes for a case to engage with the system after having the first symptoms.

Proportion of cases who engaged with the system ('reached') within 3 days of first symptoms (over the total number of cases with symptoms)

This is derived from the indicator above.

Total number of household and non-household contacts shared per case

This indicator is an additional proxy for how cases engage with the system by sharing details of their contacts, hence improving the chances to detect clusters of infections.

The impact analysis was undertaken using 2 methodologies:

Interrupted Time Series (ITS)

ITS was used to analyse changes in the level and trends in the outcomes of interest before and after the introduction of the pilot in each local authority in Cheshire and Merseyside. ITS does not rely on the construction of a comparison group to determine whether any changes in trends can be attributed to the intervention. Therefore, the results of the ITS models are not interpreted as the causal effects of the pilot, but as robust descriptions of the trends of the outcomes of interest and to complement the results from the Synthetic Control Method (see below).

Synthetic Control Method (SCM)

SCM was used to estimate the impact of the pilot on the levels and trends in the outcomes of interest in each local authority in Cheshire and Merseyside. The SCM involves constructing a comparator from a weighted combination of potential control units (called ‘the donor pool’, which in in this case are all other local authorities across England, outside of Cheshire and Merseyside). The weights are constructed to minimise the distance between the treated and the synthetic control in a set of characteristics.[8]

For both the ITS and SCM models, the choice of estimating separate effects by local authority, rather than a combined effect for the whole of Cheshire and Merseyside is motivated by 2 observations. First, local authorities within the Cheshire and Merseyside area are very heterogeneous in terms of contextual characteristics (for example, population, deprivation rate). It is therefore reasonable to assume that different local authorities were impacted by the pilot at different stages and to different degrees. Secondly, as emerged from the qualitative findings, the 9 local authorities implemented different elements of the pilot at different paces and speeds. Estimating separate models for each local authority helped to understand whether the differences in the implementation of the pilot translated into differences in the estimated impacts and trends of the outcomes of interest.

[8] The analysis was conducted using the software ©Stata, version 17, and the packages: itsa for ITS, synth for the main SCM results (that is, main effects, weights and covariate balance) and synth_runner for the placebo effects and the graphs included in this report.

The next section provides further details on the methodological choices made for the estimation of the empirical models. The technical annex includes a technical overview of the methods and full model results.

Overview of methodology and data

Interrupted time series (ITS)

The ITS analysis for the PCR testing outcome used 57 weeks of data (23 pre-intervention and 34 post-intervention periods), while the analysis for cases used 52 weeks of data (23 pre-intervention and 29 post-intervention periods). The date of the intervention was set to the week beginning on 9 August 2021.

The ITS analytical models were estimated using Ordinary Least Squares (OLS) and corrected standard errors. For more details of the modelling approach, see Technical Annexe 1.

Synthetic control method (SCM)

The SCM models included 57 weeks of data for testing and 52 weeks for cases. For each local authority, the synthetic control was constructed using a donor pool of all the other local authorities in England, excluding:

- other local authorities in Cheshire and Merseyside
- areas where other pilots took place around the same time as the ICT pilot – this resulted in excluding: the Greater Manchester area, Cambridgeshire and Peterborough, South Yorkshire, Humber Coast and Vale
- areas with IMD score above or below 50% of the IMD score of each treated local authority – this exclusion was made to improve the comparability between each treated local authority and the respective synthetic control to avoid the bias resulting from comparing local authorities that are too dissimilar to each other[9]

For all models and outcomes, the following variables were used in the development of the synthetic controls:

Pre-treatment values of the outcomes

This variable was selected to ensure the treatment areas and donor pools were comparable in terms of the outcome measures before the intervention took place. For the testing outcomes, the most recent pre-treatment periods were selected. This was because there was a rapid change in the number of tests being undertaken in the North West region just before the programme was launched. The comparability of the number of tests being undertaken at this point was more important than comparability at earlier time periods.[10] For the model on cases,

[9] Abadie A. 'Using synthetic controls: feasibility, data requirements, and methodological aspects' Journal of Economic Literature 2021: volume 59, issue 2, pages 391 to 425.
[10] See Test and Trace Briefing England

the first week of each month for the pre-intervention period was included as pre-intervention outcomes.

Cumulative number of individuals receiving at least one dose of vaccine

At the end of the pre-intervention period, divided by the total population, as the vaccination rates would affect the number of cases of the virus.

Average Index of Multiple Deprivation (IMD)

Score at local authority level (the data refers to 2019), as there are links between deprivation and the spread of the virus or vaccination rates.

Demographic characteristics

Proportion of males over total population, proportion of population by age group (18 to 24, 25 to 49, 50 to 64) proportion of population by ethnicity (white, mixed raced, Asian, Black or American and Caribbean), as demographic characteristics affected vaccination rates.

Robustness checks have been undertaken to test the validity of the findings from both ITS and SCM, and the details and results of these are presented in the Technical Annexe.

Descriptive analysis

This section presents basic descriptive trends for the primary and secondary outcomes of the intervention.

Primary outcomes

Figure 3 shows the trend of the number of PCR tests per thousand population over the whole period of analysis (week commencing 1 March 2021 until week commencing 28 March 2022).

The solid line refers to C&M, while the dashed line presents the average for all other local authorities in England. The red line indicates the official start of the ICT pilot (week commencing 9 August 2021).

The graph shows that PCR testing increases steadily in all areas from the beginning of the time series until around September 2021, when it stabilises. This is followed by a spike in January 2022. After January 2022, the PCR testing rate decreases substantially in all local authorities, and this falling trend continues until the latest data point available.

Figure 3. Trend in the average number of PCR tests per thousand population. Cheshire and Merseyside and all other local authorities in England

(Source: Ipsos computations from UKHSA's dashboard indicators. The red line denotes the week of the introduction of the ICT pilot.

