Havering
LONDON BOROUGH

Health Needs Assessment
Long COVID

Authors:

Sedina Lewis, Public Health Specialist

Tha Han, Consultant in Public Health

Anthony Wakhisi, Public Health Intelligence Lead

August 2022

Contents

1 Summary of recommendations for decision-makers 3

2 Executive summary 5

3 Introduction 8

4 Background and Evidence-Base: What is the emerging evidence? 10

4.1 Population Significance: Prevalence of Long COVID in England population 10

4.2 Causes (aetiology) and definitions 11

4.3 Risk of Long COVID according to population characteristics and the severity of COVID 11

4.4 Prevention 13

4.4.1 Non-pharmaceutical interventions 13

4.4.2 COVID-19 vaccine and risk of long Covid 13

4.5 Symptoms and duration – children and young people 15

4.6 Symptoms and duration – adults (general population) 16

4.7 Symptoms and duration – adults (hospitalised) 17

4.8 Other impacts of Long COVID 18

4.8.1 Impact on quality of life and physical functioning 18

4.8.2 Impact on mental health 19

4.8.3 Impact on employment 21

4.8.4 Impact on education 22

4.9 Tiered approach for support – policy and evidence 23

5 Local needs: How does emerging evidence help us identify needs in the Havering population? 28

5.1 Population groups at increased risk of Long COVID 28

5.2 Modelled prevalence of Long COVID 30

5.2.1 Prevalence of Long COVID symptoms lasting up to 12 weeks 30

5.2.2 Prevalence of Long COVID symptoms lasting more than 12 weeks 34

5.2.3 Prevalence of Long COVID symptoms in hospitalised patients in Havering (using local hospital data and estimates from evidence-base) 37

5.3 Recorded Long COVID cases in primary care 39

5.4 Prevention 40

5.5 Impacts of Long COVID 40

5.5.1 Impact on quality of life 40

5.5.2 Impact on mental health 41

5.5.3 Impact on employment 41

5.5.4 Impact on education 41

6 **Local services for Long COVID: how are identified needs being met in Havering?** 42

Tier 1 – Patient-led rehabilitation and recovery 42

Tier 2 – Generalist assessment, support and rehabilitation 45

Tier 3 - Specialist assessment, support and rehabilitation; Tier 4 - specialist management of specific complications 46

7 **Action Plan to Address Recommendations** 49

List of abbreviations 52

References 53

Appendix A – Summary of Havering COVID-19 Predictive Risk Modelling Infection, Hospitalisation and Mortality 60

Appendix B – COVID-19 Vaccination Uptake in Havering in November 2021 63

Appendix C – NHS London Paediatric Long COVID Pathway (overview and detailed summary) 65

Appendix D – Suggested tiered approach for Long COVID services (Greenhalgh et al, 2020) 67

Appendix E – BHR Post COVID Pathway 68

Table of Figures

Figure 1: Cases of Long COVID in Havering - UKHSA modelling estimates and CEG data for recorded cases in Havering 6

Figure 2: An illustration demonstrating some of the reasons why the estimated prevalence of Long COVID is not comparable between studies. The illustration is based on 27 articles that estimate Long COVID prevalence (published or pre-prints) between May and October 2020 (National Institute for Health Research, 2021) 9

Figure 3: Swiss cheese respiratory pandemic model 13

Figure 4: Common symptoms of Long COVID (adapted from the NICE guideline NG188) .. 16

Figure 5: Health-related quality of life measured by the EQ5D-5L at follow-up compared to prior to admission with COVID-19 – changes in the whole cohort and stratified by severity of infection. (PHOSP-COVID Collaborative Group, 2021) 19

Figure 6: Summary of evidence on changes in employment for those experiencing Long COVID 21

Figure 7: New weekly cases of Long COVID in Havering, November 2020 – March 2022 .. 34

Figure 8: New weekly cases of Long COVID in Havering, November 2020 – March 2022 by gender 35

Figure 9: New weekly cases of Long COVID in Havering, November 2020 – March 2022, by age group 35

Figure 10: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022 36

Figure 11: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022 by gender 36

Figure 12: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022 by age group 37

Figure 13: Havering's primary care data for Long COVID, sourced from the Clinical Effectiveness Group (CEG) 39

1 Summary of recommendations for decision-makers

Upon reviewing the available evidence at a national-level and local-level, several recommendations have been proposed to support decision-makers in prompting a specific response to Long COVID within Havering. An action plan has been developed with suggestions for how recommendations can be addressed (Section 7):

Establish a working group to develop a local strategy for Long COVID, bringing together a diverse group of stakeholders, e.g. voluntary sector organisations, NHS leads, representatives from public health, education and leisure.

There needs to be a better understanding of the local impacts of Long COVID in Havering. Working with community groups and healthcare professionals to gather information about the local impacts can shape the current service offer to ensure that residents' needs are being met.

Work with local partners to identify the prevalence of Long COVID across Havering, and to improve the referral to the Long COVID clinic for those who need it.

A clearer assessment of the local prevalence of Long COVID in Havering by neighbourhood level is needed to identify areas of higher need which would benefit from targeted approaches. Collaborative working with local partners and the use of community engagement can assist in obtaining an estimate for the prevalence. Local estimates would also enable calculations to determine the local association between Long COVID and population demographics, such as age, ethnicity and deprivation.

Develop a local community engagement programme for Long COVID with the aim to raise awareness and empower residents through an understanding of:

- **The condition itself and associated symptoms**
- **How to prevent Long COVID by reducing transmission of COVID-19**
- **How to self-manage or seek support**
- **How to signpost or refer according to need**

It is important that residents are aware of the long-term consequences of an acute COVID-19 infection, how they can access support and shape the provision of the support. A local community engagement programme can aim to identify the level of awareness about Long COVID within the community and explore ways to increase awareness. Consequently this can facilitate community empowerment and improve outcomes for residents. This programme should focus on addressing health inequalities and engaging with populations which are normally 'hard to reach'.

Encourage the establishment of Long COVID 'champions' within healthcare and community settings to raise awareness and improve access to support services

Awareness of Long COVID and the support available is key in ensuring that residents are able to self-manage their condition and seek professional care if needed. Champions within the community and healthcare settings (e.g. social prescribers/link workers) should be well-equipped with information and resources to signpost Havering residents appropriately.

Consider commissioning services for self-care and self-management support for Long COVID, for example, peer support groups, mobile apps and community exercise programmes

Most people with Long COVID will be able to self-care and self-manage their symptoms. Whilst there are some national services which provide support and resources, a local offer may be valuable in providing tailored support to meet local needs. A multicomponent self-management offer co-produced with residents may also reduce the need for residents to access already overstretched healthcare services. Evidence has shown that individuals with Long COVID can feel confused and discouraged about their experiences. Peer support groups can encourage discussions, the validation of lived experiences and help individuals navigate the support available..

Review the Long COVID service offer for children and young people and consider commissioning services specifically for children and young people

There are several evidence gaps for Long COVID, more so for Long COVID in children and young people (CYP). CYP are less likely to develop Long COVID but it is expected that there are CYP in Havering currently experiencing ongoing symptoms. It is currently unclear what support is available locally for CYP and their families. To ensure equity of access, local partners need to identify what is available and consider filling in any gaps in provision by commissioning local services.

2 Executive summary

Background

On the 11th March 2020, the World Health Organisation declared the COVID-19 outbreak a global pandemic (Cucinotta & Vanelli, 2019). The COVID-19 pandemic has led to diverse impacts internationally, nationally and locally. Healthcare and social systems have had to respond rapidly to high levels of acute COVID-19 infections and the related consequences. Whilst responding to the unprecedented immediate impacts of the COVID-19 pandemic, new clinical pathways were developed and community support was increased to meet the emerging needs.

In the early stages of the COVID-19 pandemic, the long-term effects and complexities of an acute infection were unknown. As time has progressed it has become apparent that some individuals who have had an acute COVID-19 infection are developing ongoing, wide range of symptoms. This condition has since been widely recognised and has been termed different worldwide, terms including “Long COVID”, “post-COVID-19 syndrome” and “Long-haul COVID-19”- “Long COVID” will be used throughout this document.

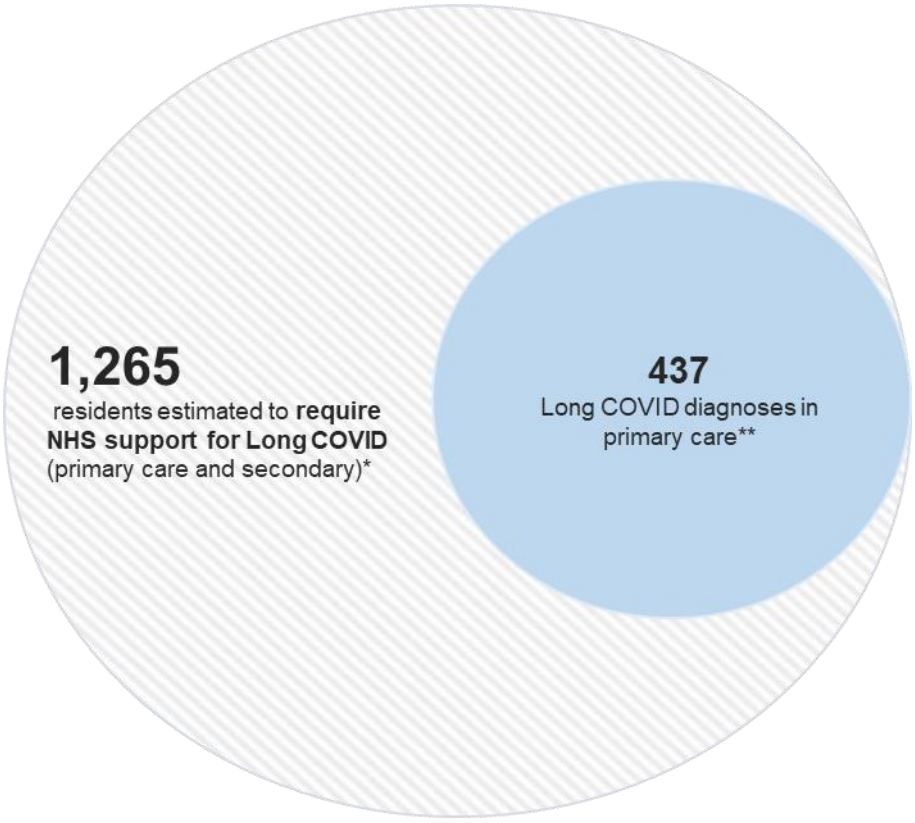
Number of Long COVID cases

Similar to other local authorities in England, London Borough of Havering has had many COVID-19 infections since March 2020. According to the Office of National Statistics (ONS) Coronavirus Infection Survey (CIS), around 1 in 10 of the COVID-19 cases will go on to develop Long COVID and a quarter of those with Long COVID will suffer from shortness of breath (Office of National Statistics, 2021). Long COVID affects both children, young people and adults. The risk of developing Long COVID does increase with age, with those aged 35 to 49 years or 50 to 69 years being more likely to develop the condition. In addition to older age being a risk factor, some estimates suggest that up to 50% of people hospitalised would need formal rehabilitation services. Encouragingly, the COVID-19 vaccination programme may have had positive impacts, reducing the number of residents developing Long COVID (Ayoubkhani, Pouwels, Nafilyan, Khunti, & Alwan, 2022).

With the high number of cases it is inevitable that a proportion of Havering residents will experience these ongoing symptoms. It is currently unclear what the true prevalence of Long COVID is in children, young people and adults.

A model was developed by the UK Health Security Agency (UKHSA) to estimate the total number of Long COVID cases expected in local areas and the number of Long COVID cases requiring NHS support, between November 2020 and March 2022. The UKHSA model estimates that 7,230 residents in Havering are expected to have Long COVID and 1,265 residents will require NHS support. This has been reviewed and compared with primary care data from the Clinical Effectiveness Group (CEG) relating to Long COVID (Figure 1). There is a clear gap between the number of Long COVID cases expected within the healthcare system and patients who are actually presenting in primary care. UKHSA modelling has estimated that 1,265 residents will need NHS support, only 437 people have been diagnosed as having Long COVID in Havering by primary care. Local analyses to determine the prevalence of Long COVID cases in Havering would be beneficial for identifying cases in different populations, particularly those at increased risk.

Figure 1: Cases of Long COVID needing support in Havering - UKHSA modelling estimates and CEG data for recorded cases in Havering



* Based on UKHSA modelling estimates for cases between November 2020 - March 2022
** Based on primary care data from the Clinical Effectiveness Group (CEG), collected September 2020 – August 2022

Impacts of Long COVID

Evidence is still emerging about Long COVID and its impacts. Research has shown that Long COVID can adversely impact quality of life, mental health and employment.

"The ONS CIS found that of all people in UK private households with self-reported Long COVID, 780,000 (65%) experienced at least some limitation to their day-to-day activities"

Local research needs to be conducted to gather insight from residents about the impacts of Long COVID (including in children and young people) to identify the main impacts which require support. This will assist decision-makers needing to develop support services for Long COVID, ensuring that services address the needs. Understanding what the local impacts are will also inform local communications which go out to residents, providing relevant information and reassurance about their symptoms.

Local support for Long COVID

The majority of residents with Long COVID will be able to self-manage their condition, for example by using the NHS-developed online rehabilitation service (Your COVID Recovery).

There are various services available to Havering resident which provide general support for some of the Long COVID symptoms experienced such as mental health symptoms. However,

the availability of services to provide specific support for the self-management of Long COVID is currently limited within Havering. The development of a service should be considered by commissioners as such a service may be beneficial for residents experiencing Long COVID. Some residents (Greenhalgh et al 2020, estimates 80% of people with Long COVID) will however need to access generalist assessment, support and rehabilitation from their GP practice. GP services can refer residents on to a specialist Long COVID clinic for further investigations and support when appropriate. The local clinic for Havering residents is currently based at King George Hospital.

Services and professionals operating in Havering need a shared-understanding of what is available for residents and how support can be accessed. It is essential that all residents in Havering with Long COVID feel supported in their experiences and have access to resources and healthcare in a timely manner. Whilst we continue to journey through the pandemic is also important that residents are aware of the long-term impacts of an acute COVID-19 and are encouraged to “do their bit” in limiting the spread of COVID-19.

3 Introduction

While most people with COVID-19 who do not need treatment from hospital settings to recover and return to normal health, some patients can have symptoms that can last for weeks or even months after recovery from acute illness. Individuals discharged from hospital after COVID-19 had increased rates of multi-organ dysfunction compared with the expected risk in the general population. (Ayoubkhani, et al., 2021) The increase in risk was not confined to the elderly and was not uniform across ethnicities.

The persistence of symptoms following a COVID-19 infection is commonly termed as 'Long COVID' but has also been referred to as 'ongoing symptomatic COVID-19' and 'post-COVID-19 syndrome'. There has been variation in the definitions of Long COVID and the required duration of symptoms for Long COVID to be diagnosed.

The NICE guideline (initially published in December 2020, updated in November 2021) covering the management of the long-term effects of COVID-19 has included the following clinical definitions within its definition of 'Long COVID' (National Institute for Health and Care Excellence, 2021):

- **Ongoing symptomatic COVID-19**: signs and symptoms of COVID-19 from 4 to 12 weeks
- **Post-COVID-19 syndrome**: signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis

Long COVID not only has an impact on the individual but is suspected to introduce an additional burden to the wider population including the NHS. It is critical that there is an assessment of the needs associated with Long COVID for the Havering population.

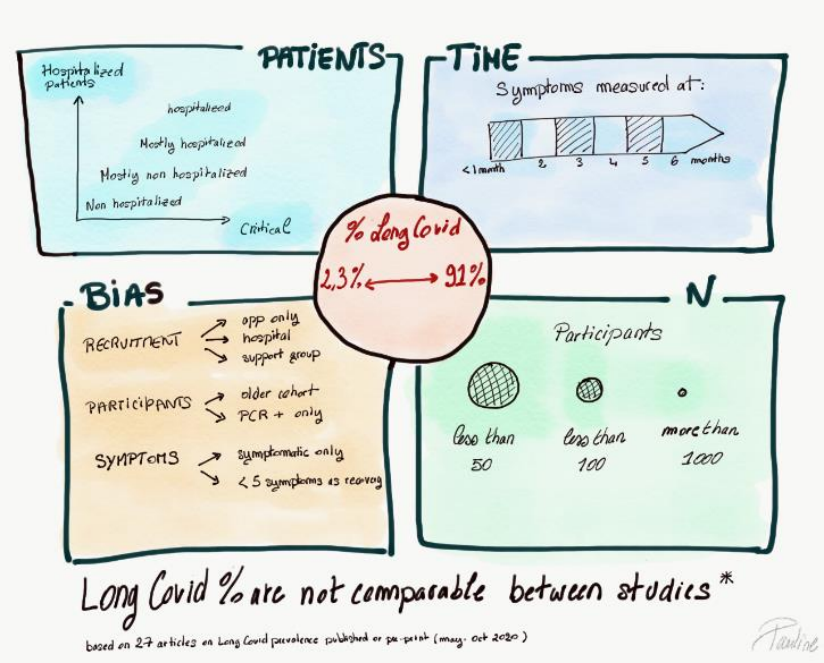
This needs assessment will look at the current evidence-base for Long COVID including the symptoms reported, impacts of Long COVID, the evolving evidence of what works, national policy and the current service provision.

It is important to note that as Long COVID is a new condition, research is ongoing to increase the understanding of Long COVID. Emerging evidence aims to measure the prevalence within different population groups and effective clinical and non-clinical management of Long COVID. As expected there are limitations in the limited evidence-base as demonstrated in Figure 2 which summarises the variation in the types of patients included in studies, size of the studies and follow-up in studies aiming to measure prevalence.

Nevertheless, there is a need to respond to this condition which is affecting residents within Havering and decision-making is required based on the current best available evidence.

The development of this needs assessment involved the compilation of data and information from various sources, including engagement with internal and external stakeholders (including the local Clinical Commissioning Group (CCG)). Literature searches conducted by Public Health England and the North East London Foundation Trust (NELFT) library services along with subsequent citation searching was used to identify relevant evidence.

Figure 2: An illustration demonstrating some of the reasons why the estimated prevalence of Long COVID is not comparable between studies. The illustration is based on 27 articles that estimate Long COVID prevalence (published or pre-prints) between May and October 2020 (National Institute for Health Research, 2021)



4 **Background and Evidence-Base:** What is the emerging evidence?

