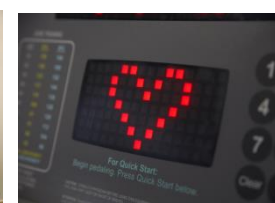


# Service evaluation of the Virtual Services Team

December 2024

Christos Fysarakis – Head of Innovation & VRI Programme Lead



## Executive summary

### Background

- Bradford Teaching Hospital NHS Foundation Trust (BTHFT) established the Virtual Services Team (VST) with the aim of creating a single Trust-wide and multi-specialty virtual ward (Hospital at Home service) with single governance, information requirements, principles and oversight. The aim was to ensure that every major speciality in the Trust can offer access to the virtual ward to every clinically suitable patient

### Approach

- A service evaluation of the VST activity was conducted using activity data from the service's launch on 26/06/2023 to 31/08/2024. The analysis included the substantive review of all VW admissions and explored the following:
  - ✓ Referral outcomes
  - ✓ VW length of stay
  - ✓ Admission type (step-up/down)
  - ✓ Return to hospital rate
  - ✓ Occupancy evolution
  - ✓ Admissions & discharges by day of the week
  - ✓ Demographic analysis covering: age, sex, ethnicity and deprivation
  - ✓ Patient & clinician feedback
  - ✓ Impact on inpatient bed-days
  - ✓ Cost of VW bed-day
  - ✓ Return on Investment

# Executive summary

## Key findings

<b>Adoption and reach</b>	<ul style="list-style-type: none"> <li>7 specialties currently utilise the VST services</li> </ul>
<b>Service utilisation</b>	<ul style="list-style-type: none"> <li>Referral acceptance rate of 80% with 754 patients admitted to the VW</li> <li>The average length of stay, of those discharged, was of 9.8 days</li> <li>The average monthly admission rate is steadily increasing, reaching 73 in FY24-25</li> <li>Mix of step-up &amp; step-down patients (50%-50%)</li> </ul>
<b>Patient profile</b>	<ul style="list-style-type: none"> <li>VST patients are generally older than inpatients, with 67.4% over 55 years old v. 53.2% for the inpatient cohort</li> <li>Most deprived patients (deprivation index 1-3) are over-represented compared to the inpatient cohort (75.6% - 70.3%)</li> <li>Sex and ethnicity distributions are largely consistent with inpatient demographics</li> </ul>
<b>Patient and clinician satisfaction</b>	<ul style="list-style-type: none"> <li>Patient satisfaction is exceptionally high, with 96.6% reporting good or very good experience</li> <li>Clinician feedback is overwhelmingly positive, with consultants praising the VST's positive impact on patient care and resource management</li> </ul>
<b>Impact on IP bed-days</b>	<ul style="list-style-type: none"> <li>Significant impact on scaling demand for inpatient beds</li> <li>The estimated number of inpatient bed-days avoided was 1,671 in FY23-24 and 1,577 in FY24-25, the equivalent of 6.7 and 11.5 beds per day respectively</li> </ul>
<b>Cost-Effectiveness</b>	<ul style="list-style-type: none"> <li>For FY23-24 VST delivered a positive return on investment with £2.1 for every £1 invested</li> <li>For FY24-25 VST delivered a positive return on investment with £4.9 for every £1 invested</li> </ul>

# Background information

## Our ambition

*“To create one Trust-wide virtual ward with single governance, information requirements, principles and oversight; ensuring that every major speciality in the Trust is able to offer access to the virtual ward for every clinically suitable patient.”*

**Virtual Services Strategy**

## NHSE definition

Virtual Wards provide hospital level care at home

### virtual ward

🔊 'və:tfʊ(ə)l wɔ:d

A virtual ward is a safe and efficient **alternative to NHS bedded care**.

Virtual wards support patients who would **otherwise be in hospital** to receive the acute care and treatment they need in their own home.

This includes either **preventing avoidable admissions** into hospital, or **supporting early discharge** out of hospital.

- **The acuity and complexity of the patient's condition differentiates virtual wards from other community and home-based services**
- It provides **urgent access to hospital-level diagnostics** (such as endoscopy, radiology, or cardiology) and may include bedside tests such as **point of care (POC) blood tests and point of care ultrasound**
- It provides **hospital-level interventions** (such as access to intravenous fluids, therapy, and oxygen)
- It requires **daily input from a multidisciplinary team** and sometimes **multiple visits and provisions** for 24 h cover with the ability to respond to urgent visits, often **enabled by technology**
- It requires **consultant practitioner specialist leadership** and **clear lines of clinical responsibility**
- **Defined inclusion and exclusion criteria**, with defined target population and deliver a **time-limited short-term intervention** of 1–14 days.
- **VW patients have equity of access to other specialty advice as though an in-patient.**

**NB:** A virtual ward **is not** a mechanism intended for enhanced primary care programmes; chronic disease management; home intravenous or infusion services; intermediate or day care; safety netting; or proactive deterioration prevention. Wider virtual care supported services (including NHS@home) are scaling to enabling these cohorts to be increasingly supported at home / in the community,

# The benefits seen in existing virtual wards

## Patient choice and preference

**>99%**

Over 99% of patients on existing virtual wards would recommend the service \*



Treatment and care in a more comfortable home environment

**23%**

Keeping patients in the place where they would prefer to be cared for in future \*

23% of patients treated in a virtual ward achieved a more independent social care outcome than they would have in an acute setting.