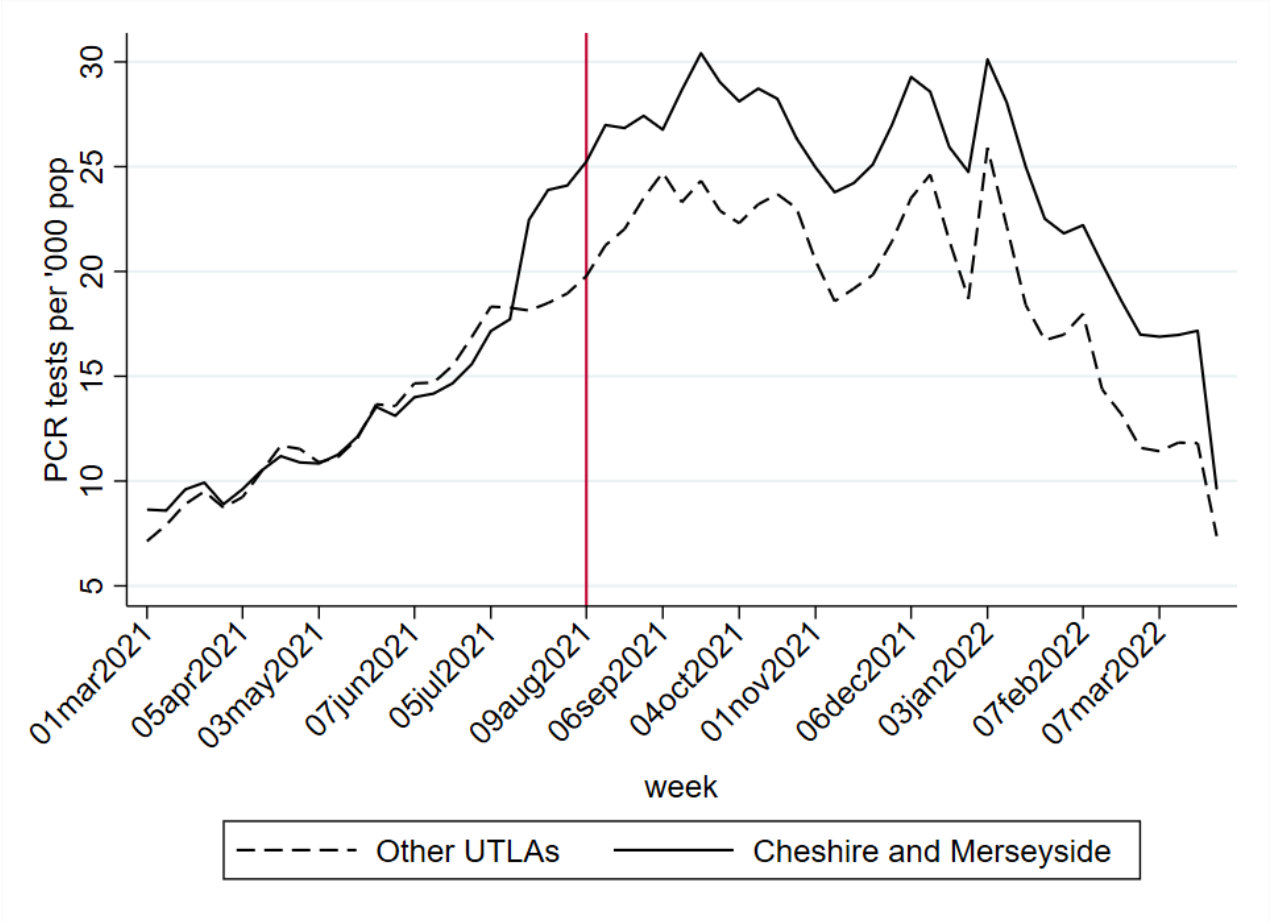
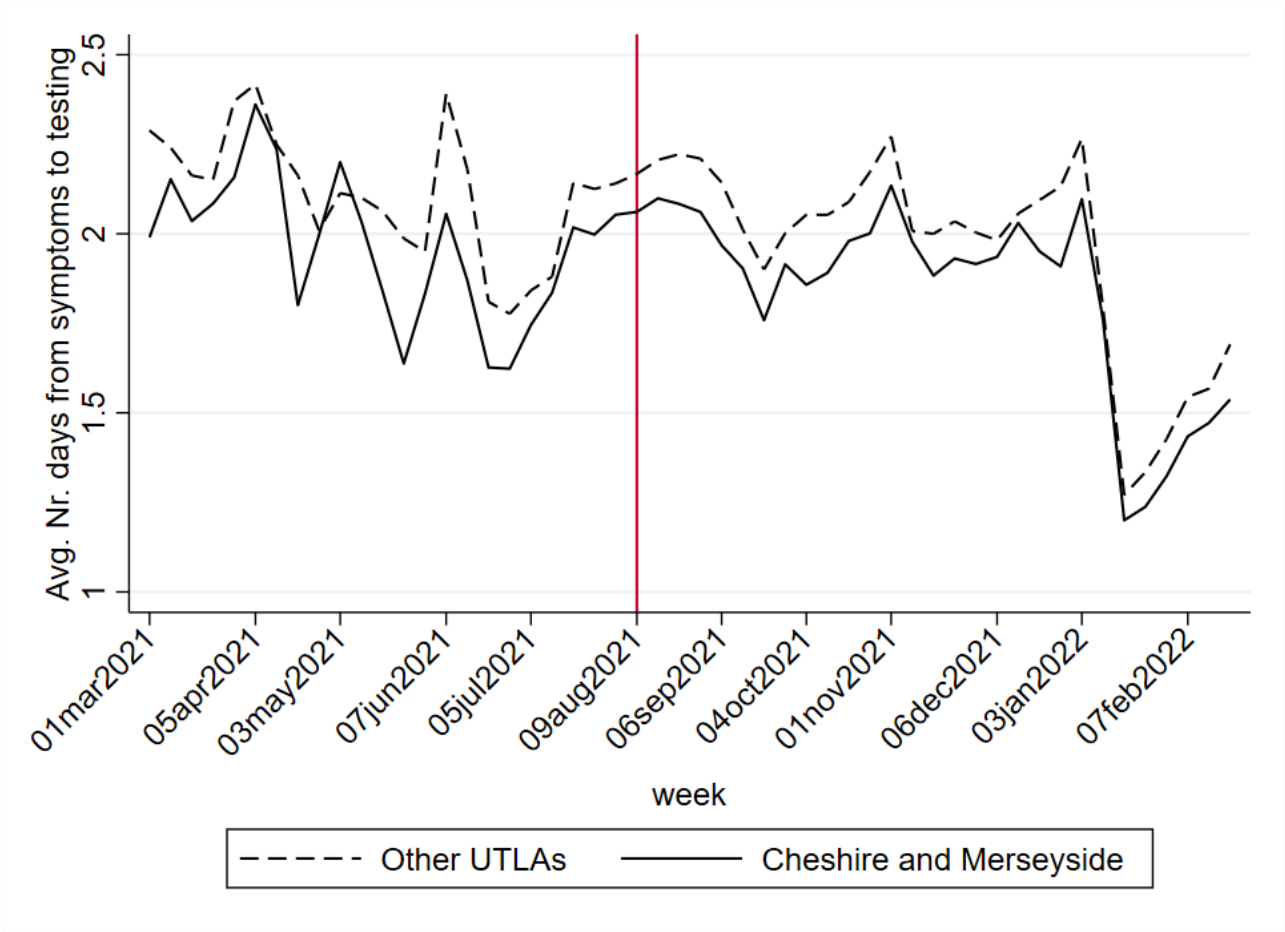


Figure 3 also presented a noticeable discontinuity in PCR testing in Cheshire and Merseyside in July 2021, when testing starts to increase considerably more in this region than the rest of England. This discontinuity is perhaps earlier than expected, given the official start of the programme in August 2021, and might be driven by the rise in cases in the region over the same period.

In terms of the average time from symptoms to testing, the analysis of the trends for this outcome measure (Figure 3) shows that the pattern of the average time from symptoms to testing is similar in Cheshire and Merseyside and the rest of England. The introduction of the pilot (the red line) does not seem to affect the trend or level of this outcome measure in the treated areas. Figure 4 shows the trend in the average number of days between cases having symptoms and getting tested for Cheshire and Merseyside, and all other local authorities in England.

Figure 4. Trend in the average number of days between cases having symptoms and getting tested. Cheshire and Merseyside and all other local authorities in England
(Source: Ipsos computations from UKHSA's dashboard indicators. The red line denotes the week of the introduction of the ICT pilot.)



Secondary outcomes

The aim of the secondary analysis is to add further detail to the primary outcomes analysed above.

In terms of testing, besides the overall number of PCR tests, it is useful to analyse whether the pilot is associated with an increase in the detection of positive cases (and hence clusters of outbreaks). Some insights in this respect can be gained by looking at how the share of positive PCR tests has evolved in Cheshire and Merseyside compared to the rest of England. Figure 5 shows that on average the trend of positive over total tests is similar between pilot and non-pilot areas. It is important to note, however, that this indicator is likely to be affected by the overall trend of the pandemic, which may mask any influence that the pilot might have had on the detection of positive cases.

In terms of cases, the secondary outcomes analysis focuses on 4 outcome measures which denote the extent to which cases engage with the contact tracing system, hence increasing the likelihood of the system to detect and stop clusters of infections.