Key Messages:

- There has been an increase in the prevalence of Long COVID in the UK
- Some population groups may be at increased risk of developing Long COVID including residents who were previously hospitalised, older residents (35-69 years) and those living in deprived areas
- Preventative measures for Long COVID include uptake of the COVID-19 vaccine and clear messaging to the public about Long COVID and its impacts
- There are various symptoms associated with Long COVID in children & young people and adults. The most common symptoms in adults are: fatigue, shortness of breath, loss of smell and difficulty concentrating.
- Symptoms are more common and severe in those who were previously hospitalised, particularly those who were admitted to an intensive care unit (ICU)
- Emerging evidence demonstrates impacts of Long COVID on physical health, quality of life, mental health and employment
- 19% of the participants in ONS survey reported that their day-to-day activities had been limited a lot due to Long COVID. 47.8% of discharged patients who were admitted to intensive care having severe acute infections, were no longer working.
- Most residents will be able self-manage their Long COVID, a proportion will need to access generalist NHS support and subgroup of these will need a referral to the local BHRUT Long COVID clinic for additional support.
- Follow-up is required earlier than 120 days for those who has been hospitalised due to COVID-19 because there is a high rate of mortality among them.

4.1 Population Significance: Prevalence of Long COVID in England population

The exact number of people experiencing Long COVID symptoms is unclear, with reported prevalence estimates (and duration of symptoms) varying widely (National Institute for Health Research, 2021). Research into the prevalence of the illness is ongoing, including the use of the Coronavirus Infection Survey (CIS) by the Office of National Statistics to gather data (Office of National Statistics, 2021). The ONS has defined Long COVID as “symptoms persisting for more than four weeks after the first suspected coronavirus (COVID-19) infection that were not explained by something else”. The CIS has identified various estimates for people in private households in the UK experiencing self-reported Long COVID in their monthly updates, presenting the uncertainty in these emerging condition and potentially the increasing needs associated with Long COVID.

It is likely that this prevalence rate is an underestimate especially for older people due to the inclusion of only private households. It is likely that these numbers will increase as coronavirus infection rates also increase.

4.2 Causes (aetiology) and definitions

The mechanism behind the persistent symptoms post-acute infection is still currently under investigation with potential mechanisms include virus-specific pathophysiologic changes and inflammatory damage in response to the acute infection (Nalbandian, et al., 2021) (British Society for Immunology, 2020). The ongoing symptoms do not appear to be linked to the severity of the initial infection (Townsend, et al., 2020).

Long COVID is a clinical diagnosis, based on a medical assessment and does not need a positive swab or antibody test. It is best diagnosed by a history consistent with acute COVID-19 followed by a prolonged recovery (Greenhalgh, Ladds, Knight, & Ravindran, 2020).

The aetiology of Long COVID has been grouped into the categories including (The Health Foundation, 2021) (Royal College of Nursing, 2020):

1. **Post-viral fatigue**: Common symptoms include fatigue, aching muscles and difficulty concentrating.

2. **Fluctuating multi-system symptoms**: the heart, lungs, digestive system, brain and skin.

3. **Lasting organ damage**

4. **Post-intensive care syndrome**: It varies between patients, but they might have shortness of breath, cognitive function disorder, mood or mental health issues including post-traumatic stress disorder, chronic pain and fatigue. There is a wide range of symptoms they might develop.

The expectation is that the number of patients within these categories decreases with the increasing level of severity. It is likely that the level of need for patients in the more severe categories (e.g. post-intensive care syndrome) will be more substantial requiring specialist care and additional support.

4.3 Risk of Long COVID according to population characteristics and the severity of COVID

There is limited evidence on the risks of developing Long COVID according to patient characteristics. In addition, it is unclear what the impact of different variants of COVID-19 have on the risk of Long COVID. The current evidence-base has been summarised in Table 1 below.

Table 1: Summary of current evidence-base looking at risk of Long COVID according to specific patient characteristics

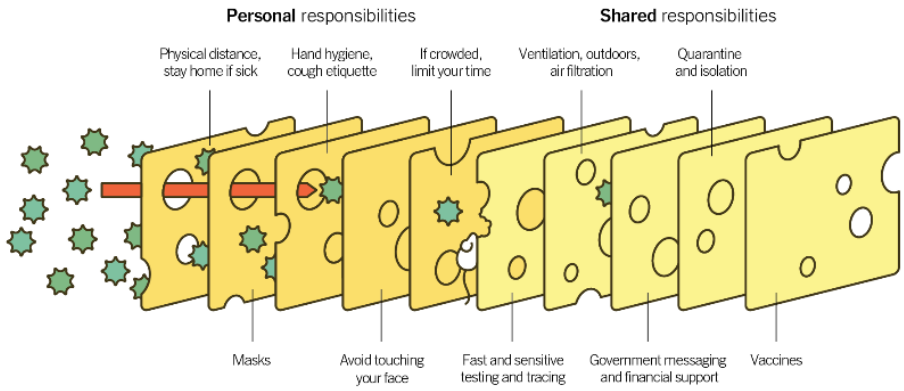
Age	Gender
It is likely that risk of developing Long COVID increases with age. In April 2021, the ONS reported that the prevalence rate of self-reported Long COVID was greatest among people aged 35 to 49 years or 50 to 69 years (2.5% and 2.4% respectively). The rate was statistically significantly higher in all adult age groups than in those aged 2 to 11 years or 12 to 16 years (Office of National Statistics, 2021). A prospective cohort study reported similar findings where it was found that Long COVID was significantly associated with age (Sudre, et al., 2021).	In April 2021, the ONS CIS study reported that there is no significant difference between men and women in the risk of developing Long COVID although women appear to be slightly more likely to suffer from Long COVID than men (Office of National Statistics, 2021). A study found a more distinct difference in risk between men and women, with females have higher risk of developing Long COVID (Sudre, et al., 2021) and later CIS findings report a higher prevalence of Long COVID in women (Office of National Statistics, 2021).
Ethnicity	**Deprivation**
Evidence is currently mixed for risk of Long COVID according to ethnicity. One UK-based study evaluated the association of ethnicity in hospitalised patients and reported that individuals belonging to the B.A.M.E group were more likely to experience moderate or severe breathlessness than White individuals (42.1% versus 25%) at 4–8 weeks post-discharge (Halpin, et al., 2021). However, the ONS CIS found that individuals of Asian and Black ethnic backgrounds were 0.7 and 0.8 times as likely (approximately 25% less) to report Long COVID symptoms, respectively, than those of White ethnic background (Office of National Statistics, 2021).	The ONS CIS study found that the prevalence of self-reported Long COVID exhibited a clear deprivation gradient. Individuals in the most deprived quintile group of the Index of Multiple Deprivation experienced the highest rates (2.5%) and those in the least deprived quintile group experienced the lowest rates (1.6%) of self-reported Long COVID (Office of National Statistics, 2021).
Previous hospital admission	**Pre-existing medical conditions**
Evidence is summarised in Section 5.4, a UK-based longitudinal study with a median follow-up (initial symptoms-to assessment) of 140 days found that organ impairment was more common in hospitalised individuals versus non-hospitalised individuals (Dennis, et al., 2021). The hospitalised group were older, had a high proportion of non-white participants. Halpin et al 2021, found that prevalence of 'any new fatigue' was higher in ICU patients compared to ward patients (72% vs 60.3%), similar picture for breathlessness (Halpin, et al., 2021).	Sudre et al reported from their study that people with asthma were more likely to develop Long COVID (OR = 2.14 (95% CI 1.55-2.96), there were no clear association to any other underlying health conditions (Sudre, et al., 2021). Logue et al in their study found that of the 31 patients with hypertension or diabetes, 11 (35.5%) experienced ongoing symptoms at follow-up (median (range) of 169 (31-300) days) (Logue, et al., 2021)
More than 5 symptoms during acute COVID-19 infection	
Experiencing more than five symptoms during the first week of illness was associated with Long COVID (odds ratio = 3.53 (2.76–4.50) (Sudre, et al., 2021).	
Occupation status	**BMI**
The ONS CIS study found that the prevalence of Long COVID was greater in those working in health or social care and education (Office of National Statistics, 2021).	People developing Long COVID having a slightly higher average BMI than those with shorter length of COVID symptoms (Sudre, et al., 2021).
OR – odds ratio, BAME – Black, Asian and minority ethnic, CI – confidence intervals, Office of National Statistics, CIS – Coronavirus Infection Survey	

4.4 Prevention

4.4.1 Non-pharmaceutical interventions

The best way to prevent Long COVID is to ultimately prevent the spread and infection of COVID-19. The “Swiss cheese respiratory pandemic model” summarises the effective multi-faceted approach to preventing the spread of COVID-19 (see Figure 3). The concept behind the model is that no layer of prevention is perfect but several layers combined reduces the overall risk. A systematic review found that measures such as social distancing, washing hands and wearing face masks are associated with reductions in COVID-19 infection (Talic, et al., 2021).

Figure 3: Swiss cheese respiratory pandemic model



Source: Adapted from Ian M. Mackay (virologydownunder.com) and James T. Reason. Illustration by Rose Wong

It is important that there is clear, empowering messaging about ways in which individuals can prevent the spread of COVID-19 and the development of Long COVID. Clear messaging on the benefits of adopting prevention strategies can facilitate sustained changes in behaviour over longer periods of time (Finset, et al., 2020) (Porat, Nyrup, Calvo, Paudyal, & Ford, 2020). As previously summarised, there are some subpopulations at increased risk of developing Long COVID. It is however important that the general population (including lower-risk groups) is aware of the impacts of Long COVID and do their part to prevent the transmission of COVID-19.

4.4.2 COVID-19 vaccine and risk of long Covid

Emerging evidence suggests that uptake of the COVID-19 vaccination may reduce odds of longer term symptoms (≥28 days). A UK-based study has reported on risk factors and disease profile of post-vaccination COVID-19 infection in users of the COVID Symptom Study app, including 1.24 million users in their study (Antonelli, et al., 2021). They found that when

comparing individuals who had two doses of COVID-19 vaccination and unvaccinated controls, they were reduced odds of long-duration (≥28 days) symptoms, hospitalisation or having more than five symptoms in the first week of illness and following the second dose. In addition, the ONS found that the COVID-19 vaccinations have a positive impact on Long COVID, with one dose being associated with an initial 13% decrease in the likelihood of self-reported Long COVID. Receiving a second dose was associated with 9% decrease in the likelihood of self-reported Long COVID, relative to having received the first vaccination (Office of National Statistics, 2021).Another study had similar findings were the likelihood of Long COVID symptoms decreased after the first dose of the COVID-19 vaccination with sustained improvement after the second dose (Ayoubkhani, Pouwels, Nafilyan, Khunti, & Alwan, 2022).

4.5 Symptoms and duration – children and young people

Symptoms

There is a lack of evidence on symptoms of Long COVID in children and young people. One study has reported that 35.6% of the children included in the study (asymptomatic and symptomatic initial COVID-19 infection) reported having one or two persisting symptoms. These symptoms were similar to those identified in adults with Long COVID, with the following symptoms recorded at >60 days (Thomson, 2021):

- Insomnia (18.6%)
- Respiratory symptoms (including pain and chest tightness) (14.7%)
- Nasal congestion (12.4%)
- Fatigue (10.8%)
- Muscle pain (10.1%)
- Concentration difficulties (10.1%)
- Joint pain (6.9%)

Another study found that the most common symptoms experienced by children in the study population with Long COVID (symptoms lasting more than 28 days) were fatigue (84.4%), headache (77.9%), anosmia (77.9%), and sore throat (74%) (Molteni, et al., 2021). The most common symptoms varied slightly for children with symptoms lasting more than 56 days - anosmia (84%), headache (80%), sore throat (80%), and fatigue (76.0%).

Duration

Current research on Long COVID has been predominantly based in adult study populations. Whilst the risk of Long COVID is lower in children, emerging evidence highlights that children can be impacted by Long COVID. A study looking at Long COVID in children found that 42.6% of study population (68 children with follow-up after 120 days) was impaired by symptoms during daily activities (Buonsenso, et al., 2021).

However, a large UK-based study including 1,734 children with a positive COVID-19 test found that 4.4% of the study population had ongoing symptoms lasting for more than 28 days, this included 18 younger children (5-11 years old) and 59 older children (12-17 years old). The median illness duration for these children was 46 days (Molteni, et al., 2021).

4.6 Symptoms and duration – adults (general population)

Symptoms

A **wide range of Long COVID symptoms** have been identified in emerging research, with evidence presenting that individuals may even experience a combination of Long COVID symptoms. NICE guideline (NG188) summarises the common symptoms of Long COVID (see Figure 4). The CIS findings published in November 2021 found that the most prevalent self-reported symptoms that persisted for at least 4 weeks after the assumed date of infection were **fatigue** (55%), **shortness of breath** (39%), **loss of smell** (33%) and **difficulty concentrating** (30%) (Office of National Statistics, 2021).

Sudre et al suggests that those experience more than five symptoms during the first week of an acute COVID-19 infection are at increased risk of developing Long COVID (Sudre, et al., 2021).

Michelen et al, reviewed 39 international studies and found that the most commonly described Long COVID symptoms (with prevalence of 25% or greater) were weakness (41%), general malaise (33%), fatigue (31%), concentration impairment (26%) and breathlessness (25%). The longest follow-up period in any study was an average of 221.7 days post onset (Michelen, et al., 2021).

Figure 4: Common symptoms of Long COVID (adapted from the NICE guideline NG188)

Respiratory symptoms	Cardiovascular symptoms	Generalised symptoms	Neurological symptoms
○ Breathlessness ○ Cough	○ Chest tightness ○ Chest pain ○ Palpitations	○ Fatigue ○ Fever ○ Pain	○ Cognitive impairment ('brain fog', loss of concentration or memory issues) ○ Headache ○ Sleep disturbance ○ Peripheral neuropathy symptoms (pins and needles and numbness) ○ Dizziness ○ Delirium (in older populations)
Gastrointestinal symptoms ○ Abdominal pain ○ Nausea ○ Diarrhoea ○ Anorexia and reduced appetite (in older populations)	**Musculoskeletal symptoms** ○ Joint pain ○ Muscle pain	**Ear, nose and throat symptoms** ○ Tinnitus ○ Earache ○ Sore throat ○ Dizziness ○ Loss of taste and/or smell	
Dermatological ○ Skin rashes	**Psychological/psychiatric symptoms** ○ Symptoms of depression ○ Symptoms of anxiety		

Duration

NICE defines the duration of Long COVID as 'ongoing symptomatic COVID-19' (from 4 to 12 weeks) and 'post-COVID-19 syndrome' (12 weeks or more) (National Institute for Health and Care Excellence, 2021). In the literature, various durations of Long COVID symptoms are reported, with studies reporting different follow-up periods. A majority of studies looking at the duration of Long COVID follow-up patients for less than 100 days (National Institute for Health Research, 2021). However, an international online survey with 3,762 participants (35% from the UK and Northern Ireland) found that a total of 2,454 (65.2%) respondents were experiencing symptoms for at least 6 months (Davis, et al., 2021).

4.7 Symptoms and duration – adults (hospitalised)

- Dennis et al had similar findings where the **COVID-19 hospitalised patients** included in their study population were **more likely to develop organ impairment** (defined as MRI-derived measurements from the heart, lungs, kidney, liver, pancreas and spleen compared with established reference ranges) (Dennis, et al., 2021). The hospitalised group were older, had a high proportion of non-white participants.
- Ayoubkhani et al also found that an increased risk was demonstrated when an analysis was conducted to compare patients admitted to intensive care unit (ICU) and patients not admitted to ICU with the matched control group (Ayoubkhani, et al., 2021). **More ICU patients went on to receive a new diagnosis of respiratory disease and diabetes than non-ICU patients**. Higher proportions of diagnoses for MACE and CKD were seen in the non-ICU patients (MACE – 5% of cases vs 3.6%; CKD – 1.5% vs 1.3%). However, this could be because most ICU patients already had MACE and CKD, or they died in the ICU.
- Halpin et al 2021, found that prevalence of 'any **new fatigue' was higher in ICU patients** compared to ward patients (72% vs 60.3%), similar picture for breathlessness (Halpin, et al., 2021).
- Whilst most patients with acute COVID-19 are not hospitalised, hospitalised patients are **more likely to display severe and/or chronic symptoms associated lasting organ damage and post-intensive care syndrome**. Some estimates suggest that up to **50% of people hospitalised would need formal rehabilitation services** (Curci, et al., 2020) (Ferraro, Calafiore, Dambruoso, Guidarini, & de Sire, 2021) (Salawu, et al., 2020) (Tsutsui, Gerayeli, & Sin, 2021).
- Unsurprisingly, these patients were also **more likely to be readmitted to hospital following discharge** (29.4% vs 9.2% in the control group). The reasons for readmissions were however not analysed in this study. An observational study conducted in the United States, investigated readmission after hospital discharge at 60 days and found that the most common readmission diagnoses were COVID-19 (30.2%), sepsis (8.5%), pneumonia (3.1%) and heart failure (3.1%) (Donnelly, Wang, Iwashyna, & Hallie, 2021). Presenting the additional needs and costs associated with long-term COVID-19 complications for those previously hospitalised due to COVID-19.

A UK-based observational study of 47,780 individuals in hospital with COVID-19 was conducted with a mean follow-up time of 140 days, compared hospitalised COVID-19 patients to a matched control group representing the general population (Ayoubkhani, et al., 2021). The study analysed data for post-COVID complications following admission looking at rates of adverse events including new-onset clinical diagnoses. The study found that there were significantly more new diagnoses of respiratory disease, diabetes, major adverse cardiovascular event (MACE), chronic kidney disease and chronic liver disease following hospital admission in the COVID-19 patients:

Hospitalised patients vs control group (general population)

- Respiratory disease (21.5% vs 0.8%)
- Diabetes (1.1% vs 0.3%)
- MACE (2.6% vs 0.5%)
- Chronic kidney disease (0.6% vs 0.3%)
- Chronic liver disease (0.2% versus 0.04%)

4.8 Other impacts of Long COVID

4.8.1 Impact on quality of life and physical functioning

The World Health Organisation (WHO) defines quality of life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (World Health Organization, 2012). Quality of life is influenced by whether an individual is able to fulfil a normal role and day-to-day activities (Carr, Gibson, & Robinson, 2001).

As the information and evidence on Long COVID is relatively new, there is still a lot of uncertainty and confusion for individuals with Long COVID. Qualitative research exploring individuals' experiences with the Long COVID have presented the fact that the condition can be confusing for both the individual and those close to them. A participant in one study described the impact of their symptoms on their partner and family, and how they felt they did not believe her (Kingstone T. , et al., 2020):

> *'I feel like I constantly have to explain… I'm just exhausted and I just want to know why I'm so exhausted … It's quite bad. I used to enjoy running, and exercising, and stuff like that. I rarely even go on walks now because I know if I walk to the end of the street, they're going to start hurting*.'