## Patient wellbeing and safety

**5x**

Patients are five times less likely to acquire an infection \* when treated on a virtual ward compared to an acute setting

**8x**

Patients are eight times less likely to experience functional decline \* whilst in a virtual ward compared to equivalent treatment in an acute setting



Avoiding potential harms in a hospital setting, such as falls and delirium

## Capacity and productivity

**2.5x**

Two and half times fewer patients treated on a virtual ward are readmitted \* to frailty beds than the national acute benchmark



Frees up physical beds for other patients who require an in-patient admission

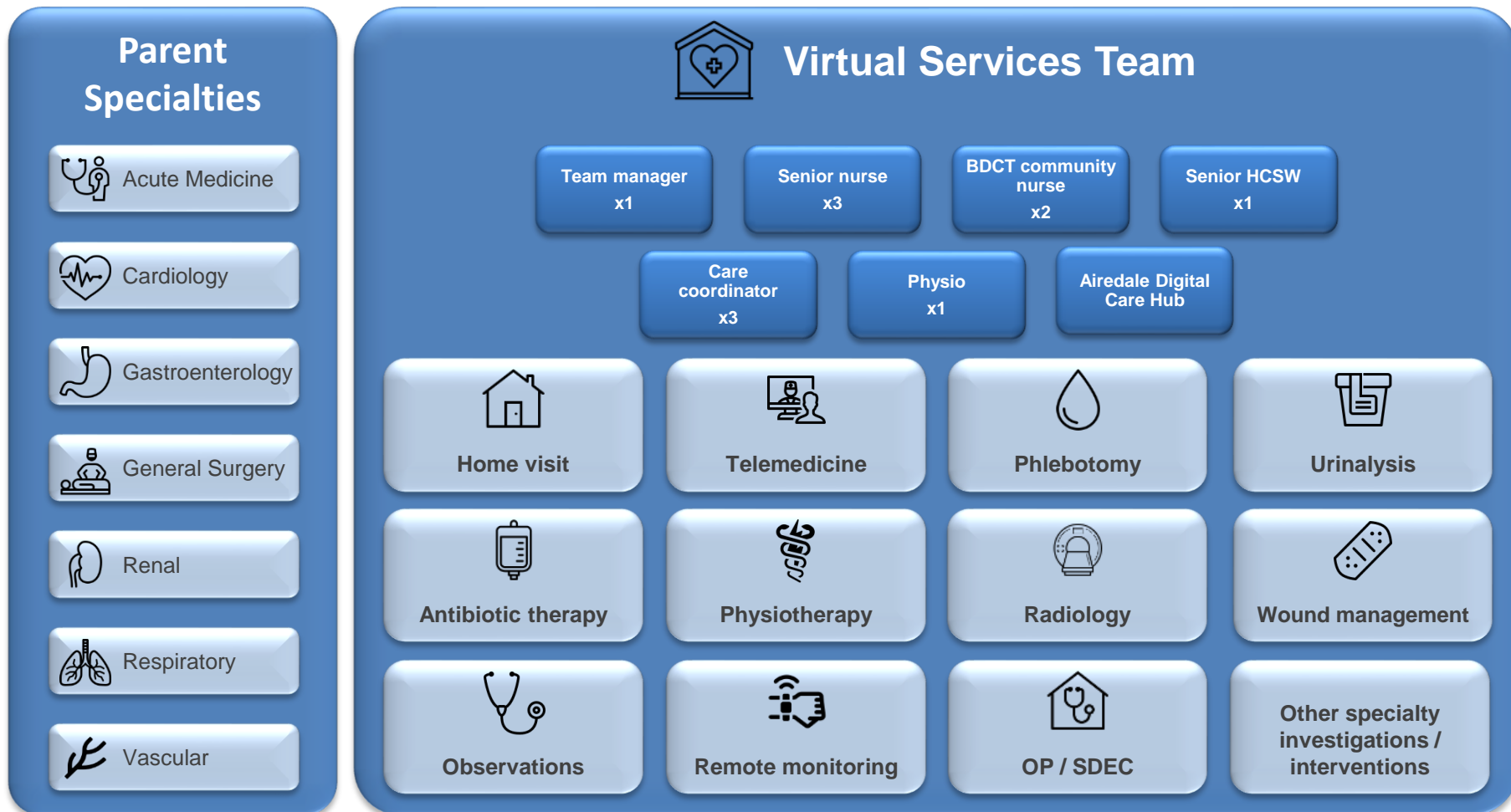


Improved staff experience and opportunities



Enabled by technology including remote monitoring

# Virtual Services Team (VST)





## Virtual Services Team (VST)

### Key characteristics



**Single team delivering  
Virtual Ward services to all  
adult specialties**



**Single referral and  
recording mechanism  
within Cerner**



**Patient accountability lies  
with a named Consultant  
Physician mirroring  
inpatient process**

# VST service evaluation

26/06/23 – 31/08/24

## Methodology

- A service evaluation of the VST activity was conducted using activity data from the service's launch on 26/06/2023 to 31/08/2024
- The analysis included the substantive review of all VW admissions and explored the following:
  - ✓ Referral outcomes
  - ✓ VW length of stay
  - ✓ Admission type (step-up/down)
  - ✓ Return to hospital rate
  - ✓ Occupancy evolution
  - ✓ Admissions & discharges by day of the week
  - ✓ Demographic analysis covering: age, sex, ethnicity and deprivation
  - ✓ Patient & clinician feedback
  - ✓ Impact on inpatient bed-days
  - ✓ Cost of VW bed-day
  - ✓ Return on Investment
- Data sources:
  - ✓ Cerner (EPR)
  - ✓ Interviews of clinical staff including Consultant Physicians, ACPs and Nurses
- Assumptions:
  - The estimated number of inpatient bed-days avoided is based on clinician interviews which may introduce subjectivity. A further clinical audit may be required to validate the findings
  - 90% utilisation rate for inpatient beds was assumed to calculate the number of IP beds released per day
  - An average inpatient bed-day cost of £600, based on 2022/23 PLICS data, was used to calculate the opportunity saving, representing the costs avoided by treating patients at home

