### **Virtual Wards**

# Workforce mix, revenue cost, digital access and implications for the RTT surgical backlog.

#### **Executive summary**

- By December 2023 the English NHS should have access to 28,000 virtual beds this is 27% more beds than are currently available.
- > The capital needed to open these beds is zero since they are in patients own homes.
- For the NHS to deliver the same number of beds the capital cost is circa £18 billion and would require 33 additional hospitals in England.
- The Governments ambition to create 28,000 virtual 'auxiliary' hospital beds is a much needed, system wide "pressure release valve" to help prevent hospital sites failing to cope with predictable increases is service demand.
- 28,000 virtual beds delivers a massive clinical isolation resource when managing a pan or epidemic situation in the future.
- The cost of a Virtual Ward serving a population of 500,000 is £10,450,000 pa.
- A Virtual Ward serving a population of 500,000 will need 114 wte Nurses (50% Registered and 50% HCA grade).
- 14,000 virtual beds could drive the day case RTT numbers down to pre pandemic levels in 15 weeks.
- 14,000 virtual beds could drive the inpatient surgical RTT numbers down to pre pandemic levels in 2.75 years.
- The governance arrangement for a Virtual Ward could be assigned to the Ambulance Service or the A&E Department in a local hospital.
- The technology for delivering a safe Virtual Ward system is already available and in use in the international health care system.
- The application of digital health techniques will impact positively on clinical risk management and will widen the range of acuity which can be dealt with in the community.
- Virtual Wards can be set up based on information management systems which incorporate a Big Data approach as part of the governance and research ethos of the NHS.

#### **National Policy Background**

The NHS 2022/23 priorities and operational planning guidance makes the following policy statement<sup>1</sup>

 develop the workforce required to deliver multidisciplinary care closer to home, including supporting the rollout of virtual wards and discharge to assess models

By December 2023, we expect systems to have completed the comprehensive development of virtual wards towards a national ambition of 40–50 virtual beds per 100,000 population. Successful implementation will require systems to:

- maximise their overall bed capacity to include virtual wards
- prevent virtual wards becoming a new community-based safety netting service; they should only be used for patients who would otherwise be admitted to an NHS acute hospital bed or to facilitate early discharge

In 22 months' time provider Trusts and ICS / ICB organisations will be held accountable for achieving this Government policy ambition i.e. to "maximise overall bed capacity" available to the NHS.<sup>2</sup>

The Government's ambition is to have 400 to 500 virtual beds per 1,000,000 population.

56<sup>3</sup> x 400 - 500 virtual beds = 22,400 - 28,000 virtual beds available for use by the NHS in England.

The current number of General & Acute beds in the English NHS is circa 101,432<sup>4</sup> down from 180,889 General & Acute beds in 1988.



<sup>1</sup> https://www.england.nhs.uk/wp-content/uploads/2021/12/B1160-2022-23-priorities-and-operational-planning-guidance-v2.pdf

<sup>2</sup> Trust leaders now face a far more 'performance management-orientated world' than most have realised, following a prolonged period in which there has been little grip from regulators, Sir Jim Mackey has warned. <u>Prepare for tighter grip from</u> regulators, says Mackey | News | Health Service Journal (hsj.co.uk)

https://www.bing.com/search?q=population+of+england+2021&form=ANNTH1&refig=68006e7f923b454281b0117bbef8da9e&sp=1&qs= HS&pq=population+of+england&sk=PRE51&sc=8-21&cvid=68006e7f923b454281b0117bbef8da9e 4 https://www.kingsfund.org.uk/publications/nhs-hospital-bed-numbers The Government's ambition is to augment the current hospital bed stock by opening "auxiliary" beds aka Virtual beds which are located in the homes of patients.

The by December 2023 the expected total beds stock available to the English NHS will be circa 101,432 General & Acute beds + 28,000 auxiliary beds in the community.

This represents an increase of bed stock available to the NHS of 27% for <u>no capital investment in</u> <u>buildings owned by the NHS.</u>

To build 28,000 beds would need circa 33 <u>additional</u> hospitals over and above the existing number of hospital sites. Estimated capital cost circa 550,000,000 per hospital = £18.15 billion.