Another qualitative study identified a similar theme where participants with Long COVID described their symptoms as "fluctuating, made worse by the uncertain prognosis and stalled recovery, all of which combined to make sense of their suffering – an experience intensified by absence of medical knowledge or guidance" (Ladds, et al., 2020).

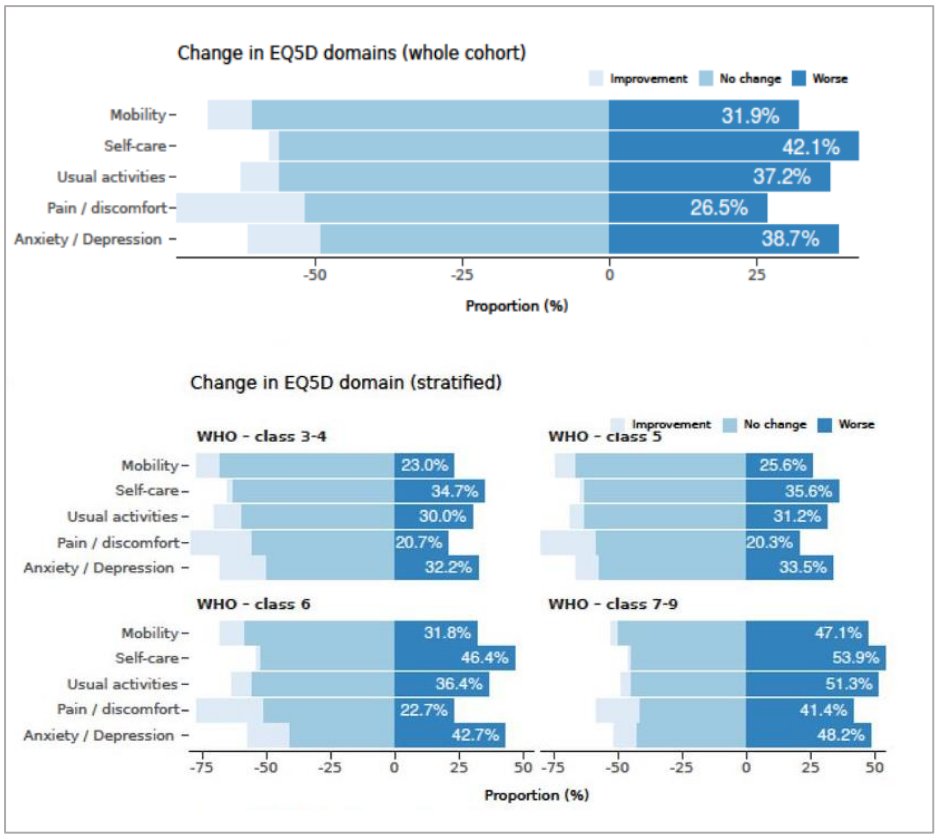
This is consistent with findings from the ONS CIS which found that of all people in UK private households with self-reported Long COVID, 780,000 (65%) experienced at least some limitation to their day-to-day activities as a result and 233,000 (19%) reported that their day-to-day activities had been limited a lot during the duration of their symptoms (Office of National Statistics, 2021).

Studies following patients discharged from hospital after a COVID-19 infection have found that quality of life was significantly impacted. Raman et al, followed fifty-eight COVID-19 patients post-hospital discharge and used the Short Form-36 (SF-36) questionnaire to measure quality of life (Raman, et al., 2021). At 2-3 months post-discharge, it was found that after hospitalisation, the COVID-19 patients were more likely to experience reductions in quality of life compared to a control group (uninfected individuals), most significantly in physical and emotional functioning.

The PHOSP-COVID study found that patients rated their EQ5D-5L (another measure of quality of life) worse than before the hospital admission, when stratified the greatest decrement was seen in those with severe infection (WHO category 7-9: needing mechanical ventilation and/or vasopressors, dialysis or ECMO (Figure 5) (PHOSP-COVID Collaborative Group, 2021) (WHO Working Group on the Clinical Characterisation and Management of COVID-19 infection, 2020).

Halpin et al, compared discharged COVID-19 patients were in hospital wards and those in ICU, and also found a decrease in quality of life using the EQ-5D-5L measure (Halpin, et al., 2021). 68.8% of the COVID-19 patients in ICU (severe infection) and 45.6% of ward COVID-19 patients' (milder acute infection) had at least a 0.05 reduction in their EQ-5D scores - 0.05 being the minimal clinically important difference for the patient.

Figure 5: Health-related quality of life measured by the EQ5D-5L at follow-up compared to prior to admission with COVID-19 – changes in the whole cohort and stratified by severity of infection. (PHOSP-COVID Collaborative Group, 2021)



4.8.2 Impact on mental health

4.8.2.1 Adults

The COVID-19 pandemic has in itself negatively impacted mental health due to factors such as the control measures (including social distancing and lockdown) and employment and financial concerns (Daly, Sutin, & Robinson, 2020) (Jia, et al., 2020). Contracting a COVID-19 infection can worsen poor mental health outcomes. Raman et al, found that COVID-19 patients had higher cumulative self-reported symptom scores for depression (Patient Health Questionnaire-9 (PHQ-9) median score of 3 versus 1.5) compared to controls at 2-3 months follow-up (Raman, et al., 2021). 19% of COVID-19 patients reported symptoms of moderate to severe depression at 2-3 months follow-up, 5.2% of COVID-19 patients were recorded as

having depression at baseline. The symptom score for anxiety was also higher (Generalised Anxiety Disorder Assessment (GAD-7) median score 2 vs 0.5) in COVID-19 patients compared to controls. Halpin et al have reported that in addition to depression and anxiety they found that symptoms of post-traumatic stress disorder (PTSD) were reported in hospitalised COVID-19 patients (Halpin, et al., 2021). PTSD symptoms was more pronounced in ICU patients, consistent with findings from Chamberlain et al who found that PTSD symptoms were more prominent in those requiring ventilator support. Halpin et al looked at the rates of PTSD symptoms according to population characteristics and found that for:

Gender – higher rates of PTSD symptoms were identified in females in the ICU ward than males in the ICU ward (76.9% versus 38.5%), the proportions were however similar for ward-treated patients.
Age - in both the ICU and ward groups, patients reporting PTSD symptoms were younger, the median age of all participants with these symptoms was 59 years, compared with 68 years in those without PTSD symptoms.
BMI – PTSD symptom reporting co-occurred with obesity in the ICU group, but not in the ward group - 85.7% of obese patients reported PTSD symptoms, compared with 16.7% for those with a BMI of less than 30 in the ICU group.
Ethnicity - rates of PTSD symptoms reported by B.A.M.E individuals were similar to white participants (35.0% and 29.2% respectively).

4.8.2.2 Children and young people

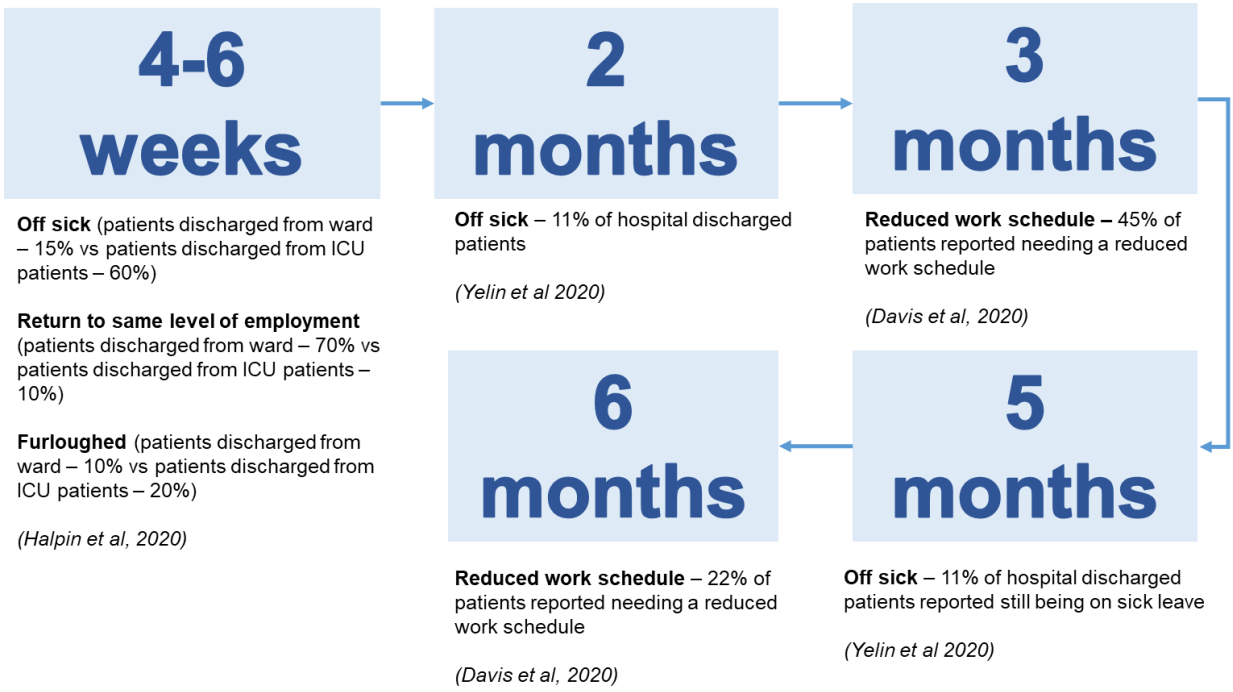
There is especially limited evidence available for the mental health impacts of Long COVID in children and young people, however Buonsenso et al (pre-print study), found from their 'Long COVID Kids Rapid Survey 2' involving 510 children that mental health/cognitive issues were prevalent in children with symptoms lasting longer than 4 weeks (Buonsenso, Pujol, Munblit, Mcfarland, & Simpson, 2020). It was reported that 54.7% of the children included in the study reported having 3 or more mental health/cognitive issues since their COVID-19 infection. 38% of these children did not have any mental health/cognitive issues before their COVID infection.

The CloCk study is a Longitudinal study currently in progress that is aiming to assess the impact of Long COVID on the mental health of children and young people (aged 11-17 years old) in the UK especially as they have also been greatly impacted by the COVID-19 pandemic due to school closures, social isolation and loneliness (Pierce, et al., 2020) (Stephenson, et al., 2021) (Loades, et al., 2020). Whilst there is a clear evidence-gap in this area, it is important to note that pre-COVID evidence suggests that poor mental health in childhood, adolescence and early adulthood may be associated with increased risk of poor mental health and physical health in midlife (Clark, Rodgers, Caldwell, Power, & Stansfeld, 2007) (Public Health England, 2017). Consequently, it is critical that early interventions are implemented to tackle mental health issues associated with COVID-19 in children and young people.

4.8.3 Impact on employment

Emerging evidence has found that Long COVID has impacted the ability for people to return to work, with impacts seen even at 6 months (see Figure 6 for summary of evidence). This is consistent with evidence on the negative impacts of Long COVID on quality of life, physical and mental wellbeing as all these implications are intertwined. Unemployment and/or an inability to work can contribute to worse mental health and quality of life outcomes due to increased stress and worries about finances which can in turn lower health status (Cheng & Mendolia, 2021) (Daly & Delaney, 2013).

Figure 6: Summary of evidence on changes in employment for those experiencing Long COVID



Main groups more likely to be impacted by unemployment or inability to work due to Long COVID

Patients admitted to ICU

Evidence previously mentioned suggests that people admitted to ICU for an acute COVID-19 infection are more likely to have worse Long COVID outcomes when compared to hospitalised patients and those who are not hospitalised due to COVID-19. The PHOSP-COVID study found at follow-up (median:179 days) that 47.8% of discharged patients who were in WHO category 7-9 having severe acute infections, were no longer working and 54.8% experienced a health-related change in occupational status (PHOSP-COVID Collaborative Group, 2021).

Groups who are disproportionately affected by COVID:

- **Black, Asian and minority ethnic (B.A.M.E) groups**
- **Clinically extremely vulnerable (CEV) individuals**
- **Individuals with learning disabilities**

There are generally inequalities in unemployment with higher rates of unemployment seen in: (1) B.A.M.E groups compared to White British individuals in the UK (Office for National Statistics, 2021) (House of Commons Women & Equalities Committee, 2020) (2) individuals with learning disabilities and (3) CEV individuals (e.g. those with long-term health conditions).

There is limited and mixed evidence on the risk of Long COVID and ethnicity (as previously described) and research has not yet been conducted to investigate the risk of Long COVID in CEV individuals and those with learning disabilities. Emerging research suggests that individuals in these three groups are more likely to be hospitalised and/or have worse outcomes as a result of acute COVID-19 infection (Williamson, et al., 2021) (Apea, et al., 2021) (Downes, et al., 2021) (Williamson, et al., 2021) (Semenzato, et al., 2021). It is widely recognised that hospitalisation and severe outcomes associated with COVID-19 infection, increases the risk of Long COVID. Consequently these individuals may be more likely to be impacted by unemployment and inability to work.

Young adults

Young adults have also been more hardly hit by unemployment during the COVID-19 pandemic, with higher rates of unemployment (job loss in 17-24 year olds - 11.10% compared to 3.9% in 46-55 year olds) (Centre for Economic Performance, 2020). Long COVID may exacerbate this issue making it more difficult for young adults to work. Youth unemployment can have long-term implications such as subsequent lower pay and mental health problems in midlife (Strandh, Winefield, Nilsson, & Hammarstrom, 2014).

Financial support

ONS CIS found that those in the more deprived groups are more likely to report Long COVID symptoms (Office of National Statistics, 2021). Those who are more deprived are likely to be struggle financially and have higher rates of unemployment (Office for National Statistics, 2010). Currently, there is not any financial support available from the government specifically for Long COVID. Members of Parliament have proposed via the All Party Parliamentary Group that Long COVID is recognised at as an occupational disease and that key workers are compensated for the longer term of the symptoms (Limb, 2021). Recognising Long COVID as an occupational disease will ensure that the necessary financial provisions are in place for those with Long COVID, and reduce inequalities rather than increase them.

4.8.4 Impact on education

Education is a crucial factor influencing intergenerational mobility, financial security and wellbeing (Blanden & Macmillan, 2014). The COVID-19 pandemic has severely impacted education with the closure of education settings and reductions in teaching hours during lockdowns.

For those with Long COVID, the normal teaching hours lost may potentially be higher as some may have symptoms which prevent them from returning to education settings or engaging virtually. Ludvigsson's paper on a case report of five children presents that some of the children had improved after experiencing Long COVID symptoms for 6–8 months, but all of them still suffered from fatigue and none of them had been able to return to school full time (Ludvigsson, 2020).

More evidence is needed on the impact of acute COVID-19 infection and Long COVID on education and socio-economic inequalities, in children, young people and teaching staff. The COVID Social Mobility and Opportunities Study (COSMO) study in young people (in Year 11) is currently underway and will seek to gather such evidence, mainly the short-term effects on educational attainment and well-being, and long-term educational and career outcomes (The Sutton Trust, 2021).

In June 2020, the government announced £1 billion of funding to support children and young people to catch-up on missed learning caused by COVID-19 especially for the most vulnerable pupils and pupils from disadvantaged backgrounds (Department for Education, 2021). This funding was provided early 2021 until the summer 2021 term and included one-off universal catch-up premium and funding for the National Tutoring Programme to provide additional and targeted support. It is unclear at this stage if funding will be provided in the next academic year.

It is important that there is additional educational provision in place for those who have experienced Long COVID or still experiencing it, as they are more likely to have delayed return to education settings. As per stated in recommendation 5.3 within the NICE guideline on Long COVID, individuals should be supported with discussions with their employer, school or college about returning to work or education, for example by having a phased return (National Institute for Health and Care Excellence, 2021). This is more critical for those who are in the more deprived/disadvantaged groups where stark inequalities already exist.

4.9 Tiered approach for support – policy and evidence

NHS England and NHS Improvement launched its five-point plan to support people with Long COVID in October 2020 (NHS England, 2021). This includes: the development of the NICE guideline on Long COVID (NG188), an online rehabilitation service (Your COVID Recovery), Long COVID clinics, National Institute for Health Research (NIHR) funded research and a new NHS England Long COVID taskforce.

Greenhalgh et al have proposed a 4-tiered approach for supporting individuals with Long COVID (see Appendix D) and proposed the proportions of patients who will need the different levels of support (Greenhalgh, Ladds, Knight, & Ravindran, 2020):

Tier 1: Patient-led rehabilitation and recovery	All patients
Tier 2: Generalist assessment, support and rehabilitation	80% of patients
Tier 3: Specialist assessment, support and rehabilitation	10% of patients
Tier 4: Specialist management of specific complications	1% of patients

Children and young people

NHS England has set up specialist Long COVID hubs for children and young people, the nearest hub to Havering is the London hub led by the Evelina, Imperial, University College London Hospital (UCLH) and Great Ormond Street Hospital for Children (GOSH) (NHS England, 2021).

In April 2021, NHS London shared the London-wide paediatric pathway (see Appendix C), including the establishment of a collaborative virtual multi-disciplinary team (MDT) in partnership with University College London Hospitals NHS Foundation Trust, Evelina London Children's Hospital and Great Ormond Street Hospital for Children NHS Foundation Trust. The awareness and use of this pathway locally is unclear.

Tier 1 – Patient-led rehabilitation and recovery

Pulse oximetry

Pulse oximetry may be extremely useful for assessing and monitoring respiratory symptoms after COVID-19 infection. Not only there is no evidence that their use in the home leads to increased anxiety, the use of it will encourage breathing exercise to speed up pulmonary recovery (Greenhalgh, Knight, A'Court, Buxton, & Husain, 2020).

Pacing and physical activity

Individuals with Long COVID often report symptoms such as fatigue and reported that mental and/or physical exertion triggered the relapse of symptoms (Davis, et al., 2021). People with Long COVID in Havering should be made aware that physical limitations associated with Long COVID are expected and normal, and they should be mindful of the fact that there is not currently a consensus on physical activity-related advice specifically for people with Long COVID (Humphreys, Kilby, Kudiersky, & Copeland, 2021).