## Key metrics

26/06/23 – 31/08/24

- 754 patients admitted to the VW
- The average length of stay, of those discharged, was of 9.8 days (7.0-23.8)
- The return to hospital rate of 13.0% (7.6%-33.3%)

### Key statistics to date

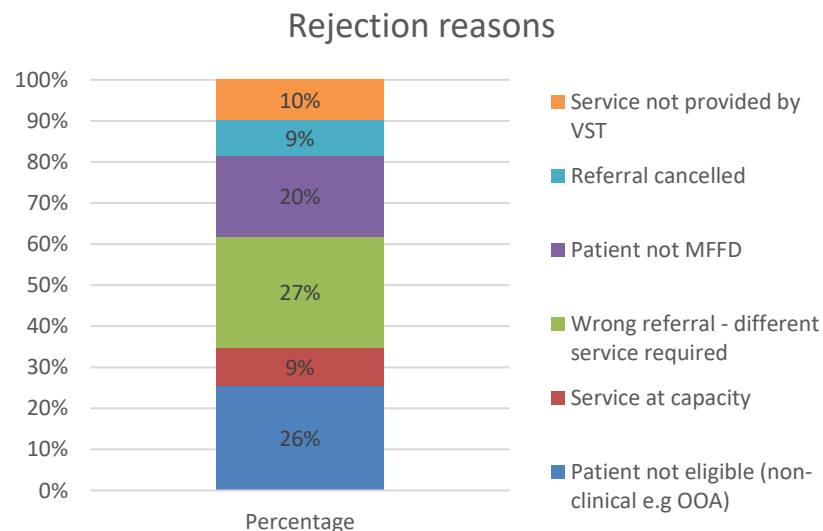
Specialty	Admissions	Discharges	Bed-days (of discharged)	Average Length of stay	Patients returning to hospital	Return to hospital rate
Acute Medicine	204	198	1,505	7.6	15	7.6%
Cardiology	22	18	428	23.8	6	33.3%
Gastroenterology	32	28	396	14.1	4	14.3%
General Surgery	250	241	1,697	7.0	41	17.0%
Renal	60	58	479	8.3	5	8.6%
Respiratory	118	116	1,327	11.4	13	11.2%
Vascular	68	66	1,187	18.0	10	15.2%
<b>Total</b>	<b>754</b>	<b>725</b>	<b>7,019</b>	<b>9.8</b>	<b>94</b>	<b>13.0%</b>

# Referrals

26/06/23 – 31/08/24

- 938 patients were referred to the VW of which 754 (80%) were admitted to the service
- 20% of referrals (184 patients) were rejected as per the reasons outlined below

Referral analysis				
Specialty	Referrals	Accepted	Rejected	% rejected
Acute Medicine	248	204	44	18%
Cardiology	28	22	6	21%
Gastroenterology	43	32	11	26%
General Surgery	317	250	67	21%
Renal	68	60	8	12%
Respiratory	149	118	31	21%
Vascular	85	68	17	20%
<b>Total</b>	<b>938</b>	<b>754</b>	<b>184</b>	<b>20%</b>



# Admissions

## 26/06/23 – 31/08/24

- 754 patients were admitted between 26/06/2023 and 31/08/2024 with an average of 54 admissions per month (excluding June 23). For FY24-25 the average monthly admissions were 73

