UK Parliament POST Note, Virtual wards - written submission

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1. **How does technology-enabled remote monitoring affect patient and carers experiences of virtual wards?**

2. **How has technology-enabled remote monitoring impacted the NHS?**

The DECIDE team is funded by the National Institute for Health Research (2023-2026) to conduct rapid evaluations of technology-enabled remote monitoring (TERM) services (see here for a working definition of TERM) in health and social care, and to inform decision-making underpinning evolving policy and practice. With one completed evaluation of tech-enabled remote monitoring for COPD patients, and four other live evaluations across health and social care (largely in England), to date our focus has been on the use of technology outside of hospital in primary, community and social care. DECIDE's work provides transferable insights relevant to virtual wards, for instance around the use of TERM in primary care and community settings to reduce unnecessary hospital admissions and support reablement post discharge.

A number of TERM interventions launched across settings and service user populations before and during the pandemic, for instance using implantables for remote management of people with heart failure, monitoring real time prevalence of COVID in patients with multiple sclerosis or diabetes, and developing remote neurorehabilitation services. There has continued to be a significant push for TERM post-pandemic. That said, the systematic use of remote monitoring interventions – including in the use of virtual wards – remains fairly new. Evidence is promising but emergent. It is also heterogeneous reflecting a breadth in service development and implementation practices which are necessary to enable tailoring of TERM to fit local needs and circumstances (see programme protocol).

Published literature indicates that TERM interventions to date have often been small scale, focused on a specific clinical or geographic focus, and provided limited evidence about outcomes that are meaningful for care providers and patients. This leaves those making decisions about the wider scaling and adoption of such interventions unclear about the potential benefits and costs. Key messages drawing on evidence from all five DECIDE evaluations is provided below, with links to published evidence where possible (some evaluations are on-going and we therefore indicate where we are drawing on emerging findings that are not yet published).

a) Evidence on patient outcomes varies by area. For example, there is established evidence to support the effectiveness of remote technology-enabled blood pressure monitoring on controlling blood pressure in patients with hypertension (*unpublished evidence review of tech-enabled remote blood pressure monitoring*). However, there are also significant gaps in understanding which aspects and types of remote monitoring approaches can support optimal patient outcomes and service impacts in specific contexts, how and why (see evaluation protocol for evidence review on TERM for BP). In other areas, for example COPD, while there appear to be potential benefits, evidence of impact on patient outcomes is inconclusive and needs further research.

b) The evidence base on impact on service utilisation is relatively weak due to the lack of a body of high-quality evaluations and related data architecture/access issues. For example, our literature review of TERM for COPD found that the quality of the evidence base was low in many of the reviews. There are relatively few well-designed studies that examine impacts of

remote blood pressure health service utilisation (for example, using quasi-experimental approaches), as well as cost-related evidence. This relates to challenges in accessing such datasets and to an evolving data landscape (BP evaluation protocol). The terms technology-enabled remote monitoring and remote monitoring are often used interchangeably (in COPD and more widely), and some interventions have tech and non-tech components, which can complicate interpretations of evidence on the impact of tech-enablement. While our literature review found some evidence emerging that remote monitoring technologies may reduce hospitalisation and readmission risk in COPD patients, the evidence base remains inconclusive (COPD literature review, programme protocol).

c) The evidence base on cost-effectiveness also is yet to mature – there is need for more health economic evaluation and for improved data collection, access and sharing in the health and social care system to support that (COPD literature review, programme protocol).

d) There is a need for much better evidence on implementation, scale and spread of TERM. We need to understand more about the critical elements of TERM pathways and those that are perhaps 'nice to have', also what can be effectively shared across different settings (including primary, community, hospital; as well as across health and social care); and what needs to be flexible and adaptable to bespoke needs (*emerging insights from across evaluations, programme protocol*). While evidence on challenges to implementing and scaling TERM is relatively abundant, there is far less compelling evidence on how challenges can be effectively navigated and addressed (BP protocol). There is an urgent need for further process evaluation and rapid evaluation to inform policy and practice, including the implementation of intended government shifts from analogue to digital, sickness to prevention, and hospital to community (programme protocol).

3. **What are key considerations that policymakers should understand regarding the implementation of technology-enabled remote monitoring in virtual wards?**

Evaluations conducted via DECIDE focus on technology-enabled remote monitoring (e.g. of heart failure, COPD or blood pressure). While not specific to use of TERM *in virtual wards*, there is relevant learning, as follows:

a) **There is no one size fits all TERM solution or pathway that aligns neatly with existing pathways, services or settings.** Remote monitoring technologies (of which there are many, individually and in combination) need to be considered in the context of the wider care pathway, workforce capacity and skills, the infrastructure and legacy systems in place to support TERM and diverse patient needs (programme protocol). The functionalities of the technology, and the organisation of workforce around it, can vary. When designing care pathways and services using technology to enable care, it is important to consider what is key and what needs to be bespoke, and to think carefully about the adoption context and how workflows will be organised (*forthcoming final report from evaluation of TERM for COPD*).