However, a commonly reported approach to self-management for Long COVID is ‘pacing’ (National Institute for Health Research, 2021) (Garner, 2020) (Kingstone, et al., 2020). This involves the strategic use of physical and mental energy reserves, with the aim of preventing or mitigating symptom flare-ups (Royal College of Occupational Therapists , 2021) (Long Covid Physio, 2021). This can include completing activities of daily living such as housework and gardening. Resources such as the ‘Your COVID Recovery’ is an online tailored interactive self-management programme developed by NHS England and NHS Improvement with the University Hospitals Leicester NHS Trust (NHS - Your COVID Recovery, 2021). It is designed to inform patients about Long COVID and help individuals recover from the Long term effects of COVID-19 and manage the effects both on their body and mind effectively, reducing the impact it has on their day-to-day life. The ‘Your COVID Recovery’ programme can only be accessed after a referral has been made by a healthcare professional.

Peer support groups

Evidence has indicated online peer support groups for Long COVID can be beneficial through providing the sharing of experiences, practical advice, knowledge and validation (Ladds, et al., 2020).

Tier 2 – Generalist assessment, support and rehabilitation

Qualitative research found that participants with Long COVID found accessing NHS services "difficult and exhausting" (Ladds, et al., 2020). Participants reported that there is a perception among providers that their symptoms were less serious than they actually were and that there were not any clear referral pathways. As shared by "understanding, support, and reassurance from the primary care clinician are a crucial component of management" (Greenhalgh, Knight, A'Court, Buxton, & Husain, 2020).

Enhanced Service for GP practices

GP practices have been offered the opportunity to apply for Enhanced Service (ES) funding for patients with Long COVID. The additional funding for this ES is for GP practices to plan their workforce set up, training needs and infrastructure in order to support patients with this new condition. This ES requires GP practices to achieve the objectives including:

1) For staff to have the knowledge, as appropriate to their role, to identify, assess, refer and support patients with Long COVID
2) To code data consistently and accurately
3) To reduce inequity of access - practices are required to consider how to reduce potential inequity of access to Long COVID services. This may include using existing infrastructure, such as working with the practice Patient Participation Group (PPG) and system partners to help raise awareness of support (such as Your COVID Recovery website) and to understand any potential barriers to support
4) Take reasonable steps to provide information to patients about the services pursuant to this ES, including information on how to access the services and any changes to them
5) Ensure that it has in place suitable arrangements to enable the lawful sharing of data, including patient records, to support the delivery of the services, business administration and analysis activities in line with data protection legislation

Social prescribing and link workers

Long COVID can impact on mental health, physical health and finances. Primary care settings such as GP practices are community-based point of contacts venues and best placed to be point of contacts for support to residents. It has been reported that generally up to one in five cases seen by a GP are for difficulties that could be classed as 'non-medical' (e.g. inadequate housing, financial issues, bereavement, loneliness) (Tierney, et al., 2020). The number of GP visits could be potentially reduced by addressing some of the wider determinants of health which contribute to 'non-medical' concerns. This is the basis of social prescribing which aims to link residents with services (via link workers) which can support their health and wellbeing, see **Box 1** for further information.

Box 1 – What is social prescribing?

Social prescribing is a way for local agencies to refer people to a link worker. Link workers give people time, focusing on 'what matters to me' and taking a holistic approach to people's health and wellbeing. They connect people to community groups and statutory services for practical and emotional support (NHS England, 2021). Social prescribing can meet many different types of non-clinical need, ranging from support and advice for individuals experiencing debt, unemployment, housing or mobility issues to tackling loneliness by building social connections through joining local community groups, such as walking, singing or gardening groups (Public Health England, 2019).

Tier 3 - Specialist assessment, support and rehabilitation; Tier 4 - specialist management of specific complications

Follow-up for those hospitalised due to COVID-19 infection

As described earlier in this document, individuals previously hospitalised due to COVID-19 are at increased of developing Long COVID and are more severely impacted. A systematic review concluded that from the **clinical perspective, multidisciplinary teams are crucial** to developing preventive measures, rehabilitation techniques, and clinical management strategies with whole-patient perspectives designed to address Long COVID-19 care (Lopez-Leon, et al., 2021).
Studies have shown that follow-up is required earlier than 120 days for those who has been hospitalised due to COVID-19 because there is a high rate of mortality among those who were admitted and higher risk of complications:

Ayoubkhani et al (Ayoubkhani, et al., 2021)	Found that individuals discharged from hospital after COVID-19 infection had increased rates of multi-organ dysfunction compared with the expected risk in the general population.
Gunster et al (Gunster, et al., 2021)	Found that the 30-day all-cause mortality rate was 23.9%, the 90-day rate was 27.9%, and the 180-day rate, 29.6% after hospital discharge. In sub-group analysis, the 180-day mortality was 52.3% for inpatients aged ≥80 years, 53.0% in case of those ventilated invasively (853/1,608) and 23.6% (1,621/6,865) if not ventilated during index hospitalisation. Risk

	factors for the 180-day all-cause mortality included coagulopathy, BMI ≥ 40, and age.
Donnelly et al (Donnelly, Wang, Iwashyna, & Hallie, 2021)	Found that within 60 days of discharge, 354 patients (19.9%) who survived COVID-19 hospitalisation were readmitted, 162 (9.1%) died, and 479 (27.0%) were readmitted or died. During readmission, 22.6% were treated in intensive care, 7.1% were mechanically ventilated, and 7.9% received vasopressors. Index admissions totalled 27,496 hospital days, whereas readmissions after COVID-19 resulted in 3728 additional hospitalisation days.

British Thoracic Society survey calls for an assessment at 6–8 weeks following a hospital discharge, focusing on a broad range of possible symptoms and supporting a return to work (Singh, et al., 2020).

Evidence suggests that the majority of patients with Long COVID tend to have ongoing symptoms of fatigue, exercise programmes may help in rebuilding fitness. A recent UK study enrolled 32 individuals with Long COVID following hospitalisation due to an acute COVID-19 infection to a rehabilitation programme. The 6-week programme consisted of aerobic exercise sessions and education discussions (Daynes, Gerlis, Chaplin, Gardiner, & Singh, 2021).

Long COVID clinics

Funding has been allocated for the development of Long COVID clinic(s). Patients can be referred to these clinics from primary care and secondary care services (NHS England, 2021). The Long COVID clinics hosts professionals who provide physical, cognitive and psychological assessments of those experiencing suspected Long COVID, so that they can be referred to the right specialist, this include the following services:

Specialist lung disease services, sleep clinics, and pulmonary rehabilitation	Primary care led care including care coordinators and social prescribers	Co-morbidity management e.g. for diabetes or obesity
Cardiac services	Improving Access to Psychological therapies (IAPT) and other mental health services	Neurology
Pain management	Rheumatology	Dermatology
Gastroenterology	ENT	Infectious disease services
Rehabilitation services	Dietetics and nutrition services	Occupational health

5 **Local needs:** How does emerging evidence help us identify needs in the Havering population?

Key Messages:

- It was estimated that between November 2020 and March 2022 a total of 7,230 people in Havering have been diagnosed with Long COVID and 1,265 will require a support service according to the UKHSA model. Among them were 1,065 residents hospitalised between April 2020 and March 2021 due to COVID-19 who may not have fully recovered from their admission into hospital.
- Of the 69,503 patients who have been recorded in primary care as having tested positive for COVID-19 in Havering, 0.6% has been diagnosed with Long COVID in primary care.
- Most cases including those requiring support are female. Age 35-69 is estimated to have the highest number of cases.
- It is important that smaller population groups within in Havering who may be at increased of Long COVID (including B.A.M.E residents and those living in deprived areas) are not overlooked when considering needs and support services.
- It can be estimated that 1,065 Havering residents hospitalised between April 2020 and March 2021 due to COVID-19 may not have fully recovered 7 months on from their admission into hospital.
- Local data is unavailable to assess the impacts of Long COVID residents. There is a need to collect some data to increase the understanding of local needs.
- Those with long-term health conditions in Havering are generally more likely to be disproportionately impacted by unemployment. There is a 14.6% gap in the employment rate between those with a long-term health conditions and the overall employment rate in Havering (higher than the average for England, 10.6%). Long COVID may exacerbate this inequality.

5.1 Population groups at increased risk of Long COVID

The Public Health Intelligence (PHI) Team previously conducted modelling to identify individuals/groups among Havering residents at high risk of acute COVID-19 infection and experiencing COVID-19 related adverse outcomes following diagnosis i.e. hospitalisation or death. These model results were reviewed in order to identify any associations and potential burdens of Long COVID in Havering (for more information, refer to Appendix A). A commentary on the risk of Long COVID according to population characteristics of those living in Havering using modelling findings and demographic information for Havering has been produced (see Table 1).

Whilst the current evidence-base and local modelling provides a valuable indication of where the risks may lie within the Havering population, there is still some uncertainty in the external validity. In order to identify the true burden of Long COVID and population groups where inequalities may exist within the Havering population, additional evidence is required. In

addition, it is crucial that smaller population groups in Havering are not overlooked, as this can give rise to inequalities in access and the provision of support, e.g. B.A.M.E. residents and those who are more deprived.

Table 2: Using current evidence-base, modelling conducted by the PHI Team relating to acute COVID-19 infection and local demographic information to explore population risks for Long COVID

Age	**Gender**
Modelling by the Havering PHI Team presented that adults (18 years and over) had a higher risk of acute COVID-19 infection as compared to children. It can be expected that there will be more adults with Long Covid in Havering compared to children.	Modelling by the Havering PHI Team presented that there were no statistically significant differences in risk of acute coronavirus infection by gender. Havering has a slightly higher proportion of women compared to men (51.8% versus 48.2%) (London Borough of Havering, 2021). With emerging evidence suggesting that women are at increased risk of Long COVID, it may be expected that more women would present with Long COVID.
Ethnicity	**Deprivation**
Modelling by the Havering PHI Team on acute COVID-19 infection presented that all ethnic minority groups had a higher risk of infection as compared to White British. Among the three main ethnic minority groups (Other White, Black, Asian), Black had the highest risk (OR 2.1, 95% CI 1.7 - 2.6). The direction of risk relating to ethnicity for Long COVID may be similar. Havering has a low proportion of B.A.M.E individuals, with 87.7% of the population being White (London Borough of Havering, 2021). Consequently, it could be expected that the majority of Long COVID cases in Havering would be in White residents.	Modelling by the Havering PHI Team on acute COVID-19 infection presented that people living in most deprived areas had a higher risk of infection as compared to the least deprived and they were 10 times more likely to test positive (OR 10.4, 7.6 – 14.3) as compared to the least deprived. Evidence presents a clear deprivation gradient associated with Long COVID, with more cases in those who are living in more deprived areas. Levels of deprivation for Havering as a whole are modest but vary significantly within the borough with pockets of significant disadvantage in Harold Hill, Rainham and parts of Romford. It may be expected that overall Long COVID cases would likely be from those who are in the least deprived quintile group.
Occupation status	**BMI**
Not covered in modelling by the Havering PHI Team. The most common industry for Havering residents is construction with 25.9% of the population. Individuals working in health or social care and education are at greater risk of developing Long COVID, this account. 1.4% of the population who work in Education and 4.1% work within Health (London Borough of Havering, 2021). Long COVID in those in Havering who work within the health or social care and education sectors may impact the local running of healthcare services and education settings.	Interestingly, modelling by the Havering PHI Team found that there wasn't an association between severe obesity and risk of acute COVID-19 infection (including hospitalisation) and mortality related to COVID-19. Limited evidence on the association between obesity and Long COVID indicates that those with a higher BMI may be at increased risk. This is a concern for Havering as data for 2019/20 presents that 67% of adults in Havering are classified as overweight or obese (London Borough of Havering, 2021). This is higher than the London and England averages, 55.7% and 62.8% respectively. It may be expected that a

	high proportion of reported Long COVID cases in Havering may be in those who are overweight or obese.
More than 5 symptoms during acute COVID-19 infection	**Previous hospital admission**
Not covered in modelling by the Havering PHI Team. Unfortunately, there isn't any local data for the number of symptoms reported by Havering residents.	Modelling by the Havering PHI Team found that there was increased risk of hospitalisation for the following groups: ○ Older people were at a higher risk of hospitalisation compared to children under 18 years ○ All major ethnic minority groups except Asians had a significantly higher risk of hospitalisation as compared to White British. Considering the findings above and the additional risks associated with those are more likely to be hospitalised, it can be expected that a portion of Long COVID cases reported in Havering will be those who were previously hospitalised. These previously hospitalised patients are likely to be in older age groups.
Pre-existing medical conditions	
Modelling by the Havering PHI Team relating to acute COVID-19 infection found that among patients with long-term conditions, those with Chronic Neurological Disease (OR 1.9, CI 1.4 – 2.6) and Chronic Kidney Disease (OR 1.5, CI 1.1 – 1.9) had a significantly higher risk of infection as compared to those without any long-term conditions. Evidence is limited for the association between Long COVID and pre-existing medical conditions, further assessment of local data is required to make an informed prediction of effects.	
OR – odds ratio, BAME – Black, Asian and minority ethnic, CI – confidence intervals, Office of National Statistics, CIS – Coronavirus Infection Survey	

5.2 Modelled prevalence of Long COVID

Determining the prevalence of Long COVID within Havering is important for identifying the level of need and services required to support residents. Modelling has been conducted to estimate the prevalence of Long COVID within Havering for those who have symptoms lasting up to 12 weeks and symptoms for longer than 12 weeks. Calculations have also been conducted to estimate the proportion of Havering residents who would develop Long COVID symptoms following hospitalisation (during the time period April 2020 – March 2021) due to acute COVID-19 infection.

5.2.1 Prevalence of Long COVID symptoms lasting up to 12 weeks

Estimates for the burden of Long-COVID in the Havering population for those with symptoms lasting up to 12 weeks were calculated using prevalence rates from the Office for National Statistics Long COVID survey published in April 2021 (Office of National Statistics, 2021). The survey included 21,622 participants who had received a positive SARS-CoV-2 swab result between 26 April 2020 and 6 March 2021.

Participants were followed-up weekly for the first month post-enrolment, then on a monthly basis for up to one year. Reported symptoms at the first positive test or within a subsequent 5 week period were tracked across time, with participants asked about symptom occurrence in

the past 7 days at each follow-up visit. When a symptom was not reported at two consecutive follow-up visits, it was classified as discontinued.

All symptoms were self-reported, and limited to the following: abdominal pain; cough; diarrhoea; fatigue; fever; headache; loss of taste; loss of smell; myalgia; nausea or vomiting; shortness of breath; and sore throat. The duration of symptoms was considered in two time intervals (5 weeks, 12 weeks). Stratifications were available based on sex and age group.

Applying estimates to the local population

The estimated prevalence of symptom duration applies to those with laboratory-confirmed SARS-CoV-2 infection. The sampling frame was limited to private households. Therefore, the estimate is not applicable to those in communal establishments, such as prisons or care homes, and our prevalence estimate can be lower than the true prevalence. All laboratory confirmed coronavirus cases in Havering up to 7 May 2021 were extracted from the Public Health England database. At that time, there were 26,946 residents who had COVID-19 of whom 833 sadly died. 4,859 cases have been admitted from nearby boroughs and Havering to the BHRUT Hospitals. Cases linked to communal establishments were removed using postcode-based extraction. The estimated percentage prevalence of symptoms at 5- and 12-week durations were applied to the laboratory confirmed dataset, stratified by sex and age group, for any symptoms and individual symptom categories. All estimates were presented with the associated 95% confidence limit.

The outcome estimates represent the percentage of surveillance-detected positive PCR cases in Havering that are expected to have had continuing symptoms at 5 and 12-weeks, based on the ONS methodology.

Results

Based on the ONS survey data, it is estimated that 2 in every 10 people testing positive develop Long COVID symptoms lasting up to 5 weeks. 1 in 10 last up to at least 12 weeks.

- The difference by gender is not significant.
- Prevalence of Long COVID appears to increase by age ranging from 1 in 10 among children aged 2 -11 years to 3 in 10 among persons aged 35-69 for up to 5 weeks. 1 in 10 for 2-11 year olds and 2 in 10 for persons aged 25 – 69 up to 12 weeks.
- The most common symptoms are cough, fatigue and headache affecting 10 in 100 up to 5 weeks and about 8 in 100 for up to 12 weeks.

Error! Reference source not found. and **Error! Reference source not found.** below show estimated prevalence of Long COVID since the pandemic started and projections based on reported cases in the last 4 weeks. Care home residents are not included to reflect ONS methodology.

Limitations of the CIS

All symptoms are self-reported, and are therefore reliant on an individual's perception of their symptoms which may vary between individuals and introduce an element of bias into the estimates.

ONS recognises that symptoms included in the analysis does not include some symptoms believed to be associated with 'Long COVID'. This is expected to lead to an underestimation of the true burden.

This analysis does not allow us to determine the current burden of 'Long COVID' in Havering. We can determine the proportion of people who are likely to still have symptoms at 5 and 12-weeks post infection.

