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May 2024

South East Region Virtual Wards Evaluation

Final Report

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Executive Summary

Foreword

PPL Senior Advisor, and former Chief Executive of the Nuffield Trust, Nigel Edwards, introduces this evaluation report

While Virtual Wards (VWs) as we know them today build on a long history of Hospital at Home models, there has been a rapid growth in capacity over the past two years. All 42 ICBs across England have invested in this model of care, based on a national definition for VWs but with wide variation in the models and pathways being delivered.

This South East region project has been a pragmatic and pioneering evaluation of VW implementation over the prior two years, focused on impact and cost-effectiveness of 'admission avoidance' pathways. **The report is one of the largest of its type that I am aware of globally,** analysing over 22,000 virtual ward admissions across 29 South East virtual wards, which accounts for 49% of the South East's overall VW capacity.

The report highlights benefits such as positive impact on avoided non-elective admissions, a strong return on investment, and **areas for improvement such as the reduction of health inequalities** associated with VWs, specifically for the BME and Core-20 populations.

Below are some of the key findings;

1) **Impact on non-elective admissions:** Are VWs one of the solutions to reducing the growing number of non-elective (NELs) hospital admissions? The answer from this report is yes, they can be. This analysis of over 22,000 admissions demonstrated that – on average – 1 NEL admission 'avoided' was shown to be *correlated* with 2.5 virtual ward admissions. For the wards analysed alone, the virtual ward admissions are correlated with over 9,000 avoided non-elective admissions a year. When examined, alongside the thematic analysis, some more mature VWs can achieve a 1:1 association between the 'avoided' non-elective admissions and VW activity. The factors for this performance include well-staffed and skilled wards, positive relationships between acute and community trusts, a focus on frailty at scale, use of technology and operating for over two years.

2) **Net financial benefit:** Of the 18 pathways analysed, there was an overall **total annualised net benefit of £10.4 million**. This suggests that yes, overall, admission avoidance VWs do provide a cost-effective solution to care when compared with traditional inpatient stays. As with the association seen with reductions in non-elective admissions, there is variety of impact across the pathways ICBs with some less developed, smaller pathways showing no net benefit at this stage – but with the potential to mature in areas such as skills development, leadership technology and, importantly, focusing on population groups such as the frail.

3) **Inequalities analysis:** Introduction of new services can widen inequalities' gaps, particularly access to services. The report highlights a negative impact across ethnic and socio-economic groups, who seem to have less access to these services. This evaluation was constrained by incomplete demographic data collection. Further work is required to understand the differences and the extent to which the findings reflect preferences, digital literacy, availability of carers, issues with housing and/or design features that make these models either less attractive or less likely to be considered by referring clinicians. Some of the pathways evaluated had been intentionally designed and using imaginative steps, to reduce the inequality gradient and to improve access but there is more evaluation required to understand how best to address this.

It is impressive to see a pragmatic approach to rapid large-scale evaluation built into the development of a new service model and that the timing of this has allowed some models to be evaluated when they have had a chance to mature and develop. This avoids the risk of premature conclusions about effectiveness or costs. As more virtual wards are established and as the model of care develops, further pragmatic evaluations of this type will be important. **The findings of this evaluation signify a step-change forward** in terms of validating the potential of virtual wards to reduce hospital activity in a cost-effective way, and provide focus for the future direction of virtual wards as they take their place within a modern digitally enabled health service.

Nigel Edwards, PPL Senior Advisor

Virtual wards in the South East

The South East region is responsible for delivering **1,939 virtual ward beds** that collectively provide health services for approximately **9.4 million people.** This represents **24 virtual ward beds per 100,000*.**