### Admissions by month

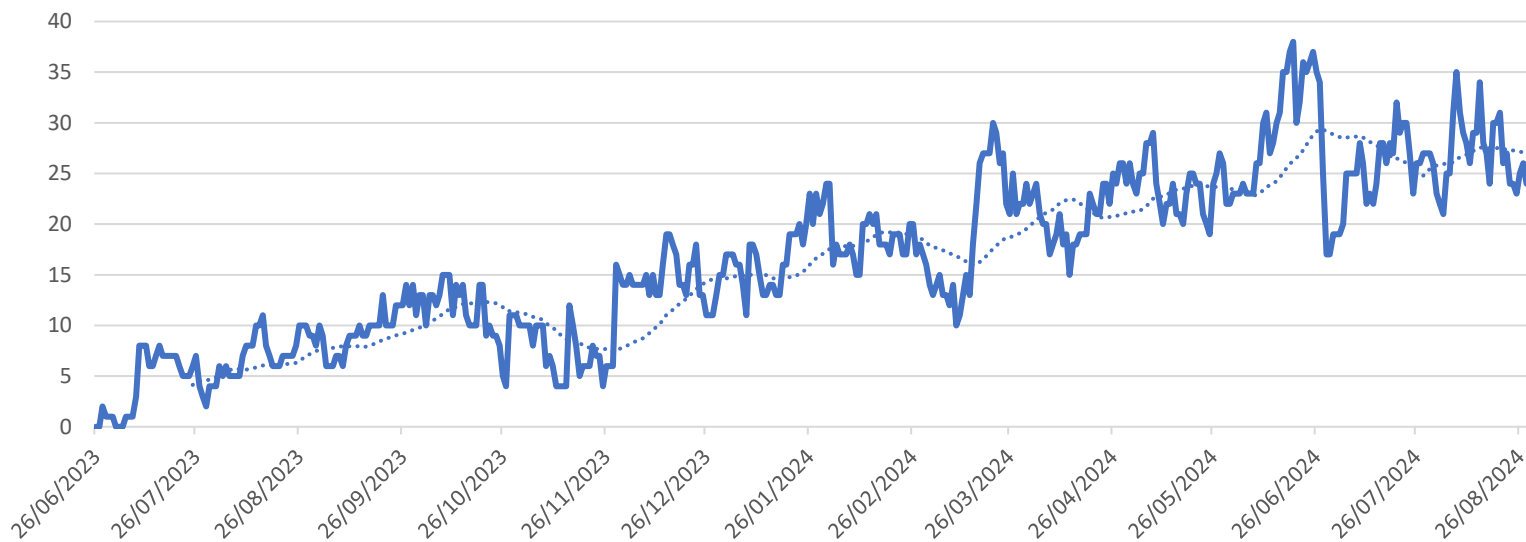
Month	Acute Medicine	Cardiology	Gastroenterology	General Surgery	Renal	Respiratory	Vascular	Total
<b>2023</b>								
Jun	0	0	0	2	0	0	0	2
Jul	5	0	0	15	0	0	4	24
Aug	8	0	0	13	0	4	2	27
Sep	10	5	0	11	0	8	1	35
Oct	12	0	2	20	0	7	0	41
Nov	13	0	1	21	0	10	0	45
Dec	15	0	4	20	0	5	13	57
<b>2024</b>								
Jan	21	3	0	11	4	13	2	54
Feb	14	0	1	16	7	8	2	48
Mar	13	3	1	14	8	14	3	56
Apr	19	2	2	18	1	9	8	59
May	13	1	3	22	6	12	9	66
Jun	22	3	4	23	16	13	10	91
Jul	24	4	4	18	6	8	4	68
Aug	15	1	10	26	12	7	10	81
<b>Total</b>	<b>204</b>	<b>22</b>	<b>32</b>	<b>250</b>	<b>60</b>	<b>118</b>	<b>68</b>	<b>754</b>

# Occupancy rate

26/06/23 – 31/08/24

- The occupancy rate has been steadily increasing as the VST model matures. The average daily occupancy in FY24-25 YTD is 25.2 patients

Daily occupancy (inc. 30-day average)



**Average occupancy by Specialty**

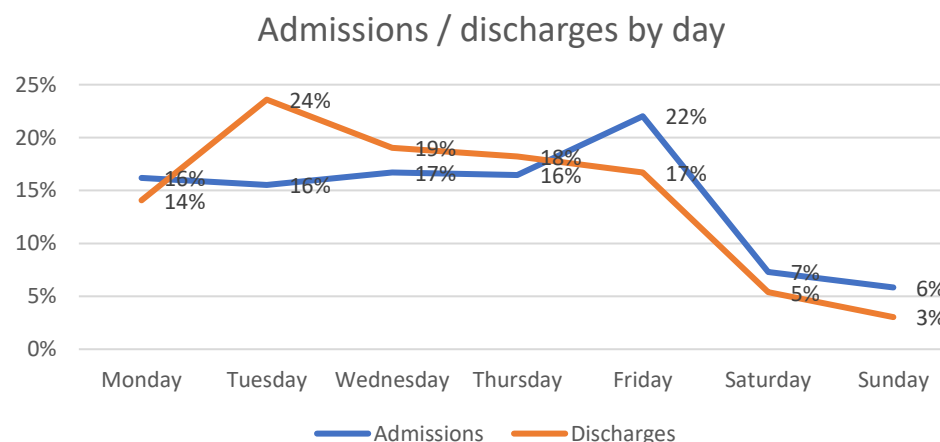
Period	Acute Medicine	Cardiology	Gastroenterology	General Surgery	Renal	Respiratory	Vascular	Total
FY23-24	3.0	1.2	0.6	3.7	1.7	2.9	1.3	12.6
FY24-25	4.7	1.9	2.0	4.6	2.2	4.1	5.7	25.2

# Admissions & discharges by day of the week

## 26/06/23 – 31/08/24

- Admissions and discharges predominantly take place during weekdays; 87% and 92% respectively
- Admissions are evenly spread over the weekdays with the exception of Friday where a 36% increase is observed, aligning to the IP admission/discharge profile
- Discharge pattern is more variable with discharges peaking on Tuesday

Admissions/discharges by day		
Day	Admissions	Discharges
Monday	123 (16%)	102 (14%)
Tuesday	117 (16%)	171 (24%)
Wednesday	126 (17%)	138 (19%)
Thursday	124 (16%)	132 (18%)
Friday	166 (22%)	121 (17%)
Saturday	55 (7%)	39 (5%)
Sunday	43 (6%)	22 (3%)
<b>Total</b>	<b>754 (100%)</b>	<b>725 (100%)</b>