Table 4: Estimated prevalence (number) of 5 week Long COVID in Havering since the pandemic started up to 7 May 2021

Symptom	Stratum	Estimate (%)	Number of confirmed cases	Long COVID Estimate	Lower 95% confidence limit	Upper 95% confidence limit
Any	All people	21.0	26,313	5,526	4,684	6,526
	Male	18.7	12,511	2,340	1,939	2,840
	Female	23.0	13,723	3,156	2,594	3,829
	Age 2-11 years	9.8	1,506	148	110	197
	Age 12-16 years	13.0	1,599	208	165	265
	Age 17-24 years	16.9	2,922	494	374	652
	Age 25-34 years	22.6	4,683	1,058	848	1,321
	Age 35-49 years	25.6	6,616	1,694	1,383	2,077
	Age 50-69 years	25.1	6,171	1,549	1,296	1,857
	Age ≥70 years	15.9	2,501	398	308	513
Abdominal pain	All people	2.4	26,313	632	553	710
Cough	All people	10.9	26,313	2,868	2,473	3,368
Diarrhoea	All people	2.7	26,313	710	605	816
Fatigue	All people	11.8	26,313	3,105	2,631	3,631
Fever	All people	5.4	26,313	1,421	1,210	1,658
Headache	All people	10.1	26,313	2,658	2,263	3,079
Loss of smell	All people	6.3	26,313	1,658	1,447	1,921
Loss of taste	All people	6.4	26,313	1,684	1,447	1,947
Myalgia	All people	7.7	26,313	2,026	1,789	2,342
Nausea/vomiting	All people	3.1	26,313	816	737	921
Shortness of breath	All people	5.6	26,313	1,474	1,263	1,710
Sore throat	All people	6.2	26,313	1,631	1,368	1,921

Table 3: Estimated prevalence (number) of 12 week Long COVID in Havering since the pandemic started up to 7 May 2021

Symptom	Stratum	Estimate (%)	Number of confirmed cases	Long COVID Estimate	Lower 95% confidence limit	Upper 95% confidence limit
Any	All people	13.7	26,313	3,605	2,842	4,578
	Male	12.7	12,511	1,589	1,226	2,052
	Female	14.7	13,723	2,017	1,468	2,786
	Age 2-11 years	7.4	1,506	111	80	158
	Age 12-16 years	8.2	1,599	131	91	189
	Age 17-24 years	11.5	2,922	336	228	491
	Age 25-34 years	18.2	4,683	852	660	1,096
	Age 35-49 years	16.1	6,616	1,065	781	1,456
	Age 50-69 years	16.4	6,171	1,012	741	1,382
	Age ≥70 years	11.2	2,501	280	210	370
Abdominal pain	All people	1.5	26,313	395	316	526
Cough	All people	7.0	26,313	1,842	1,421	2,394
Diarrhoea	All people	1.7	26,313	447	316	632
Fatigue	All people	8.3	26,313	2,184	1,763	2,710
Fever	All people	N/A	26,313	N/A	N/A	N/A
Headache	All people	7.2	26,313	1,895	1,552	2,368
Loss of smell	All people	3.8	26,313	1,000	763	1,289
Loss of taste	All people	3.6	26,313	947	710	1,263
Myalgia	All people	5.6	26,313	1,474	1,210	1,789
Nausea/vomiting	All people	2.2	26,313	579	421	789
Shortness of breath	All people	3.4	26,313	895	658	1,210
Sore throat	All people	4.0	26,313	1,053	789	1,447

5.2.2 Prevalence of Long COVID symptoms lasting more than 12 weeks

Charts below show weekly estimated number of post-acute COVID-19/Long COVID cases in Havering based on real time data driven forecasts done by Local Knowledge and Intelligence Service (LKIS) based in the UK Health Security Agency (UKHSA). The model is based on lab confirmed PCR case lists from UKHSA and ONS COVID-19 prevalence survey data. Figure 7, Figure 8, Figure 9, show all new cases and Figure 10, Figure 11 and Figure 12 show all new cases which require support from an NHS service.

It is estimated that between November 2020 and March 2022 a total of 7,230 people in Havering will be diagnosed with Long COVID and 1,265 will require a support service.

Most cases including those requiring support are female. Age 35-69 is estimated to have the highest number of cases. The proportion of Long COVID cases by age group and gender for all new cases and those requiring clinical support can be found in Table 5 and Table 6.

Limitations

The UKHSA model currently does not include the impact of vaccination, variants of COVID-19 (e.g. the Delta and Omicron variants) and repeat episodes of COVID-19. There are plans to include these factors in future modelling.

All new cases

Figure 7: New weekly cases of Long COVID in Havering, November 2020 – March 2022

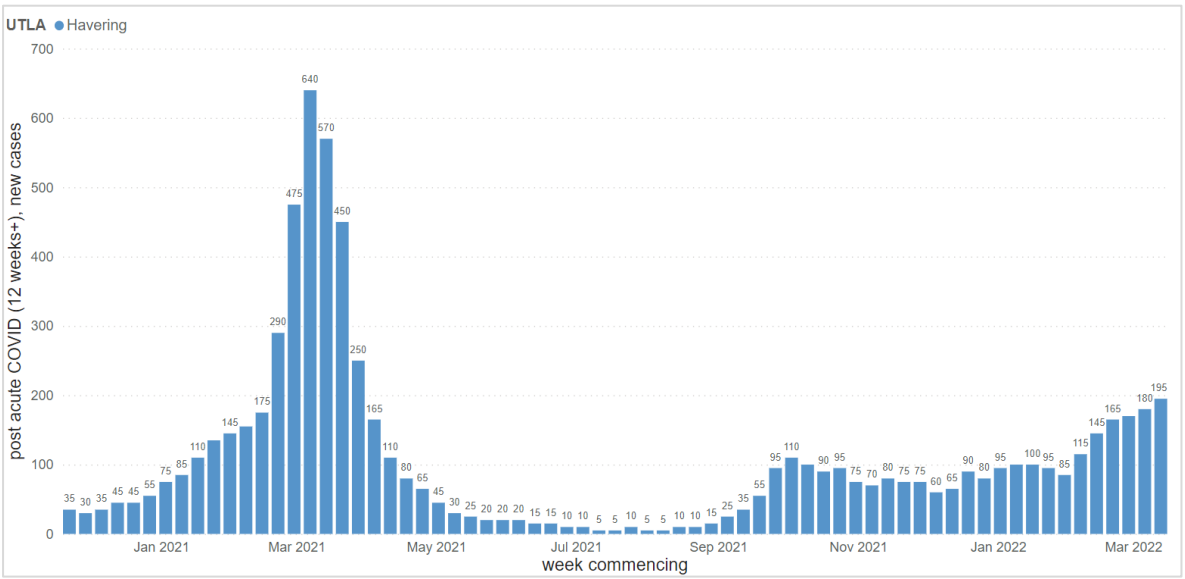


Figure 8: New weekly cases of Long COVID in Havering, November 2020 – March 2022 by gender

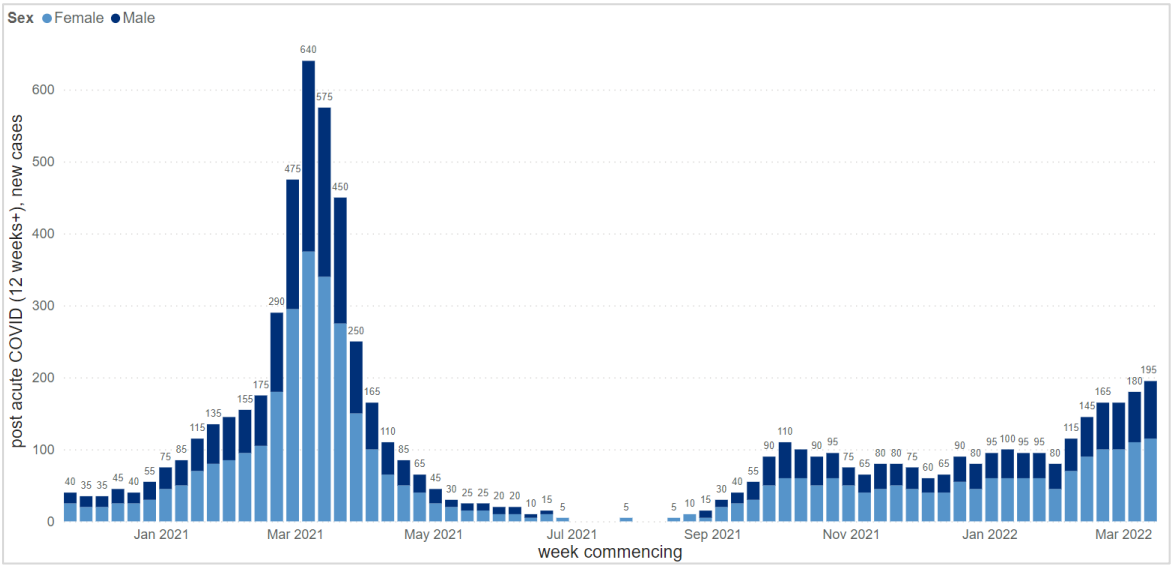


Figure 9: New weekly cases of Long COVID in Havering, November 2020 – March 2022, by age group

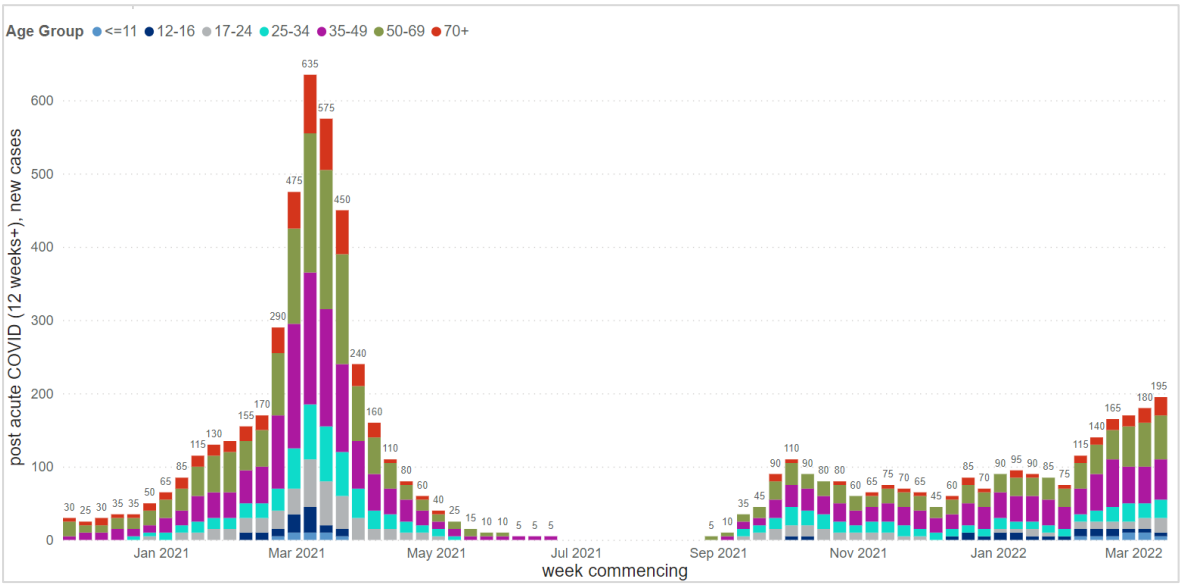


Table 5: Proportion of all new cases of Long COVID in Havering by gender and age group

Population characteristics	**Number of residents***	**Proportion of Long COVID population in Havering**
Gender		
Female	4,320	60%
Male	2,860	40%
Age groups		
<11 years old	80	1%
12-16 years old	220	3%

17-24 years old	635	9%
25-34 years old	925	14%
35-49 years old	2,130	31%
50-69 years old	2,110	31%
70+ years old	690	10%

** The total estimated numbers of residents for gender and age group and subsequent proportions of Long COVID cases are not the same as total number of cases. This is likely due to missing data about individuals' characteristics.*

New cases needing clinical support service

Figure 10: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022

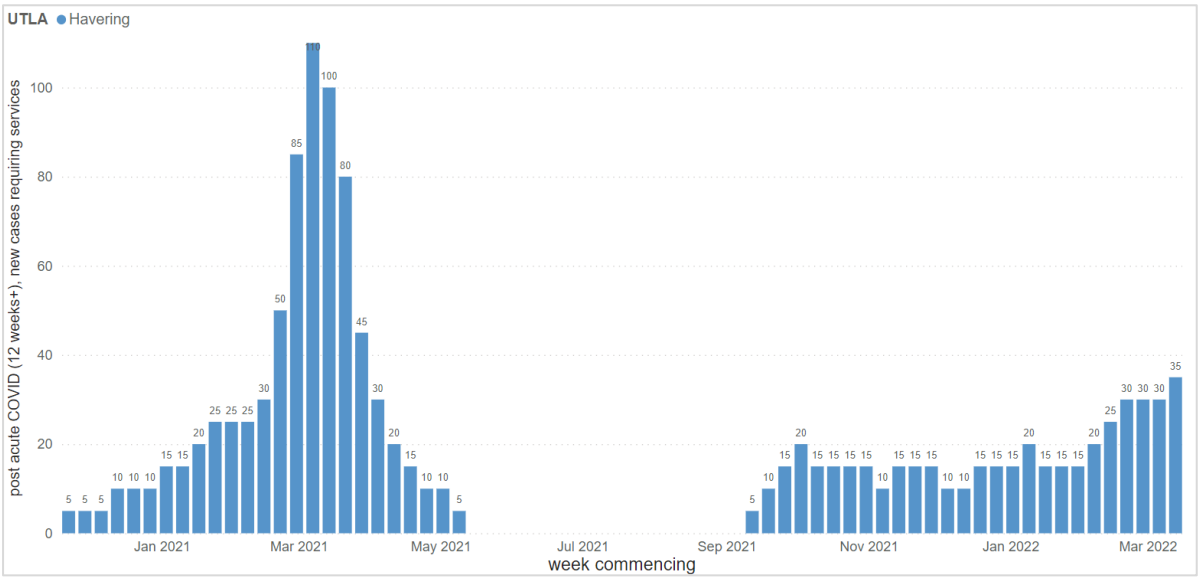


Figure 11: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022 by gender

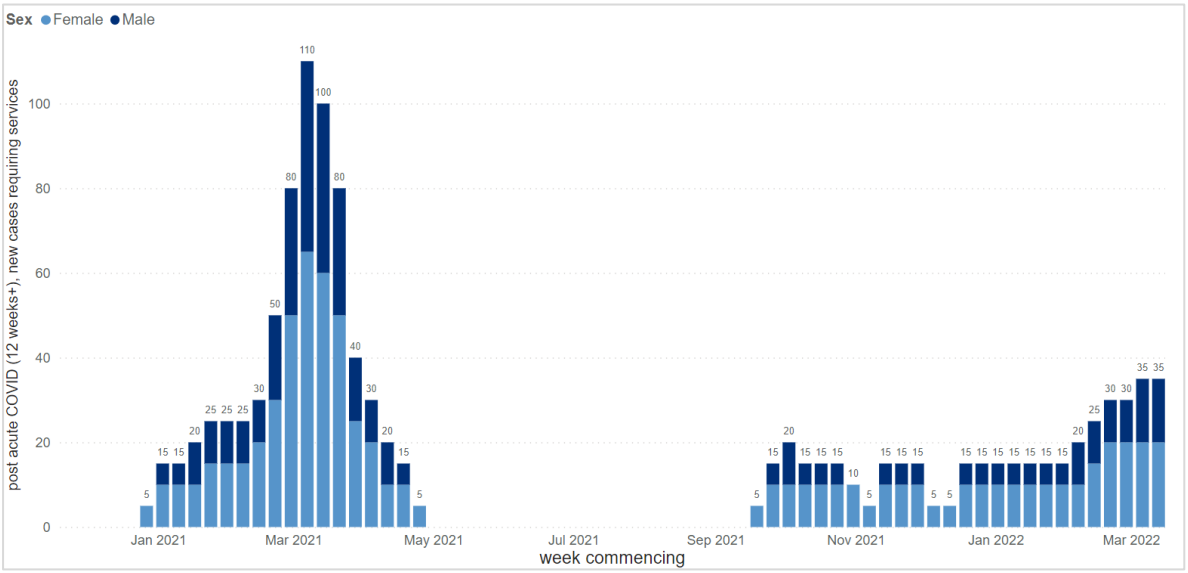


Figure 12: New weekly cases of Long COVID needing clinical support service in Havering, November 2020 – March 2022 by age group

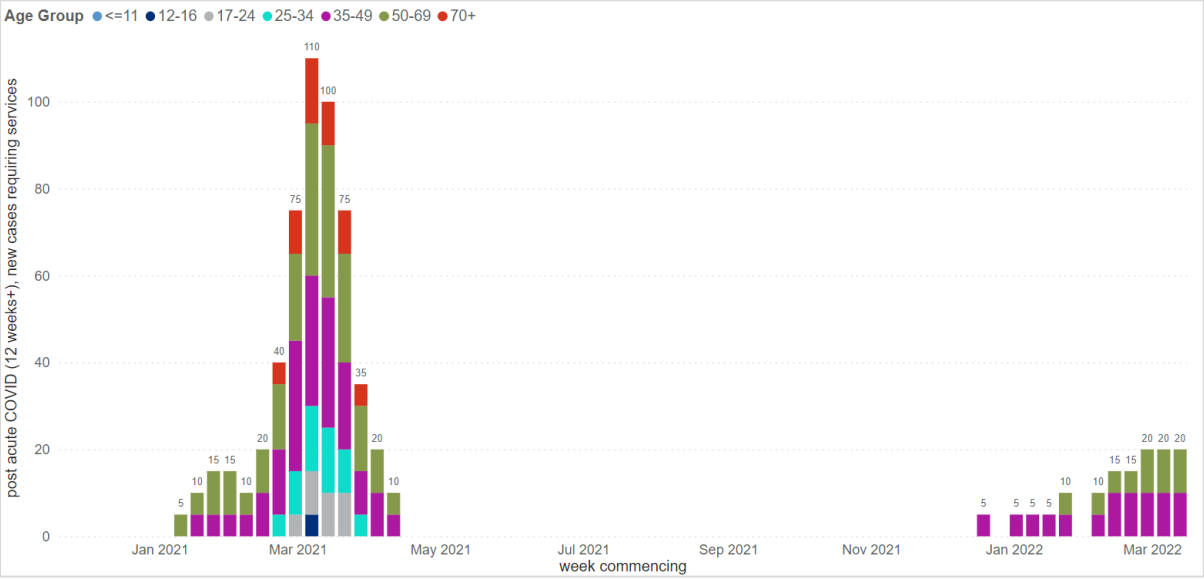


Table 6: Proportion of all new cases of Long COVID needing clinical support services in Havering by gender and age group

Population characteristics	Number of residents	Proportion of Long COVID population in Havering
Gender		
Female	710	63%
Male	415	37%
Age group		
<11 years old	0	0%
12-16 years old	5	1%
17-24 years old	35	5%
25-34 years old	60	9%
35-49 years old	260	39%
50-69 years old	255	38%
70+ years old	55	8%

** The total estimated numbers of residents for gender and age group and subsequent proportions of Long COVID cases are not the same as total number of cases. This is likely due to missing data about individuals' characteristics.*

5.2.3 Prevalence of Long COVID symptoms in hospitalised patients in Havering (using local hospital data and estimates from evidence-base)

There is some uncertainty around the prevalence of Long COVID in previously hospitalised patients due to acute infection of COVID-19. Evidence suggests that these individuals are more likely to require additional support for Long COVID. It is therefore useful to estimate the proportion of previously hospitalised patients in Havering who would go on the develop Long COVID.

Data from a UK-based study (Sigfrid, et al., 2021) and the latest available data for hospitalised Havering residents with a primary diagnosis of COVID-19 (April 2020 - March 2021) have been used to estimate Long COVID in hospitalised patients. Sigfrid et al, included 327 patients aged 18 years and over, admitted to hospital between 17th January to 5th October 2020 with confirmed or highly suspected COVID-19 infection at 31 centres. The median follow-up time from symptom onset was 222 days, approximately 7 months. The study reported two outcomes of particular interest - self-reported overall recovery and new or persistent symptoms which were measured using a questionnaire.

The study found that 54.7% of the patients did not feel fully recovered at follow-up and 93.3% of the patients had new or persistent symptoms (see Table 7).