b) **It is important to plan for pathway delivery in terms of workforce organisation and data flows at early design stages**. The implication of this is that planning also needs to consider areas of uncertainty or risk and build in some flexibility for adaptation (programme protocol, COPD literature review, *emerging insights from evaluations of TERM for BP and COPD*). Adaptation to TERM pathways is then likely to be needed over time.

c) Growing interest in technology-enabled remote monitoring (and the broader shift from analogue to digital) is accompanied by **rising concerns over inequalities between groups in the population. Such inequalities are deep-rooted and widening**, leading to disparate outcomes, varied access to and uptake of services, and poor experiences of care, particularly for certain groups (e.g. sharing characteristics such as those related to race, gender, ethnicity, disability, socioeconomic status/deprivation, geography). This is compounded by issues of digital exclusion, where some people (e.g. with learning or physical disabilities) have unequal

access and capacity to use technologies; and by the design of technology, which tends to be piloted with/targeted towards certain groups (programme protocol).

d) **Using technology to supplement or replace in-person care leads to changes in interactions between patients and providers.** This calls for new roles and activities (e.g. new or expanded roles for Health Care Assistants, nurse associates, receptionists, pharmacists), and thinking about 'who' will deliver services, 'how' and any 'training' needed as part of the wider service re-design effort (i.e. both in terms of adapted roles for existing staff and potentially new roles in the system, such as digital care coordinators at PCN or ICB levels) (programme protocol, COPD literature review, *forthcoming final report from evaluation of TERM for COPD*).

e) **Delivering TERM generally requires significant distributed work across an interprofessional team, requiring a team-based approach and clarity on roles and lines of responsibility**. There is important scope for integrating a mix of clinical and non-clinical roles in delivery (HCAs, nurse associates, pharmacists, receptionists). Where TERM is being used in primary care, it is helpful to consider where GP time is needed and adds most value key (e.g. dealing with complex cases) in pathway design (*emerging insights from evaluation of TERM for BP*).

f) **How the needs of patients who are not able to engage digitally will be met needs to be integrated in TERM pathway design, in order to mitigate inequalities** within the overall clinical care pathway and planning, and enable equity of access to services (programme protocol). Especially relevant are workforce and workflow implications, with the use of TERM potentially meaning parallel running of services- both tech enabled and traditional (*emerging insights from evaluations of TERM for BP and COPD*). It is important to involve patients and staff in service design to co-produce TERM services and ensure that patients can engage. It is important to have supportive resources to provide needed information to patients around the purpose of TERM services, risks and how they can be managed, benefits and support patients will get (from the technology supplier and from healthcare staff), clarity on how staff will monitor and engage with patients; and onboarding processes making clear how the service/s will work (*forthcoming final report from evaluation of TERM for COPD, forthcoming co-designed resources for patients with COPD*). Multiple technology offers for patients and carers (particularly those with multimorbidity and complex needs, and across health and social care) risk further complexity for patients, and embedding existing inequities in accessing and using services (*emerging insights from across evaluations; Steering Committee discussions*).

g) **In pathway resourcing, planning and design, it is important to recognise and consider that some services may be alleviated in terms of capacity demands** (e.g. GP time or hospital capacity) **but the need for others may increase** (e.g. digital onboarding, managing data flows and loads and workload implications for diverse staff, including administrative), at least in short term (e.g. *forthcoming final report from evaluation of TERM for COPD*, COPD literature review). Implementation of new technology might initially increase staff workload, especially if technologies are used as additional rather than replacement of usual care. Better long-term data is needed on effects on service utilisation.

h) **There is 'hidden work' involved in adopting, implementing and running TERM services, which needs to be planned and costed for in service design** e.g. extra time (and skills) to engage with patients and effectively onboard them in the use of technology, additional time taken for safety-netting to ensure timely information and follow-up and management of uncertainty, especially when new TERM services are being set up, extra time for parallel processing of paper based and digital data. This is often unaccounted for (particularly, but not only, as TERM services are developed and adopted but also as services begin to spread and scale) and can bring significant burden and additional unacknowledged work for clinical and non-clinical staff (*forthcoming final report from evaluation of TERM for COPD*). It is critical to ensure contingency resource for dealing with this hidden work when costing for delivery.

i) **When designing services around the technology, it is really important to be clear and to arrive at informed decisions on data thresholds (e.g. blood pressure readings, oxygen saturations) at which clinical action needs to be triggered** (*unpublished Steering committee discussions, emerging findings from across evaluations*). This can help optimise health service utilisation/capacity, manage risks and facilitate quality and safety.