Figure 6 shows the averages and trends of the secondary outcome measures for cases in the 9 local authorities in Cheshire and Merseyside and all other local authorities in England. There does not seem to be any significant difference between the 2 groups. Overall, it cannot be concluded from this descriptive analysis that the pilot was associated with a higher engagement with the Test and Trace system in the intervention areas with respect to the rest of England.

Figure 5 Trend in the proportion of positive over total PCR tests, Cheshire and Merseyside and all other local authorities in England

(Source: Ipsos computations from UKHSA's dashboard indicators. The red line denotes the week of the introduction of the ICT pilot.)

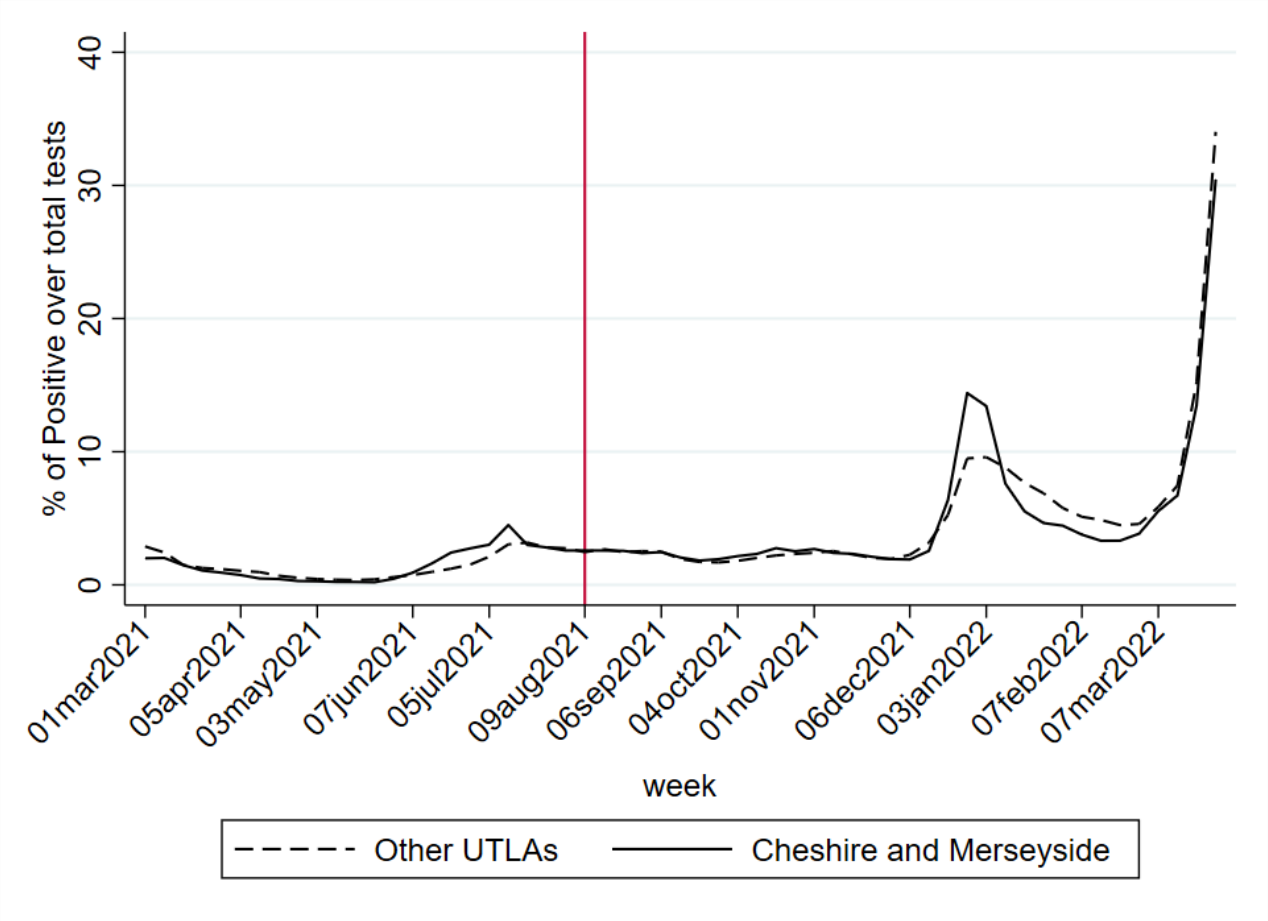
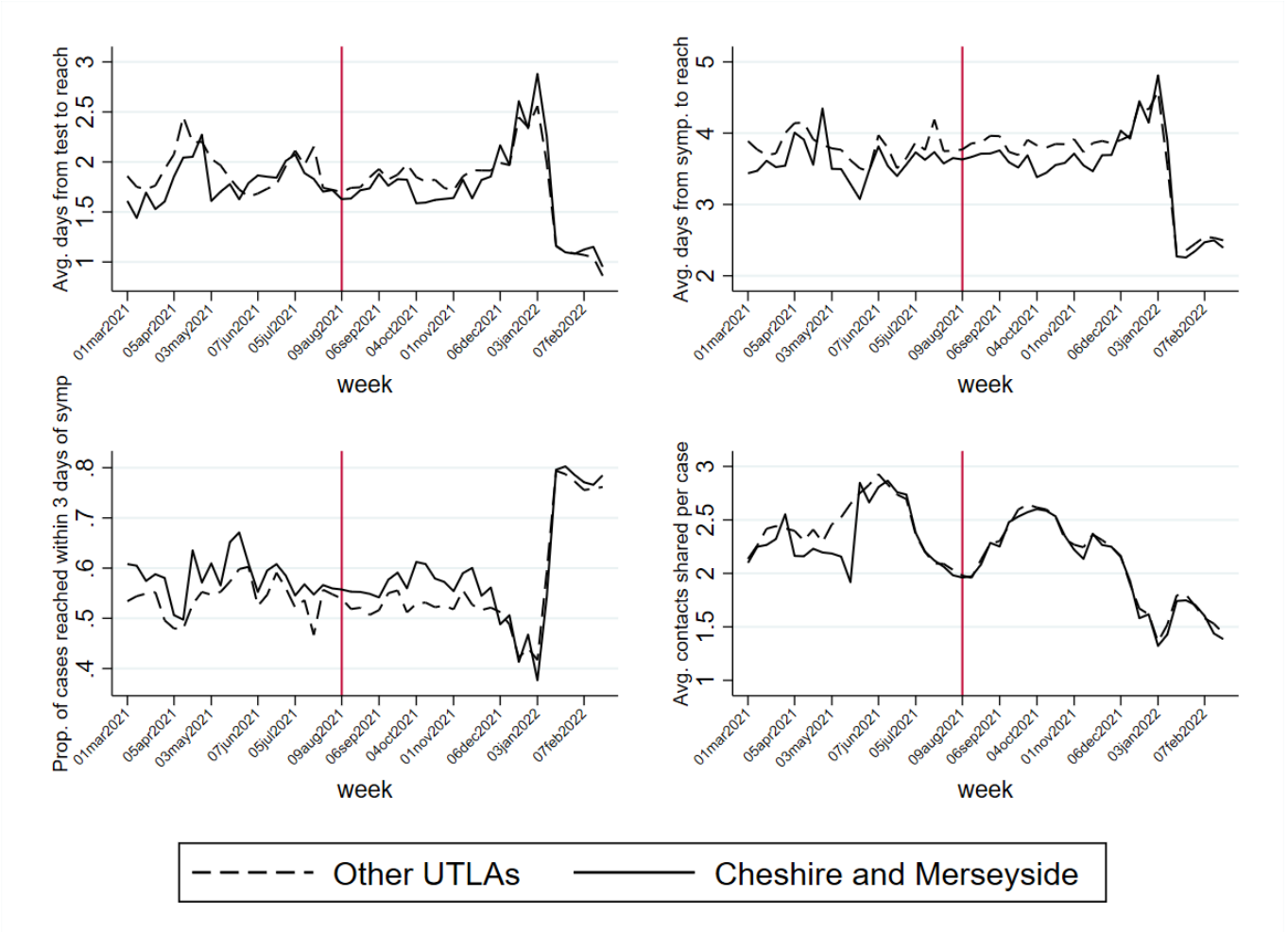


Figure 6. Overall trends in secondary outcomes on cases, Cheshire and Merseyside and all other UTLAs in England

(Source: Ipsos computations from UKHSA's dashboard indicators. The red line denotes the week of the introduction of the ICT pilot.)