The capital and revenue cost associated with opening 33 new hospitals is not affordable given:

- A) the state of the UK economy,
- B) non compatibility with the Government doctrine of shrinking the state or
- C) the policy of providing care closer to home.

A – C are some of the reasons why the Government has introduced the Virtual Ward policy.

Other reasons for the Virtual Ward policy is the increase in the population.

The cost of building more hospital capacity in response to rising demand due to population demographics, mainly from older people with chronic long term health issues, is unsustainable.<sup>5</sup>



Another circa 2,000,000 increase in the population over the next ten years will crush and break even further the current model of providing inpatient clinical care from a static number of over full Acute hospitals, most of which have major estate backlog maintenance problems.

<sup>5</sup> 

The Government's ambition to create 28,000 virtual 'auxiliary' hospital beds is a much needed system wide "pressure release valve" which will help prevent hospital sites failing to cope with predictable increases in demand for Acute Hospital servcies.

Failure to introduce Virtual Wards means the NHS risks:

- a) a poorer general population health profile due to lack of capacity to treat people in hospitals
- b) a failure to achieve the NHS backlog recovery targets and
- c) further loss of NHS credibility by the public

Given the time lag for a major hospital rebuild there is no way the English NHS can build sufficient additional hospital bed capacity in the next two years i.e. before the next general election.

Nor is there any way the private sector can bridge this gap.

Contrast this outlook with the prospect of having 27.8 million households in England<sup>6</sup> each containing a potential virtual bed space which can be used by a patient / resident at zero capital cost to the NHS.

### **Other observations:**

- A) the Virtual ward policy also allows the NHS to avoid fixed and semi fixed revenue costs associated with providing inpatient clinical care to a patient in an acute hospital bed.
- B) 28,000 virtual beds delivers a massive clinical isolation resource when managing a pan or epidemic in the future.
- C) "Admission avoidance HAH with CGA led to similar outcomes as hospital admission in the proportion of older persons living at home as well as a decrease in admissions to long-term residential care at 6 months. This type of service can provide an alternative to hospitalization for selected older persons".<sup>7</sup>

<sup>6</sup> 

https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/bulletins/familiesandhouseholds/2019#main-points

<sup>&</sup>lt;sup>7</sup> https://www.acpjournals.org/doi/10.7326/M20-5688

### Estimated cost and staff mix.

Below is my estimation of cost and staff group profile needed to run a Virtual ward to an acceptable level of quality and safety which is capable of serving a population of 500,000.<sup>8</sup>

	Labour cost	Non Labour cost	Total
Nursing	£4,318,000	£1,090,000	£5,476,500
Physiotherapists	£808,000	£202,000	£1,010,000
Social Workers	£405,000	£100,000	£505,000
Medical Geriatrician, Ortho-Geriatrician and A&E Consultant + middle grade staff	£750,00	£100,00	£850,000
Ward Monitoring & Governance	£1,722,000	£805,000	£2,572,000
Peripatetic staff food allowance £5 per day per person. <sup>9</sup>		£245,000	£245,000
TOTAL	<u>£8,003,000</u>	<u>£2,542,000</u>	<u>£10,545,000</u>

<sup>&</sup>lt;sup>8</sup> See APPENDIX A for costing details.

<sup>&</sup>lt;sup>9</sup> <u>htts://www.neas.nhs.uk/media/13535/staff\_and\_board\_member\_expense\_rates.pdf</u> example of peripatetic staff lunch allowance.

Notional cost comparison Acute hospital stay vs Acute Virtual Ward stay:

Acute hospital stay	Acute Virtual Ward stay
Cost per bed per annum = £112,840	Cost per bed per annum = £42,180
Cost per bed per week = £2,170	Cost per bed per week = £811.15
Cost per bed per day = £310	Cost per bed per day = £115.87

### Virtual Ward policy – impact on back log waiting list.

The Virtual Ward policy brings into play a lot of additional capacity i.e. 28,000 Virtual (auxiliary) citizen owned beds per day.

This represents a 27% increase above the current General & Acute inpatient bed capacity.

