BLMK ICS Data Strategy

September 2021

Contents

BLMK Integrated Care System

Executive Summary

Why a BLMK Data Strategy?

BLMK Integrated Care System (BLMK ICS) is transforming at pace to deliver on Central Government's ambition to drive collaboration across the health and care system to better support our residents and improve their outcomes.

To create the governance structures, technical infrastructure and integrated support pathways to do this **– getting the data right is critical.**

Making evidence based decisions relies on an accurate, trustworthy and timely single version of the truth, however **the data issues that have limited the potential of public sector collaboration persist**. Disparate systems, non-interoperable data standards, persistent data quality issues and capacity constraints around data skills must be addressed if we are to realise the opportunity of collaborative ICS working.

However, **BLMK has already made a good start**, from the population health management (PHM) strategy, to the two shared care records and the Business Intelligence and Analytics (BI&A) Platform – a lot of progress has been made to transform the way we collect and use data and insights.

This data strategy seeks to capture where we currently are as a system, and identify the priorities we must tackle to address our four ICS purposes, namely:

1. Direct Care – Information from across the provider systems will be shared across a Shared Health and Care Record in support of direct care and effective shared planning.

2. Case Identification – Shared information will support identifying individuals within the population at greater risk to support prevention and design timely interventions.

3. Supporting Self Care – Shared information will have a citizen-facing view in which individuals will have access to their own Record, activating their self-care.

4. System Redesign – Shared information will support PHM approaches to strategic commissioning, service management, and economic functioning of the Health and Care system.

To support the delivery of these four purposes, the data strategy will outline a future state that allows us to move forward as a system and realise the benefits of collaborating at scale, whilst acknowledging the individual statutory roles and responsibilities of each of our partners.

While underpinned by a wider set of principles, our target future state will aim to provide a framework that will help us to:

- **Embed the notion of subsidiarity**, with ICS level support providing ICS tiers and partners with the tools, insight and access to make decisions at the most appropriate level – closest to the resident.
- Understand the current landscape of data and innovation initiatives and outline a future state that **provides the infrastructure, skills and leadership** to both enable and expedite their delivery.
- Develop a future state framework and set of workplans that help drive the system forward but **allows partners to move at different speeds**, depending on their maturity – **without creating obstacles to innovation** where it is able to progress independently.
- Ensure that alongside enabling the better use of data, core principles of **resident privacy and technical security are embedded throughout**.
- **Foster a culture of evidence based decision making, outcome evaluation and continuous improvement** through providing better and more streamlined access to data for a more data literate workforce.

To develop how ICS investment, capacity and support can enable health and care planners and providers to thrive within the system, we have undertaken a comprehensive programme of engagement with ICS members and external regional partners to understand the current obstacles and future ambitions that improved access and utilisation of data assets can provide.

We would like to thank all contributing partners for their generosity in giving their time to do this and the positive and optimistic levels of engagement received to shape the opportunities identified throughout this report.

Our methodology and approach

BLMK Integrated Care System

This data strategy document is the culmination of **significant system-wide engagement and co-creative thinking and planning**. Across the ICS, 98 people were engaged via one-to-one interviews and/or collaborative working groups. Consulted individuals varied across teams, ranging from senior leaders, IT leaders, population health managers, information governance officers, clinicians and business intelligence leads.

The project's governance structure also sought to equally represent the different places and partners across the system, on behalf of the ICS CEO Group and Partnership Board. A total of 14 system leaders oversaw and guided the programme of work, alongside the project SRO and Programme Director. Several Steering Group members were appointed as working group leads across four key areas to the project – **Business Intelligence, IT and Infrastructure, Information Governance and Public Health** – where they joined in leading collaborative sessions.

Finally, project leads presented on the progress of the strategy across several CEO Group and Public meetings for regular feedback, as well as to gain buy-in and commitment from system leaders to **support an approach where the data strategy is integral to their work and care delivery**.

Our delivery partner, Agilisys, undertook an initial 10-week accelerated delivery programme of work. Their approach included the delivery of:

- **Current and future state engagement:** Via stakeholder engagement, identification of current challenges, opportunities, assets and capabilities, as well as a working definition of the ICS' future vision and principles for data as a guide for the strategy,
- **Gap analysis and roadmap:** Through a gap analysis of the current state against the future state, an action-oriented implementation roadmap bridge the existing state with the targeted state
- **Case for change:** A compelling business case to support investment by illustrating a line of sight to the benefits realisation of harnessing data.
- **Extension and use case socialisation:** An additional 6-week programme of work to refine, test and validate the insight use cases with stakeholders.

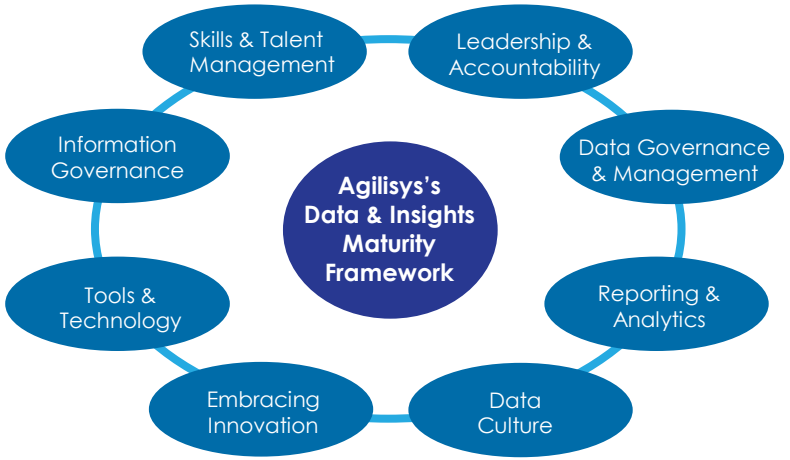
A full list of those engaged throughout the development of the data strategy can be found in the appendices at the end of this document.

The data strategy is underpinned by the **Data Maturity Framework** deployed by our delivery partner Agilisys, which in turn is based on acknowledged best practice, including the TOGAF® Standard and DAMA's Data Management Body of Knowledge (DMBoK).

It intends to provide a holistic view of an organisation's approach to data, and to ensure that recommendations effectively meet the comprehensive data and insight needs of the whole ICS footprint and its constituent partners.

This framework will provide us with an understanding of the current capabilities and desired future state for data and insights across the ICS.

Critically, the framework explores the wider culture, skills and leadership based requirements to embed data driven decision making and transformation, in addition to more standard requirements such as data management, information governance and tools and technology.



Key findings on the current state

BLMK Integrated Care System

Drawing on our partner Agilisys's bespoke Data Maturity Framework, we have outlined below a **set of key findings** on the ICS' current approach to data and insights. These findings are **based on interviews and workshops with key stakeholders**. The following slides provide a more detailed view of findings against each domain.

Leadership & Accountability

- Due to the complex stakeholder environment within the ICS, there is a risk that **system-level priorities for outcomes and performance metrics** may be mis-aligned with those from individual organisations.
- There is debate as to which partners **are best placed to shape priorities and evaluate outcomes**, hampering work to equip decision makers with the required information.
- Currently, strategic decisions are founded in **individual organisational priorities** with a focus on internal KPIs and outcomes – due to **the limited availability of external data measures.**

Information Governance

- The ICS IG community is a **mature working group** with credibility across organisations and roles from the frontline to strategic leaders.
- **Residents**' control of their data and ability to opt-out of sharing is a **priority for elected leaders** and should be a key consideration in generating public buy-in for the data strategy.
- While IG workload has increased significantly, **resourcing has not always met demand** and therefore typically teams are often **at or above capacity**.

Data Governance & Management

- Participants highlighted that **access to community care, social care and other local authority data** would significantly **improve the 'single view' of patients**.
- Data used by Partners for BI is often **disjointed and updated on a monthly basis or longer**, in some instances manually.
- **There is some lack of confidence** in data produced by primary and secondary care, due to **quality and standards issues**. However, other stakeholders are confident that the data quality is sufficient to deliver intelligence for tasks such as **risk stratification**.

Reporting & Analytics

- Analysts across the ICS can sometimes **lack capacity and capability to deliver advanced analytics** due to the sheer volume of their business as usual (BAU) workload; self-service reporting, however, these often use **out of date information.**
- There is little evaluation of the **effectiveness of multi-agency interventions** on holistic outcomes for the individual, limiting service improvements.
- Primary care providers do not always have **access to analysts to deliver reports** and break down analyses into actionable PHM insights.

Key findings on the current state

BLMK Integrated Care System

Data Culture

- **Insight driven prevention** is accepted as the direction of travel, however, **the anticipated effectiveness and feasibility is inconsistent** across partners.
- Many **strategic and operational decisions are still based on professional instincts**, and when data is used, it is focused on **improving service-based KPIs** rather than a more holistic set of outcomes measures.
- The ongoing development of the BI & A Hub is seen as a **key enabler in driving access to insights**, however its future **user base is unclear to some partners** – risking duplication of functionality and data.
- Stakeholders recognise that there is much work to do to achieve **linked, curated datasets** to deliver population health management analytics in a **productive manner**.

Embracing Innovation

- There is a clear appetite for improved use of data and insight for **moving from 'reactive' care to 'proactive' PHM**, however, not all partners can articulate how it will be done.
- The emerging BI & Analytics Warehouse platform and data warehouse has a **suite of capabilities that could underpin future innovation**.
- **Differing views on priority areas for innovation**, particularly around enhanced direct care vs. PHM, **could drive disjointed transformation across the ICS**.

Skills & Talent Management

- There is a **strong analytics capability** and understanding of underlying data across most partners aligned to **historical reporting requirements however, advanced analytics experience is limited.** Partner organisations equally have **little visibility** on the data other organisations have.
- There are **considerable capacity constraints** on **data technicians, technical developers and information governance managers**, with concerns around increasing internal organisational workloads of top of ICS initiatives
- There is not a **clear delineation of skills and capacity required** to drive ICS initiatives at the strategic ICS level and partner organisation level

Tools & Technology

- There are **two distinct Shared Health and Care Records** across the two care alliances, with **differing architectures, functions and capabilities that are not currently integrated.**
- There are **technical requirements** for both real-time data for direct care purposes and longitudinal, persisted data for analytics and PHM activities.
- Tools such as the MedeAnalytics risk stratification tool for falls and frailty risk profiling **are increasing maturity and understanding for PHM techniques** – but face issues with **untimely data and missed opportunities for wider indicators**.

Making the most of existing assets

Partner organisations are investing **a great amount of time and effort** into supporting the current direction of travel. Notably, the **strong culture of data sharing** across the ICS has helped to establish a baseline for future work. There are a number of existing assets and strengths to build upon further as part of this project:

Information Governance capability and partnership networks across the ICS are a mature, highly-regarded asset. IG Teams are **pro-active and eager to jointly solve IG obstacles** while shaping data-sharing initiatives, and will provide a **strong foundation** for the use of data going forward.

There is evidence of a clear **appetite to transform services and patient care** through the enhanced use of data and insights at every level of the ICS. This is demonstrated by the consistent theme during the engagement of **stakeholders seeking to build a better picture of the Resident** by incorporating **social care and community data** to inform risk stratification and preventative support plans.

Significant work has already gone into improving the **quality of data** available for direct care use. The introduction of **System One** across the ICS footprint, as well as standardised **Arden templates and SNOMED codes**, has helped to ensure that clinicians are inputting accurate data that is **comprehensive and interoperable** across the system.

There are **pockets of excellence** across the ICS in which Partner organisations are successfully using **new tools and technologies** to deliver comprehensive reports and analytics via tools such as MedeAnalytics for risk stratification and PowerBI for visualisation.

The **BI & Analytics Data Warehouse** will offer significant addition to the analyst resource already serving organisations in the ICS. This dedicated resource will **support customers of insights** who may not have advanced analytics and data science capabilities in-house. In addition, the **advanced analytical resources** from Arden and Gem CSU will further strengthen the ICS's ability to conduct **complex PHM analytical projects, as well as an advanced risk stratification tool for case finding and proactive care (following the Johns Hopkins model).**

Progress has been made in developing **Shared Health and Care Records** for the purposes of direct care across the two care alliances. So far, 95% of GPs have agreed to share their data, **underpinning data requirements** for longitudinal and persisted datasets **to inform population health management exercises.**

Design Principles for the Future State

BLMK Integrated Care System

Stakeholders **from multi-disciplinary teams** across the ICS were asked to contribute key design principles during the engagement for the data strategy. These **co-designed principles** helped to establish **the values on which data is shared and insight is utilised across the ICS**, and should be returned to as a **set of criteria** to use while working together to **achieve common goals**.

Decision-making should happen **as close to the resident as possible.**

Data should **drive co-articulated outcomes for residents,** with inter-connected evaluation metrics through the ICS tiers

Residents must be **empowered** to **manage their own self care** by having access to their data.

Data should be resident-centric, consistent and accessible – acknowledging **residents don't see ICS boundaries.**

Data should be seen as **a key enabler to support the reduction of inequality**.

IG transformation should be driven by collective senior mandate, to empower local teams to agree solutions.

Duplication of data across layers of the ICS should be **avoided where possible to mitigate risks and complexity.**

Interoperable **data standards** and a commitment to improving **data quality** must be woven in to processes and procurements.

A **data driven culture**, supported by training, collaboration and even shared resources where appropriate should underpin PHM activities.

Partners must be able to move at different speeds, without creating obstacles to independent innovation

This will ensure;

- ✓ Residents receive the highest quality care at any touch-point with health and wellbeing services.
- ✓ Partners in the ICS have a comprehensive and single view of the resident.
- ✓ Staff have access to the tools and insights required to embed a data driven culture.
- ✓ Colleagues across all levels of the ICS are clear on how they are contributing to Place and whole-system goals.
- ✓ Data is managed and governed effectively, and can be used efficiently to drive decisions.

Assessing maturity and ambition

BLMK Integrated Care System

Our discussions with stakeholders highlighted a **clear appetite** to advance the ICS' data and insights maturity. Outlined below are **maturity rankings** for the future state that reflects the desired future state articulated during stakeholder engagement **achievable given a steady direction of travel** from the current state **within a period of 18 months** after signing off the data strategy.

Yellow = Current State
Orange = Future State

	1	2	3	4	5
Leadership & Accountability	Individual partners drive data transformation in line with internal priorities, with pockets of integration and collaboration	A high-level data vision exists, but no one leader or mandate to embed it, causing varied interpretations and limited benefits.	Empowered data lead appointed with a high level data strategy and funded on a project basis.	Empowered data lead who has cross-org influence and a bounded but impactful programme.	Designated data lead drives investment and change in line with agreed partnership priorities & requirements
Data Governance & Management	Poor quality data assets with misaligned standards, limit sharing & integration with no clarity around what data exists in the system	Data quality varies between partners, with pockets of excellence and examples of integrated standards and access	Up to date data catalo-gues and dictionaries, with accessible and trusted data and interoperable standards across most partners	Searchable repositories in place to operational-se data catalogues – semantic layer simplifies use of data but limited quality issues persist.	Easily accessible data assets with auditable, searchable metadata siting above an assured, high quality dataset.
Information Governance	IG seen as a blocker to data sharing with a pervading culture of fear disincentivising engagement.	IG teams are in place and consulted on an ad-hoc basis, often later than optimal and seen as a QA function.	IG teams are consulted and support innovation efforts, but certain IG challenges persist & are not tackled due to lack of buy-in	IG team has a strong problem solving ethos and regularly consulted with suite of tools to share templates and upskill wider staff.	IG is a core capability, embedded in strategic decisions and well resourced - supporting an upskilled, IG literate workforce.
Tools & Technology	Little oversight of tech arch resulting in duplication, little to no interoperability, and systems that do not meet basic user needs.	Technology meets core direct care needs but is inflexible, fostering & siloed practices due to limited scope of PHM capabilities.	Centralised partially interoperable tools support a single source of truth, albeit with additional inputs and ad-hoc use of tools.	Use of integrated cloud tools, with intuitive UI for systems, with analytical tools embedded into decision workflows and mature interoperability.	Cloud tech allows for cost effective, scalable, tools to be used on fully interoperable data and systems for advanced analytics & evaluation

Assessing maturity and ambition

BLMK Integrated Care System

Yellow = Current State
Orange = Future State

	1	2	3	4	5
Reporting & Analytics	Analysis is largely descriptive and not widely trusted by service leads. Limited self-service capabilities available.	Analysis generates basic insights, with pockets of more advanced analytics, but still a highly manual process.	Established data reports are automatically refreshed, with emerging data science capabilities embedded.	Intuitive, visualised reports and insights are readily available, with advanced analytics support called upon, resources permitting.	Reports and analytics are automated, with standardised QA and advanced data science insights regularly embedded.
Skills & Talent Management	Data skills gaps are pre-valent, with resourcing challenges for BaU activities and ineffective knowledge sharing & duplication of roles.	Data skills under pressure from BaU limits ability to drive strategic initiatives. Emerging use of visualis-ation tools but limited advanced analytics	Some co-ordination across data roles with strategic reviews of emerging skills gaps. Many training opps for those in data roles.	Clear data roles and recommended training in place, with well resourced teams and increasing data literacy for wider workforce.	All relevant staff are confident using data and have role-based data training. Resource and succession plans for the data profession.
Data Culture	Data is not seen as fundamental to decision making or strategic planning. Limited discussion of data across organisation.	Data is used to support instinct, with emerging grassroots activity to improve uses & access to insights, for proactive care use in particular	Data consistently informs commissioning, care and PHM, although support and coaching is required to support translation of insight into actions	Data is key to strategic planning & day-to-day decisions but some struggle to embed into decision making, but do use for performance	Data is championed as a critical enabler by all – with a culture of accountability and data literacy.
Embracing Innovation	Emerging awareness of pioneering tools, technologies and techniques, but little appetite to explore across organisation.	Pockets of innovative activity occurring at a grassroots level, with senior support, but a lack of committed funding and resource.	Senior sponsored, prioritised analytics roadmap, with dedicated funding for innovation investment.	A dedicated data science unit with strong investment in 'future-proofing' and a leader with a mandate to change.	Data unit manages pipeline of innovative use cases and implementation of advanced tools e.g. NLP and automation as BaU.

Subsidiarity of Evaluation

BLMK Integrated Care System

The effective, **integrated evaluation of decisions, interventions and outcomes** is at the heart of a successful, data-driven ICS – and another example where the principle of subsidiarity should be applied.

Aligning with the ICS Design Frameworks third principle around **a collective model of accountability**, the ICS should have a **central thread of evaluating between the ICS partner tiers**, reflecting the specific dynamics of their commissioning or delivery role, and the health, wellbeing or societal focus of their interventions.

	Evaluation Priorities	Examples
PCN	Providing tools to evaluate and benchmark against key operational delivery KPIs to **assess throughput and the effectiveness of clinical decisions**.	Performance and demand KPIs, along with aggregated outcomes of prescribed services,
Place	Evaluating the effective **delivery of interventions on priority cohorts**, refined to reflect local variances of need and relevance.	Balanced scorecard of health and care outcomes, service delivery metrics and qualitative staff feedback.
Care Alliance	Evaluating the **health outcomes** of the population as a whole, as well as impacts of interventions on priority cohorts and associated cost savings.	Cohort presentation at acute hospital post intervention, prevalence of chronic diseases, effectiveness of preventative interventions against null hypothesis.
ICS	Evaluating expected **societal outcomes** resulting from a healthy population – tied to interventions and aggregated, record level outcomes where possible.	Economic engagement, social deprivation, crime and anti-social behaviour, worklessness

Resident

Service level engagement and **outcomes at a resident level should act as the central thread** to drive effective evaluation – with operational outcomes aggregated up through initial presentation of demand, through preventative services and health outcomes **to arrive at a societal view of population wellbeing.**

This evidences the wider benefits of PHM approaches and underpins future discussions around funding.

Articulating the future state

BLMK Integrated Care System

Outlined below are a set of **key capabilities** that will characterise BLMK ICS' future approach to data and insights. The assessment is based on interviews and workshops with ICS stakeholders. Drawing on Agilisys's bespoke Data Maturity Framework, these key **capabilities reflect the changes and advancements made** to the ICS' current state capabilities and approach.

Leadership & Accountability

- An ICS Data, Digital and Tech group (DDaT) in place to be **accountable for aligning and delivering strategic commitments** for collaborative ICS initiatives.
- A strategic leader for data is designated and **responsible for delivering ICS data programmes & capabilities**, set by DDaT.
- A joint data and PHM operating model, with suitably **resourced delivery capability** – to implement both strategies.
- Clear **delineation of responsibilities and decision making between ICS partners** with respect to PHM prioritisation, interventions and outcome evaluation.
- **Opportunities for collaboration with neighbouring partners and academics** outside the ICS with respect to PHM formally identified and committed to.

Information Governance

- Top **down strategic commitments on data sharing,** through a Data Charter, to create a **mandate for change** and **accelerate IG discussions** at project level.
- **Co-designed, standardised IG templates shared across organisations**, particularly to support the transition for data sharing after COPI agreements end.
- **Communication to Residents about how their data is used**, and Residents have the **ability to opt-out** of sharing their data.
- A programme **to improve adoption and training to make use of tools** such as the Information Sharing Gateway to streamline IG processes.

Data Governance & Management

- **Health and social care data shared** by ICS partners, is pseudonymised by a common key, and linked to build a **holistic single view of the health and well-being of the Resident**. Wider determinants data, such as housing data or locality indices, expands this view.
- Data sharing **supports direct care and secondary uses**, enabled by **rigorous information governance** assurance **and role based access** controls.
- Accessible, understandable, and up to date **data catalogues give partners sight** of system data assets, and a data translation (semantic) layer supports system-wide interoperability of standards.
- Quality of data used for PHM **actively monitored, cleansed, and reported on**, with a view to the impact on decisions and opportunity cost.

Reporting & Analytics

- **Self-service dashboards** use timely data, **alleviating pressure on BI Analysts** and enable production of greater **value-adding analytics**.
- A **shared data science capability supporting the development of advanced analytics** for PHM purposes in a cost effective way.
- An **integrated outcomes framework embedded** across each tier of the ICS should be put in place to **reliably evaluate the ICS's aggregated impact.**
- PHM activities supported by **the mature usage** of accessible risk-stratification tools and population segmentation methods, **informing decisions at place and shared across teams** where appropriate in line with IG requirements.

Articulating the future state

BLMK Integrated Care System

Data Culture

- Partner organisations in the ICS **understand the value of a whole-system approach to data** that underpins **place-based priorities and decision making.**
- **Translation of data and insight** requirement conversations between clinicians and analysts is a **core capability**, through business data champions or upskilled analysts.
- Support **for evaluating programmes and interventions is provided at relevant ICS level** to ensure the effectiveness of multi-agency and PHM interventions to **build consistency and support the shift** towards prevention.
- Supported **knowledge sharing communities** between partners' analytics functions, around deployment of advanced analytics initiatives, **to upskill staff** on the 'art of the possible.'

Embracing Innovation

- New approaches to PHM or care pathway design, **underpinned by holistic evaluation of multi-agency outcomes** – to inform future decisions around service improvement and justifying partner investment in new processes and approaches.
- PHM activities are **supported by the mature usage of accessible risk-stratification tools and methods**, which are regularly informing decisions at place.
- PHM **analytics platforms and capabilities** explore scenario modelling, root cause analysis etc., providing a **clear case on the use of the insights, to drive prioritisation**.
- **Develop Data Ethics forum and framework** around use of data, particularly relating to AI and secondary use, to provide credible assurances to residents

Skills & Talent Management

- **Data literacy training programmes** for non-technical staff, to encourage **effective adoption of new tools** and availability of insights to make decisions.
- Building on the ICS data skills assessment, **clear capacity and succession planning of PHM based skills** across partners to align hiring and reduce inter-ICS competition.
- A **resource requirements review** of ICS data and technology initiatives to **map capacity requirements** between internal BAU activities and ICS to **inform future funding and shared capacity discussions**.
- A **shared data science capability** at ICS level to guide and deploy applications of advanced analytics and upskill local analyst communities in a cost effective way

Tools & Technology

- Technology roadmap to **align capabilities of Partner organisations with ICS requirements** and commitments clearly articulated its specification.
- **Care records are robust**, with a comprehensive overview of residents' longitudinal care record and close to real-time data **accessible to clinicians for direct care decisions**.
- Partner organisations, including local authorities, are **migrated and connected to the Health and Social Care Network** (HSCN).
- Residents' portal connected to care records enabling both **oversight of individuals' own healthcare data alongside self-management of data** and data privacy.
- **Persisted datasets**, likely within BI & A platform, **drive advanced analytics and PHM decision making** and strategy development.

The role of the Data Strategy for the Future State

BLMK Integrated Care System

The data strategy has potential to realise the future state of the BLMK ICS. To that end, we have outlined below the **core benefits that the data strategy will unlock** and enable the ICS to achieve its ambition of becoming data-led.

A common language.

The data will unlock the foundation for interoperable data standards by sharing and implementing best practice while providing a semantic layer to translate data. This foundation will also be built on the common principle of privacy by default, shared by all providers across the footprint.

Integrated Transformation.

The data strategy will unlock a collaborative, multi-agency approach to problem solving by enabling the delivery of integrated tools for multiple users. This will enable new ways of working across the system ignoring organisational boundaries through multi-disciplinary teams having access to richer insights, real-time integrated tools, and an evidence base to track outcomes.

A new era for insights.

The data strategy will unlock advanced analytics and predictive modelling to streamline reporting and analytics and embed insights into BAU processes and decisions. In being able to self-serve reports or gain access to granular insights, strategic and clinical decision making will be more informed than ever before.

Supporting resident outcomes.

The data strategy will unlock the exploration of impacts from integrated interventions captured by different ICS partners. Equally, by giving them access to their own health and care record, residents will have greater insight to inform their own lifestyle choices.

What will be different in future?

BLMK Integrated Care System

The data strategy outlines a number of capabilities that BLMK has the ambition to put in place to enhance the way it uses data, however what this means in practice for ways of working is less clear. The eight outcomes of the strategy below seeks to set expectations for how things will be different, with the following slide mapping this change to individual roles.

Single version of the truth

Developing the integration capabilities for direct care and secondary use ensures all partners are making decisions from the same data, embedding transparency across joint decisions

Feeding curiosity – understanding places

Readily available data can expedite delivery of first level insights such as place profiles, which in turn create the lines of enquiry to fully explore the drivers of outcomes and design new use cases

Fostering data literacy

Improved access to insights through self-service dashboards, granular evaluation and streamlined place profiles puts data in the hands of everyone and facilitates a cultural shift across the system

Privacy by design

Pseudonymisation, role based access, multi-factor authentication and other privacy enhancing technologies ensure data is shared securely and only identifiable when directly benefiting residents

Embedding evaluation in commissioning

Tracking aggregated interventions and outcomes can transform commissioning and performance management by identifying what works best and developing bespoke pathways for smaller cohorts

Analyst productivity

Automated data ingestion, self-serve dashboards, and minimised data cleansing creates capacity for analysts to delve deeper and explore data, to provide more valuable interpretation of outcomes

Shifting from hindsight to insight

With more trustworthy, integrated and longitudinal data, analysts can move away from historical and descriptive outputs towards more predictive and prescriptive insights to support decision making

Modular growth with quick returns

The full value of the data platform cannot be delivered overnight, however investment in capacity to speed up ingestion of key data can deliver quick win use cases while iteratively growing the asset

Persona	My pains in the current state are…	My expected gains in the future state are…
 **Resident**	I am always giving the same details about myself when I access NHS and Local Authority services. Clinicians have a limited view of my longitudinal care record, and often times clinicians outside of primary care can't see my care record.	I spend less time at appointments repeating the same information and more time getting value from my clinician about my care. They have a 'single view' of my past and future appointments, chronic conditions, allergies, treatments, prescriptions, lab results and vaccinations. I will have access to this, which helps me manage my own care.
 **Population Health Manager**	I do not have access to comprehensive, integrated datasets to inform robust risk stratification, and cannot assess what interventions are most effective for specific risk cohorts. Overall, I have an inconsistent view of the multi-agency needs, demographics and risk profiles of specific wards and localities	Using advanced analytics tools, I am able to predict future demand and priorities for specific high risk patients. I have the intelligence to know which cohorts to intervene earlier in order to prevent the most damaging and costly outcomes for residents. In future, I can use this to set PHM priorities that maximise impact on clinical outcomes and reduce 'reactive' care.
 **Care Practitioner**	I regularly lack a longitudinal view of my patient's data not held in current shared care records or that weren't digitised. I have very limited capacity to get information about my patients from other services to understand the full picture of their health and wellbeing. I need too many logins to multiple systems, crating wasted manual effort when pressed for time	I have the ability to understand the whole context of my patient's life and lifestyle, and how these are impacting their health and wellbeing when they come for appointments. I have access to the full breadth of test results and scans my patient has completed, and am not repeating or duplicating efforts from hospital visits. I am able to coordinate care with other practitioners in my patient's care network.
 **Care Commissioner**	I do not have the tools and dashboards that would map and forecast where supply is not meeting demand at Place level. I am unable to find and predict service bottlenecks in the system before reaching crisis levels. Lack of access to granular data prevents me from truly evaluating the performance of commissioned services.	I have up-to-the-minute dashboards that provide insight on the number of residents interacting with care at any given moment. I have the ability to forecast demand using advanced models based on previous trends and live data from providers. I use geographical heat-mapping of GP referrals to direct specific care and treatments.
 **BI Analyst**	Managing business as usual reporting requirements for my internal organisation is already keeping me at capacity, and so I will struggle with any additional ICS requirements. Data quality is inconsistent and often needs manual cleansing before I can develop reports. Insight products must all be manually refreshed and sent directly to users rather than updating automatically.	Because BaU reports are automated, I have time to spend on value adding analyses that support strategic decision making across the ICS. I have capacity to build BI tools that enable colleagues to self-service their reports and support access to advanced analytics in the organisation. Access to a shared ICS data science capability helps me to develop further advanced analytics models and tools for my organisation.
 **Information Governance Lead**	Because of increased demands for DSAs and IG consultation in my organisation, I often lack capacity due to limited organisational resource internally. Tools such as the Information Sharing Gateway are not used consistently across the ICS, leading to more manual sign-off processes, delays and potential for inconsistencies	I have access to a suite of templates to guide DPIA, DSA and IG monitoring for ICS data agreements to embed consistency and streamline their completion. This has given back capacity which I can focus on adding value to new projects and initiatives that require my review. I am regularly enabling safe data sharing practices in my organisation and unlocking greater innovation between and across providers in the ICS.

Impact of Technical Capabilities

BLMK Integrated Care System

Understanding the **impact of what the enabling technological infrastructure means for residents and end-users** is key to making the case for change. The table below articulates how a **selection of these underlying capabilities underpin one or more of the four purposes** that make up the key objectives of this strategy.

	Direct Care	Case Identification	Resident Ownership	System Redesign
Integrated data on interventions, outcomes and demographic	✓	✓	✓	✓
Interoperable data standards with **semantic (translation) layer**	✓	✓	✓	✓
System-wide, current **data catalogues** provide sight of data assets	✓	✓	✓	✓
Role based access to bespoke ready made views	✓		✓	
Access to read-only, **real-time data** from source systems	✓		✓	
Persisted, longitudinal, timely data sets for insight and analytics		✓		✓
Access to **self-service** analytics or tooling to present data	✓	✓	✓	
AI assisted **data quality assessment and remediation** tools		✓		✓
Pseudonymisation engines and **anonymisation tools**				✓
Machine learning and **advanced analytics platform**				✓

Future capabilities and benefits: Direct Care

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Access real-time, integrated data to contextualise and improve decisions

Accessing resident care histories in a curated, role-relevant view, saves time and lives – enabling staff to:

- Right data at the right time, supports smarter, more personalised care
- Reducing in the risk of interventions worsening other unknown conditions
- Spend time on more value adding discussions and explorations with residents at point of care.