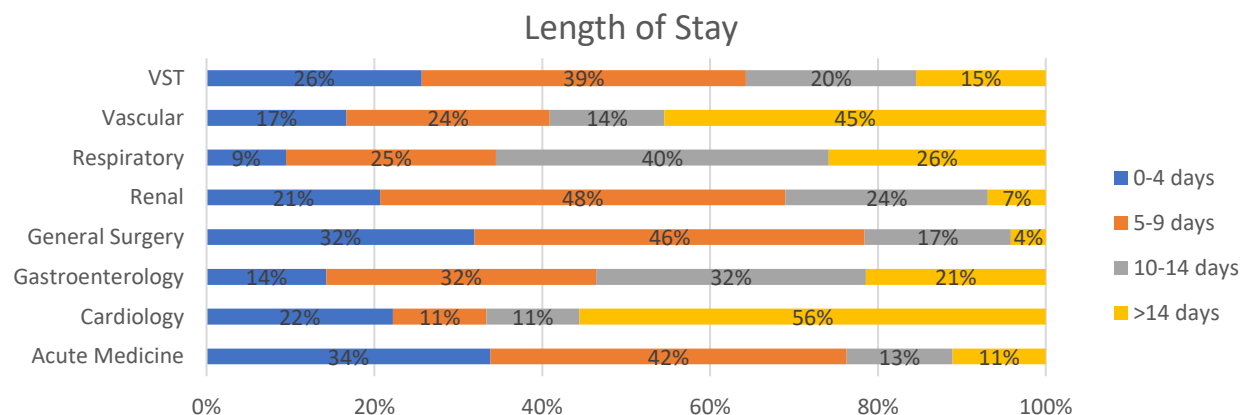




## Length of Stay

26/06/23 – 31/08/24

- 84% of our admissions were up to 14 days, in line with the NHSE guidance
- Cardiology had the highest % of patients staying >14 days, with 56%, followed by Vascular (45%)
- On the other hand for General Surgery only 4% stayed >14 days whilst for Renal the rate was 7%

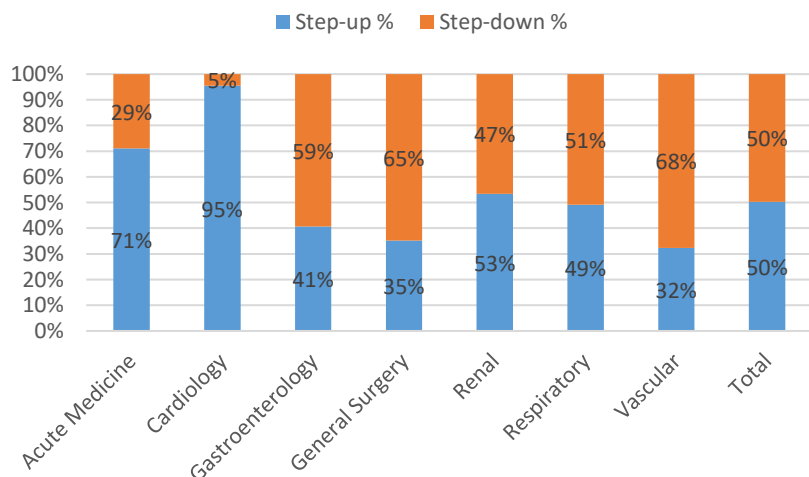


Length of stay distribution by specialty								
LoS	Acute Medicine	Cardiology	Gastroenterology	General Surgery	Renal	Respiratory	Vascular	Total
0-4 days	67	4	4	77	12	11	11	186
5-9 days	84	2	9	112	28	29	16	280
10-14 days	25	2	9	42	14	46	9	147
>14 days	22	10	6	10	4	30	30	112
<b>Total</b>	<b>198</b>	<b>18</b>	<b>28</b>	<b>241</b>	<b>58</b>	<b>116</b>	<b>66</b>	<b>725</b>

## Admission type 26/06/23 – 31/08/24

- VST supports both step-up and step-down patients\* with an overall ratio of 50%-50%
- Cardiology recorded the highest step-up ratio (95%) relating to HF patients admitted directly from the community
- Conversely Vascular recorded the highest step-down ratio of 68% (VAC dressings & larvae therapy)

Admission type by specialty



Admission type			
Specialty	Admissions	Step-up	Step-down
Acute Medicine	204	145 (71%)	59 (29%)
Cardiology	22	21 (95%)	1 (5%)
Gastroenterology	32	13 (41%)	19 (59%)
General Surgery	250	88 (35%)	162 (65%)
Renal	60	32 (53%)	28 (47%)
Respiratory	118	58 (49%)	60 (51%)
Vascular	68	22 (32%)	46 (68%)
<b>Total</b>	<b>754</b>	<b>379 (50%)</b>	<b>375 (50%)</b>

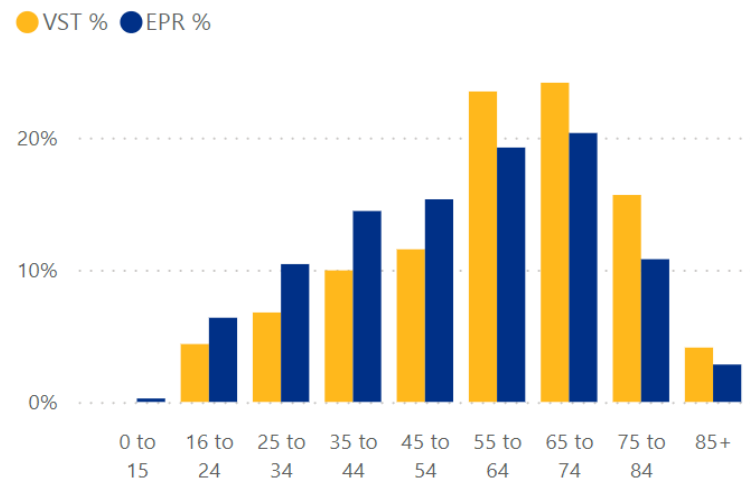
# Age distribution

26/06/23 – 31/08/24

- The table below compares the age of the VW patients versus the inpatient population for the in-scope specialties
- Patients admitted to VW are typically older than those on the inpatient wards with 67.4% being over 55 years old compared to 53.2% for the inpatient wards