Using these results, it can be estimated that **1,065 Havering residents** hospitalised between April 2020 and March 2021 due to COVID-19 may not have fully recovered 7 months on from their admission into hospital.

Table 7: Estimating prevalence of Long Covid in residents following hospitalisation due to COVID-19 using (Sigfrid, et al., 2021) and local hospital data (April 2020 - March 2021)

Outcomes	**Number of patients (Sigfrid, et al., 2021)**	**Estimate for Havering number of hospitalised = 1947**
Self-reported overall recovery		
Feels fully recovered	83/327 (25.4%)	495
Does not feel fully recovered	179/327 (54.7%)	1,065
Not sure	61/327 (18.7%)	364
Missing data	4/327 (1.2%)	23
New or persistent symptoms		
No new or persistent symptoms	22/327 (6.7%)	130
New or persistent symptoms	305/327 (93.3%)	1,817

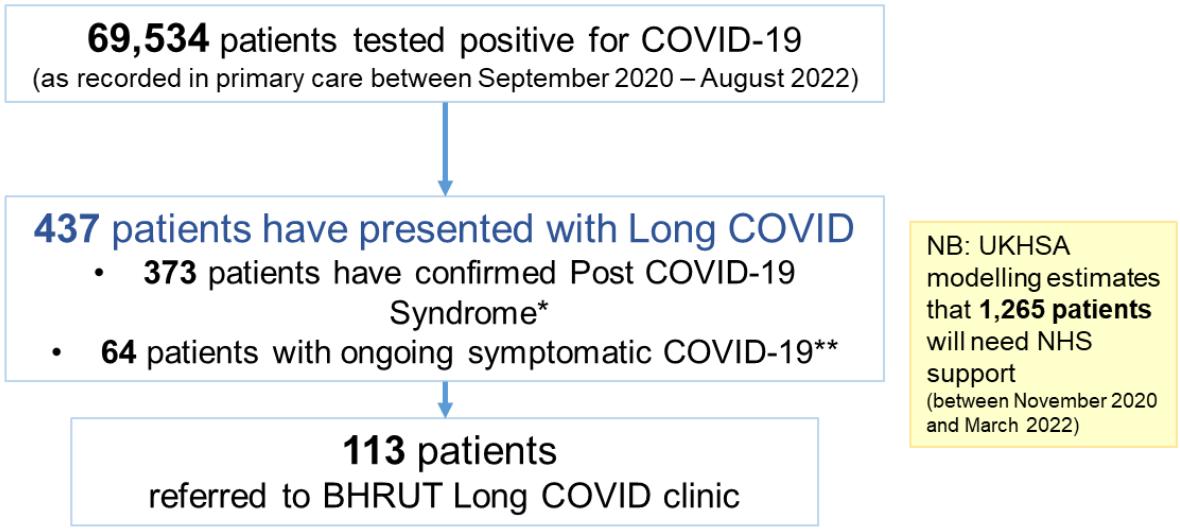
5.3 Recorded Long COVID cases in primary care

As described previously, primary care has a critical role to play in supporting residents with Long COVID. GP practices have been encouraged and supported in accurately coding patients presenting the symptoms of Long COVID. Data recorded from September 2020 up until the August 2022, presents the number of residents/patients who have tested positive for COVID-19 and those who have been coded as having Long COVID and those who have then been referred to the BHRUT Long COVID clinic (Figure 13). Most patients (85%) who have been diagnosed with Long COVID have been characterised as having Post COVID-19 Syndrome.

When comparing the local Long COVID primary care data with the UKHSA modelling estimate for the number of residents expected to need NHS support there is a significant difference in numbers. UKSA modelling estimates that 1,265 patients will need NHS support for Long COVID and only 427 patients have been diagnosed as having Long COVID by primary care in Havering.

This difference highlights the need for further actions in identifying residents in the community with Long COVID who would benefit from additional support, particularly in those where health inequalities relating to COVID are more prominent.

Figure 13: Havering's primary care data for Long COVID, sourced from the Clinical Effectiveness Group (CEG)



* Defined as "Signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis. It usually presents with clusters of symptoms, often overlapping, which can fluctuate and change over time and can affect any system in the body. Post-COVID-19 syndrome may be considered before 12 weeks while the possibility of an alternative underlying disease is also being assessed."

** Defined as "Signs and symptoms of COVID-19 from 4 weeks up to 12 weeks."

National Institute for Health and Care Excellence. COVID-19 rapid guideline: managing the long-term effects of COVID-19. 2021. www.nice.org.uk/guidance/ng188

Source of primary care data: Clinical Effectiveness Group (CEG)

5.4 Prevention

Non-pharmaceutical interventions

London Borough of Havering has developed a public health campaign which has been promoted across the COVID-19 pandemic called '#DoingMyBit' (London Borough of Havering, 2021). The campaign's messages include getting vaccinated when invited to do so, complying with NHS test and trace, observing Government quarantine measures when travelling and isolating immediately and getting tested as soon as possible if you develop symptoms. This campaign should be developed further to include messaging about Long COVID and that by residents doing their bit they can reduce the number of Long COVID cases within Havering.

Vaccination programme

As of 14th November 2021, **79.7%** of Havering population (16+) have received the first dose of the coronavirus vaccine and **74.8%** the second dose (see Appendix B). The uptake of the COVID-19 vaccination across the different age groups in Havering is higher compared to the averages for London, for example, uptake in Havering for those aged 60-64 years old is 89.3% versus 79.5% for London (see Appendix Bb). The uptake of the COVID-19 vaccine in Havering is similar to the averages for England.

The uptake of two doses of the COVID-19 vaccine is lower in the younger population in Havering and across London and England. For example, 57.1% of Havering residents aged 18-29 years old have received two doses of the COVID-19 vaccine. Whilst individuals in this age group are at a lower risk of developing severe acute COVID-19 infection and Long COVID, there is still a risk. The roll-out of one dose of the COVID-19 vaccination in children and young people aged 12-17 years has been approved and uptake has started to slowly increase.

High rates of uptake can protect the individual and general population by preventing the onward transmission of COVID-19 to those who are at increased risk of severe acute COVID-19 infection and thus the development of Long COVID. This emphasises the importance of encouraging Havering residents to get vaccinated.

5.5 Impacts of Long COVID

5.5.1 Impact on quality of life

This evidence clearly presents the impact of Long COVID on physical and emotional functioning, whereby it is more likely that Havering residents who were hospitalised with severe COVID-19 infection are more significantly affected. In addition, evidence previously discussed in Section 5 presents that Long COVID is associated with new diagnoses of chronic medical conditions in hospitalised patients including respiratory disease, diabetes and MACE. Living with a chronic medical condition can negatively impact the quality of life of the patient further due to factors such as loss of productivity, inability to complete day-to-day activities and pain/discomfort (Megari, 2013) (Heyworth, Hazell, Linehan, & Frank, 2009). It is likely that these individuals will need additional support from healthcare services, voluntary sector and

local authority. These individuals may now even need carers who in turn may need emotional support, as their quality of life may be impacted (Thomas, Saunders, Roland, & Paddison, 2015).

5.5.2 Impact on mental health

Poor mental health does not only have immediate consequences but can have longer-term impacts especially if there is serious mental illness (De Hert, et al., 2013). Long-term impacts include increased risk of developing physical illness (e.g. cardiovascular disease) and job loss, all of which can exacerbate poor mental health (Goldstein, et al., 2015) (Stevenson & Farmer, 2017). Similar to the summary of the evidence on the impact of Long COVID on quality of life and physical functioning, additional needs may be required for hospitalised COVID-19 patients in Havering.

Consequently, the mental health impacts of Long COVID should be recognised and measured in Havering to identify support required. Support should be readily available for individuals and their families.

5.5.3 Impact on employment

Local data on the impact of Long COVID on employment is currently unavailable. Long COVID may exacerbate unemployment gaps in specific populations within Havering as described above. For instance, data for Havering (2019-20) presents a:

- 14.6% gap in the employment rate between those with a long-term health condition and the overall employment rate in Havering (higher than the average for England, 10.6%) (Office for Health Improvement & Disparities, 2021)
- 68.6% gap in the employment rate between those with a learning disability and the overall employment rate in Havering (similar to the average for England, 70.6%) (Office for Health Improvement & Disparities, 2021)

Recognition of inequalities which are already present within Havering around employment and reviewing these inequalities in the context of Long COVID is critical for ensuring an appropriate response to support residents.

Businesses and organisations within Havering need to consider the impact of Long COVID on their workforce and put internal processes in place to support employees. London Borough of Havering has developed some guidance on Long COVID for employees including information on how to record Long COVID related absences and how managers should support individuals returning to work.

5.5.4 Impact on education

There is not currently any local data regarding Long COVID in education setting in Havering. Gathering this information will be useful for identifying setting with the borough which would benefit from additional support and/or funding. In addition, it would be useful to understand the impacts of staff sick leave due to Long COVID on education settings.

6 Local services for Long COVID: how are identified needs being met in Havering?

Key Messages:

- Clinical support is in place for residents in Havering, through support from GPs and referral to the BHRUT Long COVID clinic.
- There are numerous voluntary sector organisations which can provide general support for Long COVID symptoms.
- Non-clinical support based in the community specifically for Long COVID is limited
- Community-based management for children and young people in Havering is currently not well-established

The number of patients in Havering who need Long COVID management focusing on recovery and rehabilitation is likely to increase as COVID-19 pandemic continues. Understanding the impacts of Long COVID and those at increased risk of developing Long COVID will be essential in informing that which is on offer in Havering for those in the early stages of acute COVID-19 infection to those who have had Long COVID symptoms for many months. Long COVID is a multifaceted condition whereby multiple sectors may need to be involved in service provision for Long COVID. However, there are still gaps in the evidence-base which limits the local response to Long COVID. This section of the needs assessment will summarise the current service provision in Havering and highlight any gaps, where additional information and data is required to aid a greater understanding of Long COVID and its impacts at the local-level.

Preliminary findings from a local Healthwatch survey finds deficiency in communicating to the residents and professionals the availability of services for different patient groups with different needs relating to Long COVID.

Community-based management for children and young people in Havering is currently not well-established. Whilst demand for Long COVID support is not as high as for adults, equitable access is paramount. The service provision summarised below focuses on what is currently available for adults.

Tier 1 – Patient-led rehabilitation and recovery

What is currently available?

Pulse oximetry

Pulse oximeters were made available in Havering through the GPs by the CCG. A priority is given to care homes.

Promotion of self-management
The majority of individuals in Havering with Long COVID will be able to self-manage and access digital support services via the 'Your COVID Recovery' app.

General support currently available in Havering

Mental health support

- **Havering MIND** offer a six week rolling programmes for Cognitive Behavioural Therapy which is free to access and allows local people to understand and build capacity for dealing with a range of issues including stress, anxiety and adapting to change. Havering MIND also offer digitally delivered creative art sessions and group singing sessions aimed at improving wellbeing and building social support networks.

- **My Health Matters** improves the health awareness of local residents by recruiting and training Health Champion Volunteers to provide signposting to relevant agencies
  - **Local Area Coordinators** support local residents build their own vision for a good life, finding pragmatic solutions to any problems, and drawing on family and community resources.
  - **Social Inclusion Project** supporting adults with mental health problems to reduce the isolation they experience
  - **Meaningful Activities Project** supporting adults with Long term mental health needs
  - **Bereavement Support** for those coping with grief and loss
  - **Havering Mind's Live a Better Life Programme** - 12 week programme to support anyone 18+ residents from the Havering or Barking and Dagenham with a mental health issue

Employment/financial support

- **Havering Council Business Support** offer a six months support grant for confirmed Long COVID sufferers:
  - Must have ongoing unavoidable business costs
  - £300 per month for those without commercial property mortgage or rental commitments
  - £1000 per month for those with property commitments.

- **Business support** to enable modification and diversification of trade or career to allow for self-employment recovery alongside adaptation of lifestyle and management of symptoms alongside effective work practices. Including;
  - Careers support – identification of transferable skills, demand, and career aspirations
  - Digital small business support specifically around self-employment and disability
  - 24hr access to clear information in video, audio and written formats
  - Website and ecommerce support
  - Social media and marketing support
  - Capacity building for specific sectors
- **Havering Volunteer Centre** provides support to those who have been furloughed, made redundant or just looking to progress a career by providing support including volunteering roles to upskill or retrain, support with CV writing, confidence building and job searching.

Physical health

- **Activity for Health programme** that improves basic fitness and may help with a number of the Long COVID related symptoms. These sessions will be offered 3 times a week at Hornchurch through the virtual class programme bookable online.

Long COVID-specific support currently available in Havering

Havering North - Long COVID non-clinical management - Social Rx & Wellbeing Service

Residents registered to a GP practice in the North of the borough can be referred to the Wellbeing Service where they can be supported with lifestyle interventions for their Long COVID symptoms, including diet & activity and behaviour change.

Improving Access to Psychological Therapies (IAPT) service for Long COVID - 'Living Better with Long-COVID' Programme

A 9-week, Living Better with Long-COVID programme will use standard cognitive behavioural therapy (CBT) protocols as well as transdiagnostic approaches such as acceptance & commitment therapy (ACT) and Mindfulness Based Interventions. Psychological support is mainly geared to help clients cope better with low mood or anxiety, where these distressing experiences are associated with symptoms of Long-COVID. CBT approaches are used and follow NICE guidelines.

Psychological support also includes helping clients cope better with somatic/ physical health symptoms such as pain, fatigue, poor concentration and sleep disturbance. Psychological support additionally aims to assist clients pursue positive goals and maintain or improve quality of life. Referrals can be made to the service via the Long COVID clinic, GPs or self-referral.

What is needed to improve Tier 1 support?	<u>Community engagement:</u> • Use community engagement (e.g. focus groups) to ascertain residents' level of understanding, awareness about symptoms of Long COVID and impacts of Long COVID. • Co-production of self-management intervention (e.g. peer group group) for individuals for Long COVID. <u>Data and information from services:</u> • Collation and regular sharing of service user feedback • Data sharing any inequalities in those accessing the service would enable the consideration of targeted responses to reach those who are not engaging with support services.

Tier 2 – Generalist assessment, support and rehabilitation

What is currently available?

Enhanced Service for GP practices

The majority of Havering GPs have applied for the ES and will be receiving this additional funding to support their Long COVID patients. It is however not fully understood how much is known about Long COVID within primary care in Havering. A common understanding of the condition, referral pathways and support available for residents is critical in ensuring that needs are met. A Havering-specific GP survey to find out the following can be useful for obtaining clarity:

- General understanding of Long Covid
- The proportion and trend of patients with Long COVID GPs see weekly
- The experience around the referral system – how well informed are GPs in Havering
- The effectiveness of primary care offer in managing patients

Social prescribing and link workers

With the increasing needs associated with Long COVID and the COVID-19 pandemic itself, it is important that link workers in Havering are well-equipped with up-to-date information about what is available for Long COVID. More information is required from link workers to find out how they can be supported in supporting residents.

What is needed to improve Tier 2 support?	<u>Data and information from services:</u>
	• GP survey to find out the following can be useful for obtaining clarity about how primary care can be improved for residents with Long COVID:
	  ○ General understanding of Long COVID
	  ○ The proportion and trend of patients with Long COVID GPs see weekly
	  ○ The experience around the referral system – how well informed are GPs in Havering about the system
	  ○ The effectiveness of primary care offer in managing patients
	• The number of referrals to social prescribers for Long COVID related support and the information currently being provided
	• Collation and regular sharing of service user feedback
	• Data sharing any inequalities in those accessing the service would enable the consideration of targeted responses to reach those who are not engaging with support services.

Tier 3 - Specialist assessment, support and rehabilitation; Tier 4 - specialist management of specific complications

What is currently available?

Barking, Havering and Redbridge University Hospitals NHS Trust (BHRUT) pathways

Several discussions and workshops have been held to develop Long COVID pathways for healthcare professionals (see Appendix E). These pathways were developed to provide guidance on the management of Long COVID patients and enable a smoother transition of patients through the healthcare system with minimal delays in care.

There is an expectation that many people experiencing ongoing health effects following COVID-19 infection will manage their condition independently at home. However, there is currently no data available to more accurately estimate the proportions of Havering residents within the 4-tiers. However, early intervention for emerging support needs before tier 3 may be crucial in reducing burden within the secondary healthcare system.

Follow-up after COVID-19 admissions

BHRUT offers routine follow-up within 4-6 weeks after hospital discharge from COVID.

BHRUT Long COVID Clinic

The nearest clinic to Havering is located in King George Hospital, which also serves residents living in Barking and Dagenham and Redbridge. Data from the Long COVID clinic presents the patient characteristics for the **339 Havering residents** referred to the clinic from primary care and secondary care during December 2021 – July 2022 (Table 8). Most residents referred to the clinic are female, White British and aged between 35-69 years old.

The gender of those referred to the Long COVID clinic has been similar to the estimates from the UKSA model, with most Long COVID cases referred being in females (63%) (see Table 6**Error! Reference source not found.**).

The ages of residents referred to the Long COVID clinic has also been fairly similar to the UKSA model estimates. Interestingly, differences can be noted for residents aged 35-49 years old and 50-69 years old:

- The proportion of **residents aged 35-49 years** old **referred to the Long COVID clinic** (27.1%) is **lower** than the **UKSA estimated number** of Long COVID cases in that age group who would need clinical support (39.0%)
- The proportion of **residents aged 50-69 years referred to the Long COVID clinic** (49.9%) is **higher** than the UKSA estimated number of Long COVID cases in that age group who would need clinical support (38.0%).

These differences may due to the fact that the UKHSA model does not account for specific demographic characteristics. Havering has an older population which may contribute to the higher number of referrals to the Long COVID clinic in the older age group.

Long COVID Exercise Programme – follow-up from the Long COVID clinic

A BHR-wide exercise programme has been developed in collaboration with local leisure centres (Everyone Active for Havering) for Long COVID patients. Patients can access the programme via direct referral from the Long COVID clinic.
The exercise programme will aim to support residents to titrate physical activity/exercise into their lifestyle with pacing and recovery at the heart for physical, emotional and mental wellbeing benefits. Residents will be supported to utilise tools of pacing and prioritisation with rest and recovery to manage their session, day, week, month to promote recovery and avoid/manage relapse should it occur.