Integrating and automating workflows and providing live care notifications

Joined up data can act as the foundation for joined up care as multi-agency pathways become clearer, enabling:

- Real-time notifications for clinicians regarding other clinical touchpoints including attendances/admittances to A&E
- Automated patient reminders to book check-ups or jab appointments, or to attend specific appointments
- Ability to integrate AI-supported decision models that embed best practice, create capacity for clinicians and improve outcomes
- Greater adoption of IoT devices and wearables into residentt monitoring and preventative support

Ability to undertake shared care planning and preparation

Real-time view and a holistic understanding of resident history and needs can help to:

- Inform which specialists should be included in integrated care planning, supporting scheduling and reducing delays
  - Which could be further enhanced by AI-assisted decision making suggestions
- Minimise preparation for multi-disciplinary teams to bring together case files and notes

Underpinning an improved resident experience

Access to integrated datasets can improve resident experience as well as outcomes, specifically through:

- Only needing to provide basic information such as name, address etc once, rather than repeatedly for different systems
- Reduced duplication of assessment questions or even tests as secure access is provided based on staff role and need.

Direct Care, Care Coordination and Self Care

Future capabilities and benefits: Resident Self Care

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Supporting self-activation and ownership of resident care

We as a system should maximise residents' ability to own and manage their own care, with better access to data enabling:

- Greater understanding of available services and support, filtered based on resident need and risks
- Self-managing care linkages across health and care services
- Self-directed access to peer support or social prescribing
- Practicing and adopting specific behaviours which are central to managing their condition

Simplifying management of consent and monitoring of privacy

Residents should rightly have greater control over how their data is used, with a joined up approach allowing:

- Less fragmented requests for data sharing for direct care, targeted support and research purposes
- Clear sight of how data has been accessed, who it has been shared with
- Simplifying data access and management of permissions for family caregivers

Supporting Resident Self care

A digital channel for resident engagement

Digital channels are increasingly expected as a default – and as data and support channels are integrated, so too can the approach to managing and prompting engagement:

- Prompt and alert based booking notifications based on demography, risk or need – reducing frequency of those not engaging with the system
- Clear integrations and surfacing in existing digital channels such as NHS app or mobile health apps

Driving improvements in underlying data quality

Greater sight of, and engagement with, their data will enable residents to check and refine data – which is fundamental to:

- Reducing data errors and inconsistencies across all of the ICS partners' systems
- Ensuring clinicians have the best information to make the right decision
- Reducing the need for manual and duplicative questions and assessments at each touch point – maximising value of contact with resident

Future capabilities and benefits: Case identification

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

More precise risk stratification with holistic, integrated data

Comprehensive, accessible, multi-agency data embedded in to a BaU tool can transform cohort selection, improving case identification by:

- Identifying those at risk but may be disengaged from the system and would otherwise fall through the system
- Improving precision, reducing false positives and enabling a more personalised care pathway
- Ability to plan services around the greatest need and greatest future demand to manage delivery capacity
- Applying understanding of interdependencies between conditions and complex needs to test new approaches and interventions

Case Identification and Proactive Care Coordination

Enabling the objectives of the prevention agenda

New tools and approach will enable ICS partners to more easily realise the benefits of the prevention agenda through:

- Earlier identification than previously possible, providing MDTs with actionable insights to effectively triage and support
- Reducing most damaging and costly outcomes such as unplanned admissions to acute settings
- Enabling greater independence and quality of life for residents, by living longer and healthier lives

Enabling precise interventions to address strategic objectives and key cohorts

A step change in approach, creating actionable insights to support priority groups collectively, as opposed to relying on more gradual 'whole-system improvement', meaning:

- Greater ability to influence, improve and prove specific strategic outcomes
- Greater return on investment and societal impact for personalised care interventions
- Faster realisation of beneficial outcomes for those most at risk or with the most damaging outcomes

Future capabilities and benefits: System Re-Design

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Evaluating resident outcomes

Holistic data-sets will allow for comprehensive understanding of interventions and outcomes measured across each partners, to understand what combination of support maximises the overall health and wellbeing of residents, providing the:

- Evidence base for system modelling, intervention efficacy and benchmarking of success
- Evaluation of individual cohorts' precise outcomes, rather than ascribing partial impacts on demand shifts in the whole system
- Ability to compare outcomes across places where an intervention had not been implemented as a null hypothesis

Tracking cost and demand through the system

Following what actually happens from a resident perspective can give clarity to budget and care planning by helping to:

- Understand where system failures and disincentives are causing planned pathways and interventions to fall down?
- Track and predict costs during periods of high-demand (i.e. COVID and post-COVID recovery)
- Identify successful savings made ~~in~~ by managing demand for one service by investing in another

System Re-Design

Scenario modelling and strategic commissioning

With a clearer understanding of interventions' impacts on outcomes, more powerful system planning tools allow the ICS to:

- Model potential interventions and their impact on outcomes, partner demand and cost with 'what if analysis'
- Greater understanding of patterns in patient demand to inform commissioning and risk stratification
- Tools for more effective short and long term staffing in key areas of forecasted demand through capacity management

A quantitative basis for better performance management

Be it managing performance at a staff member, organisation or system level – the right tools can underpin continuous improvement initiatives by enabling:

- Better benchmarking of cost and outcomes of commissioned services for contract management
- More precise SMART objective setting and cross boundary working for staff across the ICS partnership
- Clearer basis for funding discussions and underlying business cases

Art of the possible: Future Data Opportunities

BLMK Integrated Care System

Significant progress has been made locally to **integrate acute, primary and community care data** and initial governance for adult social care data is also in place. These datasets will act as a **strong foundation for the four purposes of the data strategy**.

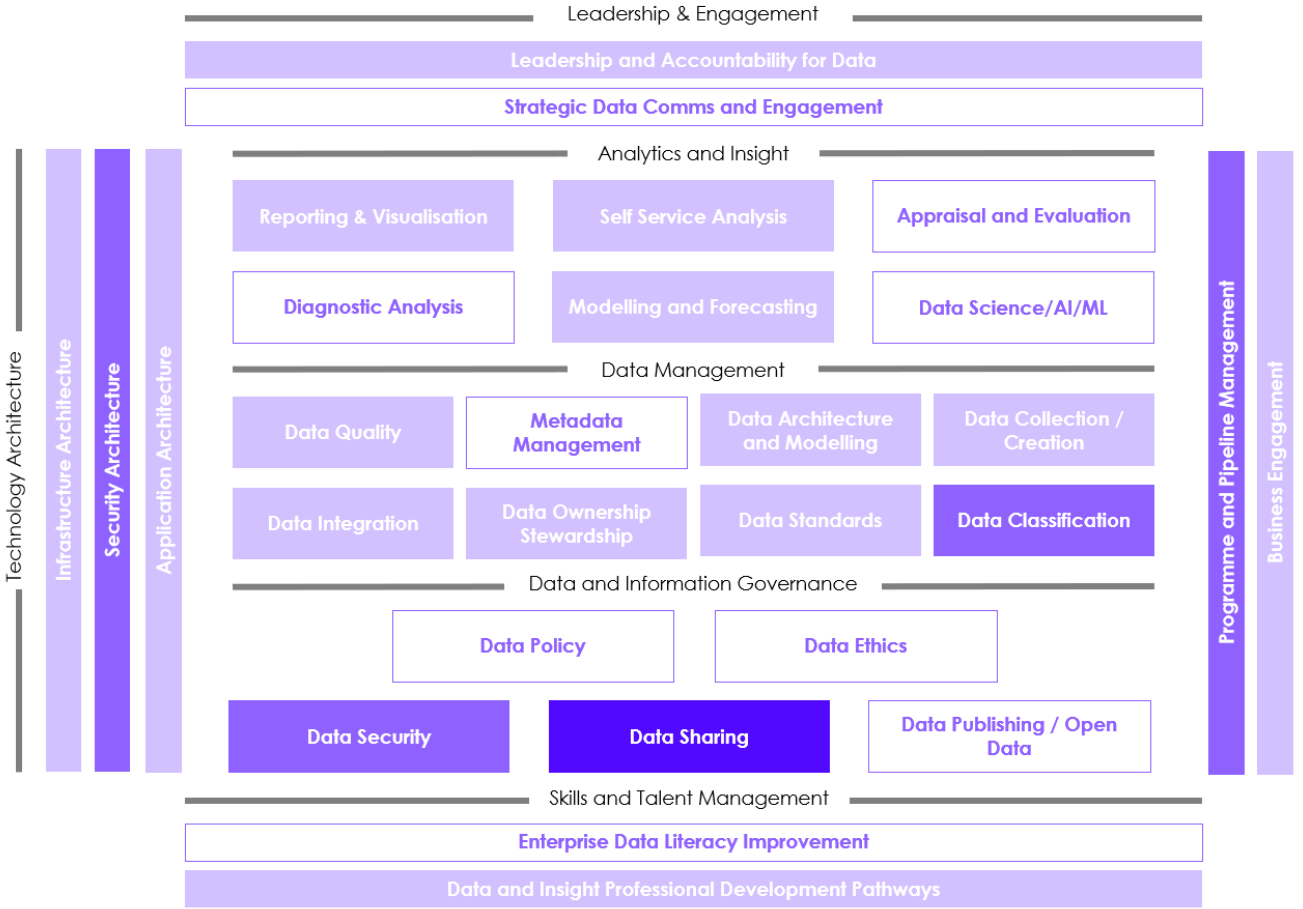
However, once this is successfully deployed, there will be **opportunities to go further**. In our engagement with the system, a number of these additional datasets and their applications were identified:

Service area	Opportunities
Housing services	Council systems (e.g. Jigsaw) holds data on historical housing support, with key PHM risk factors such as long-term or repeat homelessness and current housing status, helping to identify those who may not be well-engaged with the health system and are likely to have multiple long term health needs in future
Local Authority revenue and benefits	Indicators such as council tax relief, number of residents in the home, time at property, house tax band, and missed payments help indicate deprivation and may be correlated to system disengagement
Waste services	Supported bin-pull outs and additional collections infer risks around mobility and availability of carers – and has acted as proxies in the past, but additionality of value alongside H&SC data should be verified
Police	Data on domestic abuse call-outs, ASBOs and wider criminal justice system engagement can help identify those using the system in a disjointed way, similar to NHS Spine, supporting case identification. However these metrics can also be used to evaluate the impact of healthier outcomes on wider societal outcomes.
Environmental	Environmental Agency and potential Local Authority pollution sensors can be used to evaluate risks and impacts on health and underpin the value case for environmental interventions and their results
Educational	Testing health and wellbeing indicators against attainment, attendance, risk indicators, and free school meals can evaluate the effectiveness of interventions and capture the Return on Investment on ICS activities
Fire services	Fire prevention assessments and the opportunity to use multi-factoral assessments can help provide more granular details on fall, mobility and isolation risks to benefit case identification
DWP	Gaining information on worklessness cycles, status and prevalence alongside health information can evaluate the economic impact of better health outcomes driven in part by ICS interventions

Capability Gap Assessment

Illustrated below is the current level of maturity the ICS considers itself to possess against each of the capabilities that sit beneath the eight framework domains. It should be noted that this is a snapshot view, and progress in areas such as reporting is evolving at pace. It does not suggest that some individual partners are not more mature in certain areas, but reflects how the system has developed and integrated capabilities for ICS level requirements.

This assessment is based on interviews and discussions to map current and future state capabilities to undertake the gap analysis and further developed by the Data Strategy Steering Group.



1. Does not currently exist

2. Partially exists but considerable gaps

3. Pockets of good practice but inconsistent

4. Generally good, but some variation across system

5. Very strong across the system

Introducing the roadmap

BLMK Integrated Care System

This section will provide a **detailed roadmap** that aims to equip our ICS and a future Data Strategy delivery team with an **action-oriented blueprint for effective change**. This focuses on **building up maturity** as part of its key foundational capabilities before **developing the deployment of more advanced initiatives** as the ICS transitions to the future state.

It should **act as a framework to drive discussions** around partner commitments and work programmes.

This section includes:

- Capability gap analysis
- A roadmap overview
- Steps to realising the future state ambition
- High level outcomes by delivery phase
- Risks and mitigations
- Approach to tracking outcomes
- Indicative critical success factors
- Common challenges & lessons learnt.

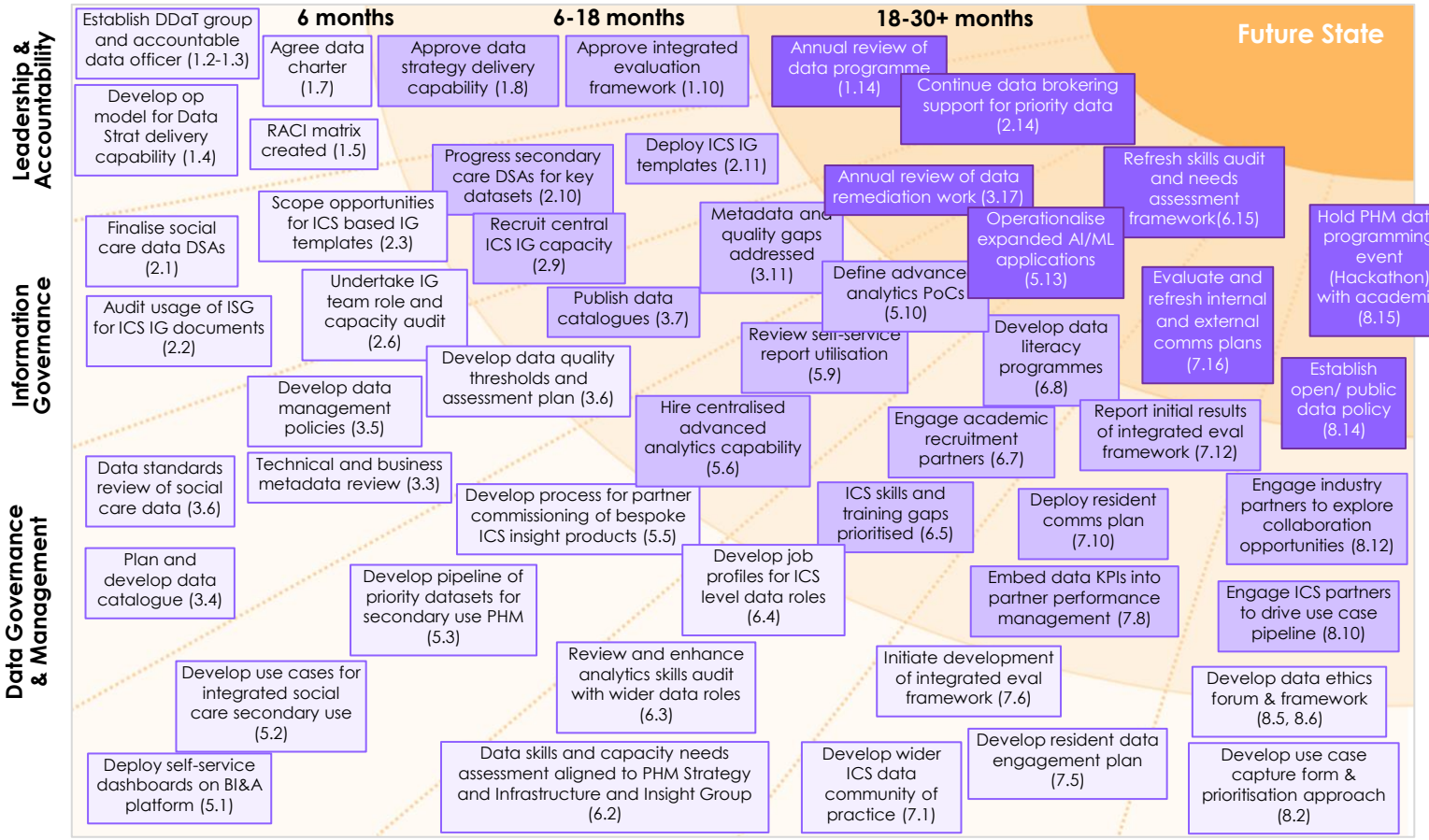
How to use the roadmap:

- The roadmap provides a set of specific activities e.g. approve the data strategy or delivery projects e.g. develop ICS data community of practice
- We have outlined the need for a dedicated delivery capability to implement the recommendations of this roadmap, with requirements scoped by the operating model
- This team would work with ICS partners to scope out a more detailed set of project outcomes, timelines and resource requirements to gain commitment for delivery.

Roadmap Overview

BLMK Integrated Care System

The sunray diagram below provides a high-level view of the roadmap and the key milestones over the next 30+ months. Each box, which represents a project or activity, is expanded on in detailed roadmap appendix and has been indexed to correspond to the expanded statement. It should be noted that **Tools & Technology** activities are not included in this diagram due to partnership and DDaT decisions to be made around the recommendations for a technology roadmap – however a detailed list of activities for this theme are included within the appendix.



High-level outcomes

BLMK Integrated Care System

The table below provides a **narrative view of the combined outcomes** of the eight roadmap domains against the three time periods identified.

	Outcomes
0-6 months	The first six months will focus on formalising a set of commitments across partners for the implementation of the roadmap, specifically in scoping out responsibilities of partners and ICS tiers with respect to the Data strategy, PHM strategy and Digital strategy. This will also include agreement on the size and sourcing of the delivery capability required to drive ICS level workplans and coordinate activities across partners and tiers to reduce transformation burden for internal teams – and led by a designated data delivery officer who is responsible for progressing it.
6-18 months	This period is characterised by the emergence of eventual BaU activities and partnerships as plans and initiatives continue to mature. In particular, the agreement and deployment of resource capability and capacity for the data strategy commitments, across IG, engineering and analytics can start to drive expedited maturation of data capabilities. In particular, assets such as data catalogues create greater sight of partner data assets and allow for better conversations and collaboration around innovative use cases. Advanced analytics teams, through a central shared resource driven by recruited data science leads and academic partnerships will use the nascent use case process to test proofs of concepts related to application of AI/ ML while increased use of self-service dashboards help to articulate the art of the possible to ICS staff that in turn help to drive continuous improvement and create a pipeline of demand for future reports. Resident engagement and communications plans will be initiated, underpinned by a credible data ethics forum and capability to articulate the benefits of PHM, allay potential fears around data privacy and ensure residents are able to make informed consent as to how their data is used.
18-30 months	As the programme approaches three years, activity will be focused around refreshing strategic direction and commitments while continuing to evolve and iterate available data and toolsets for direct care and PHM. More mature use of advanced analytics and an expanded evaluation framework will allow for the insights of both to be operationalised into BaU as opposed to bespoke commissions or narrow pilots. In particular this will underpin discussions among ICS partners and nationally to debate prospective expansion of PHM initiatives and both identifying and justifying associated funding streams.

100 Day Plan – Key Focus Areas

BLMK Integrated Care System

Mobilisation phase are activities that should be carried out after the data strategy has been signed off by the Chief Executive Group, **prior to and during** the process of **standing up the project delivery team**. These activities will **lay the foundation** for the **delivery phase**, in which the appointed delivery team begin to **deliver key implementation activities** that will *enable progress* for the next 6 to12 months of the strategy.

Mobilisation Activities – First 100 Days

- Map the delivery responsibilities of the data strategy with the delivery responsibilities of the PHM strategy to join-up efforts where possible and avoid duplication
- Develop and agree on operating model for delivering data strategy capabilities, including project managers, responsibilities and capabilities – aligned to PHM Roadmap
- Recruit and appoint aforementioned members to the data strategy delivery function in line with plan
- Agree on governance framework to oversee implementation of data strategy, including accountable officers, lines of reporting and delegated functions from the CEO, DDaT and accountable Programme Director
- Begin developing the detailed specification for technological requirements to support the capabilities needed to deliver the future state, initialising the new BLMK ICS Technology Plan
- Initiate creation ICS Community of Practice for insights, driven by the Insight and Infrastructure group
- Work with partners to identify and engage prospective members of an ICS Data Ethics Forum
- Begin developing annual skills and capacity audit to support PHM across analytics, architect and IG functions, as well as wider skills and capacity review for non-specialist roles
- Begin engaging with academic partners to support with PHM analytics and insight development

Delivery Activities – First 100 Days

- Undertake RACI matrix for data and insights functions within partner organisations in line with PHM Strategy and Op Model
- Support existing DSA work with NHS Digital to secure sharing agreements for direct and secondary care adults social care data
- Work with PHM Strategy Leads on identifying datasets to prioritise or expedite for the BI & A Platform to deliver the PHM Strategy and priority use cases – to initiate reviews of data schemas, data quality, and metadata of datasets to refine use cases
- Progress detailed specification for future state technology requirements, commencing testing metadata with partner Integration & Technology stakeholders, with a view towards sign-off of the Technology Plan by senior stakeholders at the end of 100 Day Plan partner resource
- Confirm list of participants to join the BI Community of Practice, develop a terms of reference for community (i.e. purpose, objectives, frequency of meetings and trainings), and stand-up meetings or training days for participants (agenda TBC)
- Initiate engagement with ICS partners around the integrated evaluation framework to identify indicators that capture system benefits and objectives as well as for individual partners
- Confirm list of participants to join the Data Ethics Forum, develop a terms of reference for the forum (i.e. purpose, objectives)
- Develop and initiate delivery of skills and capacity audits across the ICS, sharing outcome with partners for system-level oversight

Delivering the Roadmap: Governance

BLMK Integrated Care System

To deliver the recommendations of the strategy and roadmap, a **suitably resourced capability** will need to be in place to coordinate activities. This should be scoped out in full and agreed **as part of a joint operating model with the ICS' PHM strategic team;** however, some of the key roles we anticipate being required are:

Role	Responsibilities and Capabilities	Additional Considerations
Accountable Data Leader	**Responsibilities:** ▪ Executive leader and Programme Director responsible for managing the delivery and implementation of the data strategy, working closely with the delivery team on behalf of DDaT **Capabilities:** ▪ Responsible leader for information and insight innovation projects across BLMK ▪ Ability to lead systems change and transformation projects	Accountable Leader may already be employed by the ICS, with a similar executive portfolio, with capacity to take on implementation capability. Programme Director to be a new appointment
DDaT Committee	**Responsibilities:** ▪ Tactical group which is responsible for overseeing the data strategy, reporting on progress to Chief Executive Meeting ▪ Receiving updates and reporting on progress from implementation delivery **Capabilities:** ▪ Ability to scrutinise data strategy implementation to ensure data privacy is adhered to, security systems are appropriate and strategy objectives are being delivered against ▪ Excellent stakeholder relationship skills to drive-buy in for data, digital and technology initiatives, especially data strategy	DDaT Committee is a requirement of the ICS as outlined in the Design Framework and already in train locally Will require a SRO and CEO representative on top of the stakeholders identified as being needed in the DDaT
Delivery Capability and Capacity	**Responsibilities:** ▪ Resource team responsible for delivering and implementing the data strategy **Capabilities:** ▪ Previous experience delivering data-focussed or system-level transformation project management ▪ Ability to mobilise a team around the vision and strategic goals of a data strategy – coordinating resources across organisations and driving workstreams ▪ Ability to work closely with PHM Strategy delivery team	Due to constraints on capacity within ICS, the delivery team will likely be comprised of resource dedicated to delivering the data strategy.

Risks and Mitigations

When delivering a project of this scale and level of ambition, we would recommend the creation of a **risk log to capture any risks and define appropriate mitigations**. Outlined below are an **initial set of potential risks and mitigations** to consider when delivering the roadmap:

Because of…	There is a risk that…	Therefore the ICS must…	Mitigation
Lack of capacity and resourcing	Business as usual activities and wider transformation projects may mean there is little capacity across partners to engage with change initiatives.	Ensure there is sufficient capacity to coordinate and deliver the agreed recommendations of the strategy.	• Recognise need for additional senior Programme Director capacity (to support the CIO) to drive the oversight and delivery of the strategy • Explore opportunities for wider support alternatives, e.g. apprenticeships, temporary working groups, secondments • Clearly articulate what can (and can't) be achieved with available resource and demonstrate findings to wider system partners and stakeholders to inform capacity decisions • Develop and fund operating model to fill capacity gaps
Variable senior leadership support	Inconsistent buy-in may lead to delays in decision making risking delivery timescales and strategic alignment with wider activities.	Work to agree a set of joint commitments, aligned to Data Strategy and inter-related programmes to set clear requirements to deliver against.	• Align system objectives and agree core partnership commitments and accountabilities • Promote system and PHM achievements through ICS-wide communication channels • Regular reports submitted to senior leaders and relevant committees of respective ICS tiers to highlight progress
Lack of buy-in across the ICS	The cultural shift to more collaborative ICS working with data driven tools may be difficult to embed compared to historical working.	Encourage adoption of new ways of working, by better conveying the benefits of new tools and approaches through active co-design.	• Supporting Infrastructure and Insight community members to act as Change Ambassadors • Promote BI&A platform and wider PHM achievements through ICS-wide communication channels • Actively prioritise use-case engagement with teams that do not have initiatives within delivery pipelines
Differing priorities at Place level	Additional functionality, datasets or reports prioritised for deployment benefit some places more than others.	Commit to a fair and transparent approach to prioritising work pipelines, with a framework for decisions agreed at DDaT.	• Establish and follow agreed delivery prioritisation processes, e.g. Use Case prioritisation framework • Where required, escalate challenges to DDaT group and accountable data officer to overcome barriers and mediate between conflicting priorities
Lack of measurable benefits realisation	The benefits of interventions are not measured, or done so by partners who do not share data – limiting benefits realisation and hampering funding discussions.	Identify priority data that captures outcomes, develop advanced analytics capabilities to undertake rigorous assessment and agree success criteria from the outset.	• Developing integrated evaluation framework that tracks org and ICS tier actions and outcomes from resident level up to societal impacts to articulate measurable benefits of interventions • Regular annual evaluation reports presented to CEO group articulating outcomes and benefits on priority cohorts

Critical success factors

BLMK Integrated Care System

Outlined below are a **set of factors that we consider to be critical for the success of the BI & Analytics Platform** in the longer-term. If these critical success factors are absent, action will need to be taken to ensure they are restored:

Support and buy-in from **senior leaders**

Effective **collaboration and relationship building** across partners' data communities

Availability of **sufficient resources and capacity** for progressing data strategy and proposed change initiatives

Consistent tracking and reporting of **outcome measurements** to demonstrate value and impact of new tools for both staff and residents

Tools & technologies being fit for purpose and developed in strategic alignment with wider system partners

A consistent approach to **system-wide communications** for the BI&A platform and use cases

Well resourced, **embedded IG support teams** to underpin innovation and transformation initiatives

Grassroots engagement for **innovative use case** idea generation

Strategic Context: Overview

BLMK Integrated Care System

The development of this data strategy is not happening in a vacuum, but rather as a necessary enabler to respond to the wider health and care policy environment across the UK and the region. The shift toward integrated care systems follows several years of initiatives to integrate service provision and underlying data assets, due to the numerous benefits commonly expounded around the single version of the truth, the shift from manual and duplicative data entry, more predictive and preventative work and a better resident experience of telling us once.

This data strategy works to compliment the work that has already gone on in these areas, providing the infrastructural foundation, capabilities and capacity to progress these strategic initiatives.

While there are a number of these initiatives in place, a selection of those most closely aligned to are explored in greater detail below and in the appendices.

National Context Overview

In 2019, the *Long Term Plan* put digital and data at the heart of the NHS' vision for service transformation. It recognized the criticality of 'mainstreaming' digitally enabled care, positioning technology and innovation in the domains of prevention, care and treatment through a population health management (PHM) approach. The vehicles for executing on the long-term plan and PHM, Integrated Care Systems (ICSs), are intended to provide the cross-organisational governance required to make interoperability via shared data, a reality. The NHS's further guidance in *Integrated Care, Next Steps to building strong and effective Integrated Care Systems* (2020) further called to "increase resiliency, digitise operational services and create efficiencies" and "develop shared cross-system intelligence and analytical functions that use information to improve decision-making at every level."

In the new direction for the NHS, the demand for both a data strategy framework and a cross-system approach for investment into data and shared business intelligence tools and techniques is clear. This commitment is underpinned by both the *ICS Design Framework* (2021) and *Data Saves Lives Strategy* (2021), which secure data as a strategic asset to harness innovative approaches and foster cross-collaboration across digital, data and clinical experts at scale.

Local and Regional Context Overview

Bedford, Luton and Milton Keynes (BLMK) ICS consists of a range of partners across primary, secondary and commissioning services, as well as four local authorities and public health bodies at place. Partners from across the ICS share a common vision to to achieve our joint aims of improving the health and wellbeing of our population, ensuring they receive care, treatment and support that is personalised to meet individual, families and carer needs.

The clearest alignment between local initiatives and the whole-system data transformation being proposed by the data strategy come through the ICS' PHM Strategy and the Business Intelligence (BI) Strategy. Both not only call out digital and data as a key strategic enabler for their and the ICS' purpose, they also require a coordinated, whole-system approach and step-change to how data is used at all levels. The three strategies ultimately and synergistically enable one another:

Data Strategy

- ✓ Ensures data interoperability, system-wide governance and skills
- ✓ Provides programme of work and delivery capacity to enable BI and PHM Strategy priorities

Business Intelligence Strategy

- ✓ Requires coordinated data infrastructure and warehouse which will support all system levels
- ✓ Necessitates data flows and ambitions for end-user tools

PHM Strategy & Roadmap

- ✓ Rapid programme of work supported by BI & A Platform
- ✓ Requires live and accurate data for decision-making and monitoring at all system levels

Use Case Approach

BLMK Integrated Care System

What is a Use Case?

An insight use case is a discrete issue that can be resolved through the use of enhanced data and analytics techniques. It is focused around a problem statement, such as 'if I had X, I would be able to do A, B and C.' Use cases must have a specific solution and intervention in mind that the data can be used and manipulated to achieve; thought should also be given to the desired outcomes or benefits.

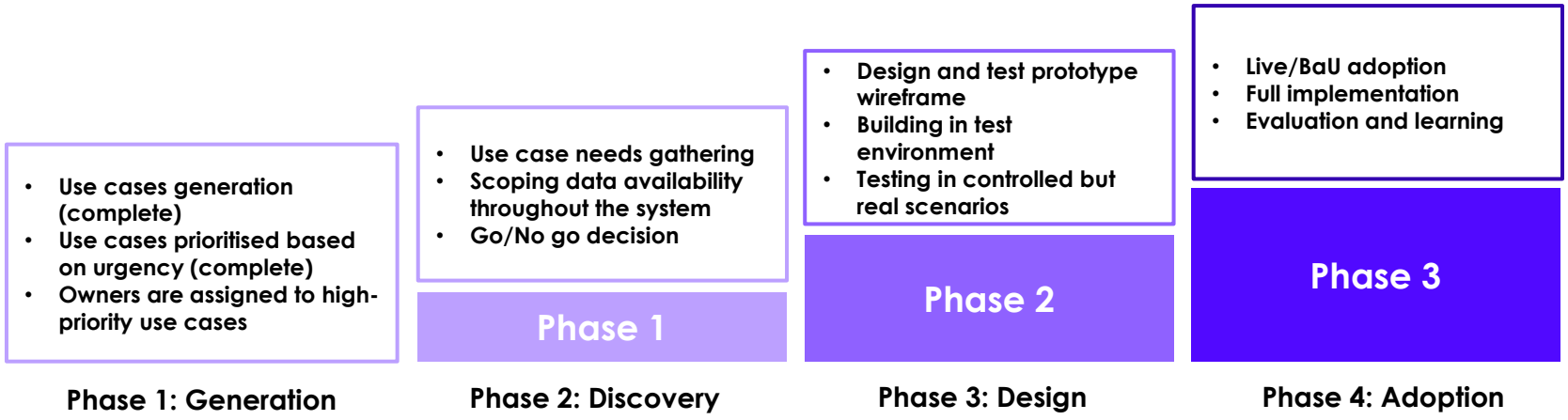
The reason we use this approach to define a conservative estimate for the types of benefits the data strategy can enable is due to the fact that better data or insight products in themselves provide limited value, but only realise value from making better decisions and achieving better outcomes. Therefore by identifying a suite of opportunities that the data strategy can enable, streamline or enhance, we are able to provide a high level quantitative assessment of the areas and initiatives that can benefit the system and its residents.

