A mixed methods evaluation of adult virtual wards that have been implemented across South Yorkshire

Preliminary report V1.0

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BACKGROUND

"Virtual wards" (VW) or "Hospital at home" (HAH) services involve delivering hospital-level monitoring and treatment to patients in their own homes as an alternative to hospital admission. This approach gained significant momentum during the COVID-19 pandemic, and since then, has been further developed through policy initiatives in England. Notably, VWs were highlighted as a key ambition in the NHS England 'Delivery Plan for Recovering Urgent and Emergency Care Services' published in January 2023,[1] and the recent 2024 Darzi Report.[2]

According to NHS England's VW Framework,[3] patients in VWs should receive hospital-grade care in their homes, facilitated by a multi-disciplinary team (MDT) comprising clinicians, nurses, and allied health professionals. The MDT is typically led by a consultant-level practitioner, such as a nurse consultant, GP, or medical consultant, who assumes overall clinical responsibility for the patient's care. VW admissions are generally short-term, typically lasting up to 14 days. Depending on the patient's needs, care may be provided in-person or remotely through telehealth services and monitoring technologies.

The primary objectives of VWs are twofold: to prevent unnecessary hospital admissions (step-up care) and to facilitate early discharge from the hospital (step-down care). The NHS England framework allows for flexibility in the implementation of VWs, tailored to local needs. However, this flexibility has led to variation in how these services are structured and delivered across different regions.

> ➢ Virtual wards across South Yorkshire (SY)

The South Yorkshire Integrated Care System (SY ICS) has developed VW pathways covering four areas. A phased approach has been used for implementation, with each VW proceeding at a different development trajectory and unique VW model created, influenced by local factors.

Across SY there are currently 255 VW beds (approximately 20.4 VW beds per 100,000).

OVERVIEW OF THE EVALUATION

The Applied Research Collaboration Yorkshire and Humber (ARC YH) Urgent Care Theme is undertaking a mixed methods service evaluation of adult VWs that have been implemented across SY. The service evaluation aims to:

1. Examine the VW models implemented across SY

➢ Documentation of the different models of VWs in operation, focusing on their delivery method and variation across the region, using document analysis and workshops with healthcare staff.

2. Explore the experiences of staff involved in the implementation and operation of VWs

➢ Capture the perspectives of healthcare professionals working within VWs, identifying the challenges and successes they encounter, using semi-structured interviews.

3. Assess the clinical and cost-related outcomes of VWs

➢ Evaluate the effectiveness of VWs in terms of patient outcomes (e.g. length of stay, readmission) and the associated financial implications, such as potential cost savings, through statistical analysis of routine inpatient and VW patient data.

4. Integration of findings from the different work packages

➢ The findings from steps 1-3 will be combined to provide a comprehensive overview of the challenges, successes, and impact of the VWs that have been implemented across SY.

PROGRESS SO FAR AND NEXT STEPS

(1) Document analysis and workshops with healthcare staff to understand the VW models implemented across SY

<u>Progress so far:</u>

A document analysis has been conducted on information provided by each of the VW services (e.g. standard operating procedures) to gain insights into the set-up and operation of the VWs at each location. Following an initial review of these documents, follow-up meetings were scheduled at each site to gather additional information that was not included in the documents.

<u>Early findings:</u>

Each of the VW models implemented across SY have been integrated into existing services, resulting in variations between the models. The purpose of this evaluation is not to determine which model is the most effective, as each service was established to meet the unique needs of its location. However, certain elements from the models may prove beneficial if applied to others. Further analysis needs to be undertaken, but early findings indicate:

- ➢ **Consultant level oversight of the VW**: In three sites, specialty specific Medical Consultants (e.g., respiratory, frailty) based in the hospital hold overall medical accountability for patients on the VW and lead the multidisciplinary team. In contrast, in one site, this responsibility is managed by Nurse Consultants who are based in the community setting.
- ➢ **Multi-disciplinary team:** All VW services across SY include a multi-disciplinary team (e.g., Advanced Clinical Practitioners, Nurses, Health Care Assistants). In most services, VW responsibilities are added to existing roles, with staff working across various services like VW, rapid response, and intermediary care. However, some roles are fully dedicated to the VW. There are differences in team structures: in one site, the VW team is entirely community-based, while in other areas, staff are split between hospital and community settings.
- ➢ **Technology-enabled care, including remote monitoring:** The SY ICB has commissioned DOCCLA (external VW technology company) to provide technology enablement, and patient monitoring for the VW pathways. At present, only one site is actively utilizing the technology. Ongoing discussions are taking place with other VW locations to explore the potential future integration of remote monitoring within their pathways.
- ➢ **Daily board rounds involving a senior decision maker, medical input, and wider MDT:** Across all VW services in SY, MDT meetings take place on weekdays only with frequency varying between locations. Escalation plans for the weekend are discussed at the Friday MDT.
- ➢ **Pharmacy, medicine reconciliation, and optimisation:** All VW services, apart from one site, have a dedicated pharmacist or pharmacy team working for the VW service. When the document analysis was undertaken, this site were attempting to recruit a pharmacist for the VW service.
- ➢ **Operating hours (8am-8pm, 7 days a week at a minimum) and out-of-hours provision:** All VWs operate throughout a 7-day week with clear out-of-hours provision. However, staffing availability is variable, particularly over the weekends. During out-of-hours periods, all VW services make use of existing out-of-hours resources, such as GP out-of-hours services, and the Single Point of Access (SPA), to ensure safe escalation points for VW patients.

<u>Next steps:</u>

The findings from the document analysis will offer a contextual foundation for explaining and interpreting the results from both the interviews and routine patient data analysis. Flow diagrams are in development in collaboration with the VW sites to visually represent the configuration of the VW services at each location, offering a simplified yet comprehensive overview of how each service works.

(2) Semi-structured interviews with healthcare staff working in VWs across SY

<u>Progress so far:</u>

Thirty-eight semi-structured interviews have been conducted with staff from a variety of job roles across the four VW pathways in SY. These interviews have provided a rich, in-depth understanding of the challenges and successes experienced by staff, enabling a comprehensive exploration of the complexities involved in implementing and working within VWs from a diverse perspective.

<u>Early findings:</u>

The analysis of the interviews is still ongoing; however, we have identified several early themes common across the VW services implemented in SY.

> **Gaining hospital-based Medical Consultant buy-in has been challenging**:

When the VW pathways were first established, hospital-based consultants were initially hesitant to refer patients to the community-based VW team, partly due to a lack of awareness about the capabilities of community-based services. This lack of understanding led to concerns about whether the community-based staff could adequately support patients with higher acuity needs. However, as relationships between teams have developed, these concerns have reduced. Despite this progress, some challenges remain, and ongoing efforts are required to further strengthen the trust between hospital and community-based teams, particularly around the development of "step-up" pathways.

> **Having a dedicated "champion" to lead the implementation of the VW pathway is crucial for its success:**

A recurring theme in the implementation of VW pathways is the critical role of a dedicated 'champion' to bring together key stakeholders and lead the implementation process. This role was often assumed by a lead clinician, although project management support was also valuable in coordinating team meetings and ensuring follow-up on actions. In some VW services, attempts to establish additional pathways for different clinical specialties have faltered, often due to the absence of a motivated individual to spearhead the initiative. As a result, these pathways have lost momentum.

> **There are concerns that remote monitoring may not be suitable for the specific patient cohorts admitted to the VW:**

Only one of the VW pathways is "technology-enabled". Clinical staff working in the VWs raised concerns that remote monitoring might not be suitable for the patient cohorts they manage, particularly frail older adults with high acuity and complex health needs. However, they expressed openness to exploring the use of remote monitoring for other patient cohorts where they feel there may be more clinical benefit. For example, it was believed that respiratory patients, being generally

younger and fitter, could benefit from remote monitoring. Similarly, heart failure and surgical patients were identified as additional cohorts that might also benefit from this approach.

