

## How population health management can help to combat health inequalities through data linkage

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### What is population health management?

Population health is defined as “...an approach that aims to improve physical and mental health outcomes, promote wellbeing and reduce health inequalities across an entire population” [1]. Accordingly, population health management (PHM) involves linking data to facilitate coordinated activities that aim to reduce health inequalities at the local, regional, and national levels [2].

Key elements of PHM in England are the use of integrated care systems (ICSs), place-based partnerships, and integrated neighbourhood teams [3]. In particular, the current 42 ICSs in England aim to connect pockets of local health and social care networks to create a cohesive, targeted strategy for both improved interventions and prevention techniques. PHM therefore relies on collaboration within communities and local authorities to understand and prioritise needs at the local level.

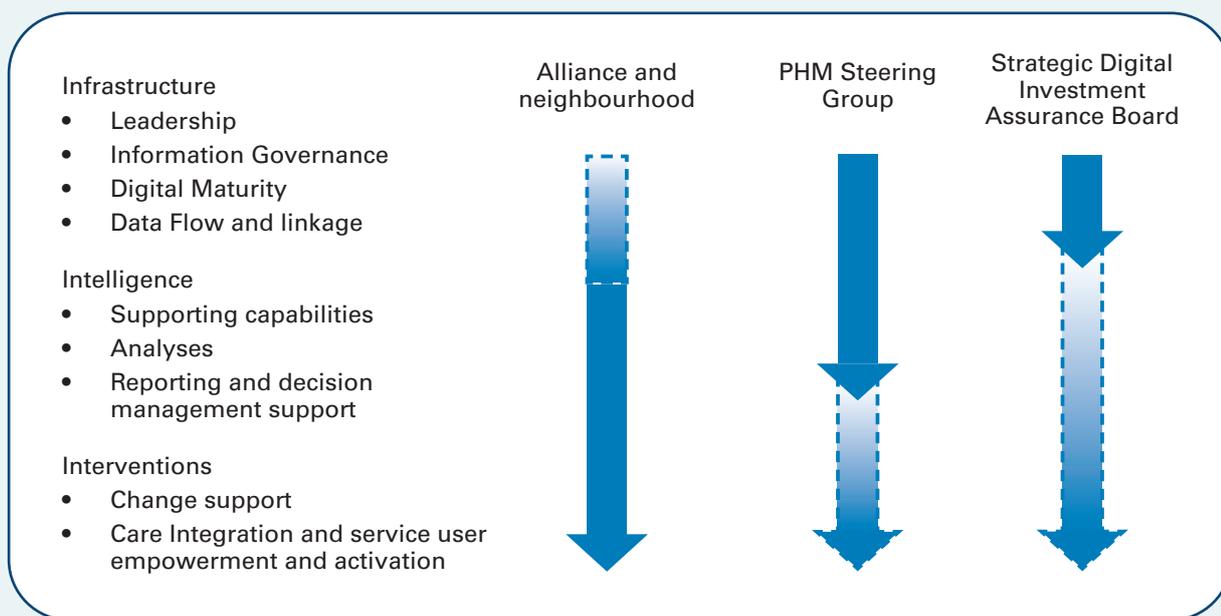
Here, we give an example of an ICS in the East of England that has used PHM to link data more effectively using a variety of strategies at different points in the data collection and analysis process. This project is enabling the Board to better understand the needs of the local population and to focus on preventative interventions that, over time, will help to combat health inequalities. We place these efforts within the context of our recent scoping review study, which highlighted best practices for creating effective data pathways across the Health Service.

### The case study: Linking data to understand health inequalities

Prior to the covid-19 pandemic, the Suffolk and North East Essex ICS initiated a PHM Strategy to link data across the local ICS population. This initiative involved members of the local health and care system across leadership, information governance, and analytics workforces (Figure 1 [3]). The ICS’s aim is to reduce inequalities by involving both members of the NHS, local authorities, and the public to aid in targeting interventions within the region, which has a population of approximately 1 million people.

A critical focus of the PHM plan was and continues to be improving completion of ethnicity data within any centralized dataset in the system. One specific project involved linking existing data across datasets using the currently accepted 16 ethnicity codes used within the NHS.