Approach

Over the course of use case development for the data strategy, a series of interviews with key stakeholders were undertaken to identify key service pain points or wicked problems across the ICS and how these pain points may be supported by greater access to integrated datasets and BI. We identified a long-list of use cases which are summarised overleaf and outlined in detail across subsequent pages. Three use cases have been appraised as priority at the time of writing and have had a high-level approach designed, as well as fully developed logic chains and a cost-benefit appraisal. The subsequent six use cases require greater consideration, particularly around the appropriate intervention.

Moving Forward

Outlined below are the multiple phases and subsequent requirements of delivering the use case. A critical success factor in the delivery of all use cases identified is whether the data requirements are available via the BI & A platform, as well as project coordination resource to coordinate use case development. Once owners for use cases are assigned, further scoping on the requirements for the use case in the discovery phase is required to alleviate pressure for multiple prototypes in the design phase (particularly in prototyping).



Use Case Pipeline

BLMK Integrated Care System

The system has identified a suite of use-cases, were they to be agreed as the system priorities, that can be realised through better access to data and insights, the initial pipeline of opportunities, explored in greater detail in the appendices, include:

#	Use case	Detail	Explanation
1	Mental Health and LTC Risk Strat	Full use case	Aligning work to prioritise digital transformation priorities by the BLMK Mental Health Digital Summit and the Mental Health PHM group, a tool to stratify adults with severe mental illness and long term conditions such as diabetes to provide additional support for successfully managing these conditions.
2	Falls and Frailty Risk Strat	Full use case	Building on Medeanalytics and aligned to emerging Bedfordshire Care Alliance (BCA) frailty initiatives, an enhanced risk stratification tool, with wider datasets, automated ingestion and AI driven evaluation can either identify larger cohorts for prevention or refine targeting to improve success rates to reduce unscheduled hospital admissions and increased social and community costs post-fall.
3	Place Profiling Tools	Full use case	Current PCN place profiles, and ad-hoc reports such as Lake Estates, are time consuming to produce, imprecise due to disjointed data and require regular refreshing. Automated data pipelines can provide more granular insights, with minimal data cleansing and near real-time updates.
4	Adults with Autism	Summary	Diagnoses for adults presenting with Special Educational Needs and Disabilities (SEND) and autism is lower than the cohort being identified in the young population. Support drops off in adulthood and it is believed that this presents itself through increased demand for housing support and entry into criminal justice system.
5	Data Observatory	Summary	Open data on system demand, performance and costs streamlines data access for analysts across the system and encourages public transparency and innovation.
6	Outcome Based Commissioning	Summary	Longitudinal, linked datasets will provide a trustworthy baseline for outcome based commissioning, allowing for granular assessment of outcomes linked to support and interventions to track performance of commissioned services and inform future commissioning decisions.
7	Supporting High Intensity Users of Public Services	Summary	Identifying a small group of the most costly families or individuals across multiple services and providing tailored care plans can see significant reduction in cost within the system, however current insight tools struggle to map these costs at a system level
8	Youth MH Social Prescribers	Summary	Aligning with local funding applications for social prescribers, an integrated data tool to segment cohorts of young people suffering mental illness and evaluating impacts of interventions
9	Children and Young People Risk Strat	Summary	A tool to identify children and young people with potential health concerns requiring additional universal or specialist service provision whom the system lose contact with after completing the Healthy Child Programme

Coordination and Delivery Capacity Costings

BLMK Integrated Care System

The exact roles and responsibilities required to deliver the data strategy will be further refined as part of the joined up delivery model with the PHM strategy, as identified in the roadmap – however the table below provides an indicative assessment of the types of skills and capacity required to deliver a programme of this scope and scale, this is against a high-level estimate of a three year return on the three priority use cases of £1.66m – £4.36m

Total Resource implies the effort required from a data strategy delivery/ coordinating team to deliver on the ambitions of the data strategy, however it does not take account of existing resources within the system. **Total Programme Cost** provides a high-level estimate for the funding required to implement this coordinating capability once existing system resource has already been taken in to account, and would form the basis for a funding request. The **Annual Programme Budget** is a flexible pot to allow the data leader to procure external support and licenses to pilot technical solutions.

The timelines for the three year roadmap have been used to guide cost forecasts, however this is dependent on identifying in year funding of £142,500 and so decisions or Go Live on initiation dates are liable to change. The benefits of this approach mean having resources and processes ready and progressing from the start of the next financial year to move at suitable pace. Consideration must also be given to where these resources are placed from an ongoing running and cost perspective, which will evolve alongside the PHM Strategy Roadmap activity, and decisions around the size and scope of ICS resources more broadly.

		3 Year Roadmap Timeframe						
Role	**Annual Cost (Salary+30% on-cost)**	**Jan-Mar 2022**	**FY 22-23**	**FY23-24**	**Apr24 - Dec25**	**Total Resource**	**Programme Cost**	**Notes on system resource availability**
Accountable data leader	£140,000	0.25	1	1	0.75	£420,000	**£0**	CIO or senior leader from the system
Programme Director	£120,000	0.25	1	1	0.75	£360,000	**£360,000**	
Project Managers x2	£65,000	0.5	2	2	1.5	£390,000	**£195,000**	***One secondee*** from the system, one new hire with data expertise
Data Scientist	£120,000	0.25	1	1	0.75	£360,000	**£0**	In conversation with CCS to share role
Advanced Analyst - Graduate sandwich course	£27,000	0	0.25	1	0.75	£54,000	**£54,000**	Graduate sandwich course to be explored with academic partners
Data Architect	£110,000	0.25	1	1	0.75	£330,000	**£0**	Mix of regional and partner support, enabled by AI driven data profiling
BI Developer x2	£55,000	0	2	1	0.75	£206,250	**£206,250**	Require secondees from 90+ analyst FTEs within the system. 2 transition resource for year 1, 1 from year 2 onwards
Data Engineers (technicians)	£65,000	0.25	1	1	0.75	£195,000	**£195,000**	Additional capacity for data pipelining into BI&A platform through CSU contract
Enterprise architect	£120,000	0.25	0.25	0	0	£60,000	**£60,000**	
IG Leader	£80,000	0.25	1	1	0.75	£240,000	**£0**	ICS IG Lead already in post
Additional IG support	£60,000	0.25	1	1	0.75	£180,000	**£0**	Recently appointed and within programme cost
Annual total resource requirements		*£236,250*	*£971,750*	*£907,000*	*£680,250*	*£2,795,250*		
Annual Programme Resource Cost		**£92,500**	**£396,750**	**£332,000**	**£249,000**		**£1,070,250**	
Annual Programme Budget		£50,000	£200,000	£200,000	£150,000			
Total Programme Costs		**£142,500**	**£596,750**	**£532,000**	**£399,000**		**£1,670,250**	

Cost Benefit Analysis

BLMK Integrated Care System

Cost/ Benefit analysis

Fully scoping out a cost benefit model for improving data capabilities is challenging due to the value of improved access to, quality of, or use of, data is tied to the specific decisions and change in approach enabled by this access to insights. Therefore with limited value in data for the sake of data, the use cases provide an indicative set of benefits that can be achieved by taking advantage of the capabilities that the data strategy provide, be it coordinating initiatives; expediting ingestion of key datasets into the BI&A platform and shared care records; or aiding in the adoption of the emerging tools and technology to make evidence based decisions and evaluations.

As such, the benefits are anticipated to be conservative estimates, predicated on the use cases that are further defined and developed by the Data Strategy delivery capability identified in the programme costs.

Despite this, just the three use cases identified provide a positive return on investment and does not include wider initiatives that would be expected to emerge from the system through ongoing engagement by the programme delivery team.

Quantitative cost benefits are outlined below:

	Annual average	Three Year
Mental Health & Diabetes	£225k – £450k	£675k – £1.35m
Falls and Frailty	£850k – £1.6m	£2.5m – £4.85m
Place Profiles	£11,083	£33,250
Total Benefit	**£1.1m - £2.0m**	**£3.2m – £6.2m**
Programme Costs	**£556,000**	**£1,670,000**
Net Benefits	**£555,000 - £1,455,000**	**£1.66m – £4.36m**
Indicative RoI of specified use cases against programme	Return on Investment of limited set of use cases **1 – 2.6 times programme investment**	

Appendices

Appendix 1:
Detailed Use Cases

Use Case Approach

BLMK Integrated Care System

What is a Use Case?

An insight use case is a discrete issue that can be resolved through the use of enhanced data and analytics techniques. It is focused around a problem statement, such as 'if I had X, I would be able to do A, B and C.' Use cases must have a specific solution and intervention in mind that the data can be used and manipulated to achieve; thought should also be given to the desired outcomes or benefits.

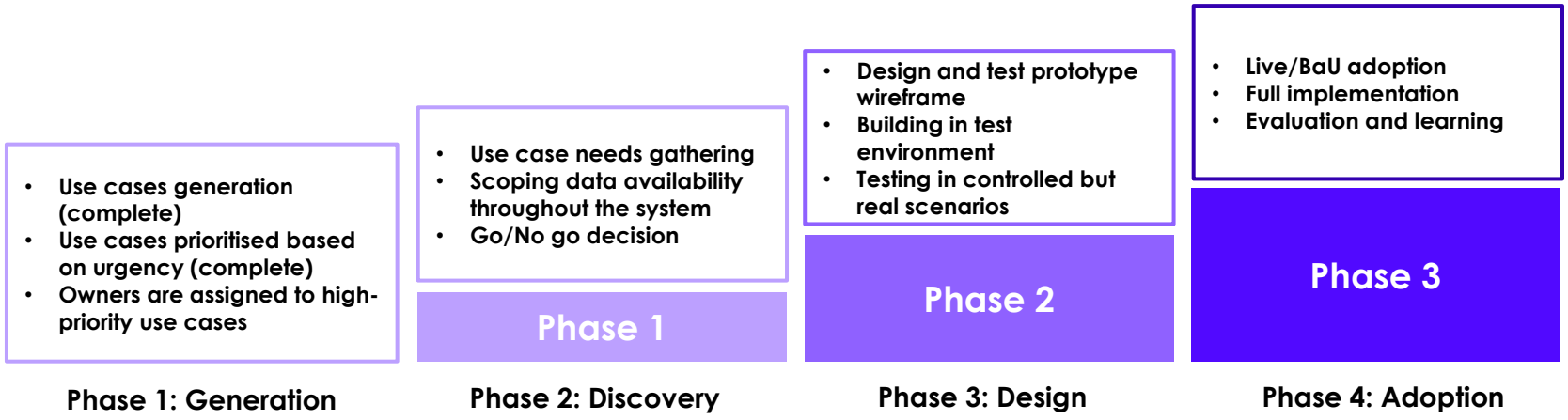
The reason we use this approach to define a conservative estimate for the types of benefits the data strategy can enable is due to the fact that better data or insight products in themselves provide limited value, but only realise value from making better decisions and achieving better outcomes. Therefore by identifying a suite of opportunities that the data strategy can enable, streamline or enhance, we are able to provide a high level quantitative assessment of the areas and initiatives that can benefit the system and its residents.

Approach

Over the course of use case development for the data strategy, a series of interviews with key stakeholders were undertaken to identify key service pain points or wicked problems across the ICS and how these pain points may be supported by greater access to integrated datasets and BI. We identified a long-list of use cases which are summarised overleaf and outlined in detail across subsequent pages. Three use cases have been appraised as priority at the time of writing and have had a high-level approach designed, as well as fully developed logic chains and a cost-benefit appraisal. The subsequent six use cases require greater consideration, particularly around the appropriate intervention.

Moving Forward

Outlined below are the multiple phases and subsequent requirements of delivering the use case. A critical success factor in the delivery of all use cases identified is whether the data requirements are available via the BI & A platform, as well as project coordination resource to coordinate use case development. Once owners for use cases are assigned, further scoping on the requirements for the use case in the discovery phase is required to alleviate pressure for multiple prototypes in the design phase (particularly in prototyping).



Use Case Pipeline

BLMK Integrated Care System

The system has identified a suite of use-cases, were they to be agreed as the system priorities, that can be realised through better access to data and insights, the initial pipeline of opportunities, explored in greater detail in the appendices, include:

#	Use case	Detail	Explanation
1	Mental Health and LTC Risk Strat	Full use case	Aligning work to prioritise digital transformation priorities by the BLMK Mental Health Digital Summit and the Mental Health PHM group, a tool to stratify adults with severe mental illness and long term conditions such as diabetes to provide additional support for successfully managing these conditions.
2	Falls and Frailty Risk Strat	Full use case	Building on Medeanalytics and aligned to emerging Bedfordshire Care Alliance (BCA) frailty initiatives, an enhanced risk stratification tool, with wider datasets, automated ingestion and AI driven evaluation can either identify larger cohorts for prevention or refine targeting to improve success rates to reduce unscheduled hospital admissions and increased social and community costs post-fall.
3	Place Profiling Tools	Full use case	Current PCN place profiles, and ad-hoc reports such as Lake Estates, are time consuming to produce, imprecise due to disjointed data and require regular refreshing. Automated data pipelines can provide more granular insights, with minimal data cleansing and near real-time updates.
4	Adults with Autism	Summary	Diagnoses for adults presenting with Special Educational Needs and Disabilities (SEND) and autism is lower than the cohort being identified in the young population. Support drops off in adulthood and it is believed that this presents itself through increased demand for housing support and entry into criminal justice system.
5	Data Observatory	Summary	Open data on system demand, performance and costs streamlines data access for analysts across the system and encourages public transparency and innovation.
6	Outcome Based Commissioning	Summary	Longitudinal, linked datasets will provide a trustworthy baseline for outcome based commissioning, allowing for granular assessment of outcomes linked to support and interventions to track performance of commissioned services and inform future commissioning decisions.
7	Supporting High Intensity Users of Public Services	Summary	Identifying a small group of the most costly families or individuals across multiple services and providing tailored care plans can see significant reduction in cost within the system, however current insight tools struggle to map these costs at a system level
8	Youth MH Social Prescribers	Summary	Aligning with local funding applications for social prescribers, an integrated data tool to segment cohorts of young people suffering mental illness and evaluating impacts of interventions
9	Children and Young People Risk Strat	Summary	A tool to identify children and young people with potential health concerns requiring additional universal or specialist service provision whom the system lose contact with after completing the Healthy Child Programme

Use Case 1: Risk stratification for falls and frailty

Business Problem

Medeanalytics tool has seen effective improvements in reducing falls and frailty related admissions. However risk strat data remains predominantly health based – leaving potential gaps in case identification for those not known to the health system but using wider public sector services that can act as risk indicators. Similarly, evaluation of both effectiveness of cohort selection, and of interventions is limited by the availability of longitudinal data to apply machine learning analytics and evaluations.

Proposed Solution

Broader, record level datasets can help to either identify wider cohorts who are at risk should capacity not be restricted, or used to refine cohort selection to improve targeting and ultimately intervention success rates than the current tool should cohorts need to stay the same.

Alongside this, the longitudinal dataset that sits alongside this can be used to develop a continuous improvement cycle, using AI and machine learning to evaluate how to better target those at risk and which interventions as part of the falls bundle are most effective in reducing incidences.

Data Requirements

- More granular, record level adults social care data and care package details
- Social isolation indicators (electoral register, live in carers etc)
- Record level social prescribing data
- Fire service fire and multi-factoral assessments data
- Local environmental and pollution data
- Waste service assisted bins data

Partners/Stakeholders

- Acute providers
- Local authorities
- Community care providers
- Arden and GEM CSU
- Mental Health providers
- BLMK IG Group
- Environment Agency
- Bedfordshire and TVP Police Service

High-Level Benefits

- Reduction in falls related A&E visits and unexpected admissions
- Reduced spend on community and social care from those who would have had a falling incident
- Ability to identify those at risk of a fall who are not currently visible in the Luton Medeanalytics risk stratification tool
- Ability to refine cohort selection to reduce false positives and improve success rates
- Collation of data to inform better evaluation of contributing risk factors based on outcomes

Use Case 1: Risk stratification for falls and frailty

Logic Chains

Inputs

- BLMK ICS BI & A Platform resource for risk stratification tool creation and analyses
- PHM analytics team/ Data strategy delivery capability analysts
- BLMK IG Group

- Data inputs:
  - Acute provider
  - Primary care
  - Community care
  - Adult social care
  - Environment Agency
  - Waste services
  - Local authority democratic services

Activities

- Prioritisation of wider datasets to inform early identification of falls risk with PHM leads
- Assessment of source data's adherence to standards, quality (including complete-ness, consistency, accuracy and integrity) and additional value in identifying risk
- Information governance support for DSAs
- Data integration testing and deployment for identified test cohort
- Cohort selection and filtering based on risk profile and proposed interventions
- MDTs to agree falls bundle of interventions
- AI/ ML driven outcomes evaluation to improve interventions and ability to refine

Outputs

- Risk stratification tool
- List of at risk individuals within refined cohort
- Templated cohort characteristics for repeatable case identification
- AI/ML based evaluation of intervention effectiveness

Outcomes

- Identifying greater proportion of those in need, not known by the system and current tools
- Reduction in false positives for GP and PHM responses
- Insight driven learnings to improve understanding of effective interventions and refined identification criteria
- Early intervention support for those at risk of falls to mitigate against more damaging outcomes
- Opportunities to identify duplicative falls risk assessments and streamline services (for public sector staff and residents)

Impacts

- Reduction in fall A&E attendances
- Reduction in acute emergency falls admittances
- Reduced system costs for support from those prevented from having fall incident (average 70% increase in hospital, community and social care for year post fall)
- Reduction in time wasted on engaging false positives by GPs and MDTs
- Improvement in prevention success rates due to evaluation learnings and refined cohort

Use Case 1: Enhanced risk stratification for falls and frailty

Qualitative Benefits

The Medeanalytics pilot has proven the benefits of risk stratifying patients at moderate-to-high risk of a frailty and specifically fall related events and providing personalised care to prevent incidents. The decision to extend this across BLMK has already been approved, however there are a number of opportunities to enhance the tool with a broader range of data indicators to refine the selection of patients to reduce false positives and support those who are most likely to respond to preventative interventions to improve the success rate – this refinement can be further supported by machine learning evaluation to understand what characteristics are best to target. This therefore assumes that without needing additional capacity to manage interventions, we could see a significant benefit for the system.

Should assumptions on improvement ranges be achieved, the preventative value of the tool with new datasets for just unscheduled admissions to acutes as a result of falls totals **£5m - £5.5m**. However, with the tool already set to be rolled out, the additionality of the use case totals these benefits as £450,000 - £675,000 in this area alone.

Falls that require admission to hospital also have a corresponding impact on both community and social care for the next year according to the King's Fund. The additional falls prevented by the enhanced tool similarly avoids these cost increases, however not all of those identified in the pilot will have been receiving care.

	10% improv (lowest saving)	15% improv (highest saving)
Unsched. admis	£450,000	£675,000
Community Care	£205,000	£500,000
Social Care	£205,000	£425,000
Total	**£850,000**	**£1,600,000**
Total 3 years	**£2,500,000**	**£4,800,000**

How the data strategy can further extend these benefits:

- Evaluation of record-level outcomes can improve:
  - Identifying false positives to reduce wasted effort
  - Identifying those who will respond best to support
- Automation of tool with data in BI&A pipeline reduces manual effort and makes review and case identification more repeatable

Quantitative Benefits

Evidence 1: Baseline impact of local pilot - Reduction of 228 people against 2,399 (9.5% success) achieved locally for those found at moderate to severe risk.

- **Proportion of 65+ within this category identified –**
  - Identified at risk/ total Luton 65+ population (2020 ONS)
  - 2,399/ 26,972 = 8.9%
- **Average cost of unscheduled admission for over 65** is £3,539.
- **Assumption 1** – additional data sources will help to refine our selection of those at risk, reducing false positives and identifying those who are most likely to respond positively to interventions, improving success rate by 10-15%.
- **Success rate improvement**
  - (Successful reduction number* 10% AND 15% improvement) / total interventions
  - (228*1.1) / 2,399 = 10.45% (0.95% additional improvement)
  - (228*1.15) / 2,399 = 10.93% (1.43% additional improvement)
- **New proportion of 65+ at risk identified across the system**
  - Proportion of 65+ identified at risk * BLMK 65+ population(ONS)
  - 8.9% * 150,043 = 13,345
- **Estimated number of avoided unscheduled admissions in future**
  - 13,345 * 0.95% = 127
  - 13,345 * 1.43% = 190
- **Estimated savings range for avoided unscheduled admissions**
  - Range of avoided submissions * average cost of unscheduled admission for 65+
  - (127 – 190)*£3,539 = **£450,000 - £675,000**

- **Evidence 2: Proportion of falls related unscheduled admissions of 65+** residents – total hospital admissions for 65+ 822,091 with falls related causes of 334,997, indicating a 40.75% prevalence REF NHS Digital
- **Evidence 3: Indicative average cost of care for one year after a fall** REF Kings Fund – Torbay example
  - Community Care cost after a fall £4,000 – £6,500
  - Social Care cost after a fall £4,000 – £5,500

- **Community Cost saving at 10-15% success rate improvement**
  - Additional unscheduled admissions avoided * Proportion of unscheduled admissions falls related * Average one year Community Care Cost post fall
  - For 10% improvement: 127 * 40.75% * £4,000: £6,500
  - For 15% improvement: 190 * 40.75% * £4,000: £6,500
  - = **£205,00 – £500,000**

- **Social Care Cost saving at 10-15% success rate improvement**
  - Additional unscheduled admissions avoided * Proportion of unscheduled admissions falls related * Average one year Social Care Cost post fall
  - For 10% improvement: 127 * 40.75% * £4,000: £6,500
  - For 15% improvement: 190 * 40.75% * £4,000: £6,500
    - = **£205,000 – £425,000**

Use Case 1: Enhanced risk stratification for falls and frailty

Qualitative Benefits

Where the previous page estimated what we could do with current resources for providing preventative support and interventions, due to the fact that capacity constraints from within the system necessitate the fact that we cannot support everyone at risk, this example of increasing the size of those identified as at risk has been requested as well.

To address this we have proposed a similar assumption of identifying an additional 10% -15% of at risk individuals and providing them with preventative support.

	10% improv (lowest saving)	15% improv (highest saving)
Unsched. admis	£450,000	£675,000
Community Care	£205,000	£500,000
Social Care	£205,000	£425,000
Total Benefit	£850,000	£1,600,000
Cost of intervention	£38,753	£51,761
Net Benefit (rounded)	**£800,000**	**£1,550,000**
Total 3 years	**£2,400,000**	**£4,650,000**

Taken together, the two assessments of prospective benefits are similar. Figures have been rounded to indicate the indicative nature of these estimates.

While the 10% - 15% assumptions have been tested locally and found appropriate, there is significant opportunity to improve the likelihood of increasing the success rate or identification rate to this level or beyond using machine learning to better evaluate the characteristics of individuals both at risk and then proceeding to fall. This, coupled with the natural learning curve and system knowledge as new ways of working become more mature mean that these estimates are a fair and potentially conservative estimate of the system benefits.

Quantitative Benefits

- **Evidence 1: Baseline impact of local pilot** - Reduction of 228 people against 2,399 (9.5% success) achieved locally for those found at moderate to severe risk.
- **Proportion of 65+ within this category identified –**
  - Identified at risk/ total Luton 65+ population (2020 ONS)
  - 2,399/ 26,972 = 8.9%
- **Average cost of unscheduled admission for over 65** is £3,539.
- **Assumption 1** – additional data sources will help to identify an additional 10-15% of those at risk than those currently identified.
- **New proportion of 65+ at risk identified**
  - Proportion of 65+ identified * 10% improvement AND 15% improvement
  - 8.9% * 1.10 = 9.8% (1% additionality)
  - 8.9%* 1.15 = 10.24% (1.34% additionality)
- **Estimated number of avoided unscheduled admissions in future**
  - Additional % of 65+ identified at risk * BLMK 65+ population(ONS) * success rate
  - 1% * 150,043* 9.5% = 143
  - 1.34% * 150,043* 9.5% = 191
- **Estimated savings range for avoided unscheduled admissions**
  - Range of avoided submissions * average cost of unscheduled admission for 65+
  - (143-191)*£3,539 = **£505,000 - £675,000**

- **Drawing on Evidence 2 and Evidence 3 from previous page**
- **Community Cost saving at 10-15% increase in those identified at risk and supported**
  - Additional unscheduled admissions avoided * Proportion of unscheduled admissions falls related * Average one year Community Care Cost post fall
  - For 10% improvement: 143 * 40.75% * £4,000: £6,500
  - For 15% improvement: 191 * 40.75% * £4,000: £6,500
  - = **£230,00 – £310,000** *(using lower and upper range bounds)*

- **Social Care Cost saving at 10-15% increase in those identified at risk and supported** *(as above)*
  - For 10% improvement: 143 * 40.75% * £4,000: £5,500
  - For 15% improvement: 191 * 40.75% * £4,000: £5,500
    - = **£205,000 – £425,000** *(using lower and upper range bounds)*

- **Average cost for operational prevention activities in Luton Pilot** = Luton pilot funding / number of interventions = £650,000 / 2,399 = £271
  - Additionally identified as at risk of fall * operational cost
  - (143 : 191 people) * £271 = **£38,753** : **£51,761**
  - Additional technical revenue costs for the solution would be minimal due to current intentions to roll it out across BLMK – with one-off activities covered by the proposed Data Strategy delivery team

Use Case 2: Risk Stratification for Adults with Mental Illness and Type 2 Diabetes

Business Problem

While mental healthcare providers in BLMK recognise the need to support adults with severe mental illness (SMI), 30% of adults often also have a co-existing long term physical condition(s) not supported by joined-up approach that bridges community care with primary care. Most commonly, these adults are unable to support manageable diseases, such as type 2 diabetes.

Proposed Solution

Develop risk stratification tool comprised of robust datasets to identify adults at risk of developing severe physical illnesses or having acute health crises, as a result of mental illness. Key steps:

- Working with community mental health care leads to prioritise datasets, including primary and secondary care and socioeconomic and lifestyle factors that impact diabetes
- Initial data quality, standards and connectivity assessment of prospective sources
- Test/evaluate risk stratification tool and work with pilot with six PCNs to identify prioritised caseload

Data Requirements

- Psychiatric diagnoses including anxiety and depression, psychosis, and bipolar disorder
- Previous primary or secondary care attendance for mental health related crises or conditions, as well as type 2 diabetic and other physical condition treatments
- Data on other physical illnesses, prescriptions and treatments
- Demographics data, such as gender and age
- Socioeconomic/poverty data
- Social exclusion or isolation data
- Local authority housing data

Partners/Stakeholders

- Users, carers and local communities
- Community and mental healthcare providers, as well as local VCSE organisations and Health Watches
- Primary and secondary care providers
- Care commissioners
- Psychologists, psychiatrists, counsellors, social workers, social prescribers
- Local authority services, including:
  - Social services
  - Drug and alcohol services
  - Education
  - Housing and employment
  - Public health
- Mental health charities
- Diabetic charities

High Level Benefits

- Overview of need and demand for joined-up support at local levels, enabling better commissioning and planning for services, supporting robust care for adults with co-existing mental illness needs and care and support with type 2 diabetes
- Identification of adults at risk of developing complex type 2 diabetes who are only known to mental health and community services; in reverse, adults who have type 2 diabetes who may have un-diagnosed mental illnesses
- Reducing the severity of poor mental and physical health outcomes in adult population by supporting adults in low to medium risk cohorts to get well and stay well for longer
- Improved overall physical and emotional health in adult population, resulting in i.e. longer lifespans, reduced alcohol and drug dependency
- Ability to switch-on filters to identify residents within a range of complex mental health problems, i.e. less complex mental illness to complex and highly complex (such as severely mentally ill)

Use Case 2: Risk Stratification for Adults with Mental Illness and Type 2 Diabetes

Logic Chains

Inputs

- Joined-up, place-based primary and community mental health providers coordinating prioritised datasets with PCNs
- BLMK ICS BI & A Platform resource for risk stratification tool creation and reports
- Funding to target resource towards the technical and operational development/maintenance of the risk stratification tool via the BI & A Platform, as well as demonstrate the benefits through evaluation of data
- PCN and community, primary care and other services involved in supporting co-existing conditions receive training to understand and utilise risk stratification tools/findings

Activities

- Data quality checks and standardisation /connectivity assessment
- Place-based strategy development for targeted interventions for each risk cohort, in alignment with local resources, PHM strategy, BLMK Mental Health Transformation plans and funding
- PCNs to co-design evaluation framework with providers and commissioners to measure effectiveness of risk stratification tool to enhance services and interventions
- BI & A Platform to deliver risk stratification analyses to place, cascaded down to mental, community and health care
- Initial risk stratification tool testing in phase 1 with select PCNs and clinicians at end of 2021, with go/no go date, with subsequent second phase with more PCNs
- Evaluation of initial outcomes

Outputs

- Risk stratification tool that can be utilised across organisations delivering mental healthcare across places
- Resourcing plan for analytics team delivering risk stratification
- Evaluation framework to measure outcomes against
- Quantitative data indicating risk stratification tool/PHM approach is/is not found to be achieving the aim of identifying, targeting and improving the support for co-existing conditions

Outcomes

- Clinicians are adept at using risk stratification to identify and target treatment, and are aware of factors that can contribute to poor mental health and adults with long term illnesses
- Preventative and joined-up mental health care treatment activities in local communities surpass acute/urgent mental treatment
- Adults in the medium or rising risk cohort have greater stability in their health and a lower chance of having a long-term mental or physical crisis or illness
- Adults in the high-risk cohort with co-morbidities have stable care in place, preventing multiple instances of high-cost emergency/acute care
- Identification and diagnosis of mind and body conditions occurring earlier in patient pathway

Impacts

- Number of PCNs using risk stratification tool surpasses those not using risk stratification (i.e. by more than 60%)
- Fewer adults with diagnosed mental illnesses have complex or highly complex type 2 diabetes because of early interventions
- Overall reduction in the number of adults in lower/medium risk cohort for co-existing mental illness/diabetes entering high/complex risk cohort i.e. over 5 year period
- Decrease in the size of highest risk cohort of adults with diabetes year on year
- Diminishing number of hospitalisations for adults with both mental and long-term complications of type 2 diabetes
- Demonstrable increase in life-expectancy of adults with co-existing mental illness and type 2 diabetes

Use Case 2: Risk Stratification for Adults with Mental Illness and Type 2 Diabetes

Qualitative Benefits

Around 40% of people with type 2 diabetes have diminished psychological well-being (ref). This is higher than the estimated 30% of all people with a general long-term condition with a co-morbid mental illness, indicating that the link between diabetes and mental illness is significant (ref). Adults living with type 2 diabetes in particular are two to three times more likely to have **depression** than the general population (ref). Co-morbid mental health problems have historically led **to greater difficulties with management of diabetic conditions and a host of other negative outcomes**, such as poor adherence to medication and dietary regimens, poor glycemic control, reduced quality of life and increased health expenditures overall (ref).