The RTT data for surgery shows that the NHS had a very bad problem pre Covid; Covid has now exacerbated RTT problems to eye watering levels.

Waiting lists data shows that the RTT 18 week standard was last met in <u>February 2016</u> - after climbing from 2,041,274 in April 2008 to 3,082,000 in February 2016.

To meet the RTT standard 92% of people on the waiting list need to have been waiting less than 18 weeks, but current performance is significantly below that



Number of people on the RTT waiting list

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Number of people on the RTT waiting list

### The current RTT waiting list profile is:<sup>10</sup>

Year	Month	Incomplete RTT pathways							
		Median wait (weeks)	92nd percentile (weeks)	No. within 18 weeks	% within 18 weeks	No. > 18 weeks	No. > 52 weeks	% > 52 weeks	Total waiting (mil)
	Mar-21	11.6	52+	3,186,952	64.4%	1,763,345	436,127	8.8%	4.95
2021/22	Apr-21	11.0	48.7	3,311,746	64.6%	1,811,971	385,379	7.5%	5.12
	May-21	10.8	45.3	3,576,159	67.4%	1,729,266	336,779	6.3%	5.31
	Jun-21	10.5	44.2	3,749,231	68.7%	1,704,255	304,823	5.6%	5.45
	Jul-21	10.9	43.8	3,828,136	68.3%	1,779,438	293,102	5.2%	5.61
	Aug-21	11.5	44.4	3,865,241	67.6%	1,850,457	292,138	5.1%	5.72
	Sep-21	11.9	44.5	3,879,621	66.5%	1,955,374	301,274	5.2%	5.83
	Oct-21	12.0	44.4	3,921,948	65.6%	2,053,268	312,665	5.2%	5.98
	Nov-21	11.5	42.9	3,929,317	65.5%	2,065,839	306,996	5.1%	<mark>6.00</mark>
	Dec-21	12.5	43.4	3,873,658	63.8%	2,193,668	310,813	5.1%	6.07
	Jan-22								
	Feb-22								
	Mar-22	[							

What would happen if 28,000 acute hospital beds across England were made available for RTT waiting list work as a result of fully implementing the Virtual Ward policy?

The number of over 18 waiters is circa 2,503,000

As a rule of thumb the case mix for surgery is circa 80% day cases and 20% inpatient cases <sup>11</sup>

<sup>&</sup>lt;sup>10</sup> https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2022/02/RTT-Overview-Timeseries-Dec21-XLS-76K-92907.xlsx

<sup>&</sup>lt;sup>11</sup> https://data.england.nhs.uk/dataset/model-hospital-trust-level-day-case-rates

80% of 28,000 = 22,400 beds could be used for the day case procedures.

20% of 28,000 = 5,600 beds could be used for inpatient surgery procedures.

### What could an additional 28,000 virtual beds make in reducing the RTT backlog?

- Assumption the beds freed up in hospital can be resourced in terms of additional theatre space and surgical staff.
- Assumption all new additions to the RTT waiting list can be treated within the current NHS inpatient capacity and within the standard 18 week target date.
- Assumption medical emergency activity e.g. surges will not overspill into beds freed up by the introduction of Virtual Wards.

Total 2,503,000 total RTT waiters.

80% Estimated waiting for day case procedure = 2,002,400

20% Estimated waiting for inpatient procedure = **500,600** 

Assume deploy 20,000 beds used for day case waiters and 8,000 beds for inpatient waiters.

20,000 day case beds x 5 days per week x 2 cases per day = 200,000 additional day cases per week

 $2,002,400 \div 200,000 = 10$  weeks to bring down the RTT for day case procedures thanks to the Virtual Ward policy

8,000 beds for inpatient case load.

Assume 4 days average length of stay = 2,000 beds available per week.

500,600 ÷ 2,000 beds per week = <u>250 weeks i.e. circa 5 years to bring down the RTT for inpatient</u> procedures thanks to the Virtual Ward policy

NB Obviously the beds made available by the introduction of Virtual Wards can be flexed between day case and inpatient work load according to clinical resources available and local political priorities pre a general election in 2024.