The region includes **six Integrated Care Systems** (ICSs), **32 NHS Trusts** delivering acute, community and ambulance services.
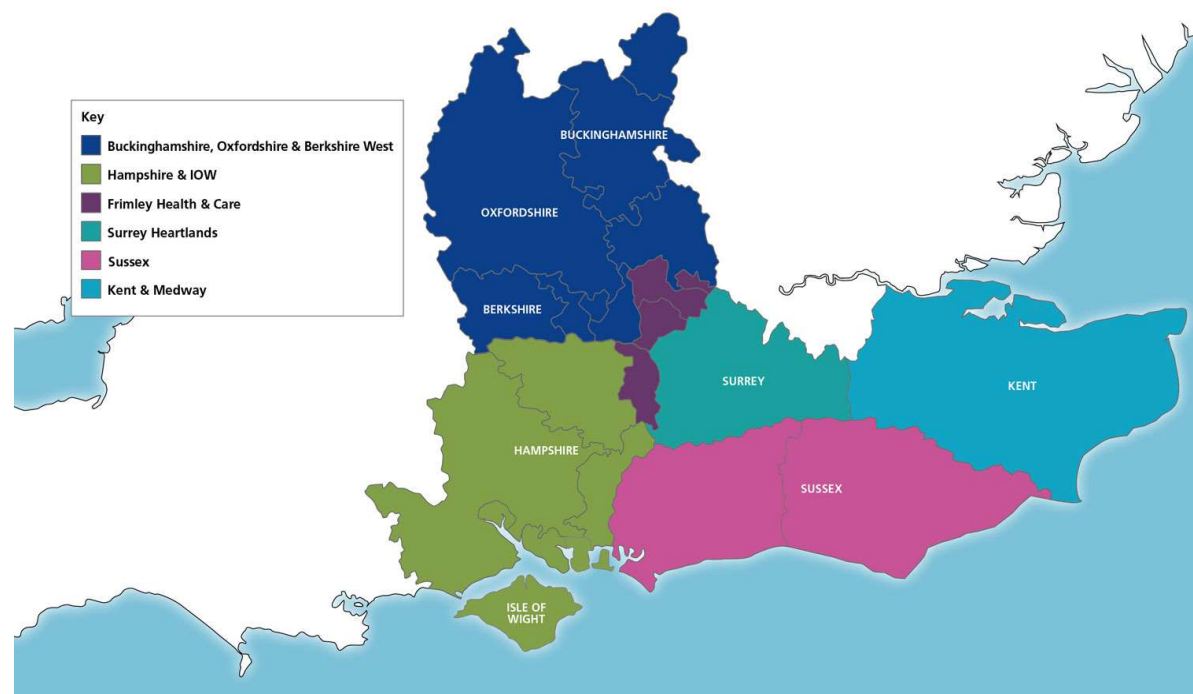
Providers are responsible for delivering **1,939 admission avoidance and early supported discharge virtual ward beds across 76 virtual wards** with 52% of this bed capacity reported to be technologically enabled*.

Virtual ward bed capacity in the region has **grown 20% over the past six-months** whilst the proportion of technologically enabled beds has also **increased by 10%** and snapshot occupancy **increased 10% over the same period.**

This suggests not only the ongoing creation of new virtual ward services but the continued integration of technology to support service provision across the region.

Current bed capacity consists of approximately:

- 31% Frailty
- 9% Respiratory
- 18% Other**
- 42% Mixed (Any combination of Frailty, Respiratory and Other specialities)

Key
- Buckinghamshire, Oxfordshire & Berkshire West
- Hampshire & IOW
- Frimley Health & Care
- Surrey Heartlands
- Sussex
- Kent & Medway

Capacity and occupancy figures are presented as reported in the 26th February 2024 SitRep report.
*** A full list of virtual ward specialties including those classified as 'Other' can be found on page 33 of the full evaluation report.*

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Our evaluation of virtual wards – bridging the evidence gap

Our independent evaluation of virtual wards in the South East is a pioneering effort to fill the critical evidence gap, offering actionable insights for healthcare providers, policymakers, and researchers.

Why is this evaluation needed?

Evidence Gap: As noted by the Health Foundation's February 2024 paper, there is a very limited published evidence on the system level consequences (such as patient flow and capacity) of virtual wards[6].

Limitations of previous evaluations: To date, there has not been a large-scale (recent evaluations have focused on hundreds of admissions), comprehensive evaluation examining multiple conditions across providers and Integrated Care Systems (ICSs).

Policy and Practice Implications: With healthcare systems under increasing pressure, virtual wards offer a promising solution but require solid evidence to guide widespread implementation and investment.

Innovating Care Delivery: By providing detailed insights into the operation and outcomes of virtual wards, this evaluation supports the evolution of healthcare towards more personalised, efficient, and accessible services.

The Uniqueness of this Evaluation

Comprehensive Approach: Our Magenta Book 3-stage evaluation approach encompasses a wide array of metrics including clinical outcomes, patient satisfaction, cost-effectiveness, and system impacts.

Scale of the evaluation: Our evaluation has analysed over 26,000 virtual ward admission avoidance attendances (22,794 once annualised to adjust for variation in the 'ages' of wards analysed) and been enabled by a large patient-level dataset. Our analysis incorporates 29 virtual wards which cover 64% of all South East region virtual ward admissions as of February 2024.

