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Evaluation of PHOSP-COVID [NIHR202708]

Title: UK evaluation of NHS support post-hospitalisation for COVID19 to inform service development and achieve holistic, integrated, equitable and cost-effective services

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Plain English Summary

Background: When people were discharged from hospital after COVID-19, many continued to experience serious health problems for months afterwards. Hospitals across the UK set up their own follow-up services to support these patients, but there was no agreed approach to what these services should look like. Some hospitals offered comprehensive care including physical rehabilitation and mental health support, whilst others provided only basic check-ups or no follow-up at all.

Aims: Our study set out to understand what follow-up services were available, how patients and staff experienced them, and whether more comprehensive services were worth the investment. We surveyed 45 hospitals across the UK, interviewed patients and healthcare staff at three sites, and analysed health and cost data from over 1,000 patients at one year after leaving hospital.

Findings: We found wide variation in the care available. Only about a third of staff running these services were in permanent posts, and over a quarter of hospitals had no mental health support for patients. One year after discharge, only 29% of patients felt fully recovered and 41% had developed a new health condition such as depression, diabetes or kidney disease. Quality of life remained substantially lower than before patients had COVID-19. Crucially, we found that the most comprehensive services – those offering structured assessment, rehabilitation and mental health support to all patients – delivered meaningfully better quality of life at modest additional cost. These services represent good value for money by standard NHS measures.

Conclusions: Our findings support the case for organised, proactive follow-up after hospitalisation with COVID-19, with secure long-term funding rather than

the temporary arrangements common during the pandemic. The current variation in services risks creating a postcode lottery that could worsen health inequalities. These lessons also have value for planning how the NHS responds to future pandemics.

Executive Summary

Study Aims: This study aimed to evaluate NHS support for adults following hospitalisation with COVID-19, with the objective of informing service development to achieve holistic, integrated, equitable and cost-effective post-discharge care.
Specifically, we sought to: (1) describe and classify the range of healthcare pathways implemented across UK hospitals; (2) understand the experiences of patients, healthcare professionals and managers within these services; (3) quantify health outcomes, health-related quality of life and healthcare costs at 12 months post-discharge; and (4) synthesise these findings to estimate the cost-effectiveness of different care pathways, including an assessment of equity implications.

Background: The COVID-19 pandemic resulted in large numbers of hospital admissions across the UK. While the severity of acute illness initially dominated clinical attention, it became clear that many survivors experienced persistent symptoms and newly acquired health conditions – commonly termed 'Long COVID'. In the absence of an evidence base, NHS trusts developed their own post-discharge follow-up services, leading to marked variation in what care was provided and to whom. Long COVID clinics were funded in England from November 2020, but service specifications drew on expert opinion rather than research on clinical or cost-effectiveness. This study, funded by the NIHR Policy Research Programme, was designed to address that evidence gap using data from the Post-Hospitalisation COVID-19 study (PHOSP-COVID), a national research platform involving 64 hospital sites across the four nations of the UK.

Methods: The research was organised into five work packages employing a mix of quantitative and qualitative methods.
Work Package 1 (WP1) surveyed post-discharge services at PHOSP-COVID sites, receiving responses from 45 of 64 sites (70%), and developed a classification of healthcare pathways through a three-stage stakeholder consensus process.
WP2 conducted qualitative case studies at three purposively sampled sites, interviewing 31 healthcare professionals and managers and 44 patients to understand how services were designed, delivered and experienced.
WP3 analysed prospectively collected data from 1,013 patients at 12 months post-discharge, examining self-reported recovery, newly diagnosed conditions, health-related quality of life (EQ-5D-5L) and healthcare resource use and costs, using regression models adjusted for demographic and clinical confounders.

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WP4 synthesised findings from the preceding work packages into a cost-effectiveness model, estimating cost per quality-adjusted life-year (QALY) for different healthcare pathways, with equity analyses stratified by deprivation, ethnicity and obesity.
WP5 coordinated patient and public involvement throughout and led dissemination activities.