Figure 1: The Suffolk and North East Essex Integrated Care System plan of action for integrating PHM at the regional level (amended)



Source: [https://drive.google.com/file/d/1NVVj43WdtbatW66Kxc6\\_Xwaqt\\_LuW\\_E/view](https://drive.google.com/file/d/1NVVj43WdtbatW66Kxc6_Xwaqt_LuW_E/view)

Working with a private healthcare consultancy focused on population health — Optum — the ICS linked data from across the region to develop models that allowed for the effective focus of analytics projects. The ICS obtained population-relevant data, such as demographic data, from multiple sources, such as Trusts and General Practitioner services, to produce population health analytics.

The project that focused on ethnicity has now run for more than 4 years. Recent analyses have suggested that while primary care recording of ethnicity is around 70% — with variance among practices — Optum’s project of linking data through a PHM framework has led to a 93.6% completion rate.

Furthermore, a dashboard is now available through Optum, which has licenses available for analysts, clinicians and transformation teams to conduct population-level analysis of the linked dataset comprising the ICS population (Figures 2 and 3).

Figure 2: Example of an Optum dashboard showing the data sources linked for a broad, population-level research framework

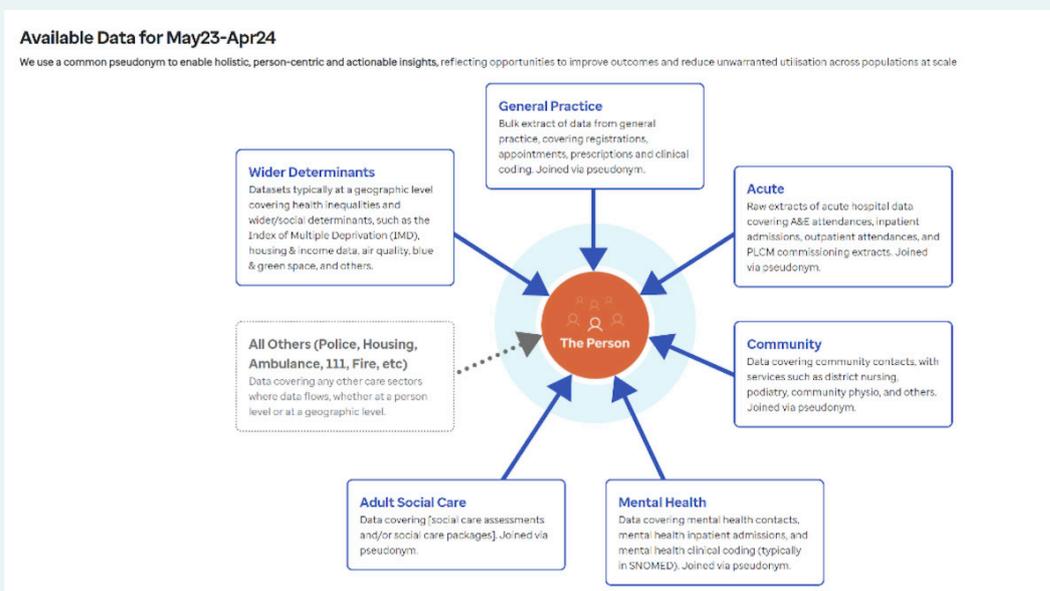
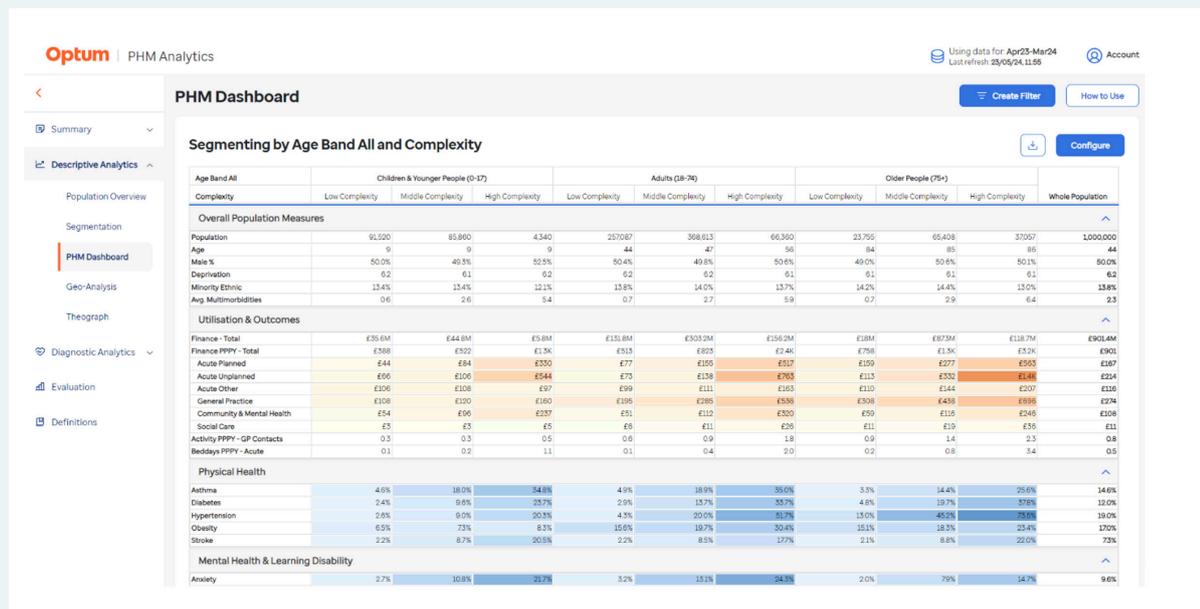