E.g.  $28,000 \div 2 = 50 / 50$  split day case / inpatient case load.

14,000 day case beds x 5 days per week = 70,000 x 2 cases per day = 140,000 additional day cases per week

140,000 x 50 weeks = 7,000,000 potential case load capacity  $\div$  2,002,400 =<u>15 weeks to bring down</u> the RTT for day case procedures thanks to the Virtual Ward policy

14,000 inpatient cases ALoS 4 days = 3,500 beds available per week

 $500,600 \div 3,500 = circa 2.75$  years to bring down the RTT for inpatient case procedures thanks to the Virtual Ward policy

### Virtual Ward Governance arrangements

The Virtual Ward policy is the formal creation of what is effectively a 'hospital without walls' patient treatment system. The system is primarily focussed on:

a) Avoiding emergency and urgent, acute undifferentiated caseload arriving at the local hospital

and

b) Freeing up beds filled with patients who are classed as Delayed Transfer of Care or Medically Fit for Discharge and who can benefit from a clinical service at home or in the home of a relative / close friend.

These two policy tasks can be assigned to a variety of providers:

- a) The ambulance service a 24 / 7 service used to training people to provide services in situe, a pre hospital care specialist organisation; 32% of ambulance calls are dealt with on a see and treat basis.<sup>12</sup>
- b) The local care / nursing home sector managing the interface between in home non clinical care services alongside higher acuity cases normally resident in a hospital. Basic local infrastructure and logistic capability in place.
- c) The A&E department effectively offering a in home 'Same Day Emergency Care' style of service for 48 hours or so. A triage / monitoring / pre hospital clinical care and decision making service a local '@Home A&E' service.
- d) The Medical / Surgical 'on-take' service at the local acute hospital.
- e) The local Community Trust in partnership with the local Primary Care Networks in the area.
- f) The local social services in conjunction with the local Acute Trust or Primary Care network.

<sup>&</sup>lt;sup>12</sup> <u>https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2022/02/AmbSYS-2022-Jan.xlsx</u>

### Admission policy.

It is government policy to avoid virtual wards becoming part of the local Community Trust services i.e. Virtual Acute Wards are not part of the virtual bed service often provided by Community Trusts + others.

Ironically much of the required skill set needed in a Virtual Acute Ward has been developed by Community Nursing services across the country over many years.

 prevent virtual wards becoming a new community-based safety netting service; they should only be used for patients who would otherwise be admitted to an NHS acute hospital bed or to facilitate early discharge

Admission to an Acute Virtual Ward implies that patients will not stay on the ward for a long period of time. They are required to have a patient flow through them – they are not what used to be called 'back wards' for geriatric patients although the majority of patients on a Acute Virtual Ward will be older people.

Discharge pathways are very important. Routes out of the Acute Virtual Ward may be a discharge into:

- a) the Community run virtual beds system i.e. the virtual community hospital service
- b) the traditional Community nursing service for longer term care or
- c) into a 'in home' social care arrangement with or without Community nursing back up or
- d) into a residential care or nursing home

The option selected depends on what best suits the person's needs.

Effectively this mimics what already happens between hospital Trusts, NHS community Trusts, Local Authorities and private / charity care & nursing residential homes or in home care services.

The principle admitters to the Virtual Ward will be A&E Consultants and Specialist Consultants e.g. Geriatricians, Chest Physicians and Ortho-Geriatric surgeons.

An alternative admission route would be through the Primary Care Network system. This carries the potential risk of turning the 250 bed Acute Virtual Ward facility into a community-based safety netting service for the "gone off legs" late afternoon early evening presentations.