A UK survey found that people with co-morbid mental health problems and type 2 diabetes experienced more hospital admissions and GP consultations for physical complaints (ref). We have identified that treating a diabetic patient with complications from type 2 diabetes **is four times more expensive to the health system than straightforward case management and treatment for diabetes. Across the BLMK population with assumed depressive disorders, savings of £450,000 for a 10% reduction in cases of both reduction and poorly managed type 2 diabetes is possible.**

The ability to identify residents in BLMK at risk of developing co-morbid depression and type 2 diabetes for targeting and intervention purposes is achievable through the data strategy. By developing a risk stratification tool for adults with these co-morbidities, greater preventative measures and more closely targeted measures can be directed appropriately.

A Mental Health PHM group has been established in BLMK and a system-wide Mental Health Digital Summit in 2021 set priorities for data quality and digital tools to support PHM work in this area. In addition to the above population health and cost benefits of a risk stratification tool to the work of the Mental Health PHM group, the data strategy can further enable:

- Resource planning for integrated mental health care which bridges the gap with physical and community care for patients across risk stratified groups
- Further potential for place-profiling areas within BLMK with medium to large cohorts of medium/high risk patients based on geographical analyses.

Quantitative Benefits

- In BLMK there are over 50,000 people diagnosed with type 2 diabetes (ref); in the UK, between 25%-40% of patients have *both* diabetes and depression
- Across the UK, 42% of people with type 2 diabetes have self-reported lack of confidence in managing their condition (ref); of the 40% of patients have *both* diabetes and depression (ref), at least 15% of patients with both diabetes and depression are likely to manage their diabetes poorly (ref)
  - Percentage of people with diabetes with depression – percentage of people with diabetes and depression who manage poorly = Additional risk of poorly managing diabetes in those with depression
  - **0.25-0.15= 0.25 or 25%**
  - Percentage of diabetes poorly managed in diabetic population – poorly managed diabetes in those with depression = Additional diabetes risk with depression
  - **0.42-0.25= 0.17 or 17%**
- Evidence: The NHS overall spends £327.78 annually per patient for treatment and management for diabetes drugs, including insulin, testing strips and medicines taken to control blood sugar levels (ref). For BLMK's diabetic population, this results in the following cost:
  - 327.78*50,500= **£16,552,890**
- Evidence: Research from the University of York (2012) demonstrated that the overall cost of supporting adults with **complications** from type 2 diabetes, such as hypoglycaemia and cardio vascular disease, **cost the NHS 4 times more** than treatment and management (ref)
  - 327.78*4= **£1,311.12**
- Assumption: 40% of diabetics in BLMK have a co-existing mental illness which could result in complications from type 2 diabetes
  - 0.40*50,500= **20,200 type 2 diabetic patients with mental illness**
  - 0.17*20,200 = **3,434 type 2 patients poorly managing diabetes due to high severity depression**
- Assume a 5-10% reduction in cases as a result of intervening in adults' care for mental illness through early identification via risk stratification tool
  - 3,434*0.10*1,311.12 = **£450,000**
  - 3,434*0.05*1,311.12 = **£225,000**

Use Case 3: Place Strategy profiling tool

Business Problem

The joint PHM Analytics team provides support for developing PCN profiles, as well as ad-hoc requests for more granular place based profiles such as the Lake Estates profile currently in development. To produce them, time consuming data gathering from multiple partners is required and must be manually refreshed annually at a minimum, while differing granularity in datasets requires results to be inferred from larger geographies – impacting accuracy.

Proposed Solution

A simple to use, automatically refreshed tool with minimal manual rework to layer aggregated, linked record-level data from a range of sources can streamline the process for producing and refreshing place profiles – providing significant capacity improvements to analytics teams to focus on more value adding insights and providing more meaningful interpretation.

It also allows for instant flexibility in terms of cutting data by granularity of geography – and the nature of combined conditions e.g. an area has 10 people prescribed both anti-depressants and methadone, rather than 12 people are prescribed methadone and 20 are on anti-depressants. This can inform more impactful interventions. This record level data can in turn help in evaluating changes in outcomes over time as a result of planned interventions to learn and improve PHM planning and approaches.

Data Requirements

- Aggregated postcode level data for
  - Population demographics
  - Prescription data
    - Methadone
    - Anti-depressants
    - Heart disease and statins
    - Insulin etc.
  - Chronic disease prevalence
  - Smoking rates
  - Anti-social behaviour and serious crime
  - Pollution levels (subject to granularity)
- Pseudonymised Record level data on key lines of investigation arising from initial postcode/ ward profiles

Partners/Stakeholders

- Data will be use case led, but those initially proposed by the system include
- Place public health teams
- PHM analytics teams
- Pharmacies
- Local authorities
- Primary Care
- Schools
- Mental Health providers
- BLMK IG Group
- Bedfordshire and TVP Police Service

High-Level Benefits

- Low effort, repeatable process to streamline development of place based profiles and provide significant additional capacity to analytics teams
- Place based profiles, at postcode and ward level, to better inform PHM planning with multi-disciplinary teams
- Clarity on place based outcomes informing more appropriate and targeted risk stratification activities
- Baseline and evaluation on health and wellbeing outcomes and effectiveness of interventions

Use Case 3: Place Strategy profiling tool

Logic Chains

Inputs

- Place based PHM teams and managers
- PHM multi-disciplinary teams to define outcomes to investigate and define prospective interventions
- Health and Wellbeing board sponsorship and oversight
- PHM analytics team/ Data strategy delivery capability analysts
- BLMK IG Group
- BLMK ICS BI & A Platform resource (tbc)
- Data inputs:
  - Primary care
  - Pharmacies
  - Mental Health
    - Stretch:
      - Environment Agency
      - Police

Activities

- PHM teams and MDTs select demand areas and data requirements
- Selection of reporting and analysis tool (BI&A platform? PowerBI dashboards? Automated data pipelines?)
- Data field sourcing and quality review
- IG engagement for aggregated data restrictions
- Design and deploy reporting tool and output
- MDT intervention design
- KPI selection based on interventions
- Record level data on combined character-istics collected and baselined
- Evaluation of intervention effective-ness and lessons learned

Outputs

- Place based profile of health and wellbeing need at postcode and ward level
- Set of priority areas to define risk stratification cohorts
- Opportunity to baseline effectiveness of place based and risk stratified interventions at:
  - Place level, population outcomes for baseline evaluation
  - Aggregated record level outcomes on combined characteristics

Outcomes

- More efficient process for building new place profiles
- Automated refreshing of data for place profiles
- Near-real time data presented in insight products
- Stronger understanding of the health issues and risk factors affecting an area
- More refined filtering of risk stratification cohorts due to more evidence based lines of enquiry
- Better learning and improvement loop for designing PHM interventions due to improved evaluation
- More appropriate resourcing of multi-disciplinary support at place level to match local needs

Impacts

- Reduced time in managing and refreshing PCN profiles and current
- Reduction in time required to develop an ad-hoc place based profile – e.g. Lake Estates
- Reduction in key outcomes, dependent on resulting interventions derived from place profile insights
- Increase in demand for PHM MDT interventions

Qualitative Benefits

This use case provides indicative cost savings achieved by the BI&A platform and the opportunities that could be enabled by expediting ingestion of high priority datasets by increasing delivery capacity and supporting coordination of use case definitions, data quality and standards review, information governance and pipelining.

The quantitative example uses the 19 PCN profiles as an example of the current resource demands to put together bespoke, geographically defined data profiles, but **the true value of mitigating capacity constraints is the ability to develop significantly more place based profiles**.

During the use case engagement process, a key limitation in terms of identifying prospective opportunities was the lack of contextual insight to define priority areas and high cost or volume cohorts within them. **Providing self-service, auto-matically updated profiles across a range of localities can equip service leaders and PHM managers with the insights they need to define the lines of enquiry for the analytics teams (with renewed capacity) to explore and support intervention design**. This is a prime example of the way in which a better data culture can be embedded, equipping ICS partners with the tools to feed their curiosity.

With regard to the example of the 19 place profiles developed over this summer, PHM analysts are currently spending 35% of their time developing profiles:

- Waiting for data requests and look up queries from partner organisations
- Downloading and formatting data to suit dashboard purposes
- De-bugging software through activities such as writing scripts as a result of changing data formats

Through automation of data ingestion and management into the BI&A platform, that can save £6,650 or more importantly 38 days of analyst productivity.

In addition, the benefits of this use case would increase in following years: with only half of the 65% of the analysis time required to refresh and refine dashboards which otherwise update automatically. In addition, the use case enhance the impact of the place profiles in their current format, specifically providing:

- Automatically refreshed, providing near-real time insights and products that are not out of date half way through the year
- Interactive dashboards rather than fixed pdfs, which allow for more granular drill downs of information in a visual format on the fly
- More accurate data, aggregated up from record level, rather than forced to fit the arbitrary geographical boundary required
- Ability to provide insights on combined characteristics of individuals (e.g. '50% of diabetics in one area have severe depression', as opposed to 'the area has 35 diabetics and 22 people with severe depression' – enhancing intervention planning and cohort selection significantly.

Quantitative Benefits

- **Evidence 1**: 2 FTE analysts can produce approximately 19 place-based insight products over the course of 8 weeks; it takes 1FTE approximately 6 days to produce one place-based insight product:
  - 19 profiles/2 FTE= 9.5 insight products per 1 FTE analyst
  - 9.5 products/8 weeks = 1.1 weeks or 6 working days to produce one place-based insight product
- **Assumption**: Each analyst spends 35% of their time waiting on and cleaning data, with only 65% of their time dedicated to analysing, modelling and visualising data
  - Per 1 insight product, 35% of 1FTE's time is wasted and only 65% full utilisation
  - 6*0.35=2 days spent ensuring data is in correct format
  - 6*0.65=4 days spent analysing and modelling data
- **Assumption**: BI analyst has a day rate of approx. £175 (from a £34,600 annual salary and 30% on-costs)
  - Across 19 insight products, eliminating 2 days of development time from the development each product totals to **38 days of savings of £6,650**
- **Assumption**: In years 2 and 3 of the data strategy, analysts will require half the time to amend profiles as dashboards update automatically – reducing from 4 to 2 days
  - 2 days saved is an additional £6,650
  - **Total savings for years 2 and 3 equal £13,300** or **76 analyst days**

	Efficiency saving
Year 1	£6,650
Year 2	£13,300
Year 3	£13,300
Total	£33,250
Average	£11,083

Future Use Cases

Summary Use Case: Enabling Life-Long Care and Support for Adults with Learning Disabilities and Autism

Business Problem

It is estimated that local authorities are only supporting 0.6% of adults with a learning disability or autism beyond school-age. Many adults with a learning disability or autism are either not known to LAs or no longer access targeted services after graduating school. LAs do not have access to NHS data which could alert to adults who require care and support.

Proposed Solution

An integrated dataset pooling health, care and social services data about adults with learning disabilities to unlock insights into their health and lifestyle factors, enabling targeted care and support, reducing the chances of poor health and life outcomes. Steps include:

- Undertaking a data matching exercise across education, health, care and social services
- Identifying and analysing needs of residents with learning disabilities which are not known to LAs

Logic Chains

Inputs

- Existing local authority service datasets
- Combined datasets from non-local authority services, such as health and police data, including national datasets
- Joined up, multi-agency working and planning across local authorities
- Funding for resource costs to build, integrate and cleanse data/datasets

Activities

- Data quality checks and standardisation /connectivity assessment
- Data pipelining
- Matching local authority and non-local authority datasets to identify adults known and not known to local authorities as having a learning disability/ autism
- Initial forecasting for service demand for local authority adult social care services based on integrated dataset
- Test and agree costs to provide sustainable medium to long-term support based on forecast
- Map multi-agency plan of action to support young people/adults throughout life-time from point of diagnosis

Outputs

- Combined dataset encompassing health, care and relevant service information for residents with learning disabilities and autism
- Timeseries forecasting for local authority services, i.e. across 1, 2 and 5 year period
- Multi-year programme and budget to support increased demand on local authority services
- Multi-year collaboration agreement across agencies supporting multi-agency working to identify, track and support children and adults with learning disabilities and autism

Outcomes

- High quality integrated care as a result of data-driven services enables a higher quality of life, greater community inclusion and safety
- Interventions to support adults via healthcare, social care, housing and employment are applied early care to prevent negative or adverse life outcomes
- Combined dataset unlocks opportunities for advanced analytics and forecasting (i.e. risk stratification, predictive modelling) via BI Teams, supporting which support health and care management strategies

Impacts

- Higher reported quality of life for adults with learning disabilities and autism
- Increase in the quality of care and support for adults
- Higher number of adults living independently
- Increase in the number of adults entering the workforce
- Decrease in the proportion of homeless adults with a learning disability or autism
- Decrease in social exclusion rates for adults
- Higher reported quality of life for carers

Summary Use Case: Data Observatory

Business Problem

Disjointed and inconsistent data both within organisations and across partners leads to misaligned reporting and insight, with differing interpretations of the truth. This leads to duplicative and manual validation of underlying data to ensure read across of insights to ensure data is trustworthy.
While those with access to the BI&A platform will be able to avoid this, access will be limited to specific stakeholders when access to aggregated data should be streamlined to facilitate a more data driven culture. This is alongside a perceived lack of transparency with the taxpayer – which in turn leads to repetitive FoIs.

Proposed Solution

A public portal, surfacing data from the BI&A platform can create a consistent baseline for all local partners to draw from with regard to demographic, outcomes, demand and cost data – aligning analysis with internal partners without direct access to the platform, providing a high level evidence base for policy teams and think tanks to develop new approaches and reducing duplicative data cleansing across the system.

Similarly, transparent and timely access to data for the public, with more granular detail than national ONS and DHSC can help reduce demand for freedom of information requests which may be liable to increase as scrutiny on the new ICS system continues to mature.

Logic Chains

Inputs

- BI&A platform
- Data inputs:
  - Primary care
  - Pharmacies
  - Mental Health
  - Community care
  - Children's social care
  - Adults' social care
- Website/ portal delivery team
- PHM analytics team for report and dashboard development
- Healthwatch and resident

Activities

- Engage public sector partner analytics teams to identify core datasets
- Healthwatch and resident engagement to identify key indicators to publish
- Development of website/ portal to host data and reports
- Development of interactive dashboards for top level insights
- Ongoing addition of reports in line with new FoI requests

Outputs

- Data observatory website to host data
- Suite of pre-made interactive dashboards tracking local health and wellbeing
- Published written reports and narrative, with associated links to partners' external reports
- Ability to custom query and download aggregated data on health and wellbeing across ICS footprint
- Opportunity to host 'synthetic data' for testing of new tools and techniques with no IG obstacles

Outcomes

- Public sector partner analytics teams' efficiency
- Consistent baseline data for reporting of outcomes, demand and costs for health and wellbeing
- More transparent engagement with taxpayers around RoI
- Self-service data and dashboards for internal and external stakeholders

Impacts

- Reduction in time spent data cleansing for ICS partner analytics teams
- Reduction in freedom of information requests
- Reduction in demand for PHM and partner analytics teams for basic reporting stats and indicators

Summary Use Case: Outcome based commissioning

Business Problem

The shift in commissioning away from payment by results necessitates a shift in the way we make decisions, but the current delays in accessing data, limitations in its integration and the corresponding difficulties in tracking the resident journey of interventions and outcomes makes it difficult to evaluate and identify high and low value interventions.

This is compounded by the fact that inconsistent data sources are used to baseline different partners' performance, causing a lack of trust in insights products

Proposed Solution

Flexible insight tools with a wide array of integrated, consistent and trusted data to create a single version of the truth capable of tracking resident journeys from multi-partner interventions through to short to medium term outcomes can underpin a programme of intervention evaluation and continuous improvement.

This can support effective management of commissioned services and assess against contracted performance levels as well as providing a trusted evidence base to join up commissioning of services by understanding the most effective combinations of high value interventions for more granular cohorts to provide personalised support and maximise positive outcomes.

Logic Chains

Inputs

- BI&A Platform
- Data inputs to be aligned with initial pilot, but core includes
- ICS commissioning analysts to interpret insights
- Service providers to agree and define key outcomes and interventions
- Shared ICS data scientist post for developing analytics model

Activities

- Commissioners and providers identify priority resident pathways
- Data strategy delivery team to facilitate ingestion of additional priority datasets
- Set key objective outcomes for residents within pathway
- Design and implement analysis methodology to identify low and high value interventions
- Interpretation and written evaluation of impacts of local interventions created
- Commissioners and service providers to review commissioned pathways and long term demand expectations to estimate capacity needs

Outputs

- Evaluation of impacts of individual and collective interventions on priority outcomes
- Pathway redesign and continuous improvement process put in place
- Research collateral to share with national bodies and industry partners

Outcomes

- More granular and trustworthy data for contract performance management
- Shift in balance of commissioning toward upstream interventions
- Clarity on effectiveness of specific interventions on more granular cohorts of residents
- More timely data and insights to make decisions and act sooner
- Ability to track impact of interventions across partners and services

Impacts

- Increase in demand for upstream prevention services and interventions
- Greater return on investment for selected pathways
- Improved outcomes
- Reduction in reactive and unplanned service provision such as hospital admissions
- Reduction in demand for high cost care plans due to more effective intermediate support

Summary Use Case: Supporting High Intensity Users of Public Services

Business Problem

A small number of Individuals and families who are regular or high intensity users of public and health services often cost the public purse the most. Matching multi-agency data to identify those most families and costs is challenging and time consuming for any one partner or local authority at place, given the breadth of services they use and the information governance implications across these.

Proposed Solution

Through shared data located at the BI & Platform, agencies across local authorities, health and associated partners can co-locate high intensity users at the system level and analyse factors contributing to their 'complex dependency,' enabling the coordination of tailored wrap-around care plans at place. and reduction in service usage.

Logic Chains

Inputs

- BI & A platform
- PHM analytics team and analyst resource
- Existing local authority service datasets including
  - Demographic data
  - Children and adults social care
  - Housing data
  - Employment and benefits data
- Combined datasets from non-local authority services, including secondary, mental health, voluntary and community data
- Police and probation services data

Activities

- Joined up, multi-agency planning across local authorities for intervention pathways
- Design low and high value interventions for users based on individual/family needs
- Design and implement methodology to identify high intensity users of public services via BI & A platform
- Agree communication plan for individuals/ families identified in the list

Outputs

- Place-based lists of high-intensity service individuals and families
- Co-designed multi-agency care pathways for individuals/families, with allocated key workers coordinating care
- Personalised whole-family interventions for users and families, inclusive of health and public health interventions
- Evaluation of collective on priority outcomes

Outcomes

- Personalised interventions are meeting the specific needs of individuals and families which are reducing the day-to-day burden on services, reducing long-term service costs
- Personalised interventions are consistently preventing individuals and families from experiencing severe life crises, reducing short-term but high-cost acute care
- Adults/parents are regularly able to sustain their own health and care needs
- Parents/families are meeting children's needs

Impacts

- Higher number of adults/parents self-reporting greater ability to manage their families, households, and finances
- Reduction of adults claiming Universal Credit benefits due to unemployment
- Fewer reported acute/hospital visits with higher reported usage of community, voluntary and mental health services in turn
- Increase in attendance for children at school
- Decrease in the number of Looked After Children in local authority care
- Reduction in the number of adults and juveniles offending and re-offending

Summary Use Case: Youth Mental Health Social Prescribers

Business Problem

While mental healthcare providers in BLMK recognise ramped up need to support adolescents or young people experiencing mental illnesses, particularly during the pandemic recovery period, they are not currently be able to stratify those at risk of mental health crises or long term mental conditions based on key risk indicators

Proposed Solution

Develop risk stratification tool comprised of robust datasets to identify young people at risk of developing mental health illnesses and/or at risk of having mental health crisis. Key steps:

- Working with PHM leads to prioritise datasets, including socioeconomic and lifestyle factors
- Initial data quality, standards and connectivity assessment of prospective sources
- Test/evaluate risk stratification tool and work with PCNs to identify prioritised caseload

Logic Chains

Inputs

- Joined-up, place-based mental health providers coordinating prioritised datasets with PHM Leads
- BLMK ICS BI & A Platform resource for risk stratification tool creation and analyses
- Funding to target resource towards the technical and operational development/maintenance of the risk stratification tool via the BI & A Platform, as well as demonstrate the benefits through evaluation of data
- PCN and clinician training to understand and utilise risk stratification tools/findings

Activities

- Data quality checks and standardisation /connectivity assessment
- Place-based strategy development for targeted interventions for each risk cohort, in alignment with local resources and PHM strategy
- Joined-up providers to establish an evaluation outcomes framework to measure effectiveness of risk stratification tool to enhance services and interventions
- BI & A Platform to deliver risk stratification analyses to place, cascaded down to primary and secondary care
- Initial testing of risk stratification tool with PCNs and clinicians, with go/no go date

Outputs

- Risk stratification tool that can be utilised across organisations delivering mental healthcare across places
- Resourcing plan for analytics team delivering risk stratification
- Evaluation framework to measure outcomes against
- Quantitative data indicating risk stratification tool/PHM approach is/is not achieving the aim of identifying, targeting and improving the support for adolescents and adults with mental illnesses

Outcomes

- Clinicians are adept at using risk stratification to identify and target treatment, and are aware of factors that can contribute to poor mental health in healthy young people
- Young people in the lowest risk category have stable mental health and care for longer
- Young people in the medium or rising risk cohort have greater stability in their mental health and a lower chance of having a long-term mental crisis or illness
- Young people in the high-risk cohort with multiple or complex mental illnesses have stable care in place,

Impacts

- Number of practices using risk stratification surpasses those not using risk stratification (i.e. by more than 60%)
- Overall reduction in the number of young people in lower/medium risk cohort entering high/complex risk cohort i.e. over 5 year period
- Decrease in the size of highest risk cohort of young people year on year
- Diminishing number of hospitalisations for young people with multiple/complex mental illnesses
- Reduction in number of reported incidences of self-harming and suicide
- Reduction in drug and alcohol abuse among young people

Summary Use Case: Risk Stratification for children and young people

Business Problem

Most universal healthy child programme information is recorded during the 0-5 years programme. Contact with 5-19s is infrequent, particularly during the pandemic. It is not possible to comprehensively stratify 5-19s potentially requiring programme support above universal service provision, and it is unclear whether children and young people (CYP) are adequately signposted or referred to specialist services, particularly if they have not interacted with primary care.

Proposed Solution

Develop a flexible risk stratification tool to identify children and young people (CYP) with potential health and wellbeing concerns, who are not currently well engaged with local public sector services, who would benefit from additional universal or specialist service provision.

With no use case currently identified, it is proposed that a priority outcome area should be chosen and an analytical exercise using BI&A data to identify predictive indicators that show a correlation with the outcome in those for which it has already occurred – to inform risk stratification for prevention in future cohorts.

Logic Chains

Inputs

- BI&A platform
- PHM analytics team for supporting analysis
- Shared data science resource for research-ing correlations
- Demographic data,
- Socioeconomic/ poverty data
- Local authority looked after children data and wider childrens' social care
- Mental healthcare provider data
- Primary care data
- Pharmacy data
- Education data

Activities

- PHM analytics team, service delivery partners and commissioners to identify priority outcomes or pathways
- Analytics exercise to identify correlations between chosen outcomes and record level data
- Re-design of CYP support pathway to provide personalised care dependent on need and risks
- Training and upskilling of MDTs or local service providers and primary care prescribers to embed new approach
- Evaluation of interventions to continuously improve interventions

Outputs

- Research into local predictive indicators of priority outcomes
- Risk stratified cohort of CYP at risk of priority negative outcome
- Tailored support pathway, process and suite of interventions to support CYP

Outcomes

- CYP with health needs are better identified and referred to appropriate specialist service provision
- Improved classification of CYP requiring 0-19 service provision above universal service
- Overview of demand to support planning and commissioning of services
- Identification of CYP at risk with no recent contact with services
- Improved physical and mental health in CYP population and reduction in severity of future poor physical and mental health outcomes

Impacts

- Higher reported quality of life for adults with learning disabilities and autism
- Increase in the quality of care and support for adults
- Higher number of adults living independently
- Increase in the number of adults entering the workforce
- Decrease in the proportion of homeless adults with a learning disability or autism
- Decrease in social exclusion rates for adults
- Higher reported quality of life for carers

Appendices

Appendix 2:
Detailed Roadmap

Roadmap

Introducing the roadmap

BLMK Integrated Care System

This section will provide a **detailed roadmap** that aims to equip our ICS and a future Data Strategy delivery team with an **action-oriented blueprint for effective change**. This focuses on **building up maturity** as part of its key foundational capabilities before **developing the deployment of more advanced initiatives** as the ICS transitions to the future state.

It should **act as a framework to drive discussions** around partner commitments and work programmes.

This section includes:

- Capability gap analysis
- A roadmap overview
- Steps to realising the future state ambition
- High level outcomes by delivery phase
- Risks and mitigations
- Approach to tracking outcomes
- Indicative critical success factors
- Common challenges & lessons learnt.

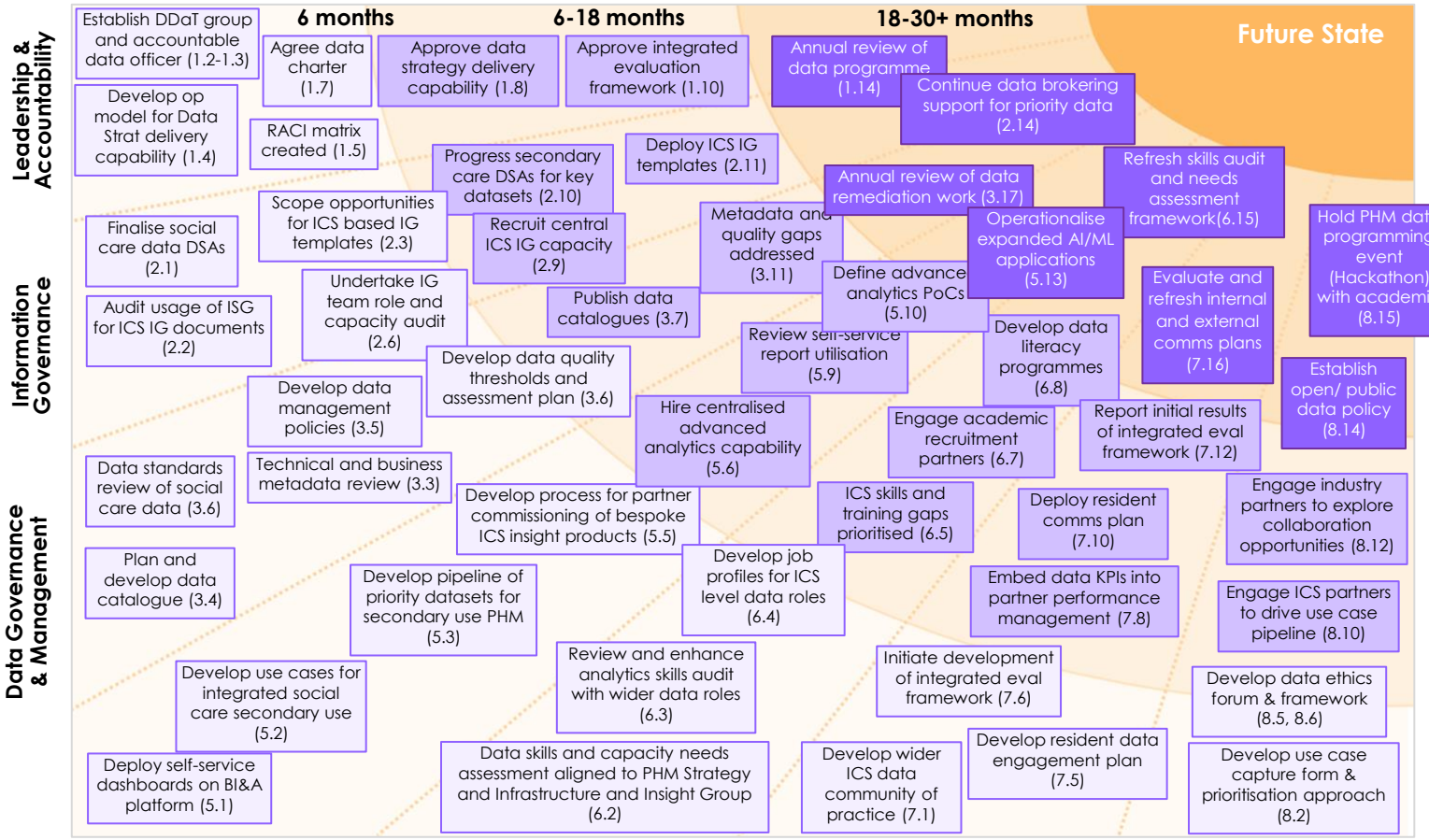
How to use the roadmap:

- Roadmap provides a set of specific activities e.g. approve the data strategy or delivery projects e.g. develop ICS data community of practice
- We have outlined the need for a dedicated delivery capability to implement the recommendations of this roadmap, with requirements scoped by the operating model
- This team would work with ICS partners to scope out a more detailed set of project outcomes, timelines and resource requirements to gain commitment for delivery.

Roadmap Overview

BLMK Integrated Care System

The sunray diagram below provides a high-level view of the roadmap and the key milestones over the next 30+ months. Each box, which represents a project or activity, is expanded on in detailed roadmap appendix and has been indexed to correspond to the expanded statement. It should be noted that **Tools & Technology** activities are not included in this diagram due to partnership and DDaT decisions to be made around the recommendations for a technology roadmap – however a detailed list of activities for this theme are included within the appendix.



Steps to realising the future state

The following slides outline **a set of proposed work packages** that will support the realisation of the ICS' future state ambition.