> **The limited awareness and understanding of the VW pathways, beyond the consultant teams directly involved, has impacted the number of referrals received:**

The VW teams have dedicated considerable time to raising awareness of the VW service to increase the number of referrals received. This has included implementing a "pull" model in some services, where a VW nurse will work in the hospital identifying patients suitable for VW care, and then working with the patient's consultant to facilitate an early discharge. However, there is still more work needed to be done to raise awareness of the VW to encourage more clinicians to refer into the service.

> **There is a perception that patients admitted to the VW are receiving enhanced care, and that they "thrive" at home:**

Healthcare professionals interviewed during this evaluation have shared numerous examples of the enhanced patient care they are able to provide through the VW. They are proud of the care they deliver to patients, which is exemplified by the positive feedback they receive. The VW teams not only address the clinical needs of patients but also emphasise the ability to deliver more holistic care. By treating patients in their own homes, they can identify broader social needs and connect patients with community services for additional support, ensuring a more comprehensive and personalised approach to care.

These themes will be further explored as we prepare the final report, and additional themes are likely to be emerge as the analysis continues.

Next steps:

In the first instance, we will continue analysing the data from each site individually using a case study approach. This will allow for a detailed exploration of the unique factors at each site. We will then search for common themes and patterns across sites, highlighting areas of shared learning. This comparative analysis will help us extract actionable insights that can be developed into a list of recommendations for the future development of virtual wards.

(3) Analysis of routine patient data to understand the impact of virtual wards on patient outcomes (e.g. readmissions, length of stay) and associated financial implications (e.g. cost savings)

Planned analysis:

Analysis of the routine patient data is about to start, as follows:

1. Impact of VW on patient outcomes:

The first statistical analysis will focus on understanding what impact the VW has had on patient outcomes.

> **Analysis of routinely collected data from EDs and acute admissions:**

A cohort of patients potentially eligible for admission to VW care will be defined according to appropriate criteria including age, diagnosis code, and other key information for each site.

For each cohort, demographics and key clinical features will be summarised overall, and by time interval (before and after the implementation of the VW). This will be done separately for each trust, and each VW. A set of interrupted time series regressions will be performed, again separately for each trust and VW. These will examine temporal trends in each outcome before and after the implementation of the VW, to ascertain whether VWs are impacting average outcomes across the eligible population. This will be performed for outcomes including average length of stay, readmissions, and ED attendances.

> **Analysis of Virtual Ward data:**

Key demographic and clinical information will be summarised for each trust and VW. Depending on data completeness, quality and VW patient case-mix, either a matched-patient analysis or multivariable regression analysis will be performed. This will compare key outcomes from VW patients with comparable inpatients recorded in the routinely collected data. Patients will be linked across the VW and routine datasets to enable identification of step-up and step-down instances in the data, and instances where a patient may have been sent to an inpatient ward from a VW. This will also allow adjustment for the same patient being present in both inpatient and VW datasets, and/or multiple times in the same dataset. This analysis will examine patient-level outcomes of being a hospital inpatient or VW patient, aiming to understand whether different outcomes may be expected as a result of VW care. Outcomes will be those similar to the interrupted time series analysis and will include length of stay, readmissions to VW or as an inpatient, and ED attendances.

2. Financial implications of the VW:

The economic evaluation will compare the economic costs associated with a VW stay and compare these with the cost of a typical inpatient stay. Comparisons will be made for each trust and VW. The costs of ED and acute admissions will be obtained by applying unit costs to routine data for ED and acute admissions. VW costs, include staff time, training and IT and will be collected via a questionnaire sent to each trust and through VW data. The analysis will also explore a cost per bed day avoided, cost per readmission avoided and cost per ED attendance avoided. Costs will be reported as incremental mean costs of VWs compared with typical inpatient care per patient and an overall cost of VWs per trust and per ward will also be presented.

(4) Combining the qualitative and quantitative findings

Next steps:

Once the first three stages of the evaluation have been completed, the findings will be integrated to provide a comprehensive understanding of the challenges, successes, and impact that the VWs have had across SY. We will also provide actionable recommendations that could be used to help inform the future development of VWs across the region.

REFERENCES

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