Figure 3: Example of an Optum dashboard showing population-level data in an ICS (data in the figure are synthetic)



In addition to the Optum dashboard, analytical teams have access to the underlying data at a pseudonymised level. Analysts are using advanced analytical techniques to explore the data in new ways, including via the creation of a population segmentation model to estimate future demand and for risk stratification.

## The broader context: Alignment with our research

Our recent scoping review and qualitative study highlight local initiatives likely to be helpful for improving data quality related to health inequalities (Table 1 [4 and 5]). The Suffolk and North East Essex ICS's experience maps onto these recommendations effectively. Specifically:

- The ICS's PHM project is supported by a strategy at the senior level [3];
- Training and engagement plans to reach all areas of the ICS, from strategic leaders, to front line teams (this includes the OneTeam programme);
- The aim to link datasets required interdisciplinary involvement from team members within the ICS and from Optum.

Table 1: Summary of best practices for improving data quality across the care pathway

Theme	Point in the Data Pathway	Actions
Distal factors	Upstream of data collection and analysis	<ul style="list-style-type: none"> <li>• Mandating data collection</li> <li>• Legal safeguards to ensure non-discrimination</li> <li>• Legislation incentivising data collection</li> <li>• Prioritisation in policy</li> </ul>
Wider actions to make improvements in data collection	Preparing for data collection	<ul style="list-style-type: none"> <li>• Achieving senior-level buy-in organisations involved in data collection</li> <li>• Engagement activities with citizens, patients, and communities</li> <li>• Staff training programmes on purpose and mechanisms for data collection</li> <li>• Developing guidance on how data can be used</li> <li>• Demonstration of the value of data collection and analysis for organisations</li> </ul>

Table 1 continued: Summary of best practices for improving data quality across the care pathway

Theme	Point in the Data Pathway	Actions
Data collection instruments, systems, and standardisation	Data collection	<ul style="list-style-type: none"> <li>Using multidisciplinary groups to inform data collection instruments, systems and standardisation</li> <li>Creating standardised definitions and coding practices across organisations</li> <li>Improving granularity of data fields</li> <li>Developing standardised processes for collecting and recording data</li> <li>Developing audit processes to monitor data quality aspects</li> <li>Creating IT systems to facilitate data collection</li> <li>Periodic revision of definitions and categories</li> </ul>
Methodological approaches to improve data quality and accuracy	Data analysis	<ul style="list-style-type: none"> <li>Linking with other data sources</li> <li>Use of proxy variables</li> <li>Imputation</li> </ul>

This project's ongoing success suggests that focus on distal factors and methodological approaches are likely to greatly aid in improving data quality related to health inequalities at the regional level. Linking datasets effectively from across a given region will aid in the development of predictive analytics frameworks. This case study suggests that not only will data completion be improved, but there are likely to be feedback loops through which researchers with access to health data can help to inform local Trusts and primary care services about changes they can make to improve their own data collection processes.

## Looking ahead

As part of the Suffolk and North East Essex ICS's PHM strategy, the local integrated care board is developing a dedicated PHM team to further a delivery plan through 2028. By continuing their relationship with Optum, predictive models will be developed to further combat health inequalities; the ICS team also hopes to begin collaborations with academic researchers in the future. Now that important data gaps — such as around ethnicity — are being bridged through this initiative, the broader goal of intervening to reduce health inequalities themselves can begin at the regional level.

## References

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<https://arc-eoe.nihr.ac.uk/research-implementation/research-themes/population-evidence-and-data-science>