	1. Leadership & Accountability — Actions	Outcomes
0 – 6 months	**1.1** Sign off data strategy and case for change across partnership members **1.2** Establish the ICS Digital, Data and Technology (DDaT) Group, with associated terms of reference reporting to CEO Group and onto Partnership Board. **1.3** Appoint designated individual responsible for the day to day oversight of the data strategy, reporting to the Chair of the DDaT, responsible for delivering data strategy action plan and reporting to the CIO **1.4** Develop, agree and initiate stand up of operating model and delivery capacity for implementing ICS/ CCG data strategy capabilities – including governance, responsibilities, roles, capacity, and integrated processes with ICS partners/ tiers **1.5** Undertake a Responsibility Assignment matrix (RACI) for partner organisations' data and insights functions required by the PHM strategy – specifically delineating between individual partners and ICS **1.6** Define data owners from each partner responsible for priority datasets to be included in PHM approach – as point of contact for standards, quality and pipelining activities **1.7** Agree data charter to create a mandate for shaping and prioritising the development of sharing agreements with ICS partners for the purposes of secondary care	• Alignment of expectations and commitments from ICS partners to enable long term decision making and solution investments • Accountable designated data delivery programme director in place (reporting to the CIO) to drive pace and agile decisions with respect to implementing data strategy • Design specification for data and PHM strategies delivery capacity and capability • Clearly defined responsibilities and roles across ICS tiers and partners
6 – 18 months	**1.8** Approve capacity requirements of proposed operating model through agreed recruitment, secondment and partnering approach to undertake ICS data transformation commitments **1.9** Data strategy implementation progress reviewed by CEO group, with reporting and delivery responsibility driven by DDaT Group and appointed data strategy lead **1.10** Develop and sign-off integrated evaluation framework, aligned to priorities and objectives of each ICS tier and partner **1.11** Agree embedding data-related KPIs into partners' internal performance management processes, specifically relating to the adoption of emerging insight products into delivery and decision making **1.12** Explore opportunities to align with national strategy, Proof of Concept initiatives and sponsoring engagement with wider funding opportunities **1.13** Explore opportunities to incorporate resident/patient voice in DDaT or other decision-making forums to ensure legitimacy and relevance to the resident community	• Close engagement between ICS delivery programmes and partner CEOs to maintain strategic alignment • Comprehensive evaluation to act as objective foundation on which partners can hold each other to account and drive strategic prioritisation
18 – 30 months	**1.14** Quarterly review of DDAT data strategy implementation progress to be presented to CEO group **1.15** Outcomes reporting and continuous improvement of integrated evaluation framework, aligned to shifting priority cohorts, access to additional metrics, and national requirements **1.16** Annual review of ICS data and insights functions and capabilities RACI to confirm accountabilities	• Mature benefits realisation and outcome reporting to bind partners together and drive fair funding and investment decisions • Ongoing development of ICS data capabilities, evolving alongside partner priorities

Steps to realising the future state

BLMK Integrated Care System

	2. Information Governance (IG) Actions	Outcomes
0 – 6 months	**2.1** Continue work with NHS Digital to develop data sharing agreements for direct care use of social care data **2.2** Review membership, utilisation, development costs and comprehensiveness of Information Sharing Gateway solution **2.3** Define system-wide IG template requirements for current and future data sharing across direct and secondary care **2.4** Commence DPIA for secondary use of social care data and engage ICO/ NHS Digital to refine data sharing protocols **2.5** Develop DPIAs and initiate engagement with NHS Digital/ ICO for top priority datasets to be added to BI&A platform, in line with PHM Strategy and the two shared care record roadmaps **2.6** Carry out IG activity and capacity audit across all partners, delineating activities by internal responsibilities and both ICS and transformation requirements **2.7** Develop privacy notice and inform communications campaign to engage residents on how data is being used on ICS platforms and the protections in place to maintain privacy **2.8** Carry out assessment of high frequency, repeatable IG documentation and co-develop a consistent set of templates alongside the ICS IG group	• Improved use of existing tools to share IG sharing agreements, automate monitoring of agreement timelines and digitise approvals workflows to simplify and expedite data collaboration • Demonstrable progress in gaining permissions to integrate social care data with health data • Pre-empting additional integration opportunities and laying IG foundations for processing and sharing data, particularly for use cases • Building case for investment in IG capacity to facilitate collaboration and demonstrate competency for future system transformation opportunities • Initiating public engagement for new ICS capabilities to ensure fair processing
6 – 18 months	**2.9** Recruit centralised IG resources to address capacity gaps identified in audit, to support with new strategic, ICS level data sharing discussions and for management and monitoring of existing agreements **2.10** Finalise social care secondary use sharing agreements and required approvals for pipelining into BI&A platform **2.11** Finalise and deploy IG templates and consistent processes and sharing provisions across partners in line with requirements **2.12** Carry out rolling comms and training campaign with ICS partners to encourage adoption of Information Sharing Gateway	• Additional IG capacity deployed to expedite opportunities to enhance BI&A platform and PHM capabilities without sacrificing BAU assurance processes • Deployment of templates streamlining BAU IG activities further enhances local IG team capacity • Successful deployment of secondary use of social care data lays foundations for further enhancement of BI&A datasets
18 – 30 months	**2.13** Undertake annual review of ICS IG templates and associated provisions **2.14** Continue brokering access to backlog of priority datasets **2.15** Continue ongoing review of Data Sharing Agreements and adherence to provisions and protocols across partners	• Mature, continuously improved and consistent processes for data and IG collaboration across partners builds trust across the ICS and enhances credibility and confidence in developing legal basis for additional datasets with wider partners

Steps to realising the future state

	3. Data Management & Governance	Actions	Outcomes
0 – 6 months	**3.1** Develop prioritised pipeline of datasets and relevant fields for BI&A platform, aligned to PHM strategy and Care Alliance priority cohorts **3.2** Develop data quality thresholds and KPIs for record level data to be pipelined into BI&A platform once priority datasets have been agreed **3.3** Assess prioritised datasets' available metadata, testing with both analyst community and IT/ data architect teams to inform identification of (semantic) translation/ alignment gaps **3.4** Develop data catalogue plan for partner datasets with potential PHM applications, to provide sight of available data to inform future pipelining and scoping of future PHM interventions and insight products **3.5** Develop data management policies for all data held within ICS level tools, as part of data sharing agreement provisions **3.6** Carry out data standards and quality review of Social Care data to be pipelined into BI&A Platform, to test alignment of definitions	• Targeted progress in enhancing value of BI&A platform applications through improved data availability • Expediting deployment and scoping of opportunities for social care data for PHM and direct care purposes, supporting the ICS' strategic priorities • Business glossary provides consistent definition of data and insight indicators to improve collaborative decision and integrated insights • Mobilising initiatives to improve business and technical metadata to ensure data is translated and understandable to analysts and technicians
6 – 18 months	**3.7** Publish data catalogue of partner held datasets with ICS partners and establish review process with data owners **3.8** Undertake data quality assessment of priority datasets in the pipeline for BI&A platform **3.9** Undertake data management audit report for all ICS level tools, reporting into DDaT, to provide assurance to original data controllers **3.10** Carry out ongoing data standards, quality and metadata review of priority datasets within the pipeline e.g. housing, environmental and policing data as they become top priority **3.11** Address business metadata gaps and data translation issues for analysts and business users of insight to align definitions across data sources through deployment of business glossary **3.12** Address technical metadata gaps and alignment issues to simplify data extraction and integration activities and reducing requirements on source system database managers **3.13** Ongoing assessment of BI&A priority datasets' metadata as pipelining plans are developed	• Greater sight of available and potential data assets to prompt collaboration and innovation • Coherent and collaborative approach to data pipelining and integration through clear and aligned definitions of metadata • Identified and addressed data quality issues and inconsistencies of data in BI&A platform
18 – 30 months	**3.14** Iterate data catalogue with additional datasets as PHM and wider partner engagement continues and understanding of potential applications become more mature **3.15** Iterate metadata and data translation resources for additional PHM datasets **3.16** Ongoing data quality review of newly pipelined data and new data sources as they are added **3.17** Undertake annual data management audit report for ICS level tools **3.18** Conduct annual review of data management policies for ICS level tools and refresh where required **3.19** Automate data catalogue review process by sending notifications to data owners quarterly **3.20** Engage with data owners and stewards to establish searchable metadata dictionary and publish internally, with detailed guidance **3.21** Outcomes of data management audit reported to CEO group via DDaT (to be scheduled on a bi-annual basis)	• Mature and iterative data catalogue will be fully embedded as a resource to drive collaboration and maximise value of insights • Mature, tried and tested assurance structures will build greater trust with partners and regulators to facilitate opportunities to innovate further • Improved ownership, management and monitoring of data will provide evolving benefits to data quality

Steps to realising the future state

BLMK Integrated Care System

	4. Tools & Technology	Actions	Outcomes
0 – 6 months	**4.1** Test, develop and agree detailed specification of underpinning technical capabilities required – aligned to high level view articulated in the data strategy future state **4.2** Develop high level data solution architecture to translate capability specification into suite of integrated products to provide target architecture for the ICS **4.3** Develop a phased, whole-system plan to achieving target architecture **4.4** Agree and gain senior commitment to integrated technology roadmap, finalising coherent future state and clear commitments for both organisation and system level changes **4.5** Review ICS/ PHM insight products in pipeline – understanding users, data feeds and associated decisions made to inform both business and technical metadata improvement initiatives **4.6** Develop/ agree Minimum Viable Product for Residents' view of data, including what should be viewable, what consent management capabilities should be included, and intended channel – acknowledging progress and approach to date **4.7** Define business requirements for Local Authority integration with HSCN connections as part of technology roadmap	• Formal agreement and clear commitments on partnership technical architecture can enable detailed planning and resourcing of technology change programmes and investment • Clarity around specification and scope of enabling capabilities for cross-ICS data sharing and data products can inform the scope of technical metadata remediation activities • Transition architectures allow for an iterative process to transformation, ensuring partners can move at manageable pace and manage risks
6 – 18 months	**4.8** Initiate deployment of first stage of data solution (transition) architecture plan **(see 4.1-4.3)** **4.9** Confirm build or buy approach for each component capability identified within solution architecture, digital strategy and integrated technology roadmap **4.10** Develop role-based access (RBAC) rules and access restrictions for each ICS insight product based on the provisions set out by IG teams, DSAs and the identified user profiles **4.11** Develop standard operating procedures for pilot AI/ML pipelines build, architecture and onward maintenance **4.12** Support selection and deployment of Artificial Intellience (AI) and Machine Learning (ML) toolsets to BI&A platform aligned to pilots and initiatives driven by advanced analytics teams and capability	• Initial technical transformation progress allows for re-evaluation of commitments and timelines to ensure pacing and ambition are correct before sunk costs become prohibitive • With basic technical foundations in place, piloting of advanced analytics tools can start deployment of advanced use cases to build greater buy-in to data transformation
18 – 30 months	**4.13** Evaluate progress, outcomes and capability of ICS technology transformation to date, with decision gateway to refine current capabilities or progress to further transition stages **4.14** Continue progress through phases of planned transition architectures **4.15** Review and refresh integrated technology roadmap and overarching strategic objectives **4.16** Build framework for automated detection of model bias and model decay for advanced analytics applications and modules on ICS tools and platforms	• Maturing IT collaboration and regular review of progress ensures alignment with both system and organisations priorities • System level collaboration ensures less mature partners have clear input and steer into direction of travel to ensure they can mature at their own pace but in overall alignment with local partners

Steps to realising the future state

BLMK Integrated Care System

	5. Reporting & Analytics	Actions	Outcomes
0 – 6 months	**5.1** Deploy and iterate self-service reporting dashboards in the BI&A platform's activity pipeline **5.2** Work with PHM leads to define reporting products utilising integrated health and social care data for both record and system level insights **5.3** Work with PHM leads and PHM strategy delivery team to engage with wider system to develop prioritised pipeline of external datasets, tied to specific interventions, evaluations or priorities **5.4** Ensure partners engage with the PHM analytics skills audit and proposed DDaT and PHM operating model to create specification for roles and capacity required to drive ICS analytics activities **5.5** Develop process for partners and business users to commission bespoke insight products and reports	• Initial progress in self-service reports builds quick credibility in ICS tools and change initiatives • Quick wins help articulate the 'art of the possible' and stimulate further engagement with use cases and iteration of reports
6 – 18 months	**5.6** Hired centralised ICS advanced analytics/ data scientist capability – in line with Infrastructure and Insight group skills assessment and requirements of proposed shared PHM and DDaT operating model **5.7** Undertake 'dip-test' audit of reports and analysis to test quality, consistency, and adherence to agreed standards – including testing with users and owners to explore opportunities for continuous improvement **5.8** Engage Partner organisations aligned to priority datasets to feed pipeline of future self-service reporting dashboards **5.9** Review self-service report utilisation rates to identify unused reports for decommissioning or to drive engagement with user groups to encourage use or drive iteration and improvement activities **5.10** Select suite of AI techniques (e.g. Image Analysis , NLP, Regression, Categorisation) to pilot aligned to skills availability identified in audit and use case pipelines	• Centralised, shared resources for specialised, high cost analytics capabilities allows for risk sharing and organisational upskilling, minimising upfront cost • Ongoing engagement with system partners facilitates buy-in and continued uptake of tools • Testing of new approaches allows for knowledge sharing and discovery of further applications
18 – 30 months	**5.11** Develop artificially manufactured (synthetic) datasets based on data held within the BI&A data warehouse in test environment to enable access and innovation with academic partners, coding events (hackathons) and research bodies **5.12** Expand self-service reporting capability and availability across the ICS, with regular re-engagement with service leads **5.13** Pilot application of optimisation engines into scenario modelling tools for priority cohorts as outcomes evaluation findings improve assumptions on the effectiveness and impact of interventions **5.14** 'Dip-test' audit of self-service reports for accuracy and functionality to maintain quality and support continuous improvement through engagement with users **5.15** Build framework for automated detection of bias and/or failure of advanced analytics applications and modules on ICS tools and platforms	• Regular auditing of report quality maintains standards and credibility with system partners – with further opportunities for continuous improvement • Artificially manufactured (or 'synthetic') data allows for greater innovation with a wider array of partners while minimising risks of privacy breaches

Steps to realising the future state

BLMK Integrated Care System

	6. Skills & Talent Management	Actions	Outcomes
0 – 6 months	**6.1** Map future skills needs assessment for ICS analytics, data architect and information governance capacity requirements to joint activities and responsibilities of proposed operating model for DDaT and PHM – delineating skills and responsibility gaps between partner and local authority PHM analytics teams and shared specialist ICS resource requirements **6.2** Review Insights and Infrastructure PHM analytics skills assessment work **6.3** Carry out additional skills and capacity assessment for wider skillsets outlined within proposed joint PHM and Data delivery operating model **6.4** Develop relevant and contemporary job profiles for ICS level data roles to support recruitment and performance management	• Comprehensive skills audit and needs assessment informs gap analysis to build operating model business case costings • Close alignment with PHM and Digital strategy and emerging operating models ensures opportunities to integrate and streamline hiring maximises system value for money
6 – 18 months	**6.5** Identify and prioritise skills and training gaps for ICS based roles, aligned to operating model **6.6** Develop role capability profiles, skills training pathways, and succession planning policies for data skills **6.7** Engage academic partners to identify opportunities for graduate sandwich courses and tailored training programmes, as well as wider opportunities to foster talent such as apprenticeships **6.8** Develop core data literacy training courses for non-data staff to improve understanding of data limitations and build confidence in the insight tools and techniques provided as part of the PHM and BI&A platform reporting modules **6.9** Deploy training pathways for data and non-data roles in line with plan **6.10** Work with ICS Infrastructure and Insights community to schedule knowledge sharing sessions to improve general data literacy and share knowledge around new insight tools and their application	• Clarity on data related role requirements, tied to capacity and agreed set of processes and decisions can inform recruitment and training pathway plans • Wider recruitment channels provide cost effective resource solutions while also encouraging use of contemporary and cutting edge tools and techniques
18 – 30 months	**6.11** Review training delivery options for both data and non-data training pathways and select preferred approach(es) **6.12** Establish internal data secondment scheme across partners and the ICS to support knowledge transfer and future collaborative working **6.13** Undertake annual skills audit of analytics capabilities across PHM and ICS analytics capabilities, with associated succession planning provisions **6.14** Undertake review of training pathways for both ICS roles and those required as part of the PHM strategy and operating model, and determine if amendments are required **6.15** Refresh skills needs assessment on a 12 month basis	• Well developed training and career pathways encourage promotion from within and maximise retention of corporate and system knowledge • Regularly refreshed skills needs assessments ensure internal capabilities keep up with industry advances both across health and care and data and insight

Steps to realising the future state

BLMK Integrated Care System

	7. Data Culture	Actions	Outcomes
0 – 6 months		**7.1** Develop an Intelligence & Infrastructure Community of Practice, led by the PHM Infrastructure and Intelligence group or by core team of senior leadership members (led by appointed Programme Director), to build cross-organisational collaboration teams and engagement channels with operational oversight from seniors **7.2** Undertake promotion exercise for increasing engagement and member of Infrastructure and Insight Community (e.g. newsletter updates, notice on intranet portals etc) **7.3** Develop data-related communications plan and determine communication channels to build awareness of new tools, techniques and development opportunities **7.4** Identify data and insight change ambassadors across partners to encourage utilisation of insight products and assist in translating business needs in to use case requests **7.5** Develop community engagement plans alongside IG privacy notice work to ensure residents are able to make informed consent for how their data is used **7.6** Initiate drafting of integrated evaluation framework to map holistic health, wellbeing and societal outcomes from record level data up to aggregated societal impacts	• System community and collaboration networks helps build awareness of data transformation initiatives – which is critical to long term success which is dependent on grassroots engagement and ideas • Resident engagement campaigns to address misinformation and concerns is critical to public buy-in and more advanced applications of PHM tools • Change ambassadors create reporting lines to continuously assess success of messaging and deployed tools
6 – 18 months		**7.7** Deliver support to develop data literacy of non-technical staff, to improve interpretation of insights, intelligent commissioning of reports and use of new visualisation tools **7.8** Embed data-related KPIs into partner organisations' performance management process **7.9** Designated data delivery officer to actively engage with data networks at national level **7.10** Seek to create residents communication plan and report back to DDaT leads & CEO group **7.11** Develop external partnership engagement plan, aligned to work on priority datasets, use cases and the evaluation framework to explore better collaborative use of data **7.12** Report on initial outcomes from integrated evaluation framework and engage partners and strategic leaders to explore opportunities for enhancement **7.13** Explore embedding advanced analysts and data scientists within business units to both upskill business users in insight capabilities and data scientists in associated business domains	• Enhanced data literacy will allow for more valuable engagement with business users, with better articulated request for more powerful insight products having an improved impact on downstream decisions and resident outcomes • Co-designed evaluation framework, assessing holistic outcomes, can inform decisions on intervention prioritisation, assess effectiveness of prevention and drive funding discussions with central gov
18 – 30 months		**7.14** Review outcomes framework indicators and approach, taking in to account newly available datasets – exploring opportunities to improve insights through engaging with wider public sector partners such as criminal justice, Department Work and Pensions and Department For Education **7.15** Review engagement with external bodies and determine optimal approach to sharing data-related best practice and building collaboration networks **7.16** Hold focus groups with stakeholders from across the organisation and public to evaluate effectiveness of data awareness initiatives **7.17** Host innovative data-related speaker event for internal and external stakeholders	• Ongoing refinement of evaluation framework, with continuously enhanced data, can underpin gain share funding discussions around reduced demand for wider public sector services • Engagement with wider networks builds the ICS and partner orgs' profiles as innovative bodies, enhancing voice in industry and attracting better talent

Steps to realising the future state

BLMK Integrated Care System

	8. Embracing Innovation	Actions	Outcomes
0 – 6 months	**8.1** Create a use case capture template, hosted in shared site, to capture insight use cases and research questions **8.2** Determine use case prioritisation methodology and schedule **8.3** Assign dedicated owner for use case pipeline **8.4** Identify list and engage prospective academic partners to support with PHM analytics and insight development **8.5** Initiate development of a data ethics advisory forum with local partners, national bodies, academia and resident groups **8.6** Collaboratively develop Data Ethics framework or policy, drawing on IG, Analytics, Clinical, Political and Patient groups	• Open and accessible innovation initiative pipeline for ICS partners, supporting grassroots idea generation, staff buy-in and impactful use cases • Emerging credibility in articulating the considerations and mitigations for ethical use of data to allay resident and regulator concerns around ICS initiatives
6 – 18 months	**8.7** Increase the awareness and interest in data-related initiatives and activities – e.g. through the promotion of use case successes as part of the ICS insight communities driven by the Infrastructure and Insight Group **8.8** Explore partnerships between DDaT and data and insight industry leaders e.g. NESTA, Turing Institute, Open Data Institute and Centre Data Ethics Innovation academics through Universities **8.9** Review use case approach and pipeline on 6 monthly basis **8.10** Actively engage clinicians, commissioners and care practitioners to identify use cases for advanced analytics and machine learning techniques to develop and test new approaches to care planning and provision **8.11** Insight and Infrastructure community of practice to report bi-annually on emerging PHM and insights technologies and innovations **8.12** Engage safeguarding groups such as MASH and MARACs to develop collaboration initiatives to support case finding	• Greater visibility of ICS initiatives and insight capabilities among staff to build confidence and buy-in as well as encourage participation in use case generation • Maturing view of prospective AI and ML use cases to align with ingestion of more granular datasets into BI&A platform • Growing external focus to increase wider partnership working and support the most vulnerable in society
18 – 30 months	**8.13** Establish Open Data and Public reporting strategy to allow access to aggregated outcomes data, with a view towards opening an Open Data Observatory **8.14** Develop initial open reports and data APIs in line with the strategy with open data **8.15** Work with academic partners to organise and deliver annual coding events (hackathons) on priority cohorts to test new tools and approaches **8.16** Work with Insights and Infrastructure community group to host data-related speaker events for internal and external **8.17** Engage with partner organisations to explore opportunities for data-focused networks and forums **8.18** Explore development of risk alerting pilots for priority cohorts using data created by IoT and wearable devices	• Fostering greater community ownership of data, with a focus on transparency and societal outcomes tracking • Burgeoning academic partnerships to fully utilise the opportunities of a growing BI&A platform, to test new insight products • Growing national and industry profile to encourage recruitment, partnering and funding opportunities

High-level outcomes

BLMK Integrated Care System

The table below provides a **narrative view of the combined outcomes** of the eight roadmap domains against the three time periods identified.

	Outcomes
0-6 months	The first six months will focus on formalising a set of commitments across partners for the implementation of the roadmap, specifically in scoping out responsibilities of partners and ICS tiers with respect to the Data strategy, PHM strategy and Digital strategy. This will also include agreement on the size and sourcing of the delivery capability required to drive ICS level workplans and coordinate activities across partners and tiers to reduce transformation burden for internal teams – and led by a designated data delivery officer who is responsible for progressing it.
6-18 months	This period is characterised by the emergence of eventual BaU activities and partnerships as plans and initiatives continue to mature. In particular, the agreement and deployment of resource capability and capacity for the data strategy commitments, across IG, engineering and analytics can start to drive expedited maturation of data capabilities. In particular, assets such as data catalogues create greater sight of partner data assets and allow for better conversations and collaboration around innovative use cases. Advanced analytics teams, through a central shared resource driven by recruited data science leads and academic partnerships will use the nascent use case process to test proofs of concepts related to application of AI/ ML while increased use of self-service dashboards help to articulate the art of the possible to ICS staff that in turn help to drive continuous improvement and create a pipeline of demand for future reports. Resident engagement and communications plans will be initiated, underpinned by a credible data ethics forum and capability to articulate the benefits of PHM, allay potential fears around data privacy and ensure residents are able to make informed consent as to how their data is used.
18-30 months	As the programme approaches three years, activity will be focused around refreshing strategic direction and commitments while continuing to evolve and iterate available data and toolsets for direct care and PHM. More mature use of advanced analytics and an expanded evaluation framework will allow for the insights of both to be operationalised into BaU as opposed to bespoke commissions or narrow pilots. In particular this will underpin discussions among ICS partners and nationally to debate prospective expansion of PHM initiatives and both identifying and justifying associated funding streams.

100 Day Plan

BLMK Integrated Care System

Mobilisation phase are activities that should be carried out after the data strategy has been signed off by the Chief Executive Group, **prior to and during** the process of **standing up the project delivery team**. These activities will **lay the foundation** for the **delivery phase**, in which the appointed delivery team begin to **deliver key implementation activities** that will *enable progress* for the next 6 to12 months of the strategy.

Mobilisation Activities – First 100 Days

- Map the delivery responsibilities of the data strategy with the delivery responsibilities of the PHM strategy to join-up efforts where possible and avoid duplication
- Develop and agree on operating model for delivering data strategy capabilities, including project managers, responsibilities and capabilities – aligned to PHM Roadmap
- Recruit and appoint aforementioned members to the data strategy delivery function in line with plan
- Agree on governance framework to oversee implementation of data strategy, including accountable officers, lines of reporting and delegated functions from the CEO, DDaT and accountable Programme Director
- Begin developing the detailed specification for technological requirements to support the capabilities needed to deliver the future state, initialising the new BLMK ICS Technology Plan
- Initiate creation ICS Community of Practice for insights, driven by the Insight and Infrastructure group
- Work with partners to identify and engage prospective members of an ICS Data Ethics Forum
- Begin developing annual skills and capacity audit to support PHM across analytics, architect and IG functions, as well as wider skills and capacity review for non-specialist roles
- Begin engaging with academic partners to support with PHM analytics and insight development

Delivery Activities – First 100 Days

- Undertake RACI matrix for data and insights functions within partner organisations in line with PHM Strategy and Op Model
- Support existing DSA work with NHS Digital to secure sharing agreements for direct and secondary care adults social care data
- Work with PHM Strategy Leads on identifying datasets to prioritise or expedite for the BI & A Platform to deliver the PHM Strategy and priority use cases – to initiate reviews of data schemas, data quality, and metadata of datasets to refine use cases
- Progress detailed specification for future state technology requirements, commencing testing metadata with partner Integration & Technology stakeholders, with a view towards sign-off of the Technology Plan by senior stakeholders at the end of 100 Day Plan partner resource
- Confirm list of participants to join the BI Community of Practice, develop a terms of reference for community (i.e. purpose, objectives, frequency of meetings and trainings), and stand-up meetings or training days for participants (agenda TBC)
- Initiate engagement with ICS partners around the integrated evaluation framework to identify indicators that capture system benefits and objectives as well as for individual partners
- Confirm list of participants to join the Data Ethics Forum, develop a terms of reference for the forum (i.e. purpose, objectives)
- Develop and initiate delivery of skills and capacity audits across the ICS, sharing outcome with partners for system-level oversight

Delivering the Roadmap: Governance

BLMK Integrated Care System

To deliver the recommendations of the strategy and roadmap, a **suitably resourced capability** will need to be in place to coordinate activities. This should be scoped out in full and agreed **as part of a joint operating model with the ICS' PHM strategic team;** however, some of the key roles we anticipate being required are:

Role	Responsibilities and Capabilities	Additional Considerations
Accountable Data Leader	**Responsibilities:** ▪ Executive leader and Programme Director responsible for managing the delivery and implementation of the data strategy, working closely with the delivery team on behalf of DDaT **Capabilities:** ▪ Responsible leader for information and insight innovation projects across BLMK ▪ Ability to lead systems change and transformation projects	Accountable Leader may already be employed by the ICS, with a similar executive portfolio, with capacity to take on implementation capability. Programme Director to be a new appointment
DDaT Committee	**Responsibilities:** ▪ Tactical group which is responsible for overseeing the data strategy, reporting on progress to Chief Executive Meeting ▪ Receiving updates and reporting on progress from implementation delivery **Capabilities:** ▪ Ability to scrutinise data strategy implementation to ensure data privacy is adhered to, security systems are appropriate and strategy objectives are being delivered against ▪ Excellent stakeholder relationship skills to drive-buy in for data, digital and technology initiatives, especially data strategy	DDaT Committee is a requirement of the ICS as outlined in the Design Framework and already in train locally Will require a SRO and CEO representative on top of the stakeholders identified as being needed in the DDaT
Delivery Capability and Capacity	**Responsibilities:** ▪ Resource team responsible for delivering and implementing the data strategy **Capabilities:** ▪ Previous experience delivering data-focussed or system-level transformation project management ▪ Ability to mobilise a team around the vision and strategic goals of a data strategy – coordinating resources across organisations and driving workstreams ▪ Ability to work closely with PHM Strategy delivery team	Due to constraints on capacity within ICS, the delivery team will likely be comprised of resource dedicated to delivering the data strategy.

Risks and Mitigations

When delivering a project of this scale and level of ambition, we would recommend the creation of a **risk log to capture any risks and define appropriate mitigations**. Outlined below are an **initial set of potential risks and mitigations** to consider when delivering the roadmap:

Because of…	There is a risk that…	Therefore the ICS must…	Mitigation
Lack of capacity and resourcing	Business as usual activities and wider transformation projects may mean there is little capacity across partners to engage with change initiatives.	Ensure there is sufficient capacity to coordinate and deliver the agreed recommendations of the strategy.	• Recognise need for additional senior Programme Director capacity (to support the CIO) to drive the oversight and delivery of the strategy • Explore opportunities for wider support alternatives, e.g. apprenticeships, temporary working groups, secondments • Clearly articulate what can (and can't) be achieved with available resource and demonstrate findings to wider system partners and stakeholders to inform capacity decisions • Develop and fund operating model to fill capacity gaps
Variable senior leadership support	Inconsistent buy-in may lead to delays in decision making risking delivery timescales and strategic alignment with wider activities.	Work to agree a set of joint commitments, aligned to Data Strategy and inter-related programmes to set clear requirements to deliver against.	• Align system objectives and agree core partnership commitments and accountabilities • Promote system and PHM achievements through ICS-wide communication channels • Regular reports submitted to senior leaders and relevant committees of respective ICS tiers to highlight progress
Lack of buy-in across the ICS	The cultural shift to more collaborative ICS working with data driven tools may be difficult to embed compared to historical working.	Encourage adoption of new ways of working, by better conveying the benefits of new tools and approaches through active co-design.	• Supporting Infrastructure and Insight community members to act as Change Ambassadors • Promote BI&A platform and wider PHM achievements through ICS-wide communication channels • Actively prioritise use-case engagement with teams that do not have initiatives within delivery pipelines
Differing priorities at Place level	Additional functionality, datasets or reports prioritised for deployment benefit some places more than others.	Commit to a fair and transparent approach to prioritising work pipelines, with a framework for decisions agreed at DDaT.	• Establish and follow agreed delivery prioritisation processes, e.g. Use Case prioritisation framework • Where required, escalate challenges to DDaT group and accountable data officer to overcome barriers and mediate between conflicting priorities
Lack of measurable benefits realisation	The benefits of interventions are not measured, or done so by partners who do not share data – limiting benefits realisation and hampering funding discussions.	Identify priority data that captures outcomes, develop advanced analytics capabilities to undertake rigorous assessment and agree success criteria from the outset.	• Developing integrated evaluation framework that tracks org and ICS tier actions and outcomes from resident level up to societal impacts to articulate measurable benefits of interventions • Regular annual evaluation reports presented to CEO group articulating outcomes and benefits on priority cohorts

Critical success factors

BLMK Integrated Care System

Outlined below are a **set of factors that we consider to be critical for the success of the BI & Analytics Platform** in the longer-term. If these critical success factors are absent, action will need to be taken to ensure they are restored:

Support and buy-in from **senior leaders**

Effective **collaboration and relationship building** across partners' data communities

Availability of **sufficient resources and capacity** for progressing data strategy and proposed change initiatives

Consistent tracking and reporting of **outcome measurements** to demonstrate value and impact of new tools for both staff and residents

Tools & technologies being fit for purpose and developed in strategic alignment with wider system partners

A consistent approach to **system-wide communications** for the BI&A platform and use cases

Well resourced, **embedded IG support teams** to underpin innovation and transformation initiatives

Grassroots engagement for **innovative use case** idea generation

Common challenges & lessons learnt

BLMK Integrated Care System

Our experience of delivering data strategies across the public sector has provided us with a strong understanding of common challenges. Outlined below are a **set of key lessons learnt** that we hope will support **future data strategy development**:

Engage closely with wider stakeholders

The successful implementation of a data strategy relies on the buy-in of all staff – not just those within technical teams. As such, service stakeholders should be actively involved in the shaping of the strategy to ensure that they recognise its importance and feel that it is relevant to them.

Prioritise Information Governance

IG teams are all too often not consulted in data-related initiatives until it's too late and as a result, can be perceived as a barrier to the innovative use of data rather than an enabler. By engaging as possible, they can help to shape planned activity to be compliant and ensure adherence to best practice.

Outcomes, outcomes, outcomes

Data strategy implementation is not always simple and required tasks can be onerous. Frame discussions from an outcomes perspective to demonstrate to stakeholders the benefits that can be unlocked if the strategy is successfully implemented.

Leverage your assets

Whilst the current state assessment should recognise areas of improvement, it should also highlight existing assets. An unfair assessment may alienate stakeholders and these assets, if harnessed effectively, may be key to the successful implementation of the strategy and so it's important that they're acknowledged.

Accountability is key

Once the data strategy is completed, a key priority should be identifying those who are accountable for each of the roadmap steps being completed. We would recommend that one person is not held accountable for the entire roadmap delivery as this is likely to be unfeasible and result in delays/non-completion.

What gets measured, gets done

This maxim is particularly true for foundational tasks, such as data management, which do not always present immediate benefits. A robust approach to outcomes measurement and monitoring, with regular reporting to DDaT, will ensure that tasks are prioritised and completed.

Appendices

Appendix 3:
Detailed Current and Future State

Current State Capability Assessment

Making the most of existing assets

Partner organisations are investing **a great amount of time and effort** into supporting the current direction of travel. Notably, the **strong culture of data sharing** across the ICS has helped to establish a baseline for future work. There are a number of existing assets and strengths to build upon further as part of this project:

Information Governance capability and partnership networks across the ICS are a mature, highly-regarded asset. IG Teams are **pro-active and eager to jointly solve IG obstacles** while shaping data-sharing initiatives, and will provide a **strong foundation** for the use of data going forward.