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### Technology

The digital health technology which will enhance patient risk management and make safer the working arrangements in the Virtual Ward is:

- A Virtual Ward dedicated smart phone provided to all staff working on the Virtual Ward staff should not be expected to use their own smart phone.
- 2) Smart phones owned by Virtual Ward patients. 65% of over 65s use a smart phone.<sup>13</sup>
- Smart TVs owned by patients.
  See: <u>REMOTE CARE THROUGH SMART TV FACILITY.</u>
- 4) A Virtual Ward Tablet or laptop for Virtual Ward personnel with video capability and connection to patient digital records e.g. EMIS records plus direct access to the A&E Department or the discharging doctor or to the patients GP practice.
- 5) Digital pulse oximeter
- 6) A smart watch patient monitor e.g. <u>https://www.empatica.com/en-gb/embraceplus/</u>
- 7) An electronic stethoscope to record and share data.
- 8) Dan Medical remote monitoring system https://danmedical.com/D-MAS\_Remote.html
- 9) Ultra sound <u>https://www.philips.co.uk/healthcare/sites/lumify</u>
- 10) A digital pain diary <u>http://www.mypaindiary.com/</u> + <u>https://www.youtube.com/watch?v=WzANTrg0dB4&list=PLH6CMTmMV-A4ELGdffLr-</u> <u>XnXz0D4mwas &t=1s</u>

Please see:

Prevention ideas from Philips Accelerating the shift to preventive care | Philips

In the fullness of time patients admitted to a virtual ward will have access to a range of mobile health technology which is already in their home or is provided as part of the Virtual Ward delivery system.

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<sup>&</sup>lt;sup>13</sup> <u>https://lb-aps-frontend.statista.com/statistics/300402/smartphone-usage-in-the-uk-by-age/</u>

### Taking the Hospital to the patient's home. A mobile hospital.



Mobile Pathology – bloods & urine

Mobile eye examination

Mobile Ear, Nose and Throat examinations

Mobile wound management

Mobile patient self management making every contact count.

To see what a Virtual Wards looks like in Australia and USA open these links:-

https://www.youtube.com/watch?v=KGv2iRzQzQg

https://www.youtube.com/watch?v=jAQuEZUdB-A

https://www.mercyvirtual.net/wpcontent/uploads/MRC\_31300\_MV\_VIrtual\_Tour\_Guidebook\_singlepages.pdf

https://www.tytocare.com/

See what is happening in **Cumbria**:

Care home using Microsoft's HoloLens 2 to help clinically vulnerable – no reason why Virtual Ward staff cannot use this technology.

https://www.digitalhealth.net/2022/01/care-home-microsoft-hololens/

To get an idea of how to use data capture technology already in the home see:

Turning something as ordinary as switching on a kettle into health insight (digitalhealth.net)

### Big Data

When building a Virtual Ward it is essential that data collection is built in day novo to the operational policy and the work a day practice of the Virtual Ward.

The opening of a Virtual Acute Ward should incorporate advanced data science techniques and have a conscious policy of collecting and <u>using</u> data in order to:

- a) Monitor patients in real time and respond as necessary should a patient 's condition be observed or predicted to deteriorate.
- b) Use a patients data to develop a specific health plan for the patient during the post discharge period of the care or better still as a technique to avoid admission in the medium to long term a pre-planned action plan ready for the next exacerbation.
- c) Use Virtual Ward patient population data to develop population health strategies at macro and mezzo levels of operational practice in a given area e.g. ICS or PCN.
- d) Use AI to interrogate collected data and develop predictive medicine models of care for individuals and populations in a specific area or sub area.
- e) Use Virtual Ward data collections in the context of medical research and pharmacological research.
- f) Provide staff working in the Virtual Ward with access to 'their' patients data for personal reflection, group audit and local R&D activity.

NB with just a little forethought the data problems of physical hospitals need not be inflicted on Acute Virtual Wards because Acute Virtual Wards represent a clean page in terms of NHS staff can design how work is organised and how data is collected and used.

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### Appendix A

### How many nurses will be required to run a 250 bedded Virtual Ward?

Current advice from the Queens Nursing Institute <u>Workforce Standards for the District Nursing</u> Service <sup>14</sup>

"The consensus of professional opinion borne out by the data was that a Registered Nurse visit should be a minimum of 30 minutes to allow for the entire nursing process to be enacted (assess, plan, implement and evaluate)."

"The average travel time from the data examined varies but generally has a mean of 2-3 hours per day."

### Assume that an average patient on a Virtual Ward will require 1 hour of face to face nursing<sup>15</sup> input per day.

The number of direct nursing contact hours required for 250 patients on a Virtual Ward is 250 hours per day.