Advanced Analytical Techniques: We used robust data science methodologies, including predictive modelling to accurately assess the efficacy and efficiency of virtual wards.

Stakeholder Engagement: Collaborating with healthcare professionals, patients, and policymakers to ensure a multifaceted understanding of virtual ward impact.

PPL is an independent evaluator: who has carried over 200 evaluations over the last 15 years in the public sector.

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Evaluating virtual wards – our approach and outputs

Our evaluation independently assesses virtual wards' effectiveness, employing a structured methodology to cover six key areas specified in the Invitation To Tender (ITT), in alignment with the **Treasury's Magenta Book 3-stage evaluation** guidelines[7].

Process evaluation

To understand the context within which the virtual wards have been implemented and support to develop a deep understanding of the core components of each virtual ward and the variation in the models.

- P1 – Are virtual wards being delivered as local providers intended?
- P2 - How have contextual and external factors influenced the delivery and functioning of virtual wards?
- P3 - What can be learned from the delivery of virtual wards so far?
- P4 - How have patients, carers, and staff experienced virtual wards?
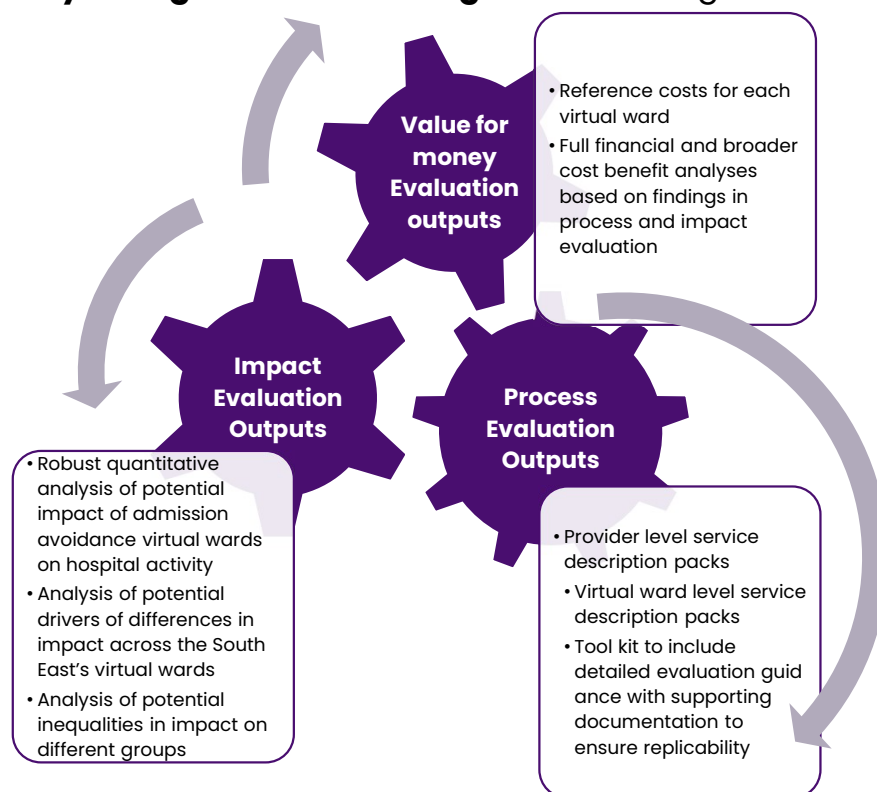
Impact evaluation

To demonstrate quantitative and qualitative impact, with a focus on admission avoidance, provision of equitable access and outcomes, and inequalities.

- IM1 – Has the implementation of virtual wards been associated with its intended impact of reducing hospital activity so far?
- IM2 – How might differences across virtual wards drive differences in impact?
- IM3 – To what extent have different groups at risk of inequalities (including ethnicity, deprivation, gender) seen differences in impact and why?

Cost-benefit evaluation

System cost benefit analysis, with a focus on admission avoidance.

- C1 – Have virtual wards been cost-effective so far?
- C2 – Is the intervention the best use of resources?