There is evidence of a clear **appetite to transform services and patient care** through the enhanced use of data and insights at every level of the ICS. This is demonstrated by the consistent theme during the engagement of **stakeholders seeking to build a better picture of the Resident** by incorporating **social care and community data** to inform risk stratification and preventative support plans.

Significant work has already gone into improving the **quality of data** available for direct care use. The introduction of **System One** across the ICS footprint, as well as standardised **Arden templates and SNOMED codes**, has helped to ensure that clinicians are inputting accurate data that is **comprehensive and interoperable** across the system.

There are **pockets of excellence** across the ICS in which Partner organisations are successfully using **new tools and technologies** to deliver comprehensive reports and analytics via tools such as MedeAnalytics for risk stratification and PowerBI for visualisation.

The **BI & Analytics Data Warehouse** will offer significant addition to the analyst resource already serving organisations in the ICS. This dedicated resource will **support customers of insights** who may not have advanced analytics and data science capabilities in-house. In addition, the **advanced analytical resources** from Arden and Gem CSU will further strengthen the ICS's ability to conduct **complex PHM analytical projects, as well as an advanced risk stratification tool for case finding and proactive care (following the Johns Hopkins model).**

Progress has been made in developing **Shared Health and Care Records** for the purposes of direct care across the two care alliances. So far, 95% of GPs have agreed to share their data, **underpinning data requirements** for longitudinal and persisted datasets **to inform population health management exercises.**

Key findings on the current state

BLMK Integrated Care System

Drawing on our partner Agilisys's bespoke Data Maturity Framework, we have outlined below a **set of key findings** on the ICS' current approach to data and insights. These findings are **based on interviews and workshops with key stakeholders**. The following slides provide a more detailed view of findings against each domain.

Leadership & Accountability

- Due to the complex stakeholder environment within the ICS, there is a risk that **system-level priorities for outcomes and performance metrics** may be mis-aligned with those from individual organisations.
- There is debate as to which partners **are best placed to shape priorities and evaluate outcomes**, hampering work to equip decision makers with the required information.
- Currently, strategic decisions are founded in **individual organisational priorities** with a focus on internal KPIs and outcomes – due to **the limited availability of external data measures.**

Information Governance

- The ICS IG community is a **mature working group** with credibility across organisations and roles from the frontline to strategic leaders.
- **Residents**' control of their data and ability to opt-out of sharing is a **priority for elected leaders** and should be a key consideration in generating public buy-in for the data strategy.
- While IG workload has increased significantly, **resourcing has not always met demand** and therefore typically teams are often **at or above capacity**.

Data Governance & Management

- Participants highlighted that **access to community care, social care and other local authority data** would significantly **improve the 'single view' of patients**.
- Data used by Partners for BI is often **disjointed and updated on a monthly basis or longer**, in some instances manually.
- **There is some lack of confidence** in data produced by primary and secondary care, due to **quality and standards issues**. However, other stakeholders are confident that the data quality is sufficient to deliver intelligence for tasks such as **risk stratification**.

Reporting & Analytics

- Analysts across the ICS can sometimes **lack capacity and capability to deliver advanced analytics** due to the sheer volume of their business as usual (BAU) workload; self-service reporting, however, these often use **out of date information.**
- There is little evaluation of the **effectiveness of multi-agency interventions** on holistic outcomes for the individual, limiting service improvements.
- Primary care providers do not always have **access to analysts to deliver reports** and break down analyses into actionable PHM insights.

Key findings on the current state

BLMK Integrated Care System

Data Culture

- **Insight driven prevention** is accepted as the direction of travel, however, **the anticipated effectiveness and feasibility is inconsistent** across partners.
- Many **strategic and operational decisions are still based on professional instincts**, and when data is used, it is focused on **improving service-based KPIs** rather than a more holistic set of outcomes measures.
- The ongoing development of the BI & A Hub is seen as a **key enabler in driving access to insights**, however its future **user base is unclear to some partners** – risking duplication of functionality and data.
- Stakeholders recognise that there is much work to do to achieve **linked, curated datasets** to deliver population health management analytics in a **productive manner**.

Embracing Innovation

- There is a clear appetite for improved use of data and insight for **moving from 'reactive' care to 'proactive' PHM**, however, not all partners can articulate how it will be done.
- The emerging BI & Analytics Warehouse platform and data warehouse has a **suite of capabilities that could underpin future innovation**.
- **Differing views on priority areas for innovation**, particularly around enhanced direct care vs. PHM, **could drive disjointed transformation across the ICS**.

Skills & Talent Management

- There is a **strong analytics capability** and understanding of underlying data across most partners aligned to **historical reporting requirements however, advanced analytics experience is limited.** Partner organisations equally have **little visibility** on the data other organisations have.
- There are **considerable capacity constraints** on **data technicians, technical developers and information governance managers**, with concerns around increasing internal organisational workloads of top of ICS initiatives
- There is not a **clear delineation of skills and capacity required** to drive ICS initiatives at the strategic ICS level and partner organisation level

Tools & Technology

- There are **two distinct Shared Health and Care Records** across the two care alliances, with **differing architectures, functions and capabilities that are not currently integrated.**
- There are **technical requirements** for both real-time data for direct care purposes and longitudinal, persisted data for analytics and PHM activities.
- Tools such as the MedeAnalytics risk stratification tool for falls and frailty risk profiling **are increasing maturity and understanding for PHM techniques** – but face issues with **untimely data and missed opportunities for wider indicators**.

A closer look:
Leadership & Accountability

BLMK Integrated Care System

Leadership & Accountability

Complex stakeholder inter-dependencies within the ICS risk misalignment of priorities and disjointed evaluation of programme and resident outcomes.

There is debate as to which partners are **best placed to shape priorities and evaluate outcomes**, hampering work to equip decision makers with the required information.

While data is **consistently regarded as a strategic asset** across partners and there is wide ambition around data, it is not always clear if and **how data is used** to inform strategic decisions.

Additional Findings

- Senior stakeholders across the ICS agree on the **importance of using data to track patient outcomes** holistically, and support preventative Population Health Management (PHM) activities.
- There is a lack of clarity as to **who will commission, and who will provide, insight products** to each level of the ICS and what decisions they will underpin – with clear implications on **resourcing and team capacity planning.**
- Currently, strategic decisions are founded in **individual organisational priorities** with a focus on internal KPIs and outcomes – due to the **limited availability of external data measures**.
- It is key that the data and technology solutions do **not limit the pace of progress** as a result of **inconsistent data maturity** across different partners.
- Data integration initiatives are typically health driven due to advanced maturity, however the **local authority voice** is seen as critical to articulating the business requirements of the PHM agenda.
- While there is support and sponsorship for deploying AI driven solutions at a senior level, there is concern that there is a **lack of clarity and focus on the journey** required to make this achievable.

Root Cause Analysis

- Uncertainties around **sustainable data programme funding**, for both capital and revenue costs, is creating a **degree of apprehension** to fully signing up to the commitments of the data strategy and ICS more broadly.
- With the ICS currently not being a legal entity it is perceived by some as lacking power to **enact change and ensure alignment** – and ongoing statutory responsibilities of individual partners to deliver services leaves them **focusing on their own obligations** rather than as a system.
- There is lack of clarity around **responsibilities for strategic and tactical decisions** across the tiers of the ICS, risking **misalignment and duplication** of strategic plans and activities; in some instances, the principle of subsidiarity on which the ICS seeks to operate is not clearly understood.
- There is a lack of clarity around what the highest priority and most critical issues are across the system, which will have a knock-on effect as to which use case is taken forward.

A closer look:
Data Management & Governance

BLMK Integrated Care System

Data Management & Governance

Data used by Partners for BI is often disjointed and updated on a **monthly basis or longer**, in some instances **manually.**

Participants highlighted that access to **social care and community care data** would significantly improve the 'single view' of patients.

Lack of confidence in data produced by primary and secondary care, due to quality and standards issues, **create concern around PHM applications.**

Additional Findings

- Inconsistencies in the application of data standards impacts on data quality across the ICS; in particular uncertainty around **primary and community care data is prevalent**, however, progress in adoption of the Arden templates means data quality is expected to improve – although clinicians noted they are **complex and time consuming** to use.
- Social care data is seen as critical to underpinning PHM approaches, however, concerns around **data inconsistencies and often subjective scoring** for categorical data; as well as the prevalence of free-text data, has **created uncertainty** for what data will be useable and impactful for decision making.
- There are **large quantities of unstructured data** across the ICS partnership but **limited platforms and applications** to utilise this data.
- Use of SNOMED codes alone is seen as **insufficient** as they do not capture the full set of codable outcomes and interventions **needed for resident PHM.**
- **Integrating data outside of the health space** is expected to be a more challenging exercise with **inconsistent availability of connectors** such as NHS number in source systems.
- Concerns around **duplicating data** across systems and resulting risks of **inconsistent data** are regularly noted as **risks of the multiple data integration initiatives** live across the ICS footprint.

Root Cause Analysis

- There is a **disconnect** between those capturing data (predominantly for direct care) and the **analysts dealing with the implications of inconsistent data** for PHM and risk stratification.
- **Data requirements** for **PHM interventions have not been fully defined**, further exacerbating this disconnect.
- Lack of metadata dictionaries mean partners have a **limited understanding of what data partners hold** and therefore what would be **useful to enhance a holistic view of the resident** at each point of care.
- Lack of data dictionaries mean that, even with access to data, the **ability to use it in reporting and decision making is limited** without expert knowledge of data

A closer look:
Information Governance

BLMK Integrated Care System

Information Governance (IG)	The ICS IG community is a **mature working group** with **credibility** across organisations and roles from the frontline to strategic leaders.	The My Care Record DSA has built **maturity and credibility** for multi-agency sharing, however, it is focused on sharing data for **direct care purposes.**	While IG workload has increased significantly, resourcing has **not met demand** and teams are often **at or above capacity.**

Additional Findings

- Residents' **control of their data** and ability to opt-out of sharing is **a priority for elected leaders** and key risk to successful deployment of the data strategy.
- IG resource capacity at individual organisation and ICS level is **overstretched** and will **struggle to meet demands** of an increasingly data driven system.
- Implications of **duplicated and persisted data** on **managing subject access requests** must be considered as new systems are implemented.
- Pandemic COPI guidance and allowances for sharing may end in September and will need to be reviewed, **placing additional pressure on capacity**.
- General **lack of 'IG literacy'** in project and contract development teams results in **delays** and additional iteration steps to progress.
- Access to social care data, for both direct care and PHM secondary use, is currently limited, although progress is being made in current **discussions with NHS digital** to sign off **embedding this data within current sharing agreements.**
- While data sharing agreements for secondary use remain limited, a **DSA** for risk stratification, case finding and commissioning between CCG, CSU and primary care has been **signed by 95% of partners**.
- NHS Digital is increasingly **building its understanding of the needs** of the ICS and its partners when it comes to data sharing.

Root Cause Analysis

- Successful shifts in culture to **include IG early** to embed privacy by default and privacy by design into new initiatives has **radically increased demand** for IG services.
- Despite this early engagement from some, there are still cases of **late engagement**, particularly on more **strategic initiatives**, that often cannot be ratified to deadlines and cause disagreements.
- COVID guidance and resulting cultural shifts in data sharing have **changed expectations of IG considerations**, with an increasing assumption that new initiatives only require **a 'rubber stamp'.**
- There is a **disconnect** between IG leads and digital innovators at the ICS, CCG and place/ locality level, with instances of **siloed working** causing IG blind spots and late engagement.
- Strong IG networking across partners has helped **share knowledge and problem solving**, however it is felt more can be done to **standardise and template approaches** with top down sign-off to drive progress.

A closer look:
Reporting & Analytics

BLMK Integrated Care System

Reporting & Analytics

Analysts across the ICS **lack capacity to deliver** due to the sheer volume of their business as usual (BAU) workload.

Self-service reporting is **limited across the ICS** and dashboards are often using **out of date information**.

Primary care providers **do not always have access** to analysts to deliver reports and **break down analyses into actionable insights** for PHM.

Additional Findings

- Demand for analysts time, both internally and for ICS purposes, is predominantly driven by BAU reporting requirements, which many felt **could be automated through self-service reporting** – allowing them to focus on more **value adding activities.**
- Analysts are increasingly being asked to deliver more **granular and bespoke reports**, however these often **do not then inform actionable decisions**, limiting the value of insights and putting pressure on capacity.
- Reporting and analytics remains largely Excel-based across the ICS, albeit with **some partners showing growing maturity** around use of Power BI.
- Use of data is typically **descriptive rather than predictive**, for PHM and planning purposes, with rough trend data driving **reactive strategic decisions**.
- There is little **evaluation of the effectiveness of multi-agency interventions** on holistic outcomes for the individual, limiting service improvements.
- There is limited access to **granular details about cohorts at neighbourhood/ LSOA level**, meaning **some high risk clusters are lost** in more aggregated data.

Root Cause Analysis

- The distributed nature of BI resources and data assets has resulted in **a highly varied approach to reporting and analytics** across the partnership.
- There is limited access to integrated data from which to derive insights, with progress to date focused on **real-time, non-persisted data for direct care**.
- 'Customers' of insight products own data literacy means they **struggle to articulate their requirements**, instead needing to be **coached by analysts to articulate their needs and interpret results**.

A closer look: **Data Culture**

BLMK Integrated Care System

Data Culture	Across the ICS, there is significant interest in **using data and insight for service improvement and PHM purposes** across all roles, organisations and levels of care.	Partner organisations in the ICS **vary widely in their data maturity** and current capabilities to use insights, resulting in **significantly different starting points** in Milton Keynes and Bedfordshire.	While leaders are **keen to use data and insights** to inform decisions, it's unclear whether leaders have the capability to interpret data in order to **drive data-informed decisions**.

Additional Findings

- The national response to COVID-19 helped to **accelerate understanding of data as a strategic asset**, as well as the **importance of interoperability**, underpinned by the National Data Strategy and NHS Long Term Plan.
- Accessing holistic, real-time data for direct care is seen as a **fundamental requirement** for the future of care within the ICS.
- Insight driven prevention is accepted as the direction of travel, however the **anticipated effectiveness and feasibility is inconsistent** across partners.
- Many strategic and operational decisions are **still based on professional instinct**, and when data is used, it is focused on **improving service-based KPIs rather than a more holistic** set of outcomes measures.
- The ongoing development of the **BI & A Hub is seen as a key enabler in driving access to insights**, however its future user base is unclear to some partners – risking duplication of functionality and data.

Root Cause Analysis

- While senior leaders can articulate the importance of progressing a data vision, there is a legacy of "**talking the talk, not walking the walk**" when embedding tangible actions into areas where insights are improved.
- Data is increasingly being used to make decisions, but not used to **learn and improve decisions**.
- Partners are not universally convinced of the value and priority of population health management – meaning **constrained resources to embed changes** and transform data systems **may not be able to move at sufficient pace** without additional investment and support.

A closer look:
Skills & Talent Management

BLMK Integrated Care System

Skills and Talent Management

Capacity bottlenecks across all specialist data and technology roles are prevalent and risk ability to respond to ICS initiatives without support

There is a **strong analytics capability and understanding of underlying data** across most partners aligned to historical reporting requirements however, advanced analytics experience is limited

There is **not a clear delineation of skills and capacity** required to drive ICS initiatives at the strategic ICS level and partner organisation level

Additional Findings

- **Data literacy** outside of the analyst profession is **inconsistent and often limited**, meaning many will have to be coached through the commissioning of insight products to ensure they are asking and answering the right question.
- There are **considerable capacity constraints** on data engineers, technical developers and information governance managers, with concerns around increasing internal organisational workloads of top of ICS initiatives.
- There are **pockets of excellence in reporting and analytics teams** adopting visualisation tools such as PowerBI, and analyst communities show a consistent appetite to adopt these and upskill given sufficient opportunity to do so.
- There is **limited advanced analytics capability and experience** within the ICS such as data scientists and those working with big data.
- The contract with the CSU to provide the BI & A Hub for the ICS includes **capacity for 17 analyst** FTE equivalents to drive reporting developments is historically less resource than was previously available across the CCGs.
- At the primary care level, a significant proportion of GPs are likely to **require training and support** to properly interpret and action any insights provided.
- BI & A functions across the ICS have undertaken **a standardised skills assessment of Analysts' capabilities**, and there are clear plans in place to upskill Analysts in new tools and methods that underpin modern BI

Root Cause Analysis

- Capacity challenges are exacerbated by **competition across the ICS partners**, as well as general shortages at a national level – with resulting cost implications
- A **historical reliance on professional instinct, and the unavailability of data**, mean many across the system do not have the experience to successfully embed data into decision making with dedicated training
- **Data Science capabilities are not mature across the ICS**, in part due to the lack of an integrated data estate and the prohibitive costs for any single partner to take on

A closer look:
Embracing Innovation

BLMK Integrated Care System

Embracing Innovation

There is a clear appetite for improved use of data and insight for moving from **'reactive' care to 'proactive' PHM**, however, not all partners can articulate how it will be done.

The emerging BI & Analytics Warehouse platform and data warehouse has a **suite of capabilities** that could **underpin future innovation**.

Differing views on priority areas for innovation, particularly around enhanced direct care vs. PHM, could drive **disjointed innovation across the ICS.**

Additional Findings

- It is felt there is a clear mandate to use technology, data and insights **from most levels of the organisation** to support business and ICS goals.
- Emerging population health management tools such as falls and frailty related risk stratification are being **trialled and expanded** across the ICS footprint – with associated experience in MDTs **shaping interventions as a consequence**.
- The funding and development of the BI & A Hub and roadmap for risk stratification capabilities shows a clear statement of intent for **adopting new ways of working**.
- While accepting insights will help partners understand current performance and future planning, there must also be **demonstrable immediate benefits for leaders, staff and residents.**
- **Clinical** interviewees indicated that **the value of data on outcomes and PHM** could be lost if not **made abundantly clear** and **easy to use and understand**, or else be too difficult to integrate reports and analysis into BAU.

Root Cause Analysis

- Pressures of BAU activities across all partners but particularly in primary care means **adopting new ways of working will be challenging** without **intuitive insight products, clear expectations. better training and additional support capacity.**
- Local authority data, such as social care and housing data, is lacking access but most commonly referred to as **the most important missing datasets** which could have the **biggest impact on both acute treatment and PHM decisions.**
- Inconsistent maturity and misaligned objectives between partners' insight teams **limit the ability to share best practice** and **build communities for knowledge sharing**.

A closer look:
Tools and Technology

BLMK Integrated Care System

Tools and Technology

There are **two distinct Shared Health and Care Records across the two care alliances**, with differing architectures, functions and capabilities that are not currently integrated

There are **technical requirements** for both real-time data for direct care purposes and longitudinal, persisted data for analytics and PHM activities

The deployment of System One across Primary and Community Care is a key asset in **simplifying integration of data** with Shared Health and Care Records and PHM databases.

Additional Findings

- **Concerns around sustainable funding for ICS level solutions**, both capital and revenue, are reflected by numerous partners.
- The persisting of data in the InterSystems Shared Health and Care Record and long term intentions for the BI & A Hub create a **risk of potentially duplicating data, functionality and uses.**
- **Self-service reporting capabilities** are starting to mature within some partners across the ICS, and is seen as a key enabler for efficiency savings and data driven decision making.
- **Tools** such as the MedeAnalytics risk stratification tool for falls and frailty risk profiling are **increasing maturity and understanding** for PHM techniques – but face issues with untimely data and missed opportunities for wider indicators.
- There are **multiple options for how data could be persisted and analysed** at a CCG or care alliance level, including the BI & A Hub, Cerner modules and the InterSystems solution – the ease of integration and incentives for adopting differ between partners and a decision on alignment has not been made.
- The BI & A Hub does not currently connect to the two Shared Health and Care Records and **is currently focused on storing aggregated data** – however this is intended to expand to integrated, record level data in time.

Root Cause Analysis

- BAU IT management and ongoing technical implementation programmes of both **new systems** (e.g. Liquid logic) and integration initiatives with external partners create **material resource bottlenecks** for ICS partners.
- **Prioritisation of improving and enhancing real-time data for direct care priorities** means initiatives for enabling PHM tools, which are less clearly defined, have not progressed as quickly.
- **Differing priorities**; data and tech maturities; and legislative requirements to progress Shared Health and Care Records, alongside the more recent creation of the ICS, has led to numerous technology plans to build internal capabilities – without a joined up vision for **how these capabilities will work alongside each other**.

Assessing the current level of maturity

BLMK Integrated Care System

The maturity framework provides us with a model to assess BLMK's **current approach to data and insights as a whole system**, and benchmark it against the **desired maturity**. Please note this is **not an assessment of individual organisations within the ICS but of the system itself**. It has been based on engagement with stakeholders and relevant documents provided to us. The current state rankings are highlighted below:

	1	2	3	4	5
Leadership & Accountability	Individual partners drive data transformation in line with internal priorities, with pockets of integration and collaboration	A high-level data vision exists, but no one leader or mandate to embed it, causing varied interpretations and limited benefits.	Empowered data lead appointed with a high level data strategy and funded on a project basis.	Empowered data lead who has cross-org influence and a bounded but impactful programme.	Designated data lead drives investment and change in line with agreed partnership priorities & requirements
Data Governance & Management	Poor quality data assets with misaligned standards, limit sharing & integration with no clarity around what data exists in the system	Data quality varies between partners, with pockets of excellence and examples of integrated standards and access	Up to date data catalo-gues and dictionaries, with accessible and trusted data and interoperable standards across most partners	Searchable repositories in place to operationali-se data catalogues – semantic layer simplifies use of data but limited quality issues persist.	Easily accessible data assets with auditable, searchable metadata siting above an assured, high quality dataset.
Information Governance	IG seen as a blocker to data sharing with a pervading culture of fear disincentivising engagement.	IG teams are in place and consulted on an ad-hoc basis, often later than optimal and seen as a QA function.	IG teams are consulted and support innovation efforts, but certain IG challenges persist & are not tackled due to lack of buy-in	IG team has a strong problem solving ethos and regularly consulted with suite of tools to share templates and upskill wider staff.	IG is a core capability, embedded in strategic decisions and well resourced - supporting an upskilled, IG literate workforce.
Tools & Technology	Little oversight of tech arch resulting in duplication, little to no interoperability, and systems that do not meet basic user needs.	Technology meets core direct care needs but is inflexible, fostering work arounds & siloed practi-ces due to limited scope of PHM capabilities.	Centralised partially interoperable tools support a single source of truth, albeit with additional inputs and ad-hoc use of tools.	Use of integrated cloud tools, with intuitive UI for systems, with analytical tools embedded into decision workflows and mature interoperability.	Cloud tech allows for cost effective, scalable, tools to be used on fully interoperable data and systems for advanced analytics & evaluation

Assessing the current level of maturity

BLMK Integrated Care System

	1	2	3	4	5
Reporting & Analytics	Analysis is largely descriptive and not widely trusted by service leads. Limited self-service capabilities available.	Analysis generates basic insights, with pockets of more advanced analytics, but still a highly manual process.	Established data reports are automatically refreshed, with emerging data science capabilities embedded.	Intuitive, visualised reports and insights are readily available, with advanced analytics support called upon, resources permitting.	Reports and analytics are automated, with standardised QA and advanced data science insights regularly embedded.
Skills & Talent Management	Data skills gaps are pre-valent, with resourcing challenges for BaU activities and ineffective knowledge sharing & duplication of roles.	Data skills under pressure from BaU limits ability to drive strategic initiatives. Emerging use of visualis-ation tools but limited advanced analytics	Some co-ordination across data roles with strategic reviews of emerging skills gaps. Many training opps for those in data roles.	Clear data roles and recommended training in place, with well resourced teams and increasing data literacy for wider workforce.	All staff are confident using data and have undertaken role-based data training. Resource and succession plans for the data profession.
Data Culture	Data is not seen as fundamental to decision making or strategic planning. Limited discussion of data across organisation.	Data is used to support instinct, with emerging grassroots activity to improve uses & access to insights, for proactive care use in particular	Data consistently informs commissioning, care and PHM, although support and coaching is required to support translation of insight into actions	Data is key to strategic planning & day-to-day decisions but some struggle to embed into decision making, but do use for performance	Data is championed as a critical enabler by all – with a culture of accountability and data literacy.
Embracing Innovation	Emerging awareness of pioneering tools, technologies and techniques, but little appetite to explore across organisation.	Pockets of innovative activity occurring at a grassroots level, with senior support, but a lack of committed funding and resource.	Senior sponsored, prioritised analytics roadmap, with dedicated funding for innovation investment.	A dedicated data science unit with strong investment in 'future-proofing' and a leader with a mandate to change.	Data unit manages pipeline of innovative use cases and implementation of advanced tools e.g. NLP and automation as BaU.

What is the impact of this level of current state maturity?

Integrated Care System

Outlined below are a few indicative examples of the types of **challenges that can arise from the ICS' current approach to data and insight**. The personas set out on this page will return in deliverables, to **explore the impact of the new strategy**.

Persona	What is the current experience of people in this role?
 Resident	"I am always giving the same details about myself when I access NHS and Local Authority services. Clinicians have a limited view of my longitudinal care record, and often times clinicians outside of primary care can't see my care record."
 Population Health Manager	"I do not have access to comprehensive, integrated datasets to inform robust risk stratification, and cannot assess what interventions are most effective for specific risk cohorts. Overall, I have an inconsistent view of the multi-agency needs, demographics and risk profiles of specific wards and localities"
 Care Practitioner	"I regularly lack of a longitudinal view of my patient's data not held in current shared care records or that weren't digitised. I have very limited capacity to get information about my patients from other services to understand the full picture of their health and wellbeing. I need too many logins to multiple systems, crating wasted manual effort when pressed for time"

What is the impact of this level of current state maturity?

Integrated Care System

Outlined below are a few indicative examples of the types of **challenges that can arise from the ICS' current approach to data and insight**. The personas set out on this page will return in deliverables, to **explore the impact of the new strategy**.

Example role ('persona')	What is the current experience of people in this role?
 Care Commissioner	"I do not have the tools and dashboards that would map and forecast where supply is not meeting demand at Place level. I am unable to find and predict service bottlenecks in the system before reaching crisis levels. Lack of access to granular data prevents me from truly evaluating the performance of commissioned services."
 BI Analyst	"Managing business as usual reporting requirements for my internal organisation is already keeping me at capacity, and so I will struggle with any additional ICS requirements. Data quality is inconsistent and often needs manual cleansing before I can develop reports. Insight products must all be manually refreshed and sent directly to users rather than updating automatically."
 IG Lead	"Because of increased demands for DSAs and IG consultation in my organisation, I often lack capacity due to limited organisational resource internally. Tools such as the Information Sharing Gateway aren't used consistently across the ICS, leading to more manual sign-off processes, delays and potential for inconsistencies"

BLMK ICS' Core Challenges

BLMK Integrated Care System

Within the ICS structure, **there is evidence of both strong assets and a collective commitment to the direction of travel** needed to enable the achievement of the Digital Ambition. However, it is clear that there are **three core issues that must be addressed** in order to progress towards implementing the data strategy, which are unpacked in the Future State and delivery Roadmap.

We are here…	Buy-in for the ICS across partners at strategic and tactical levels is inconsistent – with uncertainty around the beneficial impacts it will drive.	There is no joined-up data, digital and technology strategy in place with a clear future state that partners are committed to.	There has been limited progress in identifying, integrating and analysing social care data with health data, particularly for PHM and secondary use.
We want to be here…	Partner organisations in the ICS are clear on their roles, and how the system benefits both them and their Resident populations.	Organisations are confident on what data they are providing to who, how they are pipelining data, and that data is stored securely without duplication.	There is a clear path forward to bring social care, other Local Authority and wider datasets for primary care and secondary use.

Future State

Design Principles for the Future State

BLMK Integrated Care System

Stakeholders **from multi-disciplinary teams** across the ICS were asked to contribute key design principles during the engagement for the data strategy. These **co-designed principles** helped to establish **the values on which data is shared and insight is utilised across the ICS**, and should be returned to as a **set of criteria** to use while working together to **achieve common goals**.

Decision-making should happen **as close to the resident as possible.**

Data should **drive co-articulated outcomes for residents,** with inter-connected evaluation metrics through the ICS tiers

Residents must be **empowered** to **manage their own self care** by having access to their data.

Data should be resident-centric, consistent and accessible – acknowledging **residents don't see ICS boundaries.**

Data should be seen as **a key enabler to support the reduction of inequality**.

IG transformation should be driven by collective senior mandate, to empower local teams to agree solutions.

Duplication of data across layers of the ICS should be **avoided where possible to mitigate risks and complexity.**

Interoperable **data standards** and a commitment to improving **data quality** must be woven in to processes and procurements.

A **data driven culture**, supported by training, collaboration and even shared resources where appropriate should underpin PHM activities.

Partners must be able to move at different speeds, without creating obstacles to independent innovation

This will ensure;

- ✓ Residents receive the highest quality care at any touch-point with health and wellbeing services.
- ✓ Partners in the ICS have a comprehensive and single view of the resident.
- ✓ Staff have access to the tools and insights required to embed a data driven culture.
- ✓ Colleagues across all levels of the ICS are clear on how they are contributing to Place and whole-system goals.
- ✓ Data is managed and governed effectively, and can be used efficiently to drive decisions.

Assessing the current level of maturity

BLMK Integrated Care System

Our discussions with stakeholders highlighted a **clear appetite** to advance the ICS' data and insights maturity. Outlined below are **maturity rankings** for the future state that reflects the desired future state articulated during stakeholder engagement **achievable given a steady direction of travel** from the current state **within a period of 18 months** after signing off the data strategy.