Results: WP1 found that 82% of sites had established a follow-up service by the second wave, but provision was highly variable. Services were predominantly secondary care based (95%), with respiratory consultants typically providing clinical leadership. Only 36% of staff were in permanent positions, and 27.5% of sites had no identifiable mental health services. Access to rehabilitation varied: 76% of sites offered some rehabilitation, but only 44% provided comprehensive multidisciplinary-supervised programmes. We classified pathways according to population access (all patients versus a selected subgroup), assessment complexity and availability of rehabilitation and mental health services.
WP2 revealed a strong moral imperative among staff to provide follow-up, but services were often developed rapidly with limited or temporary funding. Multi-disciplinary team working improved clinical efficiency and staff morale, though patients frequently experienced services as more fragmented than professionals perceived them to be. Patients valued holistic assessment and continuity of care, but reported long waits between appointments, limited mental health support and substantial uncertainty about their diagnosis and prognosis. Many described severe impacts on their capacity to work, alongside social isolation and psychological distress.
WP3 found that at 12 months post-discharge, only 29% of participants felt fully recovered and 41% had at least one newly diagnosed condition. The most common newly acquired conditions were depression and anxiety (20%), diabetes (11%), chronic kidney disease (9%) and cognitive impairment (8%). Health-related quality of life remained persistently reduced compared with pre-COVID levels, with a median EQ-5D utility of 0.752 at 12 months versus a pre-COVID baseline of 0.889. Female sex, socioeconomic deprivation, pre-existing respiratory comorbidity and greater severity of acute illness were all associated with worse outcomes. Mean 12-month healthcare costs were approximately £1,000 per patient, rising to nearly £1,500 among those who had not recovered and had newly diagnosed conditions. Importantly, access to comprehensive rehabilitation services was associated with reduced quality-of-life deficit.
WP4 estimated the cost-effectiveness of different healthcare pathways. The most comprehensive services – where all patients could potentially access assessment, rehabilitation and mental health support – were more clinically effective than no service or light-touch services (mean QALY 0.789 (SE 0.012) versus 0.725 (SE 0.026)), with an estimated cost per QALY of £1,700 (95% uncertainty interval: dominated to £24,800). This falls well within the

commonly accepted NHS cost-effectiveness threshold of £20,000–£30,000 per QALY. Equity analyses showed that deprivation and severe acute illness were drivers of worse outcomes. We found no strong evidence that comprehensive pathways benefited deprived patients more than others. Because access to these pathways depends on where a patient was treated, the current variable provision risks widening existing health inequalities.

Key Findings: The headline finding is that proactive, comprehensive post-discharge follow-up for adults hospitalised with COVID-19 is likely to be both clinically effective and cost-effective. At 12 months, the burden of Long COVID among hospitalised patients is substantial and persistent: seven in ten patients do not feel recovered, and four in ten have acquired a new chronic condition. Services that provide structured assessment combined with access to rehabilitation deliver meaningfully better quality of life at modest additional cost. However, the current landscape of post-discharge care across the UK is characterised by marked heterogeneity, unstable funding and inconsistent integration of mental health and rehabilitation services, creating a postcode lottery that risks deepening existing health inequalities.

Conclusions and Recommendations for Further Research: Our analysis supports the need for proactive, stratified, comprehensive follow-up – particularly assessment and rehabilitation – for adults after hospitalisation with COVID-19. These services are likely to be both clinically and cost-effective according to commonly accepted thresholds. Further research is needed to identify which specific components of comprehensive pathways drive the observed benefits, to evaluate longer-term outcomes beyond 12 months, and to design services that explicitly address equity gaps. The challenge of mental health integration within post-discharge pathways warrants particular attention, given the high prevalence of depression, anxiety and cognitive impairment among survivors and the inconsistent provision identified across UK sites.

Dissemination: Findings were presented at a number of internal NHS England meetings, publicly at the PHOSP-COVID Symposium and at the NIHR Long COVID meeting. The final cost-effectiveness results were published as a preprint and subsequently in BMJ Open Respiratory Research (2025). Patient and public involvement was embedded throughout the project, with people with lived experience of Long COVID contributing to the Project Advisory Group, survey design, interview topic guides and dissemination planning, in partnership with Long COVID Support and Asthma and Lung UK.

Expected influence/impact: This research provides the first UK evidence on the cost-effectiveness of post-discharge healthcare pathways for adults hospitalised with COVID-19. The findings are directly relevant to NHS England's Long COVID programme and to commissioners across Integrated Care Systems

responsible for designing follow-up services. The classification of healthcare pathways developed in WP1 provides a practical framework for benchmarking and standardising service provision. The evidence that comprehensive services represent good value for money at standard NHS thresholds supports the case for sustained, recurrent funding rather than the temporary and year-on-year commissioning arrangements that characterised the pandemic response. More broadly, the methods and findings have relevance for planning post-discharge follow-up for future pandemic preparedness and for other conditions where service models vary widely across the NHS.

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Glossary

EQ-5D-5L	EuroQol-5 Dimensions-5 Levels questionnaire
QALY	Quality-Adjusted Life Year

Publications

1. A.H. Briggs et al (2025) Clinical and cost-effectiveness of diverse posthospitalisation pathways for COVID-19: a UK evaluation using the PHOSP-COVID cohort. *BMJ Open Respiratory Research*.
2. L. Houchen-Wolloff et al (2023) A typology of healthcare pathways after hospital discharge for adults with COVID-19: the evolution of UK services during pandemic conditions. *ERJ Open Research*.
3. N. Armstrong et al (2023) Responsive and resilient healthcare? 'Moments of Resilience' in post-hospitalisation services for COVID-19. *BMC Health Services Research*.