Value for money Evaluation outputs
- Reference costs for each virtual ward
- Full financial and broader cost benefit analyses based on findings in process and impact evaluation

Impact Evaluation Outputs
- Robust quantitative analysis of potential impact of admission avoidance virtual wards on hospital activity
- Analysis of potential drivers of differences in impact across the South East's virtual wards
- Analysis of potential inequalities in impact on different groups

Process Evaluation Outputs
- Provider level service description packs
- Virtual ward level service description packs
- Tool kit to include detailed evaluation guidance with supporting documentation to ensure replicability

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Key findings – impact and cost-benefit evaluation

Most important findings of the evaluation, highlighting significant data points, trends, and any unexpected results organised around the evaluation's key questions or objectives.

Key conclusions

1. Virtual wards in South East England are **associated** with **a positive impact on non-elective (NEL) hospital activity – on average 1 NEL admission 'avoided' was shown to be** *correlated* **with 2.5 virtual ward admissions,** with some more mature virtual wards achieving a 1:1 association between the 'avoided' NEL admissions and virtual ward activity.

2. There is evidence of **positive net financial benefits** associated with the regional virtual ward provision – overall total **annualised** net benefit of £10.4 million, for the virtual wards analysed.

3. **It is clear that the longer they run, the more likely virtual wards are to show impact**, as volumes of admissions going through virtual wards increase, and costs per admission start to fall.

4. **Black & minority ethnic (BME) people are consistently underrepresented in virtual ward patient cohorts.** However, there is are significant gaps in ethnicity data recorded in patient level data.

5. **Core-20 representation in virtual ward patient cohorts is more mixed**, however it is more consistently reported.

The impact evidenced in this evaluation varies greatly between geographies and pathways – with our qualitative evaluation understanding reasons driving this variation.

Headline figures

Number of virtual wards analysed	**29**
% of all virtual ward admissions in the South East admitted to virtual wards analysed as part of this evaluation (as of 26th February 2024 snapshot from national 'SitRep' report)	**64%**
Total annualised virtual ward admission avoidance admissions across virtual wards analysed	**22,794**
Estimated avoided NEL admissions per year associated with admission avoidance admissions of virtual wards analysed	**9,165**
Estimated gross benefit per annum associated with admission avoidance admissions of virtual wards analysed	**£24.5m**
Estimated gross cost per annum associated with admission avoidance admissions of virtual wards analysed	**£14.2m**
Estimated net benefit per annum associated with admission avoidance admissions of virtual wards analysed	**£10.4m**

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Key findings – process evaluation

P1 – Are virtual wards being delivered as local providers intended?

- They are being delivered as local providers intended to some extent. Context-specific variation drives how effectively virtual ward services are being delivered.

- Virtual wards adopting a flexible implementation approach and building upon existing services more frequently reported effective implementation.

- Having a pre-existing service engaged in delivering aspects of acute care and remote monitoring in the community is a significant theme amongst staff that felt their virtual wards were delivered as intended. As those services were able to draw on established SOPs, professional relationships and an incumbent skilled workforce.

- In some cases, funding limitations in ICBs alter virtual ward delivery plans away from original intentions and have meant providers draw from other budgets and their existing workforce to staff new services. Misaligned strategies and expectations can undermine collaborative efforts to develop integrated services.

- Successful patient identification strategies demonstrate the reach of virtual wards; however, opportunities remain to ensure that the model effectively mitigates the influence of underlying health inequalities that might preclude some groups from presenting to the service.

P2 - How have contextual and external factors influenced the delivery and functioning of virtual wards?

- Seasonal service demands (peaking between October and February) drive virtual ward activity through increased patient volumes and acuity.

- Large or rural geographies can prove challenging to a single, centralised virtual ward team, but some services mitigated this issue by spreading a larger team across multiple localities with representation from the full MDT.

- Digital integration, if done well, leads to more effective tech enabled virtual wards that improves information sharing processes within and across healthcare organisations. Misaligned digital strategies and technical incompatibilities across healthcare providers and GPs can hinder effectiveness.

- A shared workforce can support operational resilience by prioritising focus across co-located services in response to demand.

- Healthcare organisations adjacent to virtual ward services play a fundamental role in supporting the delivery of holistic patient-centred care. A range of factors are responsible for determining the extent of operational integration and collaboration between complimentary services which ultimately influence the effectiveness of virtual ward activity.

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Key findings – process evaluation

P3 - What can be learned from the delivery of virtual wards so far?

- Virtual ward clinicians and managers frequently felt that positive examples of virtual ward delivery championed patient-centred care and achieved success with the support of strong clinical leadership that advocated for the experience of patients and clinicians at a system-level.

- The capability of virtual ward services to effectively meet acute patients' needs in the community is a common challenge as services can lack the equipment, skills or clinical governance to deliver the required interventions (such as intravenous fluids). This can sometimes result in the need for a hospital attendance despite virtual ward admission.