Yellow = Current State
Orange = Future State

	1	2	3	4	5
Leadership & Accountability	Individual partners drive data transformation in line with internal priorities, with pockets of integration and collaboration	A high-level data vision exists, but no one leader or mandate to embed it, causing varied interpretations and limited benefits.	Empowered data lead appointed with a high level data strategy and funded on a project basis.	Empowered data lead who has cross-org influence and a bounded but impactful programme.	Designated data lead drives investment and change in line with agreed partnership priorities & requirements
Data Governance & Management	Poor quality data assets with misaligned standards, limit sharing & integration with no clarity around what data exists in the system	Data quality varies between partners, with pockets of excellence and examples of integrated standards and access	Up to date data catalo-gues and dictionaries, with accessible and trusted data and interoperable standards across most partners	Searchable repositories in place to operational-se data catalogues – semantic layer simplifies use of data but limited quality issues persist.	Easily accessible data assets with auditable, searchable metadata siting above an assured, high quality dataset.
Information Governance	IG seen as a blocker to data sharing with a pervading culture of fear disincentivising engagement.	IG teams are in place and consulted on an ad-hoc basis, often later than optimal and seen as a QA function.	IG teams are consulted and support innovation efforts, but certain IG challenges persist & are not tackled due to lack of buy-in	IG team has a strong problem solving ethos and regularly consulted with suite of tools to share templates and upskill wider staff.	IG is a core capability, embedded in strategic decisions and well resourced - supporting an upskilled, IG literate workforce.
Tools & Technology	Little oversight of tech arch resulting in duplication, little to no interoperability, and systems that do not meet basic user needs.	Technology meets core direct care needs but is inflexible, fostering & siloed practices due to limited scope of PHM capabilities.	Centralised partially interoperable tools support a single source of truth, albeit with additional inputs and ad-hoc use of tools.	Use of integrated cloud tools, with intuitive UI for systems, with analytical tools embedded into decision workflows and mature interoperability.	Cloud tech allows for cost effective, scalable, tools to be used on fully interoperable data and systems for advanced analytics & evaluation

Assessing the current level of maturity

BLMK Integrated Care System

Yellow = Current State
Orange = Future State

	1	2	3	4	5
Reporting & Analytics	Analysis is largely descriptive and not widely trusted by service leads. Limited self-service capabilities available.	Analysis generates basic insights, with pockets of more advanced analytics, but still a highly manual process.	Established data reports are automatically refreshed, with emerging data science capabilities embedded.	Intuitive, visualised reports and insights are readily available, with advanced analytics support called upon, resources permitting.	Reports and analytics are automated, with standardised QA and advanced data science insights regularly embedded.
Skills & Talent Management	Data skills gaps are pre-valent, with resourcing challenges for BaU activities and ineffective knowledge sharing & duplication of roles.	Data skills under pressure from BaU limits ability to drive strategic initiatives. Emerging use of visualis-ation tools but limited advanced analytics	Some co-ordination across data roles with strategic reviews of emerging skills gaps. Many training opps for those in data roles.	Clear data roles and recommended training in place, with well resourced teams and increasing data literacy for wider workforce.	All relevant staff are confident using data and have role-based data training. Resource and succession plans for the data profession.
Data Culture	Data is not seen as fundamental to decision making or strategic planning. Limited discussion of data across organisation.	Data is used to support instinct, with emerging grassroots activity to improve uses & access to insights, for proactive care use in particular	Data consistently informs commissioning, care and PHM, although support and coaching is required to support translation of insight into actions	Data is key to strategic planning & day-to-day decisions but some struggle to embed into decision making, but do use for performance	Data is championed as a critical enabler by all – with a culture of accountability and data literacy.
Embracing Innovation	Emerging awareness of pioneering tools, technologies and techniques, but little appetite to explore across organisation.	Pockets of innovative activity occurring at a grassroots level, with senior support, but a lack of committed funding and resource.	Senior sponsored, prioritised analytics roadmap, with dedicated funding for innovation investment.	A dedicated data science unit with strong investment in 'future-proofing' and a leader with a mandate to change.	Data unit manages pipeline of innovative use cases and implementation of advanced tools e.g. NLP and automation as BaU.

Subsidiarity of Evaluation

BLMK Integrated Care System

The effective, **integrated evaluation of decisions, interventions and outcomes** is at the heart of a successful, data-driven ICS – and another example where the principle of subsidiarity should be applied.

Aligning with the ICS Design Frameworks third principle around **a collective model of accountability**, the ICS should have a **central thread of evaluating between the ICS partner tiers**, reflecting the specific dynamics of their commissioning or delivery role, and the health, wellbeing or societal focus of their interventions.

	Evaluation Priorities	Examples
PCN	Providing tools to evaluate and benchmark against key operational delivery KPIs to **assess throughput and the effectiveness of clinical decisions**.	Performance and demand KPIs, along with aggregated outcomes of prescribed services,
Place	Evaluating the effective **delivery of interventions on priority cohorts**, refined to reflect local variances of need and relevance.	Balanced scorecard of health and care outcomes, service delivery metrics and qualitative staff feedback.
Care Alliance	Evaluating the **health outcomes** of the population as a whole, as well as impacts of interventions on priority cohorts and associated cost savings.	Cohort presentation at acute hospital post intervention, prevalence of chronic diseases, effectiveness of preventative interventions against null hypothesis.
ICS	Evaluating expected **societal outcomes** resulting from a healthy population – tied to interventions and aggregated, record level outcomes where possible.	Economic engagement, social deprivation, crime and anti-social behaviour, worklessness

Resident

Service level engagement and **outcomes at a resident level should act as the central thread** to drive effective evaluation – with operational outcomes aggregated up through initial presentation of demand, through preventative services and health outcomes **to arrive at a societal view of population wellbeing.**

This evidences the wider benefits of PHM approaches and underpins future discussions around funding.

Articulating the future state

BLMK Integrated Care System

Outlined below are a set of **key capabilities** that will characterise BLMK ICS' future approach to data and insights. The assessment is based on interviews and workshops with ICS stakeholders. Drawing on Agilisys's bespoke Data Maturity Framework, these key **capabilities reflect the changes and advancements made** to the ICS' current state capabilities and approach.

Leadership & Accountability

- An ICS Data, Digital and Tech group (DDaT) in place to be **accountable for aligning and delivering strategic commitments** for collaborative ICS initiatives.
- A strategic leader for data is designated and **responsible for delivering ICS data programmes & capabilities**, set by DDaT.
- A joint data and PHM operating model, with suitably **resourced delivery capability** – to implement both strategies.
- Clear **delineation of responsibilities and decision making between ICS partners** with respect to PHM prioritisation, interventions and outcome evaluation.
- **Opportunities for collaboration with neighbouring partners and academics** outside the ICS with respect to PHM formally identified and committed to.

Information Governance

- Top **down strategic commitments on data sharing,** through a Data Charter, to create a **mandate for change** and **accelerate IG discussions** at project level.
- **Co-designed, standardised IG templates shared across organisations**, particularly to support the transition for data sharing after COPI agreements end.
- **Communication to Residents about how their data is used**, and Residents have the **ability to opt-out** of sharing their data.
- A programme **to improve adoption and training to make use of tools** such as the Information Sharing Gateway to streamline IG processes.

Data Governance & Management

- **Health and social care data shared** by ICS partners, is pseudonymised by a common key, and linked to build a **holistic single view of the health and well-being of the Resident**. Wider determinants data, such as housing data or locality indices, expands this view.
- Data sharing **supports direct care and secondary uses**, enabled by **rigorous information governance** assurance **and role based access** controls.
- Accessible, understandable, and up to date **data catalogues give partners sight** of system data assets, and a data translation (semantic) layer supports system-wide interoperability of standards.
- Quality of data used for PHM **actively monitored, cleansed, and reported on**, with a view to the impact on decisions and opportunity cost.

Reporting & Analytics

- **Self-service dashboards** use timely data, **alleviating pressure on BI Analysts** and enable production of greater **value-adding analytics**.
- A **shared data science capability supporting the development of advanced analytics** for PHM purposes in a cost effective way.
- An **integrated outcomes framework embedded** across each tier of the ICS should be put in place to **reliably evaluate the ICS's aggregated impact.**
- PHM activities supported by **the mature usage** of accessible risk-stratification tools and population segmentation methods, **informing decisions at place and shared across teams** where appropriate in line with IG requirements.

Articulating the future state

BLMK Integrated Care System

Data Culture

- Partner organisations in the ICS **understand the value of a whole-system approach to data** that underpins **place-based priorities and decision making.**
- **Translation of data and insight** requirement conversations between clinicians and analysts is a **core capability**, through business data champions or upskilled analysts.
- Support **for evaluating programmes and interventions is provided at relevant ICS level** to ensure the effectiveness of multi-agency and PHM interventions to **build consistency and support the shift** towards prevention.
- Supported **knowledge sharing communities** between partners' analytics functions, around deployment of advanced analytics initiatives, **to upskill staff** on the 'art of the possible.'

Embracing Innovation

- New approaches to PHM or care pathway design, **underpinned by holistic evaluation of multi-agency outcomes** – to inform future decisions around service improvement and justifying partner investment in new processes and approaches.
- PHM activities are **supported by the mature usage of accessible risk-stratification tools and methods**, which are regularly informing decisions at place.
- PHM **analytics platforms and capabilities** explore scenario modelling, root cause analysis etc., providing a **clear case on the use of the insights, to drive prioritisation**.
- **Develop Data Ethics forum and framework** around use of data, particularly relating to AI and secondary use, to provide credible assurances to residents

Skills & Talent Management

- **Data literacy training programmes** for non-technical staff, to encourage **effective adoption of new tools** and availability of insights to make decisions.
- Building on the ICS data skills assessment, **clear capacity and succession planning of PHM based skills** across partners to align hiring and reduce inter-ICS competition.
- A **resource requirements review** of ICS data and technology initiatives to **map capacity requirements** between internal BAU activities and ICS to **inform future funding and shared capacity discussions**.
- A **shared data science capability** at ICS level to guide and deploy applications of advanced analytics and upskill local analyst communities in a cost effective way

Tools & Technology

- Technology roadmap to **align capabilities of Partner organisations with ICS requirements** and commitments clearly articulated its specification.
- **Care records are robust**, with a comprehensive overview of residents' longitudinal care record and close to real-time data **accessible to clinicians for direct care decisions**.
- Partner organisations, including local authorities, are **migrated and connected to the Health and Social Care Network** (HSCN).
- Residents' portal connected to care records enabling both **oversight of individuals' own healthcare data alongside self-management of data** and data privacy.
- **Persisted datasets**, likely within BI & A platform, **drive advanced analytics and PHM decision making** and strategy development.

Enabling Technical Capabilities and Infrastructure

BLMK Integrated Care System

The enabling technology to deliver the four purposes that underpin the objectives of this strategy will each require a **variety of capabilities**, some shared across multiple purposes and others specific to one**. A technology roadmap across partners will be needed** to articulate the long term commitments to the systems and underlying tools and capabilities required to collaborate across organisations.

Below are a set of **indicative capabilities and tech enabled features** that the technology roadmap could consider:

Infrastructural

- **Open Data Observatory**/ portal, with publicly published metrics on the ICS performance, costs and outcomes.
- **Resident portal** to surface live resident data and care record, with API connectivity with external market health apps.

Data Governance

- Data Quality (**DQ) profiling tools**, enabled by AI, to provide fast initial assessment of data assets and ongoing monitoring.
- **DQ remediation** tools to cleanse, de-duplicate, transform, and validate data at source and during ingestion into BI&A platform.
- Searchable **Data Catalogue** to provide sight of existing data assets across the system, to inform use case collaboration.

Identity and Access Management

- **Role Based Access** tools to embed secure information governance controls into security access for data and systems.
- **Row Level Security** to allow individuals to access the same dataset but only see data points relevant to their job.

Security

- **Single sign-on** across systems to reduce the need for multiple logins and streamline access to key insight products and records.
- **Multi-factor Authentication** to provide enhanced security for login accounts for relevant tools, reports and systems
- Clear policies and access restrictions for those who "**Bring Your Own Device**" (BYOD)
- **Privacy Enhancing Technologies** such as pseudonymisation engines and synthetic datasets.

Data matching and indexing

- **Master data management** integration engine(s) to join up data sets where no common identifier is in place.
- Residents **Index development** to simplify integration of data across systems where privacy and security are assured.

Agile Solution Development

- **Low Code Automation** to accelerate common workflows and improve productivity of ICS partner staff
- **Low Code Application Development** to provide easily amendable, bespoke apps that can join up data, workflows and decision making without significant investment

Data Pipelining and Connectivity

- **Pipeline Building Capabilities** to underpin automation of datasets into data warehouses – currently through the BI&A platform
- **Connectivity enablers** e.g. API, Web Services, Batch Scripts to provide automated export to external partners and portals.

Machine Learning and AI Stuff

- Dev, Test and Prod Environment for **ML/ AI product development.**
- **Sandbox environment** for ML/ AI experimentation.
- **Synthetic data** to provide useable data to analyse based on dataset characteristics, without risking residents' privacy.
- **Data Lake storage** for unstructured and archived data.
- **Unstructured data mining** tools to create metadata or translate unstructured data into useable and analysable information.

Impact of Technical Capabilities

BLMK Integrated Care System

Understanding the **impact of what the enabling technological infrastructure means for residents and end-users** is key to making the case for change. The table below articulates how a **selection of these underlying capabilities underpin one or more of the four purposes** that make up the key objectives of this strategy.

	Direct Care	Case Identification	Resident Ownership	System Redesign
Integrated data on interventions, outcomes and demographic	✓	✓	✓	✓
Interoperable data standards with **semantic translation layer**	✓	✓	✓	✓
System-wide, current **data catalogues** provide sight of data assets	✓	✓	✓	✓
Role based access to bespoke ready made views	✓		✓	
Access to read-only, **real-time data** from source systems	✓		✓	
Persisted, longitudinal, timely data sets for insight and analytics		✓		✓
Access to **self-service** analytics or tooling to present data	✓	✓	✓	
AI assisted **data quality assessment and remediation** tools		✓		✓
Pseudonymisation engines and **anonymisation tools**				✓
Machine learning and **advanced analytics platform**				✓

Persona	My pains in the current state are…	My expected gains in the future state are…
 **Resident**	I am always giving the same details about myself when I access NHS and Local Authority services. Clinicians have a limited view of my longitudinal care record, and often times clinicians outside of primary care can't see my care record.	I spend less time at appointments repeating the same information and more time getting value from my clinician about my care. They have a 'single view' of my past and future appointments, chronic conditions, allergies, treatments, prescriptions, lab results and vaccinations. I will have access to this, which helps me manage my own care.
 **Population Health Manager**	I do not have access to comprehensive, integrated datasets to inform robust risk stratification, and cannot assess what interventions are most effective for specific risk cohorts. Overall, I have an inconsistent view of the multi-agency needs, demographics and risk profiles of specific wards and localities	Using advanced analytics tools, I am able to predict future demand and priorities for specific high risk patients. I have the intelligence to know which cohorts to intervene earlier in order to prevent the most damaging and costly outcomes for residents. In future, I can use this to set PHM priorities that maximise impact on clinical outcomes and reduce 'reactive' care.
 **Care Practitioner**	I regularly lack of a longitudinal view of my patient's data not held in current shared care records or that weren't digitised. I have very limited capacity to get information about my patients from other services to understand the full picture of their health and wellbeing. I need too many logins to multiple systems, crating wasted manual effort when pressed for time	I have the ability to understand the whole context of my patient's life and lifestyle, and how these are impacting their health and wellbeing when they come for appointments. I have access to the full breadth of test results and scans my patient has completed, and am not repeating or duplicating efforts from hospital visits. I am able to coordinate care with other practitioners in my patient's care network.
 **Care Commissioner**	I do not have the tools and dashboards that would map and forecast where supply is not meeting demand at Place level. I am unable to find and predict service bottlenecks in the system before reaching crisis levels. Lack of access to granular data prevents me from truly evaluating the performance of commissioned services.	I have up-to-the-minute dashboards that provide insight on the number of residents interacting with care at any given moment. I have the ability to forecast demand using advanced models based on previous trends and live data from providers. I use geographical heat-mapping of GP referrals to direct specific care and treatments.
 **BI Analyst**	Managing business as usual reporting requirements for my internal organisation is already keeping me at capacity, and so I will struggle with any additional ICS requirements. Data quality is inconsistent and often needs manual cleansing before I can develop reports. Insight products must all be manually refreshed and sent directly to users rather than updating automatically.	Because BaU reports are automated, I have time to spend on value adding analyses that support strategic decision making across the ICS. I have capacity to build BI tools that enable colleagues to self-service their reports and support access to advanced analytics in the organisation. Access to a shared ICS data science capability helps me to develop further advanced analytics models and tools for my organisation.
 **Information Governance Lead**	Because of increased demands for DSAs and IG consultation in my organisation, I often lack capacity due to limited organisational resource internally. Tools such as the Information Sharing Gateway are not used consistently across the ICS, leading to more manual sign-off processes, delays and potential for inconsistencies	I have access to a suite of templates to guide DPIA, DSA and IG monitoring for ICS data agreements to embed consistency and streamline their completion. This has given back capacity which I can focus on adding value to new projects and initiatives that require my review. I am regularly enabling safe data sharing practices in my organisation and unlocking greater innovation between and across providers in the ICS.

What will be the impact of the future state maturity?

BLMK Integrated Care System

Persona

I am a… BLMK Resident

I live in… Central Bedfordshire

My age is… 71

I need… Joined up primary, secondary and social prescribing services and the ability to see my own information on a Patient Portal

So that… When I attend an appointment or A&E, I and care colleagues have a clear picture of my history of care

Profile

My current pains are…

- Offering the same details about myself when I access multiple NHS and Local Authority services
- Limited/fragmented view of my longitudinal care record
- Lack of clarity on who else sees my care record outside of primary care professionals
- I don't know how to manage my consent and permissions for data sharing

My expected benefits are…

- Less time at appointments repeating the same basic information to multiple people and more time getting value from my clinician or caseworker about my care
- Higher quality interventions informed by a 'single view' of every touch point I've had with the NHS or Local Authority
- Ability to access information about my past and future appointments, chronic conditions, allergies, treatments, prescriptions, lab results and vaccinations
- More independence to activate and manage my own self-care


Resident


Population Health Manager


Care Practitioner


Care Commissioner


BI Analyst


Information Governance Lead

What will be the impact of the future state maturity?

BLMK Integrated Care System

Persona

I am a… Population Health Manager

I work in… BLMK ICs

I need… In-depth, aggregate population-level information, including social care data, and an outcomes framework in line with the priorities of Place/ICS

So that… I can monitor progress on clinical health outcomes and support better care coordination at CCG

Profile

My current pains are…

- Lack of access to comprehensive, integrated datasets to inform robust risk stratification
- Little evaluation to assess what interventions are most effective for specific risk cohorts
- An inconsistent view of the multi-agency needs, demographics and risk profiles of specific wards and localities

My expected benefits are…

- Predicting future demand and priorities for specific high risk patients
- Intervening earlier to prevent the most damaging and costly outcomes for residents
- Unlocking greater access to care and resources to patients with higher risk levels
- Setting PHM priorities that maximise impact on clinical outcomes and reduce 'reactive' care
- Better understanding of specific interventions, aligned the PHM priorities, that are most effective in helping residents to drive care planning and budget forecasting


Resident


Population Health Manager


Care Practitioner


Care Commissioner


BI Analyst


Information Governance Lead

What will be the impact of the future state maturity?

BLMK Integrated Care System

Persona

I am a… Care Practitioner

I work in… GP Practice in Milton Keynes

I need… A comprehensive picture of my patients' care, inclusive of secondary and social care data and simple, actionable information about priority cohorts that are at risk.

So that… I can deliver high quality primary care to Residents and support a healthier local population.

Profile

My current pains are…

- Lack of a longitudinal view of the resident for data not held in current shared care records
- Very limited capacity to get information about my patients from other services
- Too many logins to multiple systems drive wasted manual effort when already pressed for time

My expected benefits are…

- Ability to understand the whole context of my patient's life and lifestyle, and how these are impacting their health and wellbeing
- Access to the full breadth of test results and scans my patient has completed, not repeating or duplicating efforts
- Coordinating care with other care practitioners in my patient's care network where possible in order to support them holistically


Resident


Population Health Manager


Care Practitioner

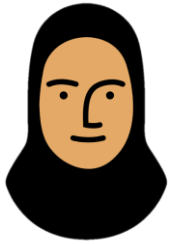

Care Commissioner


BI Analyst


Information Governance Lead

What will be the impact of the future state maturity?

BLMK Integrated Care System



Persona

I am a… Care Commissioner

I work in… BLMK CCG

I need… BLMK-wide datasets from acute, community, mental health and other providers and insights on what local services are already in place.

So that… I can ensure that care providers in the local area are meeting resident need, or adapt the supply to meet demand across the ICS footprint.

Profile

My current pains are…

- Lack of tools and dashboards to map and forecast where supply is not meeting demand.
- Inability to find and predict service bottlenecks in the system before reaching crisis levels
- Lack of access to granular data to evaluate the performance of commissioned services and contracts

My expected benefits are…

- Up-to-the-minute dashboards that provide insight on the number of residents interacting with care at any given moment, i.e. number of patients at A&E, number of patients on waiting lists for specific services.
- Ability to forecast demand using advanced models based on previous trends and live data from providers.
- Geographical heat-mapping of GP referrals for specific care and treatments.


Resident


Population Health Manager


Care Practitioner


Care Commissioner


BI Analyst


Information Governance Lead

What will be the impact of the future state maturity?

BLMK Integrated Care System

Persona

I am a… BI Analyst

I work in… a Community Care Provider

I need… Access to up to date quality data that I can use across systems, as well as training on advanced analytics methods and data visualisation tools.

So that… I can deliver operational and strategic insight to improve outcomes for Residents.

Profile

My current pains are…

- Managing business as usual reporting requirements for my internal organisation is already keeping me at capacity, and so I will struggle with any additional ICS requirements
- Data quality is inconsistent and often needs manual cleansing before I can develop reports
- Insight products must all be manually refreshed and sent directly to users rather than updating automatically

My expected benefits are…

- Automating BaU reports and having time to spend on value adding analyses that support strategic decision making
- Building dashboards and other BI tools that enable colleagues to self-service their reports and supporting access to advanced analytics in the organisation
- Building on Excel and coding skills to learn Python and other modern coding languages
- Access to a shared ICS data science capability to develop advanced analytics models and tools, teach me how to maintain them, and upskill me more generally


Resident


Population Health Manager


Care Practitioner

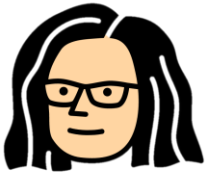

Care Commissioner


BI Analyst


Information Governance Lead

What will be the impact of the future state maturity?

BLMK Integrated Care System



Persona

I am a… Information Governance Lead

I work in… a Hospital Trust

I need… Earlier oversight of projects that require DPIAs or DSAs, especially if they have complex data requirements. I also need access to a bank of ICS standardised templates that can reduce workload and duplicated efforts,

So that… I can support innovative data-driven initiatives between organisations in the ICS that will improve care for residents.

Profile

My current pains are…

- Lack of capacity due to limited organisational resource and higher demand for IG involvement
- Tools such as the Information Sharing Gateway aren't used consistently across the ICS, leading to more manual sign-off processes, delays and potential for inconsistencies

My expected benefits are…

- Enabling safe data sharing practices in my organisation and unlocking greater innovation between and across providers in the ICS
- A clear senior-led mandate on strategic intentions to share data, to add impetus to discussions
- Ability to plan capacity around new projects and initiatives that require my review
- A suit of templates to guide DPIA, DSA and IG monitoring for ICS data agreements to embed consistency and streamline their completion


Resident


Population Health Manager


Care Practitioner


Care Commissioner


BI Analyst


Information Governance Lead

The role of the Data Strategy for the Future State

BLMK Integrated Care System

The data strategy has potential to realise the future state of the BLMK ICS. To that end, we have outlined below the **core benefits that the data strategy will unlock** and enable the ICS to achieve its ambition of becoming data-led.

A common language.

The data will unlock the foundation for interoperable data standards by sharing and implementing best practice while providing a semantic layer to translate data. This foundation will also be built on the common principle of privacy by default, shared by all providers across the footprint.

Integrated Transformation.

The data strategy will unlock a collaborative, multi-agency approach to problem solving by enabling the delivery of integrated tools for multiple users. This will enable new ways of working across the system ignoring organisational boundaries through multi-disciplinary teams having access to richer insights, real-time integrated tools, and an evidence base to track outcomes.

A new era for insights.

The data strategy will unlock advanced analytics and predictive modelling to streamline reporting and analytics and embed insights into BAU processes and decisions. In being able to self-serve reports or gain access to granular insights, strategic and clinical decision making will be more informed than ever before.

Supporting resident outcomes.

The data strategy will unlock the exploration of impacts from integrated interventions captured by different ICS partners. Equally, by giving them access to their own health and care record, residents will have greater insight to inform their own lifestyle choices.

What will be different in future?

BLMK Integrated Care System

The data strategy has potential to realise the future state of the BLMK ICS. To that end, we have outlined below the **core benefits that the data strategy will unlock** and enable the ICS to achieve its ambition of becoming data-led.

Single version of the truth

Developing the integration capabilities for direct care and secondary use ensures all partners are making decisions from the same data, embedding transparency across joint decisions

Embedding evaluation in commissioning

Tracking aggregated interventions and outcomes can transform commissioning and performance management by identifying what works best and developing bespoke pathways for smaller cohorts

Feeding curiosity – understanding places

Readily available data can expedite delivery of first level insights such as place profiles, which in turn create the lines of enquiry to fully explore the drivers of outcomes and design new use cases

Analyst productivity

Automated data ingestion, self-serve dashboards, and minimised data cleansing creates capacity for analysts to delve deeper and explore data, to provide more valuable interpretation of outcomes

Fostering data literacy

Improved access to insights through self-service dashboards, granular evaluation and streamlined place profiles puts data in the hands of everyone and facilitates a cultural shift across the system

Shifting from hindsight to insight

With more trustworthy, integrated and longitudinal data, analysts can move away from historical and descriptive outputs towards more predictive and prescriptive insights to support decision making

Privacy by design

Pseudonymisation, role based access, multi-factor authentication and other privacy enhancing technologies ensure data is shared securely and only identifiable when directly benefiting residents

Modular growth with quick returns

The full value of the data platform cannot be delivered overnight, however investment in capacity to speed up ingestion of key data can deliver quick win use cases while iteratively growing the asset

Future capabilities and benefits: Direct Care

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Access real-time, integrated data to contextualise and improve decisions

Accessing resident care histories in a curated, role-relevant view, saves time and lives – enabling staff to:

- Right data at the right time, supports smarter, more personalised care
- Reducing in the risk of interventions worsening other unknown conditions
- Spend time on more value adding discussions and explorations with residents at point of care.

Integrating and automating workflows and providing live care notifications

Joined up data can act as the foundation for joined up care as multi-agency pathways become clearer, enabling:

- Real-time notifications for clinicians regarding other clinical touchpoints including attendances/admittances to A&E
- Automated patient reminders to book check-ups or jab appointments, or to attend specific appointments
- Ability to integrate AI-supported decision models that embed best practice, create capacity for clinicians and improve outcomes
- Greater adoption of IoT devices and wearables into residentt monitoring and preventative support

Ability to undertake shared care planning and preparation

Real-time view and a holistic understanding of resident history and needs can help to:

- Inform which specialists should be included in integrated care planning, supporting scheduling and reducing delays
  - Which could be further enhanced by AI-assisted decision making suggestions
- Minimise preparation for multi-disciplinary teams to bring together case files and notes

Underpinning an improved resident experience

Access to integrated datasets can improve resident experience as well as outcomes, specifically through:

- Only needing to provide basic information such as name, address etc once, rather than repeatedly for different systems
- Reduced duplication of assessment questions or even tests as secure access is provided based on staff role and need.

Direct Care, Care Coordination and Self Care

Future capabilities and benefits: Resident Self Care

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Supporting self-activation and ownership of resident care

We as a system should maximise residents' ability to own and manage their own care, with better access to data enabling:

- Greater understanding of available services and support, filtered based on resident need and risks
- Self-managing care linkages across health and care services
- Self-directed access to peer support or social prescribing
- Practicing and adopting specific behaviours which are central to managing their condition

Simplifying management of consent and monitoring of privacy

Residents should rightly have greater control over how their data is used, with a joined up approach allowing:

- Less fragmented requests for data sharing for direct care, targeted support and research purposes
- Clear sight of how data has been accessed, who it has been shared with
- Simplifying data access and management of permissions for family caregivers

Supporting Resident Self care

A digital channel for resident engagement

Digital channels are increasingly expected as a default – and as data and support channels are integrated, so too can the approach to managing and prompting engagement:

- Prompt and alert based booking notifications based on demography, risk or need – reducing frequency of those not engaging with the system
- Clear integrations and surfacing in existing digital channels such as NHS app or mobile health apps

Driving improvements in underlying data quality

Greater sight of, and engagement with, their data will enable residents to check and refine data – which is fundamental to:

- Reducing data errors and inconsistencies across all of the ICS partners' systems
- Ensuring clinicians have the best information to make the right decision
- Reducing the need for manual and duplicative questions and assessments at each touch point – maximising value of contact with resident

Future capabilities and benefits: Case identification

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

More precise risk stratification with holistic, integrated data

Comprehensive, accessible, multi-agency data embedded in to a BaU tool can transform cohort selection, improving case identification by:

- Identifying those at risk but may be disengaged from the system and would otherwise fall through the system
- Improving precision, reducing false positives and enabling a more personalised care pathway
- Ability to plan services around the greatest need and greatest future demand to manage delivery capacity
- Applying understanding of interdependencies between conditions and complex needs to test new approaches and interventions

Case Identification and Proactive Care Coordination

Enabling the objectives of the prevention agenda

New tools and approach will enable ICS partners to more easily realise the benefits of the prevention agenda through:

- Earlier identification than previously possible, providing MDTs with actionable insights to effectively triage and support
- Reducing most damaging and costly outcomes such as unplanned admissions to acute settings
- Enabling greater independence and quality of life for residents, by living longer and healthier lives

Enabling precise interventions to address strategic objectives and key cohorts

A step change in approach, creating actionable insights to support priority groups collectively, as opposed to relying on more gradual 'whole-system improvement', meaning:

- Greater ability to influence, improve and prove specific strategic outcomes
- Greater return on investment and societal impact for personalised care interventions
- Faster realisation of beneficial outcomes for those most at risk or with the most damaging outcomes

Future capabilities and benefits: System Re-Design

BLMK Integrated Care System

The future data and insights capabilities supported by the data strategy will enable the ICS to tap into its data and unlock value-adding insights across direct care and secondary use. Outlined below are the **key capabilities and associated benefits** that a future ICS data ecosystem should seek to **deliver for residents, staff and wider society**.

Evaluating resident outcomes

Holistic data-sets will allow for comprehensive understanding of interventions and outcomes measured across each partners, to understand what combination of support maximises the overall health and wellbeing of residents, providing the:

- Evidence base for system modelling, intervention efficacy and benchmarking of success
- Evaluation of individual cohorts' precise outcomes, rather than ascribing partial impacts on demand shifts in the whole system
- Ability to compare outcomes across places where an intervention had not been implemented as a null hypothesis

Tracking cost and demand through the system

Following what actually happens from a resident perspective can give clarity to budget and care planning by helping to:

- Understand where system failures and disincentives are causing planned pathways and interventions to fall down?
- Track and predict costs during periods of high-demand (i.e. COVID and post-COVID recovery)
- Identify successful savings made ~~in~~ by managing demand for one service by investing in another

System Re-Design

Scenario modelling and strategic commissioning

With a clearer understanding of interventions' impacts on outcomes, more powerful system planning tools allow the ICS to:

- Model potential interventions and their impact on outcomes, partner demand and cost with 'what if analysis'
- Greater understanding of patterns in patient demand to inform commissioning and risk stratification
- Tools for more effective short and long term staffing in key areas of forecasted demand through capacity management

A quantitative basis for better performance management

Be it managing performance at a staff member, organisation or system level – the right tools can underpin continuous improvement initiatives by enabling:

- Better benchmarking of cost and outcomes of commissioned services for contract management
- More precise SMART objective setting and cross boundary working for staff across the ICS partnership
- Clearer basis for funding discussions and underlying business cases

Art of the possible: Future Data Opportunities

BLMK Integrated Care System

Significant progress has been made locally to **integrate acute, primary and community care data** and initial governance for adult social care data is also in place. These datasets will act as a **strong foundation for the four purposes of the data strategy**.