Summary of descriptive analysis results

The following conclusions can be derived from the descriptive analysis presented in this section:

There appears to be a greater increase in PCR testing in Cheshire and Merseyside compared to other UTLAs in England, between July 2021 and March 2022. The time from which there is a noticeable spike in PCR testing does not correspond to the official starting date of the programme, and therefore further investigation is required in the impact analysis to check whether this result is robust to the construction of a robust comparison group.

In terms of the other primary and secondary outcomes, the 9 local authorities in Cheshire and Merseyside do not seem to behave differently or follow different trends than the rest of England after the introduction of the programme. This will also be investigated in the impact analysis, through the construction of a robust comparison group and the analysis of heterogeneous effects by local authority.

Impact analysis findings

As originally designed, the programme was expected to have an impact on the level of testing in Cheshire and Merseyside and the amount of time it takes to spot positive cases. It was expected that the programme would lead to a decrease in the amount of time needed to identify a case, and increase the number of tests being taken. The impact analysis below tests whether these expected outcomes have been observed.

Tests

The primary testing outcome was defined as the proportion of PCR tests per thousand population.

In terms of trends, the ITS analysis (in Figure 7 shows similar patterns throughout the 9 local authorities in Cheshire and Merseyside. The initial proportion of tests per thousand population (the starting point of the trend in the graphs) was estimated at between 6 (in Cheshire East) and 9 (in Warrington). Before the intervention started, all local authorities were experiencing an increase in testing. On the week of the intervention, the level of testing increased in all local authorities, with clear changes from before the intervention observed for Sefton, Knowsley, Liverpool, and Wirral. The greatest estimated increase was in Liverpool, where there was an increase by 13 tests per thousand population in the week of the introduction of the pilot. The findings also show that these changes, when observed, start at least one month from the official start of the pilot. This matches the descriptive results (see above) for the whole of Cheshire and Merseyside. The overall trend after the introduction of the pilot was negative for all local authorities: it is estimated that the number of PCR tests decreased by between 0.3 and 0.4 tests per thousand population per week (around the beginning of January for all local authorities). This decreasing trend might be explained by both the gradual reduction of cases and the lifting of COVID-19 restrictions over the course of the pilot.

The SCM analysis compared the above trends estimated for each local authority with an appropriately constructed synthetic control group. The SCM results are shown in Figure 8, and the full results are reported in the technical annexe.

The estimated synthetic control groups are a satisfactory statistical match for their respective treatment groups (based on the variables used) for all local authority areas except Sefton, Liverpool, and Knowsley, where the quality of the match between the synthetic control and the actual outcome data in the pre-intervention period is less precise. For all the other local authorities, levels and trends in testing in the treated and synthetic groups almost coincide in the pre-intervention period, suggesting they are a good statistical match.

The differences in the number of tests in Cheshire and Merseyside local authorities and synthetic control groups in each post-pilot week can be interpreted as the estimated effects of the pilot. Overall, there is no statistically significant difference in the number of tests completed in the Cheshire and Merseyside local authorities and the synthetic control groups, suggesting

the programme has not had an impact in the intervention period. In Cheshire and Merseyside the levels of testing have been slightly higher levels than in the synthetic control groups after the introduction of the pilot, but these differences are not statistically significant.[11]

[11] The exact p-values for the whole post-treatment period ranges from 0.102 in Cheshire East and 0.683 in St Helens. Full results are available in the technical appendix.