Age distribution		
Age band	VST	Inpatients
0 – 15	0%	0.3%
16 – 24	4.4%	6.4%
25 – 34	6.8%	10.4%
35 – 44	9.9%	14.4%
45 – 54	11.5%	15.3%
55 – 64	23.5%	19.2%
65 – 74	24.1%	20.3%
75 – 84	15.6%	10.8%
85+	4.1%	2.8%

VST % and EPR % by Age Band



## Sex distribution

26/06/23 – 31/08/24

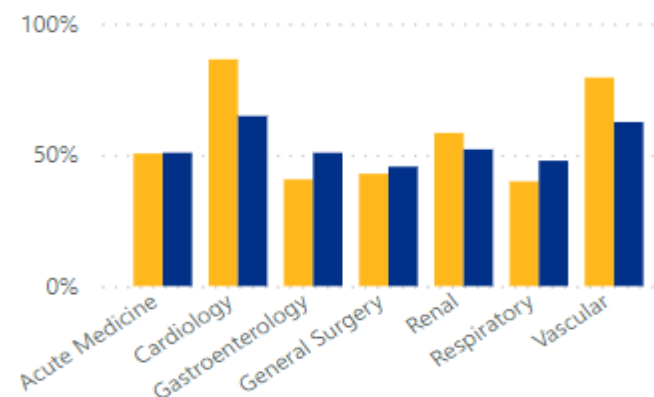
- The table below compares the sex of the VW patients versus the inpatient population for the in-scope specialties
- The sex distribution is approximately 50%-50% between male & female, aligned with that of the inpatient wards
- Further analysis would need to be conducted to explore the reasons behind the seemingly material over-representation of males in Cardiology and Vascular

Sex distribution		
Gender	VST	Inpatients
Male	50.1%	50.6%
Female	49.9%	49.4%

Sex distribution by specialty				
Specialty	VST		Inpatients	
	Male	Female	Male	Female
Acute Medicine	50.5%	49.5%	51.3%	48.7%
Cardiology	86.4%	13.6%	64.5%	35.5%
Gastroenterology	40.6%	59.4%	50.8%	49.2%
General Surgery	42.8%	57.2%	45.4%	54.6%
Renal	58.3%	41.7%	51.2%	48.8%
Respiratory	39.8%	60.2%	46.7%	53.3%
Vascular	79.4%	20.6%	62.6%	37.4%

Admissions Male %

● VST ● EPR



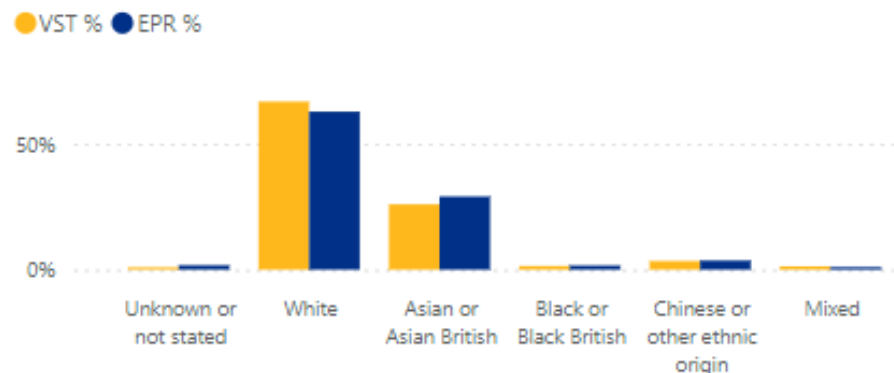
# Ethnicity distribution

26/06/23 – 31/08/24

- The table below compares the ethnicity of the VW patients versus the inpatient population for the in-scope specialties
- Overall the case load of the VW aligns with that of the inpatient wards with regards to ethnicity

Ethnicity breakdown		
Ethnicity	VST	Inpatients
Asian or Asian British	26.0%	29.1%
Black or Black British	1.5%	1.7%
Chinese or other ethnic origin	3.4%	3.6%
Mixed	1.3%	1.0%
White	66.8%	62.8%
Unknown or not stated	0.9%	1.8%