- Virtual ward clinicians felt that the complexity and time required to provide care is not necessarily reflected within current measures of acuity such as NEWS2 or the Clinical Frailty Score.

P4 – How have patients, carers, and staff experienced virtual wards

- Patient experience of virtual ward services has generally been positive. Patients articulate an appreciation for home-based care, being closer to family and more comfortable than in an acute hospital setting

- Carers recognised the benefits of patients being treated in their own home and having more independence. However, carers did acknowledge the increased burden of care.

- Staff viewed virtual wards generally positively and saw value in the model of care. Some virtual ward staff feel patients recover more quickly as a result. Additionally, virtual ward staff recognised that they enjoyed working in a new and developing services that enabled them to develop new skills. However, some staff did feel operational pressures relating to virtual wards.

- Some staff observed inequalities in access driven by the requirements for virtual ward services to be able to deliver safe care such as a means of verbal communication and fixed address. The patient groups accessing virtual ward services are influenced by those most likely to present to the healthcare system. This was sometimes felt to be not representative of the wider patient population. In some areas, virtual ward outreach activities to engage black & minority ethnic communities have been planned to educate and raise the profile of virtual ward services.

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Key findings – what a good virtual ward looks like

Based on our findings, we have set out below what the data suggest – and what virtual ward managers and clinicians told us – are characteristics more likely to lead to virtual wards which: impact on reduced hospital usage, and function effectively

	Typical success criteria	Barriers to success
Timing and scale	1. *The longer virtual wards run, the more likely they are to show impact on NEL admissions. Primarily due to them being larger; and being able to spread set-up, staff, and digital costs across a larger pool of admissions but also due to having time to embed the some of the elements below*	1. *Acknowledgement that virtual wards take time to* **demonstrate** *impact given the time needed to scale up, but also the time needed to build and embed collaboration and ways of working*
Staffing and resourcing	1. *Strong clinical leadership – advocating for the experience of patients and clinicians* 2. *Collaborative working, focusing on the patient, with strong links between acute, community, and primary care settings (for example carrying out daily MDT ward rounds)* 3. *Well-resourced, experienced teams with a blended skills mix (including acute and community experience)*	1. *Fragmented clinical leadership* 2. *Teams not joined up across different services, and staff feeling under-confident with new ways of working if not properly implemented* 3. *Lack of proper funding can lead to recruitment challenges, or overworked staff*
Enablers	1. *Digital integration, if done well, leads to more effective tech enabled virtual wards* 2. *Referrals received through a single point of access or via an urgent community response service*	1. *If there are misaligned digital strategies across healthcare providers and primary care* 2. *Insufficient data support and inefficient manual data collection processes*

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Conclusions

Key conclusions from our independent evaluation are presented below (subject to the stated caveats on the next slide)

1 Virtual Wards in South-East England are *associated* with **a positive impact on non-elective (NEL) hospital activity – on average 1 NEL admission 'avoided' was shown to be *correlated* with 2.5 virtual ward admissions,** with some more mature virtual wards achieving a 1:1 association between the 'avoided' non-elective admissions and virtual ward activity

2 There is evidence of **positive net financial benefits** associated with the regional virtual wards provision – the majority of virtual wards analysed generated an estimated positive net benefit.

3 **Black & minority ethnic (BME) people are consistently underrepresented in virtual ward patient cohorts.** However, there are significant gaps in ethnicity data recorded in patient level data. Respondents have identified several ways the system can better support these groups access virtual wards – which we recommend are taken forward immediately.

4 **The impact evidenced in this evaluation varies greatly between geographies and pathways** – with our qualitative evaluation understanding reasons driving this variation.

5 **It is clear that the longer they run, the more likely virtual wards are to show impact** – this is through a combination of higher volumes going through the wards, costs per admission typically falling over time, and the benefit per admission increasing.

6 **Our evaluation has identified a clear set of enablers** (including having sufficient funding, experienced staff, collaborative working, and strong clinical leadership) and **barriers** (inadequate resourcing, fragmented leadership, mis-aligned digital strategies) to effective virtual ward working.

7 **This evaluation is the starting point** – the South East needs to build on the evidence gathered and lessons learned in this evaluation, and to work closely with individual pathways to support continuous improvement of the virtual ward offering in the South East.

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Caveats to this evaluation

Limitations of the evaluation, including those around data quality, methodology, and the scope of the evaluation.