Figure 7. PCR tests per thousand population: ITS results by local authority

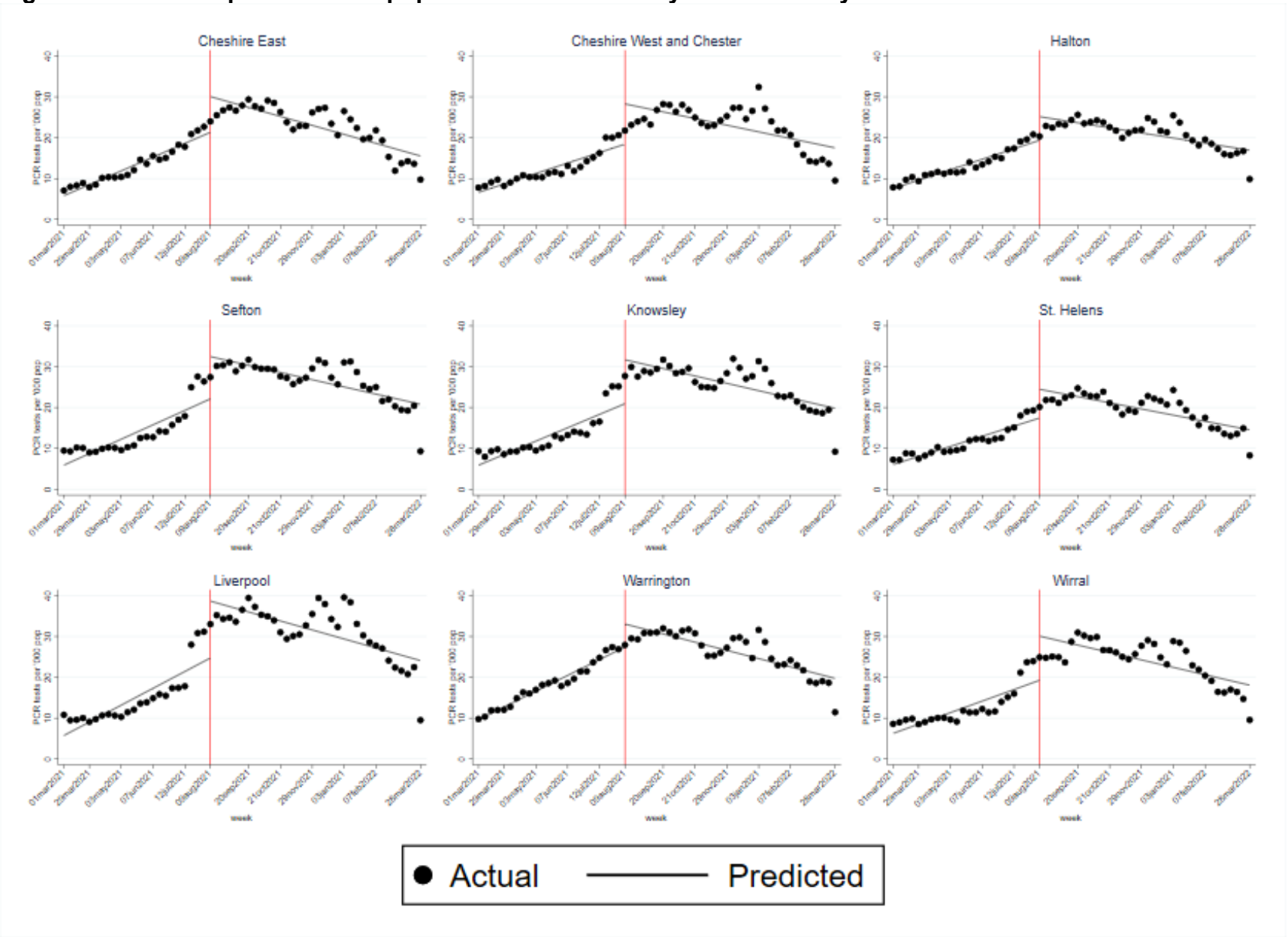
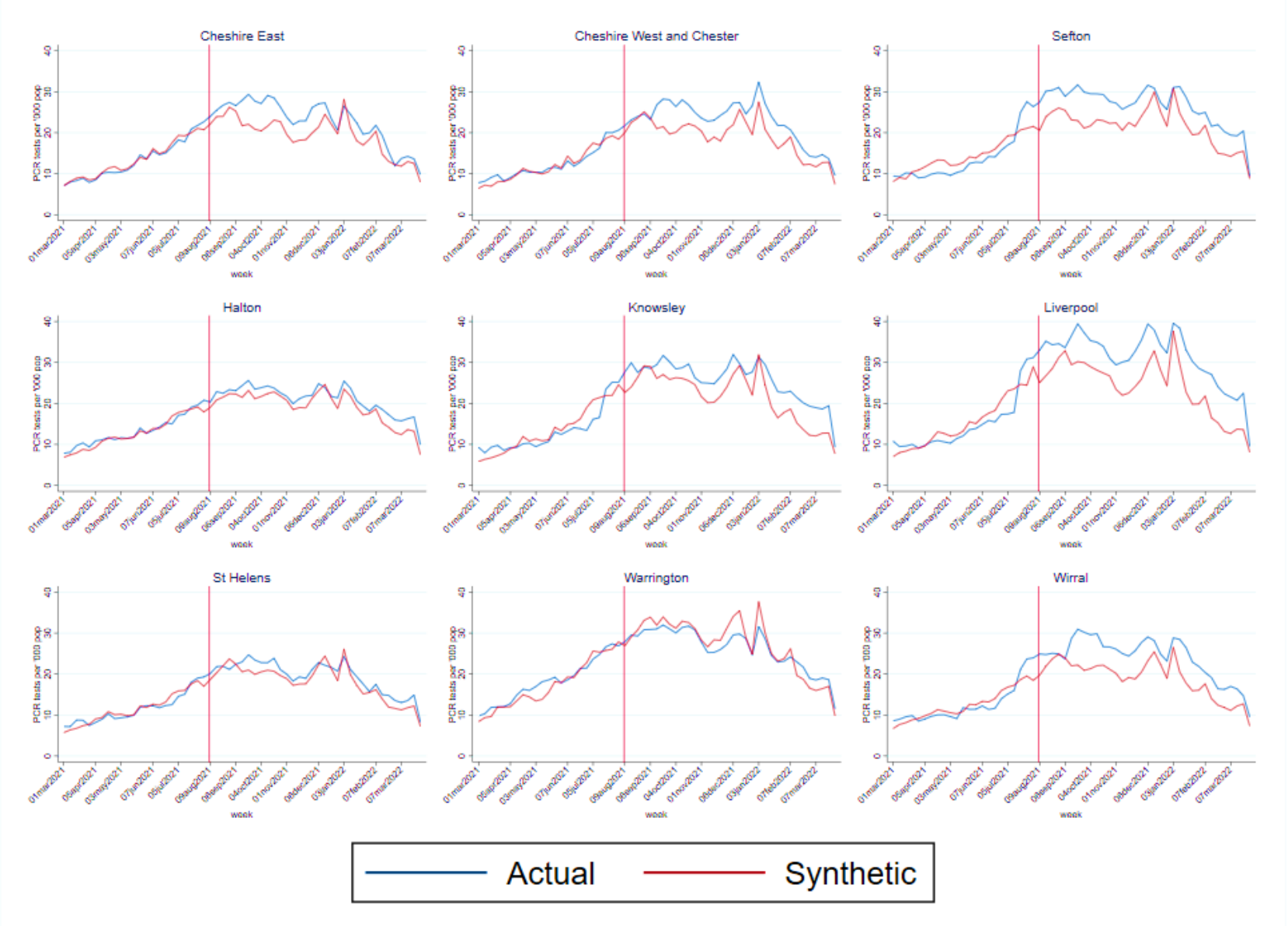


Figure 8. PCR Tests per thousand population: synthetic control method results by local authority (Source: Ipsos estimation from UKHSA's dashboard indicators and secondary data sources. The red line denotes the week of the introduction of the ICT pilot.)



Cases

The primary outcome on cases was the average time (in days) between day of the symptoms and day of the test. The ITS results, shown in Figure 9, did not detect any break in trends or levels in this outcome at (or after) the start of the pilot. On the contrary, in all 9 local authorities in Cheshire and Merseyside the average number of days from symptoms to tests remains constant over the whole period of analysis, at around 2 days.

The estimated synthetic control groups are a satisfactory statistical match for their respective treatment groups (based on the variables used), although not as good a statistical match as for the testing outcomes measure. The level of statistical match between the groups is acceptable to draw conclusions about the impact of the programme from.

This result is mirrored in the SCM models (Figure 10), with no statistically significant difference in changes in the number of days between symptoms and testing in Cheshire and Merseyside local authorities and the synthetic control group. These results suggest that the programme has had no, or a very limited effect, on the average time between symptoms and testing in Cheshire and Merseyside.

The metric for this primary outcome is based on the average number of days between symptoms and tests. Following the presentation of results to the ‘Testing Initiatives Evaluation Board’, it was highlighted that the average may be affected by outliers in the sample (very large or very small values), and therefore the median could be a better metric for the analysis. This additional data (median number of days from symptoms to test) were requested and received from UKHSA for preliminary inspection, and it was clear that the format of the data for this variable was such that the median could not display the necessary variation for the estimation of the econometric models chosen for the analysis.

Specifically, the data points for both the test and the beginning of symptoms are recorded in date formats, not date and times – so the time between symptoms and test is itself calculated in number of days. This means that the medians can only be whole numbers or half numbers, resulting in a median number between symptoms and tests highly concentrated around one and 2 days across all local authorities and periods. For this reason, analysis using the median as the primary outcome was not undertaken.

Figure 9. Average time (in days) from symptoms to testing: ITS results by local authority (Source: Ipsos estimation from UKHSA's dashboard indicators. The red line denotes the week of the introduction of the ICT pilot.)