250 x 7 days = 1,750 hours direct contact hours per week delivered by the Virtual Ward nursing staff.

1,750 hours  $\div$  37 hours (1 working week) = <u>42.3 wte nurses</u>

Travel time 3 hours x 42.3 nurses = 126 hours per day =  $126 \times 7 \text{ days} = 882 \div 42.3 = 21 \text{ wte time}$  required for travel between patients.

42.3 + 21 = 63.3 wte to provide a day shift only service to a 250 bedded Virtual Ward.

ADD ON 20% down time e.g. days off, training , maternity, vacancy factor etc. = 12.66 wet = <u>Total 76</u> wte.

For out of hours service e.g. 16.00 hrs to 09.00 hrs add on 38 wte =  $\frac{114 \text{ wte nurses}}{114 \text{ wte nurses}}$  for a 24/7 Virtual Ward service.

## A 24 / 7 Virtual Ward, 250 beds, servicing 500,000 people will require an establishment of 114 wte nurses.

<sup>&</sup>lt;sup>14</sup> Workforce-Standards-for-the-District-Nursing-Service.pdf (qni.org.uk)

<sup>&</sup>lt;sup>15</sup> I accept that there is no such thing as an average patient but there are a range of conditions which frequently affect large cohorts of individuals.

### National demand for Virtual Ward nurses = 114 x 2 x 56m = 12,768 wte

### Cost of Nurse staffing on a 250 bed Virtual ward.

Skill mix:

114 wte Nurses of which 50% are registered and 50% are HCA grade.

57 wte Registered Nurses

57 wte HCAs Nurses

Band	Annual Cost inc. 20% employers on cost	No. WTE	Full Year cost of Nursing staff.
6 (5yr experience)	£47,000	57	2,679,000
4 (3yr experience)	£29,857	57	1,702,000
		114	4,381,000

Support costs e.g. travel, PPE / clinical consumables, equipment is estimated at 25% of labour cost. £1,095,000.

### Total = £5,476,000

### How many Physiotherapists will be required to support a 250 bedded Virtual Ward?

- 1.5 Physiotherapists per 50 beds =  $1.5 \times 5 = 7.5$  Physiotherapists
- 7.5 Physiotherapists x 3hrs = 22.5 hrs = 3.2 wet travel time per day.
- 7.5 + 3.2 = 10.7 Physiotherapist per day + 20% to account for holidays, training, sickness etc.
- = 13 Physiotherapists per day.
- 250 beds will consume 13 x 7 hours per day of Physiotherapy time = 91hrs
- 250 beds will consume 91 hrs hours per day x 7 days per week = 637 hrs per week
- 637 hrs ÷ 37 hrs = *an establishment of 17.2 wet Physiotherapists to run a 7 day service.*
- 13 on duty each day and 4.2 wte for days off or on holiday, sick leave, maternity, study leave etc.

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#### Pay bill for Physiotherapists.

WTE Band 6 (5 years' experience) £ 47,000

17.2 x £47,000 = £808,000 pa.

Support costs e.g. travel, PPE / clinical consumables, equipment is estimated at 25% of labour cost. £202,000

### Total cost for Physiotherapy service = £1,010,000 pa

How many Social Workers will be required to support a 250 bedded Virtual Ward? Assume 1 duty social worker per 50 beds . 8.6 wte x £47,000 = £405,000 pa 25% non-pay cost = £100,000

### Total cost for Social Work service £505,000

#### Virtual ward monitoring and governance base.

1 x Band 8d = £108,000

5 x Band 8a = £318,000

15 x Band 7 = £828,000

10 x Band 6 = £468,000

Total establishment = 31 wet

Total pay bill =  $\pm 1,722,000$  pa.

#### Equipment & Technology.

Monitoring equipment replace on 2 year cycle £300,000 Office equipment tech £200,000 replaced on 2 year cycle Licence fees software £300,000 pa Al software £500,000 4 year cycle. Cost of office space £130,000 pa

Annual total = £ 805,000 pa

Total £805,000 + 1,722,000 = £2,527,000

Total cost for Virtual ward monitoring and governance base £2,527,000