Caveats

1. **This evaluation has looked at the virtual ward level, but has been a South East region evaluation** – more should be done at the individual virtual ward level to understand drivers for impact, and what can be improved.

2. **The nature of the available data means this is ultimately an aggregate analysis looking at correlations between overall levels of virtual ward and non-elective activity**, rather than a patient-level analysis mapping individual journeys. A patient-level analysis at a regional level would mean more effective controlling for exogenous factors, though the scale of this evaluation means meaningful conclusions can still be drawn.

3. **Differences in the way cost data is collected and compiled across the wide range of providers in the South East may have introduced inconsistencies** into this data which could be mitigated by more standardised data collection.

4. **Different virtual wards are at different levels of maturity** – therefore impact and cost-benefit results may be skewed **against** those wards that have only been operating for a few months.

5. **The scope of the impact and cost-benefit work was focused on admission avoidance beds, therefore our impact and cost-benefit analysis has not focused on early supported discharge virtual wards.** We do recommend that further work is done to evaluate early supported discharge beds.

6. **We were not provided with the necessary data to undertake impact or cost-benefit analysis for three admission avoidance wards, so these results are not a complete picture of the South East's virtual wards offer** - although we do have representation across all ICSs and have analysed virtual wards accounting for 64% of South East virtual ward admissions as per the SitRep snapshot on the 26th of February 2024.

7. **We have reviewed impact on a range of criteria, including cost-benefit, admissions avoidance, patient, carer, staff experience.** However there will be other elements of impact this study did not have the scope to achieve (such as clinical impact, or broader economic impact).

8. **Estimated 'financial values' of avoided activity were based on national tariffs and other averages** which do not account for South East specific cost variations or differences in acuity.

9. **Estimates** for the BME population relevant to each virtual ward have been calculated using census 2021 data, **where suppressed values (below five) have been averaged according to total 2021 population estimates** – this may **overestimate** suppressed values (which are **most often BME population estimates**) of which many represent zero-values in reality.

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Next Steps

High-level suggested next steps following this evaluation.

1. Socialise this document with key stakeholders

- *Share this document with key South East region, ICB, and Place stakeholders to share findings.*

2. Additional impact analysis

- *Whilst this is currently the largest evaluation of its kind in the UK, our work identified a number of areas of evaluation/analysis that could be improved upon – including:*
    - *Evaluating the impact of early supported discharge beds in the South East region (as the cost-benefit and impact elements of the evaluation focused exclusively on admission avoidance beds).*
    - *Improve the robustness of these results by (1) improving the quality of input datasets including provider financial returns and provider patient-level datasets, and (2) making more robust assumptions on the value of avoided NEL admissions based on South East data.*
    - *Use this evaluation's conclusions to develop and investigate new hypotheses on the drivers of differences in impact, cost, and benefit between virtual wards, such as acuity, length of stay, and demographics.*

3. System level

- *Continue to evaluate impact on an ongoing basis across the region (using our toolkit as the starting point, potentially through an automated dashboard).*
- *Through existing (or new) processes, ensure lessons learnt from evaluation are translated into on the ground changes.*

4. Pathway level continuous improvement

- *This evaluation has reviewed at a high level the impact and success criteria for virtual wards. More can be done at the pathway level to do more in-depth assessments of what has worked well, what has worked less well – with a focus on implementing change.*
- *We have identified that more could be done by the system to support access to virtual wards for certain groups – such as certain black & minority ethnic groups, or those without permanent residences. This should be looked into in more detail as a priority.*

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Additional information

Guidance on where to find more detailed information – this is a thorough evaluation report, and we have provided signposting to specific sections, tables, or appendices for readers seeking deeper insights into particular aspects of the evaluation.

If I want to know more about…

I should go to…

If I want to know more about…	I should go to…
Our approach to this evaluation	Evaluation Approach (pages 22 to 26)
A summary of virtual wards in the South East region (and a summary of each pathway)	Understanding the "As-Is" (pages 27 to 33) Appendix 3 – Model Profiles (pages 85 to 114)
What clinicians and managers of virtual wards told us about what worked well, and less well	Process evaluation (pages 38 to 43)
What methodology we used to estimate impact	Methodology Overview – Impact Analysis (pages 45 to 46)
A more detailed breakdown of our impact findings	Impact, Cost-benefit and Health Inequality Evaluation (page 47)
How to update the impact/cost-benefit analysis for my pathway	Our accompanying toolkit (separate document)

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