j) **In terms of scale and spread, it is important to consider early on what support will come from 'the centre' (i.e. national bodies like NHS England) and what support will come from local health systems.** Beyond initial set up and funding, it is critical to ensure strategic and longer-term system support that enables TERM services to move beyond initial 'piloting' and ensure relevant learning and implementation efforts are sustained. It is important to think about what types of roles, decisions and issues are essential at practice and team level (e.g. enabling GP autonomy), versus where there is scope for some coordination at local system level (e.g. PCN) versus where support is needed from national bodies (for example in terms data governance and standards, financial support beyond pilot efforts, clarity on commissioning routes) (*forthcoming final report from evaluation of TERM for COPD*).

k) **Without investing in data infrastructure – also access to it and lean governance - it will be difficult to arrive at robust evidence for cost-effectiveness of use at scale** (programme protocol, *forthcoming final report from evaluation of TERM for COPD*). This is true for evidence generation relating to clinical and service utilisation outcomes as well.

l) **It is important to get clarity on the processes that need to be in place for effective commissioning and procurement of technologies, and to support the development of dedicated knowledge and skills to enable that** (*emerging insights from across DECIDE evaluations; Steering Committee discussions*). This includes better demand signalling at local and national levels on specifications for TERM technologies and services to enhance evidence-based commissioning. To prevent services that are very high quality but financially unsustainable it is important to be clear on essentials vs 'nice to haves', when making specifications for tech supplier commissioning. Specifications in terms of tech functionalities (e.g. measures being collected, averaging, dealing with thresholds, batch messaging, templates for messaging, adaptability), interoperability and types of supplier support are all critical for meeting NHS workforce needs.

m) **While it is important to work with established (and evolving) system infrastructure, there is debate and some concern about a future where TERM services might be channelled through one technological interface** (e.g. the NHS App) and how this might impact on: (a) local autonomy in deciding on what types of tech offers and suppliers (where not integrated through the NHS App interface) best meet needs of individual health settings (*unpublished findings from evaluation of TERM for BP, Steering Committee discussions*); and (b) in potentially mitigating issues of inequity in accessing technology-enabled services by patients and carers, and routes to care (e.g. the NHS App being used less by people living in deprived areas) (programme protocol).

4. **How well does technology-enabled remote monitoring fit into the existing healthcare system?**

   a) TERM has a lot of potential. The current landscape is one of experimentation and adaptation to establish governance, management and pathway delivery arrangements that can align with health system realities at local/regional and national levels (programme protocol, *forthcoming final report from evaluation of TERM for COPD*).

   b) There is need for closer coordination between different parts of the health system around TERM pathways so that patients navigating primary and acute care pathways can receive more joined up care. For example, TERM for blood pressure monitoring can be used to monitor and prepare patients waiting for hospital procedures where blood pressure needs to be

controlled, avoiding last minute procedure cancellations (*emerging sights from across evaluations, Steering Committee discussions*).

c) Different types of staff in a care team may engage with a patient at different points in time, depending on the acuity of the patient's condition. The level and nature of tech-enablement (i.e. types of readings collected) may vary over time (*forthcoming final report from evaluation of TERM for COPD*).

d) TERM leads to new roles in clinical pathway delivery and new activities for the workforce ([programme protocol](#), *forthcoming final report from evaluation of TERM for COPD*, *forthcoming literature review on TERM for BP*). These new roles and activities have potential to reduce pressures on particularly stretched professions (e.g. GPs) and to support more care outside of hospital. To make the most of this potential it will be vital to devise clear workflows and roles in TERM pathways and services.

e) Long term sustainability ambitions for TERM-enabled services are challenging due to short term budgeting cycles and uncertainty in funding flows. A longer-term funding model is needed to support sustainability, scale and spread (*forthcoming final report from evaluation of TERM for COPD*).

f) The current data architecture supporting the collection of evidence on uptake, costs, clinical outcomes and impacts on health service utilisation is fragmented and challenging to navigate. Significant improvement is urgently required in order to support evidence-based practice and decision-making on scale and spread. There is a need for better data linkage (within healthcare, and between health and social care) and improved interoperability of systems collecting – and sharing - different types of data. R&D governance processes can also create barriers (e.g. lack of streamlined processes, variety across sites) to timely access to data for research and evaluation purposes, which compromises the ability generate a robust evidence base on impacts, including on health and care services.

g) Technology functionalities have been evolving to create opportunities to monitor multiple conditions and comorbidities remotely. The future landscape for TERM may evolve to support the management of patients with multimorbidity in more integrated ways, rather than single condition management (*DECIDE Steering Committee discussions*). This has implications on the funding and organisation of care pathways that need to be considered in commissioning and workforce planning.

h) Efforts to scale and spread TERM services raise questions about (a) optimal coordination arrangements between local, regional and national decisionmakers, and (b) optimal management and oversight of service delivery (e.g. what aspects of governance and management may reside in a GP practice, what aspects of coordination may be supported at PCN or ICB levels, and what aspects require national oversight). Planning for scale and spread needs to consider what types of outcomes and standards need to be set nationally and where local flexibility and autonomy in decision-making is needed (*emerging insights from evaluation of TERM for BP*).