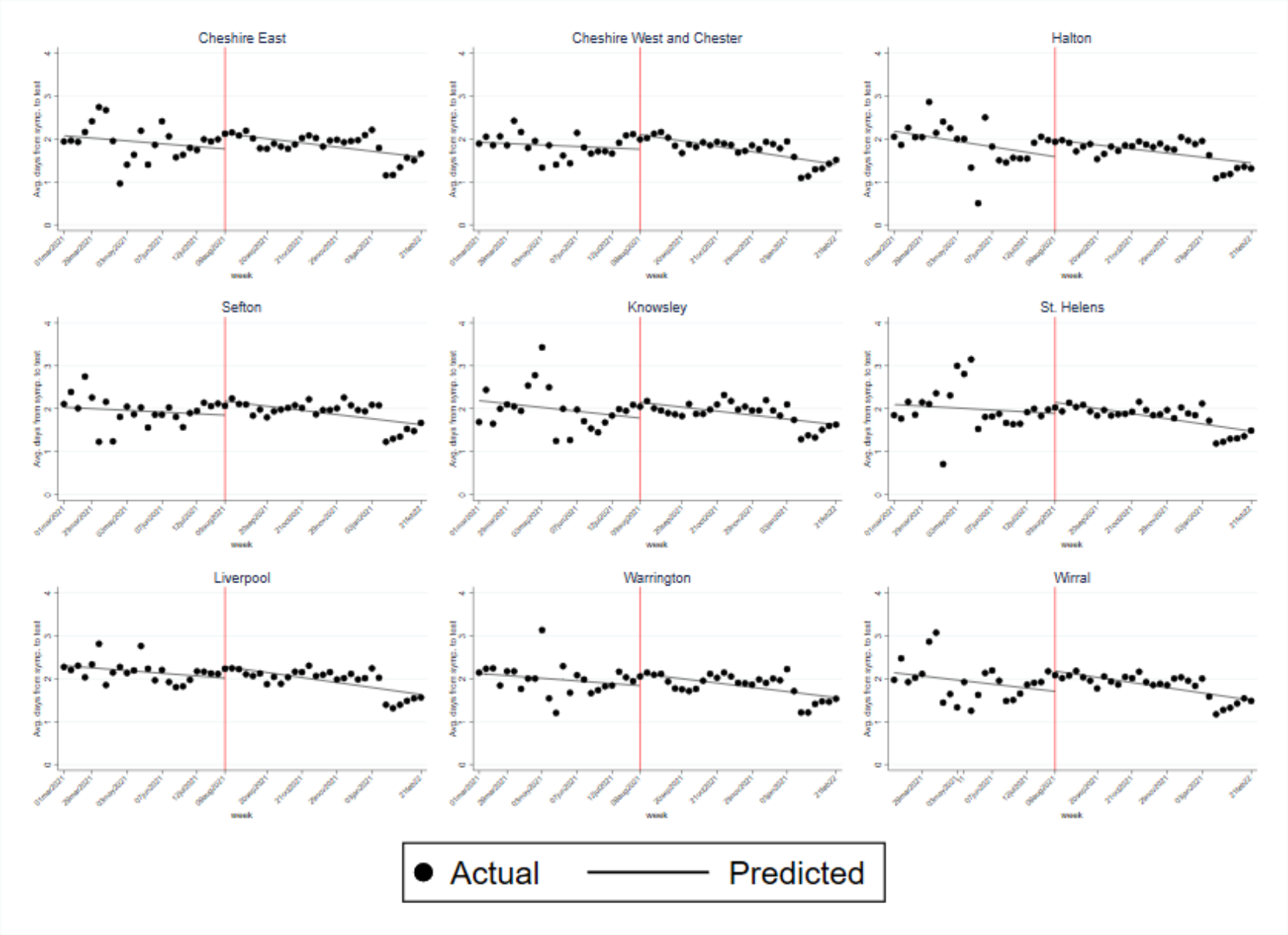
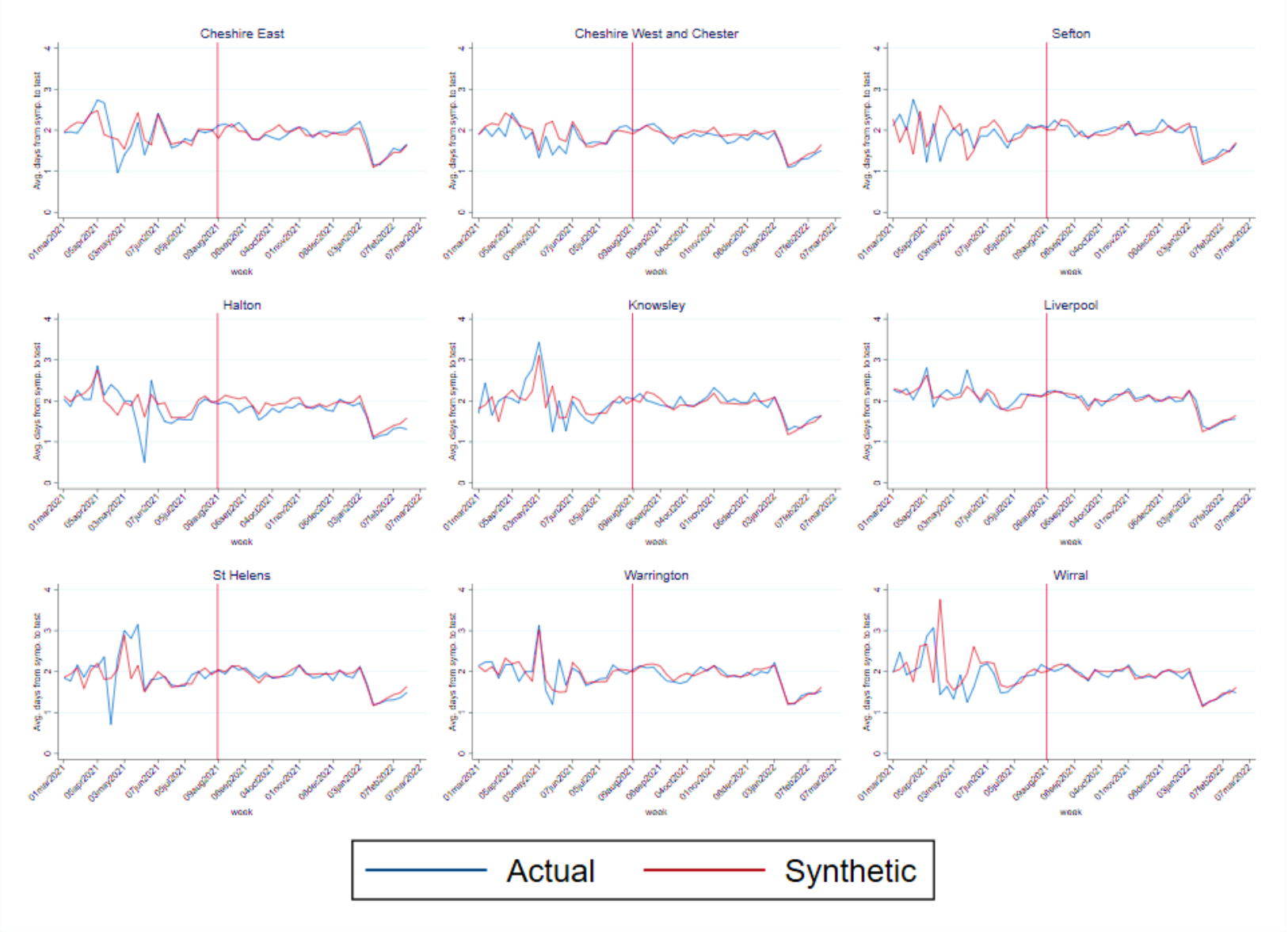


Figure 10. Average time (in days) from symptoms to testing: synthetic control method results by local authority (Source: Ipsos estimation from UKHSA's dashboard indicators and secondary data sources. The red line denotes the week of the introduction of the ICT pilot.)



Conclusions and lessons

This pilot was one of several pilots commissioned by the DHSC, and while this study used similar methodological approaches as those used in the evaluation of the other pilots, it is important to consider the differences between the interventions which comprise the C&M ICT pilot and other pilots, which limit the scope for comparing the results.