Table 8: Table showing patient characteristics of individuals referred from Havering GP practices including comparison with UKHSA model estimates for cases of Long COVID needing clinical support in Havering in by gender and age

Patient characteristics	Number of referrals (n=339) (% of total referred patients – December 2021 – July 2022)
Gender	
Female	216 (63.7%)
Male	123 (36.3%)
Age range	
17-24 years	13 (3.8%)
25-34 years	38 (11.2%)
35-49 years	92 (27.1%)
50-69 years	169 (49.9%)
≥70 years	27 (8.0%)
Ethnicity	
Bangladeshi	3 (0.9%)
Chinese	2 (0.6%)
Indian	8 (2.4%)
Pakistani	7 (2.1%)
Other Asian	6 (1.8%)
Black African	3 (0.9%)
Black Caribbean	7 (2.1%)
Other Black	4 (1.2%)
Mixed White & Asian	2 (0.6%)
Mixed White & Black African	1 (0.3%)
Other Mixed	1 (0.3%)
Other	9 (2.7%)
Other White	16 (4.7%)
White British	176 (51.9%)
Not known	55 (16.2%)
Not stated	39 (11.5%)

What is needed to improve Tier 3 and 4 support?	<u>Data and information from service(s):</u> • To understand the emerging needs of those needing support from the BHRUT Long COVID clinic, anonymised data for the following factors for those referred to the clinic would be useful: o Types of Long COVID symptoms and the duration of these symptoms o Pre-existing long-term conditions o Onward referral for specific complications and these patients' characteristics o Postcodes for Havering residents seen in the clinic • Collation and regular sharing of service user feedback • Data sharing any inequalities in those accessing the service would enable the consideration of targeted responses to reach those who are not engaging with support services.

7 Action Plan to Address Recommendations

Recommendations	Proposed actions	Proposed responsible parties
Establish a working group to develop a local strategy for Long COVID, bringing together a diverse group of stakeholders, e.g. voluntary sector organisations, NHS leads, representatives from public health, education and leisure.	• Identify key stakeholders to be involved in the local working group • Review Healthwatch Long COVID survey findings to identify key issues •	• Havering Borough Partnership with support from Public Health, LBH
Work with local partners to identify the prevalence of Long COVID across Havering, including undiagnosed cases.	• Develop a programme for proactive case finding of Long COVID cases • Acquire access to primary care data to review Long COVID cases in the community, including information about patient characteristics • Acquire access to secondary care to review Long COVID cases following discharge with reported COVID-19 infection, including information about patient characteristics • Acquire data and information from the Long COVID clinic about: ○ Types of Long COVID symptoms and the duration of these symptoms ○ Pre-existing long-term conditions ○ Onward referral for specific complications and these patients' characteristics ○ Postcodes for Havering residents seen in the clinic	• Havering Borough Partnership • Local working group, working with colleagues in NEL

Develop a local community engagement programme for Long COVID with the aim to raise awareness and empower residents through an understanding of: ○ The condition itself and associated symptoms ○ How to prevent Long COVID by reducing transmission of COVID-19 ○ How to self-manage or seek support ○ How to signpost or refer according to need	• Identify community leaders for the collaborative development of an approach for effective community engagement. The approach may include focus group(s) with residents with Long COVID to identify what information would be most helpful. • Engagement should consider those with different types and severity of symptoms and different population groups. • Collate accurate information based on focus group findings (review NEL communications resources) • Disseminate information about Long COVID, considering clinical and non-clinical settings and targeted communications in areas in the borough where Long COVID cases may be more prominent. • Develop a service directory containing information about support available to residents • Continue to promote uptake of the COVID-19 vaccine.	• Havering Borough Partnership • Havering communications team • NEL communications team • BHR clinical lead for Long COVID • Public Health, LBH • Healthwatch Havering
Encourage the establishment of Long COVID 'champions' within healthcare and community settings to raise awareness and improve access to support services	• Establish level of awareness about Long COVID within healthcare and community settings. For example, a survey for GPs to find out the following can be useful for obtaining clarity: ○ General understanding of Long COVID ○ The proportion and trend of patients with Long COVID GPs see weekly ○ The experience around the referral system – how well informed are GPs in Havering about the system ○ The effectiveness of primary care offer in managing patients	• Havering Borough Partnership • NEL/BHR commissioner • BHR clinical lead for Long COVID

	• Identify individuals across various healthcare professional roles to have a champion role in being up-to-date on support available locally for Long COVID and training opportunities for colleagues. These individuals can link in with the local working group. • Provide training for Community Health Champions on Long COVID for appropriate signposting	
Consider commissioning services for self-care and self-management support for Long COVID, for example, peer support groups, mobile apps and community exercise programmes	• Monitor outcomes from services already operating and their sustainability, e.g. the exercise rehabilitation service, IAPT, Havering North Long COVID Wellbeing Service • Identify what resources/funding is available and required to pilot self-management support, e.g. peer support group. Manchester Health and Care Commissioning facilitate a COVID-19 Recovery Peer Support Group (NHS Trafford Clinical Commissioning Group, 2022). • Use focus groups to engage with residents who have Long COVID for co-production of any appropriate service(s).	• Havering Borough Partnership • NEL/BHR commissioner • Healthwatch Havering • Public Health, LBH
Review the Long COVID service offer for children and young people and consider commissioning services specifically for children and young people (CYP)	• Engage with CYP with Long COVID to improve understanding about the local needs and impacts • Acquire and review any data from Evelina London about CYP referrals from Havering	• Havering Borough Partnership • NEL/BHR commissioner

List of abbreviations

Abbreviation	Description
B.A.M.E	Black, Asian and minority ethnic
BHRUT	Barking and Dagenham, Havering and Redbridge University Trust
CCG	Clinical Commissioning Group
CEV	Clinically extremely vulnerable
CI	Confidence intervals
CIS	Coronavirus Infection Survey
COVID-19	Coronavirus
CYP	Children and young people
ES	Enhanced service
GP	General practitioner
ICU	Intensive care unit
MACE	major adverse cardiovascular event
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health Research
ONS	Office of National Statistics
OR	Odds ratio
PHI	Public Health Intelligence
PTSD	post-traumatic stress disorder
WHO	World Health Organisation

References

Antonelli, M., Penfold, R. S., Merino, J., Sudre, C. H., Molteni, E., Berry, S., . . . Hu, C. (2021). Risk factors and disease profile of post-vaccination SARS-CoV-2 infection in UK users of the COVID Symptom Study app: a prospective, community-based, nested, case-control study. *Lancet Infect Dis*.

Apea, V. J., Wan, Y. I., Dhairyawan, R., Puthucheary, Z. A., Pearse, R. M., Orkin, C. M., & Prowle, J. R. (2021). Ethnicity and outcomes in patients hospitalised with COVID-19 infection in East London: an observational cohort study. *BMJ Open*, e042140.

Ayoubkhani, D., Khunti, K., Nafilyan, V., Maddox, T., Humberstone, B., Diamond, I., & Banerjee, A. (2021). Post-covid syndrome in individuals admitted to hospital with covid-19: retrospective cohort study. *BMJ*, n693.

Ayoubkhani, D., Pouwels, K. B., Nafilyan, V., Khunti, K., & Alwan, N. A. (2022). Trajectory of long covid symptoms after covid-19 vaccination: community based cohort study. *BMJ*, e069676.

Blanden, J., & Macmillan, L. (2014). *Education and Intergenerational Mobility: Help or Hindrance?* Quantitative Social Science - UCL Social Research Institute, University College London: DoQSS Working Paper 8.

British Society for Immunology. (2020, August). *Long-term immunological health consequences of COVID-19.* Retrieved from https://www.immunology.org/sites/default/files/BSI_Briefing_Note_August_2020_FINAL.pdf

Buonsenso, D., Munblit, D., De Rose, C., Sinatti, D., Ricchiuto, A., Carfi, A., & Valentini, P. (2021). Preliminary evidence on long COVID in children. *Acta Paediatrica*.

Buonsenso, D., Pujol, F. E., Munblit, D., Mcfarland, S., & Simpson, F. (2020). Clinical Characteristics, Activity Levels and Mental Health Problems in Children with Long COVID: A Survey of 510 Children. *Preprints*.

Carfi, A., Bernabei, R., & Landi, F. (2020). Persistent Symptoms in Patients After Acute COVID-19. *JAMA*, 603-605.

Carr, A. J., Gibson, B., & Robinson, P. G. (2001). Is quality of life determined by expectations or experience? *BMJ*, 1240-1243.

Centre for Economic Performance. (2020, October). *Generation COVID: Emerging work and education inequalities.* Retrieved from https://cep.lse.ac.uk/pubs/download/cepcovid-19-011.pdf

Cheng, Z., & Mendolia, S. (2021). Working parents, financial insecurity, and childcare: mental health in the time of COVID-19 in the UK. *Review of Economics of the Household*, 123-144.

Clark, C., Rodgers, B., Caldwell, T., Power, C., & Stansfeld, S. (2007). Childhood and Adulthood Psychological Ill Health as Predictors of Midlife Affective and Anxiety Disorders: The 1958 British Birth Cohort. *Arch Gen Psychiatry*, 668-678.

Cucinotta, D., & Vanelli, M. (2019). WHO Delcares COVID-19 a Pandemic. *Acta Biomed*, 157-160.

Curci, C., Pisano, F., Bonacci, E., Camozzi, D. M., Ceravolo, C., Bergonzi, R., . . . de Sire, A. (2020). Early rehabilitation in post-acute COVID-19 patients: data from an Italian COVID-19 Rehabilitation Unit and proposal of a treatment protocol. *Eur J Phys Rehabil Med*, 633-641.

Daly, M., & Delaney, L. (2013). The scarring effect of unemployment throughout adulthood on psychological distress at age 50: Estimates controlling for early adulthood distress and childhood psychological factors. *Social Science & Medicine*, 19-23.

Daly, M., Sutin, A. R., & Robinson, E. (2020). Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK Household Longitudinal Study. *Psychological Medicine*, 1-10.

Davis, H. E., Assaf, G. S., McCorkell, L., Wei, H., Low, R. J., Re'em, Y., . . . Akrami, A. (2021). Characterizing long COVID in an international cohort: 7 months of symptoms and their impact. *The Lancet*, 101019.

Daynes, E., Gerlis, C., Chaplin, E., Gardiner, N., & Singh, S. J. (2021). Early experiences of rehabilitation for individuals post-COVID to improve fatigue, breathlessness exercise capacity and cognition – A cohort study. *Chronic Respiratory Disease*.

De Hert, M., Correll, C. U., Bobes, J., Cetkovich-Bakmas, M., Cohen, D., Asai, I., . . . Leucht, S. (2013). Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care. *World Psychiatry*, 52-77.

Dennis, A., Wamil, M., Alberts, J., Oben, J., Cuthbertson, D. J., Wootton, D., . . . Banerjee, A. (2021). Multiorgan impairment in low-risk individuals with post-COVID-19 syndrome: a prospective, community-based study. *BMJ Open*, e048391.

Department for Education. (2021, April). *Guidance: Catch-up premium.*

Donnelly, J. P., Wang, X. Q., Iwashyna, T. J., & Hallie, P. C. (2021). Readmission and Death After Initial Hospital Discharge Among Patients With COVID-19 in a Large Multihospital System. *JAMA*, 304-306.

Downes, D. J., Cross, A. R., Hua, P., Roberts, N., Schwessinger, R., Cutler, A. J., . . . Hughes, J. R. (2021). Identification of LZTFL1 as a candidate effector gene at a COVID-19 risk locus. *Nature Genetics*, 1606-1615.

Ferraro, F., Calafiore, D., Dambruoso, F., Guidarini, S., & de Sire, A. (2021). COVID-19 related fatigue: Which role for rehabilitation in post-COVID-19 patients? A case series. *J Med Virol*, 1896-1899.

Finset, A., Bosworth, H., Butow, P., Bulbrandsen, P., Hulsman, R. L., Pieterse, A. H., . . . van Weert, J. (2020). Effective health communication – a key factor in fighting the COVID-19 pandemic. *Patient Educ Couns*, 873-876.

Garner, P. (2020). Long covid and self-help pacing groups—getting by with a little help from our friends. *BMJ Opinion*.

Goldstein, B. I., Carnethon, M. R., Matthews, K. A., McIntyre, R. S., Miller, G. E., Raghuveer, G., . . . McCrindle, B. W. (2015). Major Depressive Disorder and Bipolar Disorder

Predispose Youth to Accelerated Atherosclerosis and Early Cardiovascular Disease: A Scientific Statement From the American Heart Association. *Circulation*, 965-986.

Greenhalgh, T., Knight, M., A'Court, C., Buxton, M., & Husain, L. (2020). Management of post-acute covid-19 in primary care. *BMJ*, m3026.

Greenhalgh, T., Ladds, E., Knight, M., & Ravindran, D. (2020). *Written evidence (COV0050): 'Long Covid': evidence, recommendations and priority research questions.* Retrieved from UK Parliament: https://committees.parliament.uk/writtenevidence/12345/pdf/

Gunster, C., Busse, R., Spoden, M., Rombey, T., Schillinger, G., Hoffmann, W., . . . Karagiannidis, C. (2021). 6-month mortality and readmissions of hospitalized COVID-19 patients: A nationwide cohort study of 8,679 patients in Germany. *PLOS ONE*.

Halpin, S. J., McIvor, C., Whyatt, G., Adams, A., Harvey, O., McLean, L., . . . Sivan, M. (2021). Postdischarge symptoms and rehabilitation needs in survivors of COVID-19 infection: A cross-sectional evaluation. *J Med Virol.*, 1013-1022.

Heyworth, I. T., Hazell, M. L., Linehan, M. F., & Frank, T. L. (2009). How do common chronic conditions affect health-related quality of life? *British Journal of General Practice*, e353-e358.

House of Commons Women & Equalities Committee. (2020, December). *Unequal impact? Coronavirus and BAME people.* Retrieved from https://committees.parliament.uk/publications/3965/documents/39887/default/

Humphreys, H., Kilby, L., Kudiersky, N., & Copeland, R. (2021). Long COVID and the role of physical activity: a qualitative study. *BMJ Open*, e047632.

Jia, R., Ayling, K., Chalder, T., Massey, A., Broadbent, E., Coupland, C., & Vedhara, K. (2020). Mental health in the UK during the COVID-19 pandemic: cross-sectional analyses from a community cohort study. *BMJ Open*, e040620.

Kingstone, T., Taylor, A. K., O'Donnell, C. A., Atherton, H., Blane, D. N., & Chew-Graham, C. A. (2020). Finding the 'right' GP: a qualitative study of the experiences of people with long-COVID. *BJGP Open*, 4.

Ladds, E., Rushforth, A., Wieringa, S., Taylor, S., Rayner, C., Husain, L., & Greenhalgh, T. (2020). Persistent symptoms after Covid-19: qualitative study of 114 “long Covid” patients and draft quality principles for services. *BMC Health Services Research*, 1144.

Limb, M. (2021). Covid-19: Recognise long covid as occupational disease and compensate frontline workers, say MPs. *BMJ*, n503.

Loades, M., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., . . . Crawley, E. (2020). Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19. *J Am Acad Child Adolesc Psychiatry*, 1218-1239.

Logue, J. K., Franko, N. M., McCulloch, D. J., McDonald, D., Magedson, A., Wolf, C. R., & Chu, H. Y. (2021). Sequelae in Adults at 6 Months After COVID-19 Infection. *JAMA Network Open*, e210830.

London Borough of Havering. (2021, December). Retrieved from Havering Data Intelligence Hub: https://www.haveringdata.net/

London Borough of Havering. (2021). *#DoingMyBit*. Retrieved from https://www.havering.gov.uk/doingmybit

Long Covid Physio. (2021, October). *Pacing*. Retrieved from https://longcovid.physio/pacing

Lopez-Leon, S., Wegman-Ostrosky, T., Perelman, C., Sepulveda, R., Rebolledo, P. A., Cuapio, A., & Villapol, S. (2021). More than 50 long-term effects of COVID-19: a systematic review and meta-analysis. *Scientific Reports*, 16144.

Ludvigsson, J. F. (2020). Case report and systematic review suggest that children may experience similar long-term effects to adults after clinical COVID-19. *Acta Paediatrica*, 914-921.

Megari, K. (2013). Quality of Life in Chronic Disease Patients. *Health Psychology Research*, e27.

Michelen, M., Manoharan, L., Elkheir, N., Cheng, V., Dagens, A., Hastie, C., . . . Stavropoulou, C. (2021). Characterising long COVID: a living systematic review. *BMJ Global Health*, e005427.

Molteni, E., Sudre, C. H., Canas, L. S., Bhopal, S. S., Hughes, R. C., Antonelli, M., . . . Duncan, E. L. (2021). Illness duration and symptom profile in symptomatic UK school-aged children tested for SARS-CoV-2. *The Lancet Child & Adolescent Health*, 708-718.

Nalbandian, A., Sehgal, K., Gupta, A., Madhavan, M. V., McGroder, C., Stevens, J. S., . . . Wan, E. Y. (2021). Post-acute COVID-19 syndrome. *Nature Medicine*, 601-615.

National Institute for Health and Care Excellence. (2021, 11 11). *COVID-19 rapid guideline: managing the long-term effects of COVID-19, NICE guideline [NG188].*

National Institute for Health Research. (2021, March 16). *Living with Covid19 - Second review.* Retrieved from https://doi.org/10.3310/themedreview_45225

National Institutue for Health Research. (2020, October). *Themed Review - Living with Covid19.* Retrieved from https://evidence.nihr.ac.uk/themedreview/living-with-covid19/#Ref

NHS - Your COVID Recovery. (2021). *Supporting your recovery after COVID-19*. Retrieved from https://www.yourcovidrecovery.nhs.uk/

NHS England. (2020, December). *Long COVID patients to get help at more than 60 clinics*. Retrieved from https://www.england.nhs.uk/2020/12/long-covid-patients-to-get-help-at-more-than-60-clinics/

NHS England. (2021, June 15). *NHS sets up specialist young people's services in £100 million long COVID care expansion.* Retrieved from https://www.england.nhs.uk/2021/06/nhs-sets-up-specialist-young-peoples-services-in-100-million-long-covid-care-expansion/

NHS England. (2021). *Post-COVID Syndrome (Long COVID).* Retrieved from https://www.england.nhs.uk/coronavirus/post-covid-syndrome-long-covid/

NHS England. (2021). *Social prescribing.* Retrieved from https://www.england.nhs.uk/personalisedcare/social-prescribing/

NHS Health Education England. (2021). *Long COVID; Post-COVID syndrome*. Retrieved from https://library.nhs.uk/long-covid/

NHS Trafford Clinical Commissioning Group. (2022). *Support for patients with Post Covid-19 syndrome 'Long Covid'*. Retrieved from https://www.traffordccg.nhs.uk/Coronavirus/Support-for-patients-with-Post-Covid-19-syndrome-'Long-Covid'.aspx

Office for Health Improvement & Disparities. (2021, 12). *Fingertips: Wider Determinants of Health.* Retrieved from https://fingertips.phe.org.uk/wider-determinants#gid/1938133042/ati/6

Office for National Statistics. (2010). Disadvantaged groups in the labour market. *Economic & Labour Market Review*, 6.