VST % and EPR % by Ethnicity Group

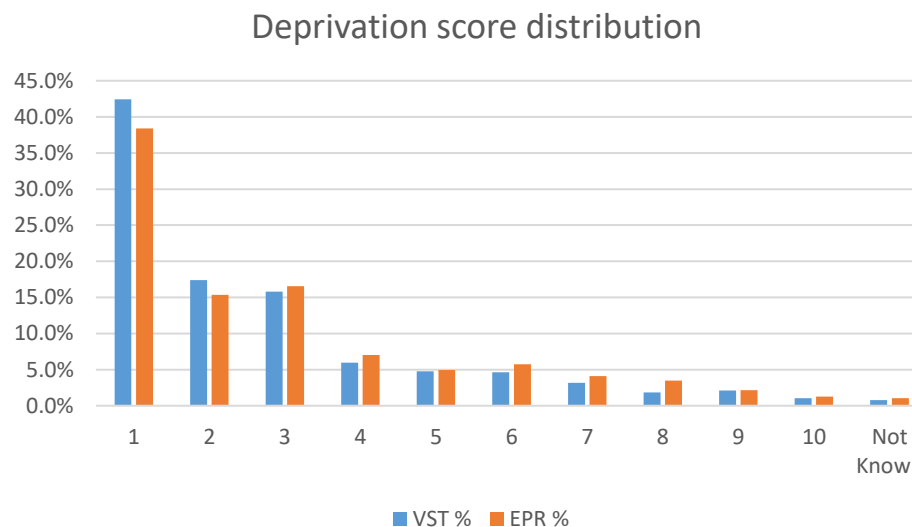


# Deprivation distribution

26/06/23 – 31/08/24

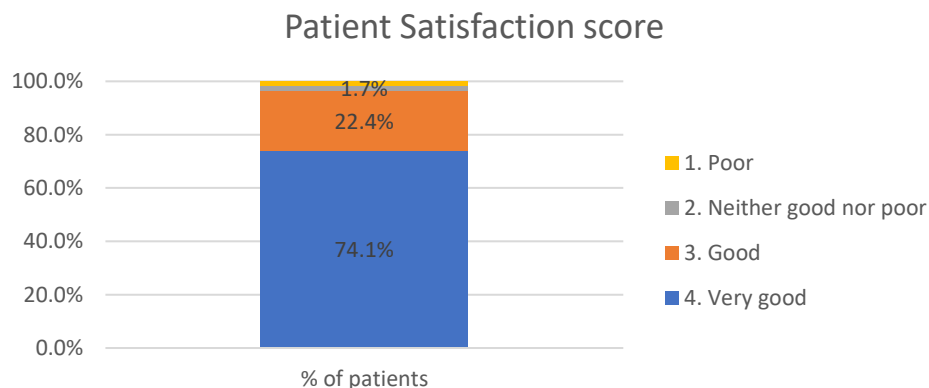
- Analysis of the deprivation score shows that most deprived patients (score 1-3) are over-represented in the VST cohort compared to the inpatient cohort for the same period of time (75.6% v. 70.3%)

Deprivation score distribution		
Deprivation score	VST	Inpatients
1	42.4%	38.4%
2	17.4%	15.3%
3	15.8%	16.6%
4	6.0%	7.0%
5	4.8%	4.9%
6	4.6%	5.7%
7	3.2%	4.1%
8	1.9%	3.5%
9	2.1%	2.1%
10	1.1%	1.2%
Not known	0.8%	1.0%



# Patient feedback

- Based on FFT score collated 96.6% of patients (N=58\*) reported a good or very good satisfaction score



## Patient feedback

*“I much prefer to be looked after at home”*

*“Excellent care from the district nursing team”*

*“I felt reassured that I was in safe hands”*

*“It’s a very good idea, you can get on with life and be active in own home rather than be stuck on a ward on bed/chair”*

*“Very good, I have 2 dogs that I was able to get back to, I had to pay someone to look after them whilst I was in hospital so coming home saved me money”*

*“Could not ask for better care”*

*“I feel I was supported in my recovery”*

*“I knew there was help available if I needed it”*

## Clinician feedback

*“The Virtual Ward, across the many and expanding number of specialties that it serves, has already proven to be a meaningful productive addition to the pathways that they offer. It has demonstrated that in providing safe at home care for patients, who would otherwise occupy a hospital bed, that it can provide safe comprehensive care enabling a patient to benefit from all of the advantages of being in their usual home environment. Undoubtedly, in these straitened times where resources are increasingly scarce, this is a development that can enable us to maintain our high quality professional care of patients whilst reserving the inpatient resource for those who need it most. Clearly, we are only part-way along this journey and there is still much work to do. All and any of those interested can contact any of the members of the Virtual Services Team for further information as we would only be too pleased to talk to you in the hope of fostering further engagement and driving wider adoption of this exciting opportunity.”* **James Halstead, Upper GI Consultant & VW Clinical Lead**

*“I consider virtual wards as an integral part of the treatment of patients with heart failure, and in many ways we have been somewhat behind the curve with this approach to how we treat our patients. We have ample data that tell us that hospitalisation whilst potentially beneficial is an inherently risky prospect for many patients with severe disease and impaired immune systems. From a patient preference point of view, again we acknowledge that patients have a strong preference to be treated in their own home wherever possible. Until now, we've had no option but to keep patients in hospital for extended periods of time, a lot of which is spent with little or no direct interaction with staff. Virtual wards allow us to deliver the same interventions and monitoring for patients, with regular review to ensure that any deterioration is captured early and allows treatment to be changed or escalated to hospital admission.”* **Jiv Gosai, Cardiology Consultant**

*“The Virtual Service Team has been one of the most important supporting services I have used in my life as a medical consultant. It not only provides reassurance to patients and the discharge team, but it is also a seed for massive future opportunities and much larger projects”* **Tameem Tawfiq, Acute Medicine Consultant**

*“We know that patients who are discharged following a COPD exacerbation are at an increased risk of readmission to the hospital. The respiratory specialist virtual ward MDT has provided us with the ability to support an earlier discharge for patients’ by delivering care directly into their homes during the acute illness and arranging a prompt outpatient follow up with the specialist team. The virtual service is an integral step in addressing this high readmission rate.”* **Tanveer Khalid, Respiratory Consultant**