The C&M ICT pilot was multi-faceted and consisted of a range of different interventions, including:

- developing a 'One Team' model for outbreak identification and rapid response across C&M
- embedding the case management system further
- developing and delivering a certificated training programme
- a small strand of self-isolation support
- restructuring of responsibilities within the region
- a communications intervention

This set of activities targeted different groups and were aimed at achieving a broad range of outcomes. The econometric analysis focused only on the epidemiological outcomes, which are only a subset of outcomes that the pilot was supposed to achieve. In addition, the changes in COVID-19 restrictions and regulations during the pilot was ongoing may have interfered with its implementation, and ultimately, with the realisation of its intended outcomes.

Delivery during a challenging period

The programme has been delivered during a period of exceptional challenge to those working in the public health and health protection sphere, the causes of which are obvious. Given this, it is notable that every workstream that was initiated made progress towards its goals. However, delivery challenges described throughout this report were evident in all interviews and have led to a programme in which:

- there is a variation in the progress of each workstream or programme activity
- there is variation in uptake of key activities across the 9 local authorities
- delays in funding arriving in C&M contributing to lost momentum, and initial plans having to be reworked
- knowledge of the programme itself across the area was limited (even after prompting, in many interviews) – it was particularly low amongst those in operational roles who often had been involved peripherally, or for a short time period; where this was the case, the fact that activities had been delivered during demanding phases of the pandemic response was given as a primary explanation (for example, the CMS rollout). It also speaks to a programme which did a lot of early work at the strategic

level (such as the design working group) and did not heavily market itself in the region

The challenges of the period, from the perspective of the programme, can be split into 2. First, and most obviously, the work of delivery (and delivery of what was a large transformation project, with many planned outputs), was hampered by the operational impacts of the pandemic. Most clearly, this included senior staff being diverted away from programme tasks to more urgent response work, or staff in operational posts across C&M being more difficult to engage (in implementing a new case management system, for example).

Second, this challenging external context was not static. It waxed and waned in its influence, and fundamentally impacted on the priorities in the area throughout. This meant the programme had to reprioritise and plan new activities on more than one occasion. This reprioritisation should be seen as a significant success of the programme as it sought to maximise its relevance to the problems at hand. In general, from those with the level of oversight necessary to comment, the programme's shifts of emphasis were supported. It also contributed to some inefficiencies (for example activities being started, but not seen through), or very significant delays and alterations to plans (in the case of communications, for example).

There was broad support for the programme's objectives, heard commonly in interviews throughout the evaluation (when prompted), and from people at different levels of seniority. This support was partly because, to a large extent, it represented continuity with the existing direction of travel in the C&M area. This meant that most senior stakeholders in the area were already amenable to some of the planned activities (with their teams following this, where they were engaged). Also, core definitional features of the programme, such as its regional (as opposed to local authority) scale were not subject to significant opposition (although most interviewees still expressed that they saw the local authority level as the key building block).

Limited attributable impact on the primary outcomes

Drawing on robust impact analysis, the evaluation is unable to show a clear, statistically significant impact of programme activities on the outcomes of interest (either positively or negatively). The level of testing after the start of the intervention was slightly higher in Cheshire and Merseyside than in the comparator areas, but this difference is not significant, and did not appear to be increasing over time. Therefore, the evaluation cannot conclude that this is the result of any particular programme activity, or a combination.

There are several possible explanations for these inconclusive results:

1. The changes in government legislation and requirements for testing during the time period the programme was operating during and the analytical timeframe. The legal position on self-isolation changed at the same time the programme was launched, which will have impacted on testing levels.

2. The programme was cut short by several weeks. These latter weeks may have proved important as impacts may have begun accruing in this period.
3. The very significant challenges to delivery documented here.
4. The fact that much of the resource went into ‘strategic’ activities likely to deliver dividends over the longer-term (assuming they successful).

A further compelling explanation relates to the fact that this is a multi-faceted programme being delivered in a complex environment. In such cases, making significant impact (which can be observed in the data) over the short term is very challenging. The ICT programme was large with several workstreams. This differed from the other pilots funded through UKHSA’s national programme. Such programmes tend to face higher delivery challenges (if only because carrying out more activities multiplies the challenges, regardless of the external context). The timescales in which outcomes emerge from such complex programmes are typically longer as they are often the result of activities in combination; often, with programmes of this sort, it is the unexpected strategic or less tangible outcomes which prove most enduring.

This discussion of the complex, longer-term nature of the ICT programme is relevant to the interpretation of the results. The ICT programme was badged as a ‘pilot’. This title implies a shorter term, narrower, and simpler intervention with stop/go decisions points built in based on a quick assessment of results. This was not the case with the ICT programme and such a design may have been more suitable for the external environment of the period in which the programme has been delivered.

Despite this challenging finding, interviews collected ample testimony which was supportive of the goals, underpinning logic and evidence, and early progress of most aspects of the programme. There was a view, held widely, that the programme had contributed to a range of changes locally which, in time (or a consistent external context), would have translated into the end programme outcomes. These include:

1. The importance of a locally-based response, that has enough capacity to make a difference. This seems to be conceived of in several ways: 1) the fact that support (for testing, or self-isolation for example) was delivered by local people; and 2) local knowledge meaning staff can see connections and clusters in a way that a national body is unable to.
2. Extra capacity: the programme is seen to have boosted team capacity in some areas, and this has given teams more ability to provide deeper support. At the strategic level, stakeholders have noted the value of extra capacity and capability to coordinate the value-added activities that are not possible to be delivered by those in more operational roles (particularly under the challenges of a pandemic).
3. Sharing good practice across local authorities was boosted by the programme (through a number of its workstreams). Stakeholders suggested this may have led to earlier evidence-based interventions being spread across the subregion.
4. Improving senior level links which may have contributed to better allocation of resources across the area at particularly challenging periods.

5. Empowerment and support for the public health consultant cohort, who were involved in delivering much of this work.

Given this, the programme can be considered to have generated value for the C&M system in a strategic sense: improved partner working, reducing barriers to working together and exchanging resources, catalysed 'common good' activities (such as the training programme) which would have otherwise been more challenging to start, and provided a forum for longer-term thinking and planning (important given the urgency of the recent period). There was a clear sense that the external investment had made this possible. The types of activities being undertaken or planned (for example a large public communications campaign, or training programme) were difficult to envisage under normal circumstances.

Eye on the future

The close relationship between the external context and programme delivery is instructive. The short-term crisis linked to the emergence of the Omicron variant was seen to be associated with an increase in the importance of aspects of the original programme plan, and this demonstrates the value of continuing to resource surveillance functions, or teams able to respond to changing demands. In a sense, it refreshed the programme's case for intervening (while also diminishing the people able to deliver it). The programme team understand this close link between context and delivery very clearly, and following the 'Living with COVID' announcements, rapidly reoriented the programme towards improving resilience to a wider range of risks in future. This move towards future challenges was evident across most workstreams and was shown to have generated more engagement with activities such as the CMS rollout. As such, it should be seen as a success of the programme, and a contributor to its legacy.

Learning and recommendations

For policy

The very significant context changes in quarter 1 2022, combined with the inconclusive impact evaluation results, mean applying the learning from this pilot at the national level is not straightforward. The pilot offers supportive evidence that tackling a range of health protection challenges at the sub-regional level can be fruitful. Providing extra resources for a central transformation team working at this level can contribute to activities being delivered which help build system resilience during crisis periods. But the links between these activities, and reduced transmissibility is not clear from this study. A resource for longer-term planning (when this is less viable by the core staff) is also a big gain, and this is important at a time when the role of public health is better-understood, and more in the spotlight than before. The pilot also demonstrates broad support for localising aspects of pandemic response, with the sub-regional footprint being a logical home for parts of this. The fact that some of the programme activities have already been recast as responses to non-COVID public health challenges also demonstrates the potential longer-term value of ostensibly Covid related investments.