However, once this is successfully deployed, there will be **opportunities to go further**. In our engagement with the system, a number of these additional datasets and their applications were identified:

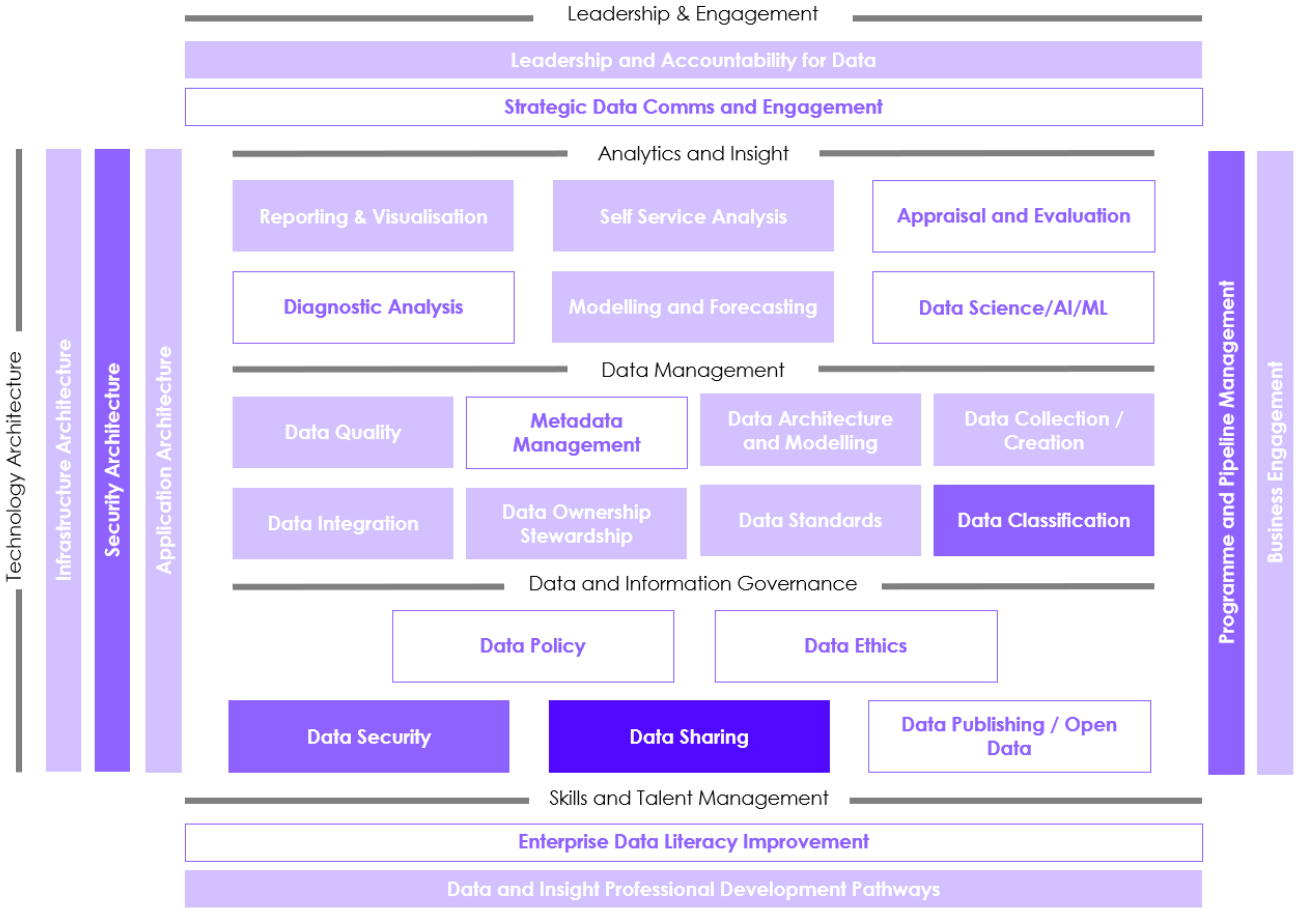
Service area	Opportunities
Housing services	Council systems (e.g. Jigsaw) holds data on historical housing support, with key PHM risk factors such as long-term or repeat homelessness and current housing status, helping to identify those who may not be well-engaged with the health system and are likely to have multiple long term health needs in future
Local Authority revenue and benefits	Indicators such as council tax relief, number of residents in the home, time at property, house tax band, and missed payments help indicate deprivation and may be correlated to system disengagement
Waste services	Supported bin-pull outs and additional collections infer risks around mobility and availability of carers – and has acted as proxies in the past, but additionality of value alongside H&SC data should be verified
Police	Data on domestic abuse call-outs, ASBOs and wider criminal justice system engagement can help identify those using the system in a disjointed way, similar to NHS Spine, supporting case identification. However these metrics can also be used to evaluate the impact of healthier outcomes on wider societal outcomes.
Environmental	Environmental Agency and potential Local Authority pollution sensors can be used to evaluate risks and impacts on health and underpin the value case for environmental interventions and their results
Educational	Testing health and wellbeing indicators against attainment, attendance, risk indicators, and free school meals can evaluate the effectiveness of interventions and capture the Return on Investment on ICS activities
Fire services	Fire prevention assessments and the opportunity to use multi-factoral assessments can help provide more granular details on fall, mobility and isolation risks to benefit case identification
DWP	Gaining information on worklessness cycles, status and prevalence alongside health information can evaluate the economic impact of better health outcomes driven in part by ICS interventions

Capability Gap Assessment

Capability Gap Assessment

Illustrated below is the current level of maturity the ICS considers itself to possess against each of the capabilities that sit beneath the eight framework domains. It should be noted that this is a snapshot view, and progress in areas such as reporting is evolving at pace. It does not suggest that some individual partners are not more mature in certain areas, but reflects how the system has developed and integrated capabilities for ICS level requirements.

This assessment is based on interviews and discussions to map current and future state capabilities to undertake the gap analysis and further developed by the Data Strategy Steering Group.



1. Does not currently exist

2. Partially exists but considerable gaps

3. Pockets of good practice but inconsistent

4. Generally good, but some variation across system

5. Very strong across the system

Prioritising the capabilities

Capability	Description
Leadership and Accountability for Data	Aims to ensure that staff have clear and understood responsibilities for data ownership, management and protection-related activities at a strategic and operational level.
Strategic Data Comms and Engagement	Focuses on two-way flow of information and effective involvement of the ICS's stakeholders to support the delivery of data-related strategic initiatives.
Reporting and Visualisation	Focuses on the development of effective, efficient reports, the presentation of information in a simple, relevant and conclusive format, and visual representation of data by the use of tools such as Power BI.
Self Service Analysis	Centres on enabling users across the ICS to analyse and gain insights from their data to perform queries and generate reports on their own, with nominal IT or data and insight support.
Appraisal and Evaluation	Allows for the advanced use of statistical and research methods to conduct original evaluation of pilots, services and projects, beginning the development of a consistent, usable evidence base for decisions.
Diagnostic Analysis	Enables deeper insight, allowing data experts to explore root causes, identify anomalies, determine causal relationships and detect patterns.
Modelling and Forecasting	Uses historic and present data to make informed estimates and uses statistics and modelling to predict the direction of future trends, which can inform service providers of how to plan the allocation of resources.
Data Science/AI/ ML	Focuses on the use of scientific methods, tools and techniques to apply knowledge and actionable insights from data and make optimised inferences and predictions, particularly in respect of large-scale datasets.
Data Quality	The condition of data is understood, prized and continuously improved, based on factors such as accuracy, completeness, consistency, reliability, relevance and timeliness.
Metadata Management	Involves understanding data relationships and establishing policies and processes that ensure information can be integrated, accessed, shared, linked, analysed and maintained to best effect.
Data Architecture and Modelling	Defines the process of discovering, analysing, representing and communicating data requirements, as well as the blueprint for managing data assets by aligning with organisational strategy.
Data Collection/Creation	Involves systematising the ongoing process of gathering and measuring information, with a focus on standardisation, consistency and future-proofing to align and optimise existing processes and approaches.
Data Integration	Refers to the process of consolidating data from different sources into a single, unified view with the ultimate goal of providing users with consistent access to data across the ICS.
Data Ownership/ Stewardship	Data owners are accountable for the quality of a defined dataset. Data stewards are responsible for the quality of a defined dataset on a day-to-day basis.
Data Standards	Refers to the rules by which data are described and recorded, and describes how data are stored or exchanged for the consistent collection and interoperability of data across multiple systems/users.

Prioritising the capabilities

Capability	Description
Data Classification	Involves the process of analysing structured or unstructured data and organizing it into categories based on file type, contents, and other metadata.
Data Policy	A set of broad, high level principles which form the guiding framework in which data activities take place and provides a common baseline and reference point for data to be understood and valued.
Data Ethics	Guides and advises on the appropriate and responsible use of data in line with the ICS's ethos. It informs staff of ethical considerations relating to data, and advises on methods of addressing them.
Data Security	The practice of protecting digital information from unauthorised access or theft throughout its entire lifecycle, encompassing every aspect of information security.
Data Sharing	Refers to sharing personally identifiable data between ICS members and departments, as well as between external partners outside of the ICS.
Data Publishing/ Open Data	Aims to make non-sensitive data public, so that they can be accessed by residents and others, thus contributing to greater transparency of the ICS's activities (and reducing ad hoc demand for data).
Enterprise Data Literacy Improvement	Centres on the improvement of general data literacy across the ICS, particularly for those in non-data-related roles.
Data and Insight Professional Development Pathways	Career and development pathways, training and learning opportunities are clearly defined, structured and used to guide and develop data specialists of multiple varieties.
Infrastructure Architecture	The technology that supports the business, including networks, systems, storage, servers, middleware, databases and datastores, in both hosted and cloud environments.
Security Architecture	Provides the framework and infrastructure for creating cross-platform, interoperable, security-enabled applications and processes to protect partner's data from unauthorised use and disclosure.
Application Architecture	Defines the framework of the ICS's application solutions as part of the overarching enterprise architecture focus on understanding and meeting business and user requirements.
Programme and Pipeline Management	Focuses on actively identifying use cases from across the ICS, followed by assessing, prioritising, planning, implementing and evaluating them.
Business Engagement	Centres on the connection between data functions – including both the BI & Analytics Warehouse and the spokes – with the wider business, such as the use of business dictionaries to align business and technical views of data.

Appendices

Appendix 4:
Detailed Case for Change

(For use cases see Appendix 1)

Case for Change

Strategic Context: Overview

BLMK Integrated Care System

The development of this data strategy is not happening in a vacuum, but rather as a necessary enabler to respond to the wider health and care policy environment across the UK and the region. The shift toward integrated care systems follows several years of initiatives to integrate service provision and underlying data assets, due to the numerous benefits commonly expounded around the single version of the truth, the shift from manual and duplicative data entry, more predictive and preventative work and a better resident experience of telling us once.

This data strategy works to compliment the work that has already gone on in these areas, providing the infrastructural foundation, capabilities and capacity to progress these strategic initiatives.

While there are a number of these initiatives in place, a selection of those most closely aligned to are explored in greater detail below and in the appendices.

National Context Overview

In 2019, the *Long Term Plan* put digital and data at the heart of the NHS' vision for service transformation. It recognized the criticality of 'mainstreaming' digitally enabled care, positioning technology and innovation in the domains of prevention, care and treatment through a population health management (PHM) approach. The vehicles for executing on the long-term plan and PHM, Integrated Care Systems (ICSs), are intended to provide the cross-organisational governance required to make interoperability via shared data, a reality. The NHS's further guidance in *Integrated Care, Next Steps to building strong and effective Integrated Care Systems* (2020) further called to "increase resiliency, digitise operational services and create efficiencies" and "develop shared cross-system intelligence and analytical functions that use information to improve decision-making at every level."

In the new direction for the NHS, the demand for both a data strategy framework and a cross-system approach for investment into data and shared business intelligence tools and techniques is clear. This commitment is underpinned by both the *ICS Design Framework* (2021) and *Data Saves Lives Strategy* (2021), which secure data as a strategic asset to harness innovative approaches and foster cross-collaboration across digital, data and clinical experts at scale.

Local and Regional Context Overview

Bedford, Luton and Milton Keynes (BLMK) ICS consists of a range of partners across primary, secondary and commissioning services, as well as four local authorities and public health bodies at place. Partners from across the ICS share a common vision to to achieve our joint aims of improving the health and wellbeing of our population, ensuring they receive care, treatment and support that is personalised to meet individual, families and carer needs.

The clearest alignment between local initiatives and the whole-system data transformation being proposed by the data strategy come through the ICS' PHM Strategy and the Business Intelligence (BI) Strategy. Both not only call out digital and data as a key strategic enabler for their and the ICS' purpose, they also require a coordinated, whole-system approach and step-change to how data is used at all levels. The three strategies ultimately and synergistically enable one another:

Data Strategy

- ✓ Ensures data interoperability, system-wide governance and skills
- ✓ Provides programme of work and delivery capacity to enable BI and PHM Strategy priorities

Business Intelligence Strategy

- ✓ Requires coordinated data infrastructure and warehouse which will support all system levels
- ✓ Necessitates data flows and ambitions for end-user tools

PHM Strategy & Roadmap

- ✓ Rapid programme of work supported by BI & A Platform
- ✓ Requires live and accurate data for decision-making and monitoring at all system levels

National Context

BLMK Integrated Care System

1.1 *NHS Long Term Plan* (2019)

In 2019, the NHS Long Term Plan put digital at the heart of the NHS' vision for service transformation. It recognized the critical importance of 'mainstreaming' digitally enabled care, positioning technology and innovation squarely in the domains of prevention, care and treatment. The NHS made clear in the *Long Term Plan* that access to data across the service would support health and care professionals, improve clinical efficiency, safety and care, and thereby improve outcomes at both the individual, place and population level.

The vehicles for executing on the long-term plan, Integrated Care Systems (ICSs), are intended to provide the cross-organisational governance required to make interoperability via shared data a reality. The NHS's further report '*Integrated Care, Next Steps to building strong and effective Integrated Care Systems*' (2020) included the following calls for ICSs to "Invest in the infrastructure needed to deliver on the transformation plan. … to increase resiliency, digitise operational services and create efficiencies" and "develop shared cross-system intelligence and analytical functions that use information to improve decision-making at every level."

1.2 *ICS Design Framework* and *Data Saves Lives: Reshaping Health and Social Care Data Strategy* (2021)

Both the ICS Design Framework and joint data strategy firmly establish data as a strategic asset for ICSs and make the case for what needs to be in place to move from a *reactive* care system to a population health management-driven *proactive* care system. The framework and data strategy indicate that each ICS has the responsibility to:

- Embed a data strategy framework that both enables and encourages a cross-system approach – prioritise the linking of datasets to be accessible to a central analytics team and other BI functions in partner organisations, as well as to harness innovative approaches and foster cross-collaboration across digital, data and clinical experts.
- Define a clear plan for people, process and governance of data and digital – to embed data transformation and business change with data at the centre by establishing data education, processes and governance that put data in the hands of the people who can provide business context, extract value and make data-driven decisions.
- Establish solid data foundations – deliver a joined-up approach to storing data securely in one central platform to prevent data silos and create a single version of the truth for residents which builds confidence in system-held data.
- Empower well-resourced BI teams – invest in individuals who understand data, know how to manipulate it and can work with business users to deliver actionable insights for commissioning, capacity and resource planning and evaluation.
- Invest in population health management tools and techniques – leverage insights to drive and plan interventions to not only facilitate better patient health and care outcomes but contribute to improved life outcomes that break cycles of inequality.

Ultimately, these strategies chose data as the mechanism for effective collaboration across the NHS, adult social care, and public health, to help care for people in the best possible way and ensuring that citizens have the best experience possible when using the system.

Regional Context

2.1 Bedfordshire, Luton and Milton Keynes Integrated Care System (BLMK ICS)

Forming in April 2018 from the BLMK STP, BLMK ICS brings together providers and commissioners of NHS services across Bedfordshire, Luton and Milton Keynes to collectively plan and integrate care for the system's 1 million residents. In line with the NHS Long Term Strategy, the ICS and its Clinical Commissioning Group (CCG) are committed to enabling data-driven system planning and quality improvement using business intelligence to drive system-working and improve outcomes for residents in line with it's five priorities:

- First, *every child has a strong, healthy start in life: from maternal health, through the first thousand days to reaching adulthood*
- Second, *all people are supported to engage with and manage their health and wellbeing*
- Third, *people age well, with proactive interventions to stay healthy, independent and active as long as possible*
- Fourth, *the system works together to build the economy and support sustainable growth*
- And finally, *everything the ICS does promotes equalities in the health and wellbeing of the population.*

Critical to the success of the ICS, a whole-system approach to sharing information to deliver more coordinated and proactive services across primary and secondary care, community and mental health services, social care, voluntary care and other providers, as well as improve system-wide understanding of patterns of poor health, wellbeing and outcomes to derive tailored interventions to individual needs across care touch-points.

Given their histories and influence in the four places, there are already significant data, digital and technology assets and capabilities across the ICS that support the development of this commitment, with places at different stages in their development. As an aggregate, the whole system has moved towards a whole-system, unified approach to data and digital, empowering places to move further in their progress towards intelligence-driven care.

2.2 *Local Digital Roadmap* (2016)

The BLMK ICS (then STP) set out on its path to become a digital leader in the local healthcare arena in its Local Digital Roadmap (LDR) in 2016. The LDR reflected an emphasis on digital and technological transformation in that period. Lack of insight-producing data at the time, for instance, was reflective of lack of digital capture in a paper-based health economy, as well as lack of systems interoperability for collaboration and coordination. At that time, it was already acknowledged that better access to data and real-time data analytics would drive transformation to 'enable care-coordination and the right decisions about next steps for our patients to be taken' (p. 3). However, building digital enablement capabilities and readiness, alongside infrastructure and standards, were the necessary priorities to enable system-wide access to data.

The LDR set three-year strategic goals and foci for priorities such as governance, electronic patient records, analytics and system-wide capabilities and overall technical infrastructure. These goals would set the stage for an advanced, coordinated digital foundation ahead of the creation of the ICS in 2018.

Regional Context Continued

BLMK Integrated Care System

2.3 *Population Health Management (PHM) Strategy* and *Roadmap* (2021)

BLMK ICS' PHM Strategy is explicitly underpinned by the utilisation of data as a transformational force for health and care. Data and digital are emphasised as the main enabler of the Strategy, calling for the requirement of timely, relevant and linked datasets and a supportive data infrastructure that connects partners across the ICS to deliver higher quality services through intelligence and analytics. The PHM Strategy notes that cross-system data leaders, a common vision for data, data warehouses, analysts, data sources (including social care and wider determinants data) and sharing arrangements are integral to the future workings of the system. Through collaboration efforts at place and provider level, decisions will be enabled closer to the resident's community with a greater likelihood of better outcomes through shared data, reduced cost and improved value in services, improved citizen experiences and increased workforce engagement.

BLMK ICS' PHM Roadmap outlines a rapidly-paced programme of work supported by a business intelligence platform and a data and digital working group responsible for Strategy. By late 2021 and early 2022, the PHM Roadmap requires capabilities and data in place to be shared across PCNs, place and other system perspectives, as well as live and accurate data to begin supporting decisions and monitoring for PHM interventions. The BLMK data strategy must be seen as an enabler to support all PHM activities.

2.4 *Business Intelligence (BI) Strategy* (2020)

The ICS' vision for the PHM Strategy, as well as the developing single BLMK CCG and two regional ICPs, necessitates a central Business Intelligence and Analytics function which provisions data intelligence across the system. The BI Strategy outlines the vision for this function, indicating that it will meet the immediate 'essential' BI and analytics needs for the CCG as well as the data-driven risk stratification, system pathway designs, demand and capacity planning, and performance reporting for the system and system partners in line with the above timescales.

In the longer term, the BI Strategy outlines indicative architectural plans for data storage through a data warehouse which will support all aspects of ICS, ICP, place and neighbourhood level working. It further outlines high-level data flows and ambitions for end-user computing and tools. As above, the BI strategy mandatorily calls into existence a data strategy, particularly a coordinated approach to using, sharing and creating data.

Case for Change

Data Strategy Delivery Costings

Coordination and Delivery Capacity Costings

BLMK Integrated Care System

The exact roles and responsibilities required to deliver the data strategy will be further refined as part of the joined up delivery model with the PHM strategy, as identified in the roadmap – however the table below provides an indicative assessment of the types of skills and capacity required to deliver a programme of this scope and scale, this is against a high-level estimate of a three year return on the three priority use cases of £1.66m – £4.36m

Total Resource implies the effort required from a data strategy delivery/ coordinating team to deliver on the ambitions of the data strategy, however it does not take account of existing resources within the system. **Total Programme Cost** provides a high-level estimate for the funding required to implement this coordinating capability once existing system resource has already been taken in to account, and would form the basis for a funding request. The **Annual Programme Budget** is a flexible pot to allow the data leader to procure external support and licenses to pilot technical solutions.

The timelines for the three year roadmap have been used to guide cost forecasts, however this is dependent on identifying in year funding of £142,500 and so decisions or Go Live on initiation dates are liable to change. The benefits of this approach mean having resources and processes ready and progressing from the start of the next financial year to move at suitable pace. Consideration must also be given to where these resources are placed from an ongoing running and cost perspective, which will evolve alongside the PHM Strategy Roadmap activity, and decisions around the size and scope of ICS resources more broadly.

		3 Year Roadmap Timeframe						
Role	**Annual Cost (Salary+30% on-cost)**	**Jan-Mar 2022**	**FY 22-23**	**FY23-24**	**Apr24 - Dec25**	**Total Resource**	**Programme Cost**	**Notes on system resource availability**
Accountable data leader	£140,000	0.25	1	1	0.75	£420,000	**£0**	CIO or senior leader from the system
Programme Director	£120,000	0.25	1	1	0.75	£360,000	**£360,000**	
Project Managers x2	£65,000	0.5	2	2	1.5	£390,000	**£195,000**	***One secondee*** from the system, one new hire with data expertise
Data Scientist	£120,000	0.25	1	1	0.75	£360,000	**£0**	In conversation with CCS to share role
Advanced Analyst - Graduate sandwich course	£27,000	0	0.25	1	0.75	£54,000	**£54,000**	Graduate sandwich course to be explored with academic partners
Data Architect	£110,000	0.25	1	1	0.75	£330,000	**£0**	Mix of regional and partner support, enabled by AI driven data profiling
BI Developer x2	£55,000	0	2	1	0.75	£206,250	**£206,250**	Require secondees from 90+ analyst FTEs within the system. 2 transition resource for year 1, 1 from year 2 onwards
Data Engineers (technicians)	£65,000	0.25	1	1	0.75	£195,000	**£195,000**	Additional capacity for data pipelining into BI&A platform through CSU contract
Enterprise architect	£120,000	0.25	0.25	0	0	£60,000	**£60,000**	
IG Leader	£80,000	0.25	1	1	0.75	£240,000	**£0**	ICS IG Lead already in post
Additional IG support	£60,000	0.25	1	1	0.75	£180,000	**£0**	Recently appointed and within programme cost
Annual total resource requirements		*£236,250*	*£971,750*	*£907,000*	*£680,250*	*£2,795,250*		
Annual Programme Resource Cost		**£92,500**	**£396,750**	**£332,000**	**£249,000**		**£1,070,250**	
Annual Programme Budget		£50,000	£200,000	£200,000	£150,000			
Total Programme Costs		**£142,500**	**£596,750**	**£532,000**	**£399,000**		**£1,670,250**	

Cost Benefit Analysis

BLMK Integrated Care System

Cost/ Benefit analysis

Fully scoping out a cost benefit model for improving data capabilities is challenging due to the value of improved access to, quality of, or use of, data is tied to the specific decisions and change in approach enabled by this access to insights. Therefore with limited value in data for the sake of data, the use cases provide an indicative set of benefits that can be achieved by taking advantage of the capabilities that the data strategy provide, be it coordinating initiatives; expediting ingestion of key datasets into the BI&A platform and shared care records; or aiding in the adoption of the emerging tools and technology to make evidence based decisions and evaluations.

As such, the benefits are anticipated to be conservative estimates, predicated on the use cases that are further defined and developed by the Data Strategy delivery capability identified in the programme costs.

Despite this, just the three use cases identified provide a positive return on investment and does not include wider initiatives that would be expected to emerge from the system through ongoing engagement by the programme delivery team.

Quantitative cost benefits are outlined below:

	Annual average	Three Year
Mental Health & Diabetes	£225k – £450k	£675k – £1.35m
Falls and Frailty	£850k – £1.6m	£2.5m – £4.85m
Place Profiles	£11,083	£33,250
Total Benefit	**£1.1m - £2.0m**	**£3.2m – £6.2m**
Programme Costs	**£556,000**	**£1,670,000**
Net Benefits	**£555,000 - £1,455,000**	**£1.66m – £4.36m**
Indicative RoI of specified use cases against programme	Return on Investment of limited set of use cases **1 – 2.6 times programme investment**	

Appendices

Appendix 6:
Stakeholder Engagement List

Stakeholder List (1 of 8)

Stakeholder	Organisation	Engagement
Vicky Head	BBC Bedford Borough Council	Contacted but was unable to engage due to capacity
Dave Hodgson MBE	BBC Bedford Borough Council	Interview
Kate Walker	BBC Bedford Borough Council	Interview
Councillor Louise Jackson	BBC Bedford Borough Council	Interview
Anu Sheikh	BBC Bedford Borough Council	Multiple interviews
Dr. Ian Brown	BBC Bedford Borough Council	Interview, on Steering Group
Rughbir Singh	BBC Bedford Borough Council	Invited to Workshop
Sue Lyons	BBC Bedford Borough Council	Invited to Workshop
Simon White	BBC Bedford Borough Council	Invited to Workshop
Ann Jones	BBC Bedford Borough Council	Workshop
Jashpal Mann	BBC Bedford Borough Council	Workshop
George Kennedy	Bedfordshire Hospitals NHS Foundation Trust	Workshop

Stakeholder List (2 of 8)

Stakeholder	Organisation	Engagement
David Carter	Bedfordshire Hospitals NHS Trust	Interview
Gill Lungley	Bedfordshire Hospitals NHS Trust	Interview
Dr. Tammy Angel	Bedfordshire Hospitals NHS Trust	Interview for use case
James Slaven	Bedfordshire Hospitals NHS Trust	Interview and workshop
Heidi Walker	Bedfordshire Hospitals NHS Trust	Invited to Workshop
Brian Appleby	Bedfordshire Hospitals NHS Trust	Workshop
Charles Wheatcroft	BLMK CCG	Interview, on Steering Group
Nicky Poulain	BLMK CCG	Interview
Paul Lindars	BLMK CCG	Interview
Mark Peedle	BLMK CCG	Interview
Felicity Cox	BLMK CCG	Interview
Mark Cox	BLMK CCG	Interview, on Steering Group
Richard Alsop	BLMK CCG	Interview for use case
Jan Wood	BLMK CCG	Interview for use case

Stakeholder List (3 of 8)

Stakeholder	Organisation	Engagement
Sarah Pearson	BLMK CCG	Interview for use case
Amanda Flower	BLMK CCG	Interview for use case
Lynda Harris	BLMK CCG	Interview and workshop, on Steering Group
Clare Steward	BLMK CCG	Project Lead, on Steering Group
Kathryn Moody	BLMK CCG	Workshop, on Steering Group
Dean Westcott	BLMK ICS	Interview for use cases
Dr. Paul Singer	BLMK ICS	Interview, on Steering Group
Simon Hardcastle	BLMK ICS	Interview for use case
Anne Murray	BLMK ICS	Interview for use case
Mark Thomas	BLMK ICS	Project Lead, on Steering Group
Lesley Meekins	BLMK ICS	Workshop
Loraine Risotti	BLMK ICS	Interview for use case
Michael Farrington	BLMKC ICS	Interview for use case
Julie Ogley	CBC Central Bedfordshire Council	Interview

Stakeholder List (4 of 8)

Stakeholder	Organisation	Engagement
Marcel Coiffait	CBC Central Bedfordshire Council	Interview
Celia Shohet	CBC Central Bedfordshire Council	Interview
Aidan Macdonald	CBC Central Bedfordshire Council	Invited to Workshop
Daniel Smitton	CBC Central Bedfordshire Council	Workshop
Andy Boocock	CCS Cambridge Community Services Trust	Interview
Mohammad Bari	CCS Cambridge Community Services Trust	Interview
Matthew Winn	CCS Cambridge Community Services Trust	Interview for use case
Monty Keuneman	CCS Cambridge Community Services Trust	Interview and workshop
Bella Ahmed	CCS Cambridge Community Services Trust	Interview, workshop and interview for use case
Ruth McLaren	CCS Cambridge Community Services Trust	Invited to Workshop
Ian Moyes	CCS Cambridge Community Services Trust	Workshop and interview for use case
Alan Millar	CNWL Central and North West London NHS Foundation Trust	Contacted but was unable to engage due to capacity
Dr. Simon Edwards	CNWL Central and North West London NHS Foundation Trust	Interview, on Steering Group
Ross Graves	CNWL Central and North West London NHS Foundation Trust	Interview and interview for use case

Stakeholder List (5 of 8)

Stakeholder	Organisation	Engagement
Nigel Tazzyman	CNWL Central and North West London NHS Foundation Trust	Workshop
Tim Hughes	Community BCA - BBC, CBC & Luton	Interview
Mike Carey	EEAST East England Ambulance Service Trust	Contacted but was unable to engage due to capacity
Fiona Lennox	EEAST East England Ambulance Service Trust	Invited to Workshop
Stephen Bromhall	EEAST East England Ambulance Service Trust	Invited to Workshop
Amar Shah	ELFT East London Foundation trust	Interview
Araripe Garboggini	ELFT East London Foundation trust	Invited to Workshop
Simon Fewer	ELFT East London Foundation trust	Invited to Workshop
Tom Nicholas	ELFT East London Foundation trust	Workshop
Chris Kitchener	ELFT East London Foundation trust	Workshop
Paul Calaminus	ELFT East London Foundation Trust	Interview
Philippa Graves	ELFT East London Foundation Trust	Interview
Richard Fradgley	ELFT East London Foundation Trust	Interview

Stakeholder List (6 of 8)

Stakeholder	Organisation	Engagement
Dr Jane Kocen	King Street Surgery	Interview
Robin Porter	LBC Luton Borough Council	Advised re. proxy interview
Laura Church	LBC Luton Borough Council	Interview
Susan Milner	LBC Luton Borough Council	Interview
Sally Cartwright	LBC Luton Borough Council	Interview
Sohifa Kadir	LBC Luton Borough Council	Invited to Workshop
Kathryn Barker	LBC Luton Borough Council	Invited to Workshop
Zoe Bulmer	LBC Luton Borough Council	Workshop
Dr. Nina Pearson	Lea Vale Medical Group	Interview, on Steering Group
Dr. James Ramsay	Luton and Dunstable University Hospital	Interview
Pete Reeve	Luton Community Health Services	Interview
Michael Bracey	MKC Milton Keynes Council	Contacted but was unable to engage due to capacity
Oliver Mytton	MKC Milton Keynes Council	Interview and interview for use case

Stakeholder List (7 of 8)

Stakeholder	Organisation	Engagement
Jonathan Eastwood	MKC Milton Keynes Council	Invited to Workshop
Lisa Beckett	MKC Milton Keynes Council	Invited to Workshop
Sarah Gonsalves	MKC Milton Keynes Council	Invited to Workshop
Jackie Palman	MKC Milton Keynes Council	Workshop
Ian Fabro	MKUH Milton Keynes University Hospital	Interview
Craig York	MKUH Milton Keynes University Hospital	Interview and workshop, on Steering Group
Hitesh Patel	MKUH Milton Keynes University Hospital	Invited to Workshop
Dawn Budd	MKUH Milton Keynes University Hospital	Invited to Workshop
Ann Gibbons	MKUH Milton Keynes University Hospital	Workshop
Joe Harrison	MKUH Milton Keynes University Hospital Trust	Interview
Dr. Tayo Kufeji	Newport Pagnell Medical Centre	Interview, on Steering Group
Dr. Vishen Ramikisson	NHS Digital	Interview
Nicola Kay	NHS ENGLAND & NHS IMPROVEMENT	Interview, on Steering Group

Stakeholder List (8 of 8)

Stakeholder	Organisation	Engagement
Simon Mortimore	SCAS South Central Ambulance Service	Interview
Jill Lanham	SCAS South Central Ambulance Service	Interview
Barbara Sansom	SCAS South Central Ambulance Service	Invited to Workshop
Mike Murphy	SCAS South Central Ambulence Service	Advised re proxy interview
David Pearson		Workshop