*“The Virtual Services Team is a very welcome addition to our array of virtual activities and delivers a consistently high standard of care for patients who are well enough to complete their treatment at home rather than in hospital. We will be looking to extend our use of the VRI from essential monitoring to therapeutic interventions in the home setting.”* **John Stoves, Renal Consultant**



# VST impact

26/06/23 – 31/08/24

## Impact on IP bed-days Limitations

- To calculate the impact of the VW we interviewed Consultant Physicians, ACPs and nurses from all specialties and through looking at the case-mix of patients we calculated an approximate number of IP bed-days avoided
- Whilst this is a desktop exercise with obvious limitations it provides a useful insight on the bed-days released by the operation of the Virtual Ward
- A clinical audit in each respective specialty may help confirm our findings

## Impact on IP bed-days

FY23-24: 26/06/23 – 31/03/24

- In FY23-24 patients spent a total of 3,099 days on the VW resulting in 1,671 IP bed days avoided
- Assuming a 90% utilisation this is the equivalent of **6.7 beds per day**

### FY23-24 (June-March): Key statistics

Specialty	Admissions	Discharges	VW Bed-days (of discharged)	Average Length of stay	IP bed-days avoided per patient	Total IP bed-days avoided	Beds @ 90% occupancy
Acute Medicine	112	109	793	7.3	3	327	1.3
Cardiology	11	9	226	25.1	11	99	0.4
Gastroenterology	9	8	71	8.9	3	24	0.1
General Surgery	143	140	978	7.0	6	840	3.3
Renal	19	15	130	8.7	2	30	0.1
Respiratory	69	61	640	10.5	3	183	0.7
Vascular	27	24	261	10.9	7	168	0.7
<b>Total</b>	<b>390</b>	<b>366</b>	<b>3,099</b>	<b>8.5</b>		<b>1,671</b>	<b>6.7</b>

## Impact on IP bed-days

FY24-25: 01/04/24 – 31/08/24

- In FY24-25 patients spent a total of 3,920 days on the VW resulting in 1,577 IP bed days avoided
- Assuming a 90% utilisation this is the equivalent of **11.5 beds per day**

### FY24-25 (April-August): Key statistics

Specialty	Admissions	Discharges	VW Bed-days (of discharged)	Average Length of stay	IP bed-days avoided per patient	Total IP bed-days avoided	Beds @ 90% occupancy
Acute Medicine	92	89	712	8.0	3	267	1.9
Cardiology	11	9	202	22.4	11	99	0.4
Gastroenterology	23	20	325	16.3	3	60	0.4
General Surgery	107	101	719	7.1	6	606	4.4
Renal	41	43	349	8.1	2	86	0.6
Respiratory	49	55	687	12.5	3	165	1.2
Vascular	41	42	926	22.0	7	294	2.1
<b>Total</b>	<b>364</b>	<b>359</b>	<b>3,920</b>	<b>10.9</b>		<b>1,577</b>	<b>11.5</b>

## Cost per VW bed-day

FY23-24: 26/06/23 – 31/08/24

- For FY23-24 the total direct cost for running VW (exc. ANHST & BDCT input) was £488,291 delivering 3,099 VW bed days. The average VW bed-day direct cost was: **£157.6**
- For FY24-25 (April-August) the total direct cost for running VW (exc. ANHST & BDCT input) was £193,620 delivering 4,012 VW bed days. The average VW bed-day cost was: **£49.4**

Direct cost			
Period	Actual spend	VW bed-days	Direct cost per VW bed-day
FY23-24	£488,291	3,099	£157.6
FY24-25 (April-August)	£193,620	3,920	£49.4

*“The 2023/24 and 2024/25 business cases for VWs should be focused on their current phase of transformation, which includes investment in testing, adaption and generation of real-world evidence. **For the next two years the business case should not be aimed at demonstrating the long-term sustainability for VWs** – before the sustainability case can be made, more work is needed on: defining the optimal model, the transformation and integration of services and real-world evidence of impact.”*

[Health Innovation Network: The benefits of Virtual Wards: writing a sustainable Business Case](#)

## Return on Investment

### FY24-25: 01/04/24 – 31/08/24

- We calculated the Return on investment presented as an opportunity saving, i.e. the costs directly avoided by patients spending less time in hospital by treating them at home. This is based on an average IP bed-day cost of £600\*
- For FY23-24 VST delivered a positive return on investment with £2.1 for every £1 invested
- For FY24-25 VST delivered a positive return on investment with £4.9 for every £1 invested

Direct cost				
Period	Actual spend	IP bed-days avoided	Opportunity saving	Return on Investment
FY23-24	£488,291	1,671	£1,002,600	2.1
FY24-25 (April-August)	£193,620	1,577	£946,200	4.9

#### Other benefits not considered above:

- Flow (e.g. gastroenteritis patients)
- 379 downstream ward admissions avoided (see slide 19)
- ICU step-down
- Vascular: *“If these patients were discharged from the vascular [IP] ward at +7 days they would need a very early diabetic foot/vascular/woundcare OPA within 1-2 weeks but at discharge from the current virtual ward these patients are now in a more stable situation and can be followed up 4-6 weeks after discharge from a physical bed.”* Kevin Mercer, Vascular Consultant



# Next steps

A photograph of a wooden staircase leading up a dune. The staircase is made of weathered wood and has a simple railing. The dune is covered in tall, dry grasses. The sky is overcast and grey.

✓ Further embedding of the service in all in-scope specialties

✓ Develop new referral streams to increase step-up admissions

✓ Onboard additional specialties