There are learnings too for the design of national programmes during a crisis. There is a need for both speed in distributing funding (so that the case for intervention and objectives have not become mis-aligned by the time the programme can start), and flexibility in its use (which has evidently been offered given the extent of the programme's evolution). National programmes constituted of several shorter-term, tightly defined pilots, testing specific interventions and their contribution to key outcomes, may be more suitable, if there is an urgent need for information on 'what works'. However this evaluation also shows the value of public health actors having the resources, freedom, and agency to act, and broader programmes, with multiple activities, can support this.

For the Cheshire and Merseyside system

The ICT programme has further demonstrated the interest in, and value of, sub-regional strategic work. Having resource set aside for transformation is necessary to get this far but the areas of perceived success – such as learning exchange or the training of staff or offering a career path within the health protection field – should be continued in some form. Some of the encouraging signs captured in the evaluation require further nurturing. These include the gains made by staff through their training (with several potential longer-term recruits); the agreements struck on cross local authority collaboration through the strategic workstreams; and the use of the CMS.

In terms of design of future programmes, teams should ensure they consider the need to communicate the presence of the programme, and its objectives to all levels of the relevant workforces. While such an activity may look inward, it builds momentum and support behind activities, and there are many examples of this contributing to sustainability. Related to this point, due to the ordering of the ICT programme's activities, the more strategic workstreams moved more rapidly in the early stages, while those strands where impact may have been more direct (and potentially shorter term), moved more slowly – workforce development and communications. There is sound logic to this ordering, however its consequence is that much of the longer-term impacts of the more direct activities will be felt after the life of this evaluation (for example the communications workstream has a set of ambitious objectives which will not be evident for several months).

The team should consider keeping a record of, and maintaining the standard operating procedures and protocols put in place, for the various responsibilities of local, sub-regional and national actors under different circumstances. This will stand the system in good stead for the future.

The pilot shed light on the challenges in implementing consistent procedures and a singular system across the 9 local authorities in Cheshire and Merseyside. However, it also demonstrated how the local authorities can collaborate and work together to achieve regional objectives. The team should consider collaboration opportunities on other initiatives and the supporting procedures required to ensure buy-in across all local authorities, such as the establishment of working groups.

Appendix 1. Programme theory of change and evaluation framework

This diagram is a visual summary of what has been described in this report: what the programme planned on doing, what the expected outcomes were, and their expected impact.

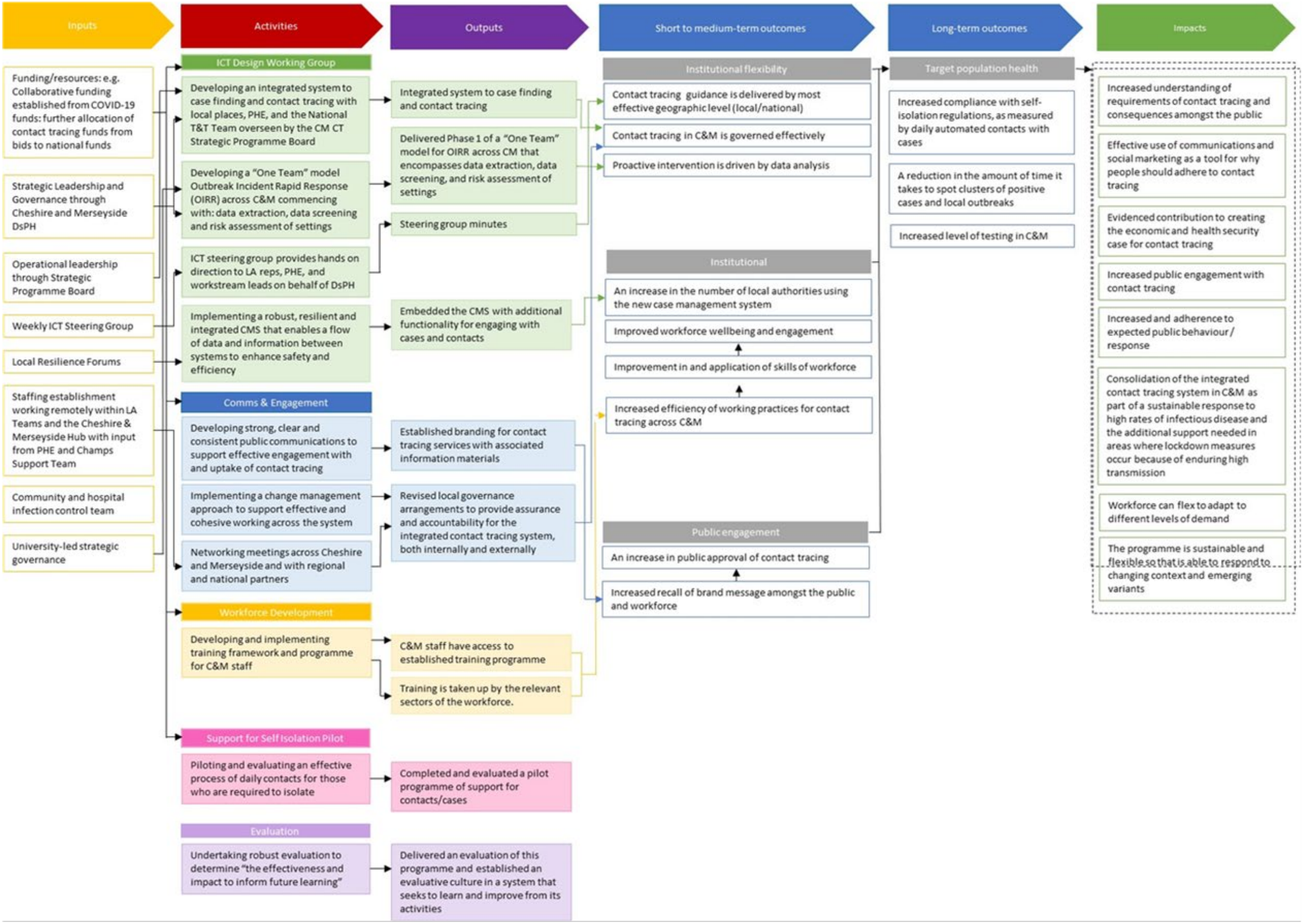


Table 3. Outcome metrics sourced from the DHSC dashboard (all measured at UTLA level)
(This table is taken from the original evaluation plan with minor amendments.)

Type	Metric	Outcome type	Variable	Measure
Increased compliance with self-isolation regulations	Isolation follow-up call outcome	Primary	Weekly proportion of cases with successful call outcomes at isolation days 4,7,10, over the total number of cases.	Proportion
Reduction in the amount of time it takes to spot positive cases, clusters, and local outbreaks	Time between cases having symptoms and getting tested	Primary	Difference (in days) between time of symptoms and day of the test	Average difference (in number of days) per week
	Time between cases being tested and being reached	Secondary	Difference (in days) between time of the test and time when the individual engaged with the system	Average difference (in number of days) per week
	Time between cases developing symptoms and being reached	Secondary	- Difference (in days) between time of symptoms and time when the individual engaged with the system - Proportion of weekly cases who engaged with the system within 3 days of first symptoms over the total number of cases with symptoms in each week	Average difference (in number of days) per week Proportion
	Contacts shared per case	Secondary	Total (household and non-household) contacts shared per case, over total number of cases per week.	Proportion
	Proportion of positive PCR test outcomes	Secondary	Total number of weekly positive tests over the total number of PCR tests taken per week	Proportion
Increase in the level of testing in C&M	PCR testing rate	Primary	Total number of PCR tests over total population	Proportion

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