Office for National Statistics. (2021, November). *A09: Labour market status by ethnic group.* Retrieved from https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/labourmarketstatusbyethnicgroupa09

Office of National Statistics. (2021, October). *Coronavirus (COVID-19) vaccination and self-reported long COVID in the UK: 25 October 2021*. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronaviruscovid19vaccinationandselfreportedlongcovidintheuk/25october2021

Office of National Statistics. (2021, April). *Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 1 April 2021*. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/1april2021

Office of National Statistics. (2021, September). *Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 2 September 2021.* Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/2september2021

Office of National Statistics. (2021, June). *Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 4 June 2021.* Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/4june2021

Office of National Statistics. (2021, November 4). *Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 4 November 2021*. Retrieved from https://www.ons.gov.uk/releases/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk4november2021

Office of National Statistics. (2021, October). *Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 7 October 2021.* Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectionintheuk/7october2021

PHOSP-COVID Collaborative Group. (2021). Physical, cognitive and mental health impacts of COVID-19 following hospitalisation – a multi-centre prospective cohort study. *MedRxiv*.

Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., . . . Abel, M. K. (2020). Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. *Lancet Psychiatry*, 883-892.

Porat, T., Nyrup, R., Calvo, R. A., Paudyal, P., & Ford, E. (2020). Public Health and Risk Communication During COVID-19—Enhancing Psychological Needs to Promote Sustainable Behavior Change. *Front Public Health*, 573397.

Public Health England. (2017, September). *Guidance: Psychosocial pathways and health equity.* Retrieved from https://www.gov.uk/government/publications/psychosocial-pathways-and-health-outcomes

Public Health England. (2019, June). *Guidance: Social prescribing: applying All Our Health.* Retrieved from https://www.gov.uk/government/publications/social-prescribing-applying-all-our-health/social-prescribing-applying-all-our-health

Raman, B., Cassar, M. P., Tunnicliffe, E. M., Fillippini, N., Griffanti, L., Alfaro-Almagro, F., . . . Jenkinson, M. (2021). Medium-term effects of SARS-CoV-2 infection on multiple vital organs, exercise capacity, cognition, quality of life and mental health, post-hospital discharge. *The Lancet*, 100683.

Royal College of Nursing. (2020, November). *Long COVID: what you need to know.* Retrieved from https://www.rcn.org.uk/magazines/bulletin/2020/nov/long-covid-need-to-know-guide

Royal College of Occupational Therapists . (2021). *How to manage post-viral fatigue after COVID-19: Practical advice for people who have been treated in hospital*. Retrieved from https://www.rcot.co.uk/how-manage-post-viral-fatigue-after-covid-19

Salawu, A., Green, A., Crooks, M. G., Brixey, N., Ross, D. H., & Sivan, M. (2020). A Proposal for Multidisciplinary Tele-Rehabilitation in the Assessment and Rehabilitation of COVID-19 Survivors. *Int J Environ Res Public Health*, 4890.

Semenzato, L., Botton, J., Drouin, J., Ceunot, F., Dray-Spira, R., Weill, A., & Zureik, M. (2021). Chronic diseases, health conditions and risk of COVID-19-related hospitalization and in-hospital mortality during the first wave of the epidemic in France: a cohort study of 66 million people. *The Lancet Regional Health - Europe*, 100158.

Sigfrid, L., Drake, T. M., Pauley, E., Jesudason, E. C., Olliaro, P., Lim, W., . . . Scott, J. T. (2021). Long Covid in adults discharged from UK hospitals after Covid-19: A prospective, multicentre cohort study using the ISARIC WHO Clinical Characterisation Protocol. *Lancet Regional Health*, 100186.

Singh, S. J., Barradell, A. C., Greening, N. J., Bolton, C., Jenkins, G., Preston, L., & Hurst, J. R. (2020). British Thoracic Society survey of rehabilitation to support recovery of the post-COVID-19 population. *BMJ Open*, e040213.

Stephenson, T., Pereira, S. P., Shafran, R., De Stavola, B., Rojas, N., McOwat, K., . . . Ladhani, S. (2021). Long COVID - the physical and mental health of children and non-hospitalised young people 3 months after SARS-CoV-2 infection; a national matched cohort study (The CLoCk) study [preprint]. *Research Square*.

Stevenson, D., & Farmer, P. (2017, October). *Thriving at Work: a review of mental health and employers.* Retrieved from Department of Work and Pensions and Department of Health and Social Care: https://www.gov.uk/government/publications/thriving-at-work-a-review-of-mental-health-and-employers

Strandh, M., Winefield, A., Nilsson, K., & Hammarstrom, A. (2014). Unemployment and mental health scarring during the life course. *European Journal of Public Health*, 440-445.

Sudre, C. H., Murray, B., Varsavsky, T., Graham, M. S., Penfold, R. S., Bowyer, R. C., . . . Steves, C. J. (2021). Attributes and predictors of long COVID. *Nature Medicine*, 626-631.

Talic, S., Wild, H., Maharaj, A., Ademi, Z., Xu, W., Theodoratou, E., . . . Ilic, D. (2021). Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and covid-19 mortality: systematic review and meta-analysis. *BMJ*, e068302.

The Health Foundation. (2021, April). *What might long COVID mean for the nation's health?* Retrieved from https://www.health.org.uk/news-and-comment/blogs/what-might-long-covid-mean-for-the-nations-health

The Sutton Trust. (2021). *COSMO: The COVID Social Mobility and Opportunities Study.* Retrieved from https://www.suttontrust.com/cosmo-the-covid-social-mobility-and-opportunities-study/

Thomas, G. P., Saunders, C. L., Roland, M. O., & Paddison, C. A. (2015). Informal carers' health-related quality of life and patient experience in primary care: evidence from 195,364 carers in England responding to a national survey. *BMC Family Practice*, 62.

Thomson, H. (2021). Children with long covid. *New Sci.*, 10-11.

Tierney, S., Wong, G., Roberts, N., Boylan, A.-M., Park, S., Abrams, R., . . . Mahtani, K. R. (2020). Supporting social prescribing in primary care by linking people to local assets: a realist review. *BMC Medicine*, 49.

Townsend, L., Dyer, A. H., Jones, K., Dunne, J., Mooney, A., Gaffney, F., . . . Conlon, N. (2020). Persistent fatigue following SARS-CoV-2 infection is common and independent of severity of initial infection. *PLOS ONE*.

Tsutsui, M., Gerayeli, F., & Sin, D. D. (2021). Pulmonary Rehabilitation in a Post-COVID-19 World: Telerehabilitation as a New Standard in Patients with COPD. *Int J Chron Obstruct Pulmon Dis*, 379-391.

WHO Working Group on the Clinical Characterisation and Management of COVID-19 infection. (2020). A minimal common outcome measure set for COVID-19 clinical research. *Lancet Infect Dis*, e192-e197.

Williamson, E. J., Bhaskaran, K., Bacon, S., Tomlinson, L., Curtis, H. J., Minassian, C., . . . Smeeth, L. (2021). Risks of covid-19 hospital admission and death for people with learning disability: population based cohort study using the OpenSAFELY platform. *BMJ*, n1592.

World Health Organization. (2012, March). *WHOQOL: Measuring Quality of Life*. Retrieved from https://www.who.int/tools/whoqol

Appendix A – Summary of Havering COVID-19 Predictive Risk Modelling Infection, Hospitalisation and Mortality

Background

The aim of this analysis was to identify individuals / groups among Havering residents at high risk of coronavirus infection and experiencing COVID-19 related adverse outcomes following diagnosis i.e. hospitalisation or death. The purpose was to enable primary care and local authority commissioners to develop effective interventions to reduce the risk of infection and experiencing specified adverse outcomes for identified vulnerable persons / groups.

Methodology

Four datasets namely; PHE COVID-19 positive cases data, GP primary care data, NHS Digital HES / secondary care data and ONS mortality data were linked using NHS number where available. Where missing, a combination of available personal details such as name, gender, address and date of birth were used. The linked dataset was uploaded into the LB Havering data warehouse and processed to append other wider determinant variables where records matched. The final data set analysed consisted of 1,842 records of Havering residents diagnosed with COVID-19, 681 admitted following diagnosis and 300 who died.

Descriptive analysis was carried to summarise details of all included records by specified independent/predictor variables and dependent / outcome variables. Results were reported as numbers and percentages. Logistic regression models were fitted to estimate the risk among Havering residents as stratified by various characteristics (independent variables) of being infected by coronavirus, hospitalised or dying following COVID-19 diagnosis.

Results

A total of 1,842 COVID-19 confirmed cases were recorded in Havering between March and September 2020 (inclusive), this is equivalent to 0.7% of the total population. 681 out of 1842 cases (37%) were hospitalised and 300 (16.3%) died. 767 tested positive for coronavirus between June and September 2020.

Risk of coronavirus infection

Infection risk modelling was based on the June to September 2020 data (767 cases) a period when testing was accessible to all with COVID-19 symptoms.

Adults (18 and over) had a higher risk of infection as compared to children. People aged 65+ were twice more likely to test positive (OR 2.1, CI 1.7 – 2.7) as compared to children under 18 years.

All ethnic minority groups had a higher risk of infection as compared to White British. Among the three main ethnic minority groups (Other White, Black, Asian), Black had the highest risk (OR 2.1, CI 1.7 - 2.6).

People living in most deprived areas had a higher risk of infection as compared to the least deprived. They were 10 times more likely to test positive (OR 10.4, 7.6 – 14.3) as compared to the least deprived.

Among patients with Long term conditions, those with Chronic Neurological Disease (OR 1.9, CI 1.4 – 2.6) and Chronic Kidney Disease (OR 1.5, CI 1.1 – 1.9) had a significantly higher risk of infection as compared to those without any LTC.

Risk differences for other specified LTCs were not statistically significant. Patients with 3 or more LTCs were 1.6 times more likely to test positive as compared to those with no LTC (OR 1.6, CI 1.1 – 2.2).

Care home residents aged 65+ were 6 times more likely to test positive (OR 5.5, CI 3.4 – 9.0) as compared to non-care home residents.

Blue badge holders (proxy measure for disability) were 3 times more likely to test positive (OR 3.1, CI 2.5 – 3.9) as compared to non-blue badge holders.

Differences in risk of coronavirus infection by gender, area of residence, receipt of housing benefits (proxy measure for financial difficulty), number of people in property and type of residential dwelling were not statistically significant.

Risk of hospitalisation

Hospitalisation risk modelling was based on the whole March to September 2020 dataset. Over this period 681 patients were hospitalised following diagnosis.

An age gradient was observed where older people were at a higher risk of hospitalisation. Persons aged 65+ were 18 times more likely to be admitted (OR 18: CI 7.7 – 50) as compared to children under 18 years.

Men were 1.6 times (OR 1.6, CI 1.2 – 2.2) more likely to be hospitalised as compared to women.

All major ethnic minority groups except Asians had a significantly higher risk of hospitalisation as compared to White British. Among the three main ethnic minority groups (Other White, Black, Asian), Black residents had a higher risk (OR 2.5, CI 1.5 - 4.0). Mixed ethnic group had the highest risk of hospitalisation (OR 12, CI 5.7 – 25).

All residents with Long Term Conditions were at a higher risk of hospitalisation. However in the adjusted model only those with Chronic Respiratory Disease remained significantly at a higher risk (OR 6.3, CI 1.8 – 32).

Residents with 1 LTC were 2.5 times more likely to be hospitalised (OR 2.5, CI 1.1 – 6.0) as compared to those with no LTC.

Differences in risk of hospitalisation by area of residence / ward, population density, deprivation, and type of residential dwelling were not statistically significant.

Risk of death
Case fatality (death) risk modelling was based on the whole March to September 2020 dataset. Over this period 300 patients died following diagnosis.

Persons aged 60 and over were 25 times more likely to die (OR 25, CI 15 – 42) as compared to those aged below 60.

Men were twice more likely to die (OR 1.9, CI 1.3 – 2.9) as compared to women.

The differences in risk of death by ethnicity for all major ethnic minority groups were not statistically significant. Mixed ethnic group had a significantly higher risk of death (OR 12, CI 5.7 – 28) as compared to White British.

People living in the most deprived areas were 2.4 times more likely to die (OR 2.4, CI 1.06 – 5.17) as compared to those in least deprived.

Residents with Chronic Respiratory Disease (OR 55, CI 12.7 – 310), Chronic Kidney Disease (OR 5.6, CI 1.4 – 23) and Stroke/TIA (OR 7.3, CI 1.6 – 38) had a significantly higher risk of dying as compared to those with no LTC.

The difference in risk of death by area of residence / ward was not statistically significant.

Conclusion
This analysis highlights existing COVID-19 inequalities as measured by risk of infection, hospitalisation and death among Havering residents. Further work with groups identified as being at high risk is recommended in order to develop effective interventions that mitigate risk of infection and prevent future poor health outcomes.

Appendix B – COVID-19 Vaccination Uptake in Havering in November 2021

(a) Number and percentage of people vaccinated in Havering, 2nd dose from 8th November to 14th November 2021. London and England data up to 7th November.

Vaccination 1st Dose

Age group	Population	Havering		London	England
		Number	%	%	%
0 - 9	34630	0	0.0%	N/A	N/A
10 - 11	6737	85	1.3%	N/A	N/A
12 - 15	13014	2831	21.8%	N/A	N/A
16 - 17	6272	3122	49.8%	N/A	N/A
18 - 19	5468	3571	65.3%	57.0%	67.3%
20 - 24	15083	10133	67.2%		
25 - 29	18161	11730	64.6%	61.0%	65.1%
30 - 34	20669	13691	66.2%	59.6%	67.3%
35 - 39	20712	14962	72.2%	61.5%	71.3%
40 - 44	18800	14559	77.4%	66.6%	76.5%
45 - 49	17175	14163	82.5%	72.2%	81.9%
50 - 54	18040	15733	87.2%	76.9%	86.4%
55 - 59	17897	15985	89.3%	79.8%	88.8%
60 - 64	15611	14190	90.9%	82.6%	90.6%
65 - 69	12315	11307	91.8%	84.8%	92.4%
70 - 74	12323	11543	93.7%	87.7%	94.5%
75 - 79	9196	8699	94.6%	89.0%	95.6%
80+	13357	12749	95.4%	89.0%	95.5%
Total 16+	221079	176137	79.7%		
London and England percentages for 16-17, 18-19 and 20-24 are not available. They have 18-24 combined.					

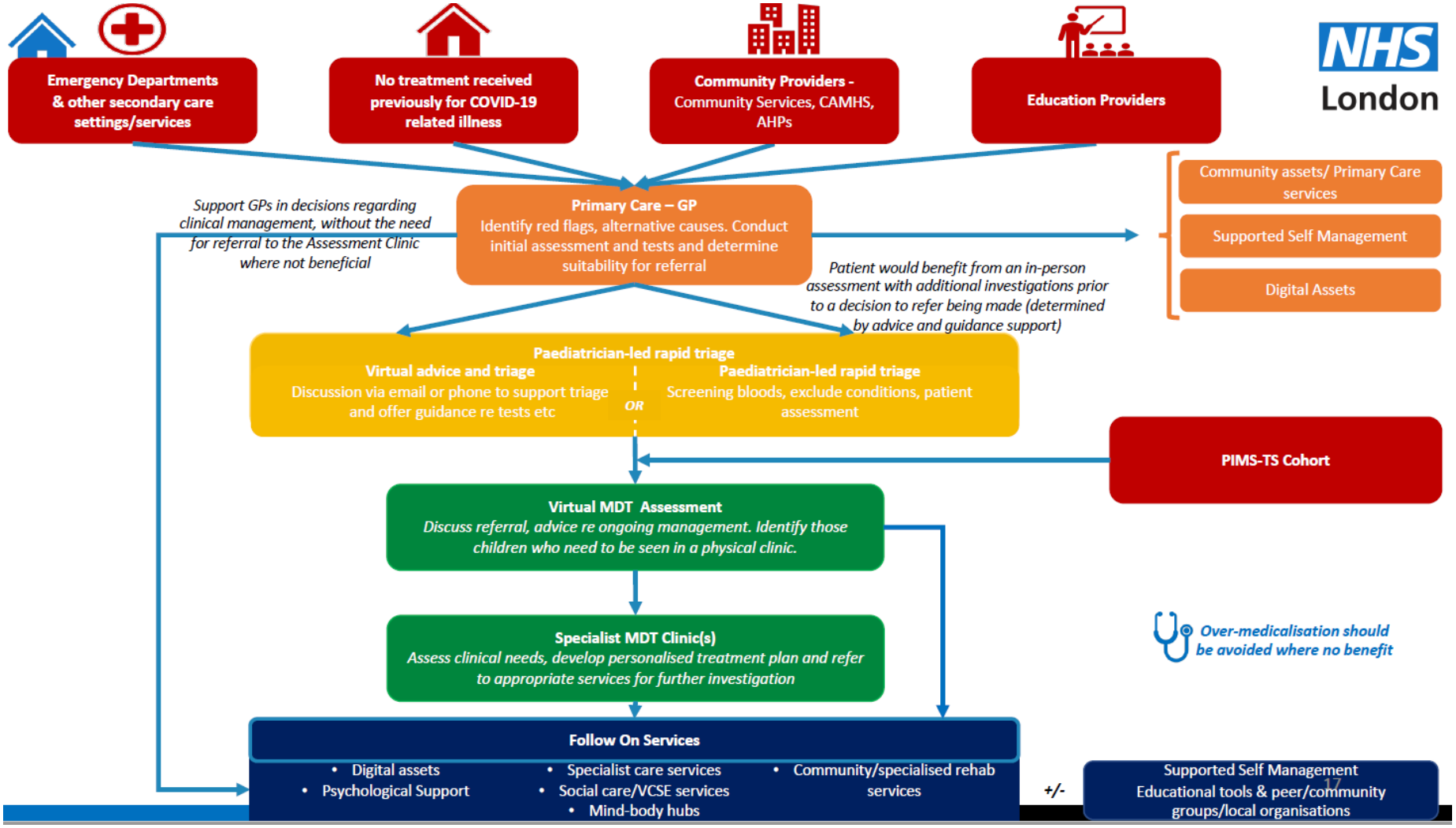
(b) Number and percentage of people vaccinated in Havering, 2nd dose from 8th November to 14th November 2021. London and England data up to 7th November.

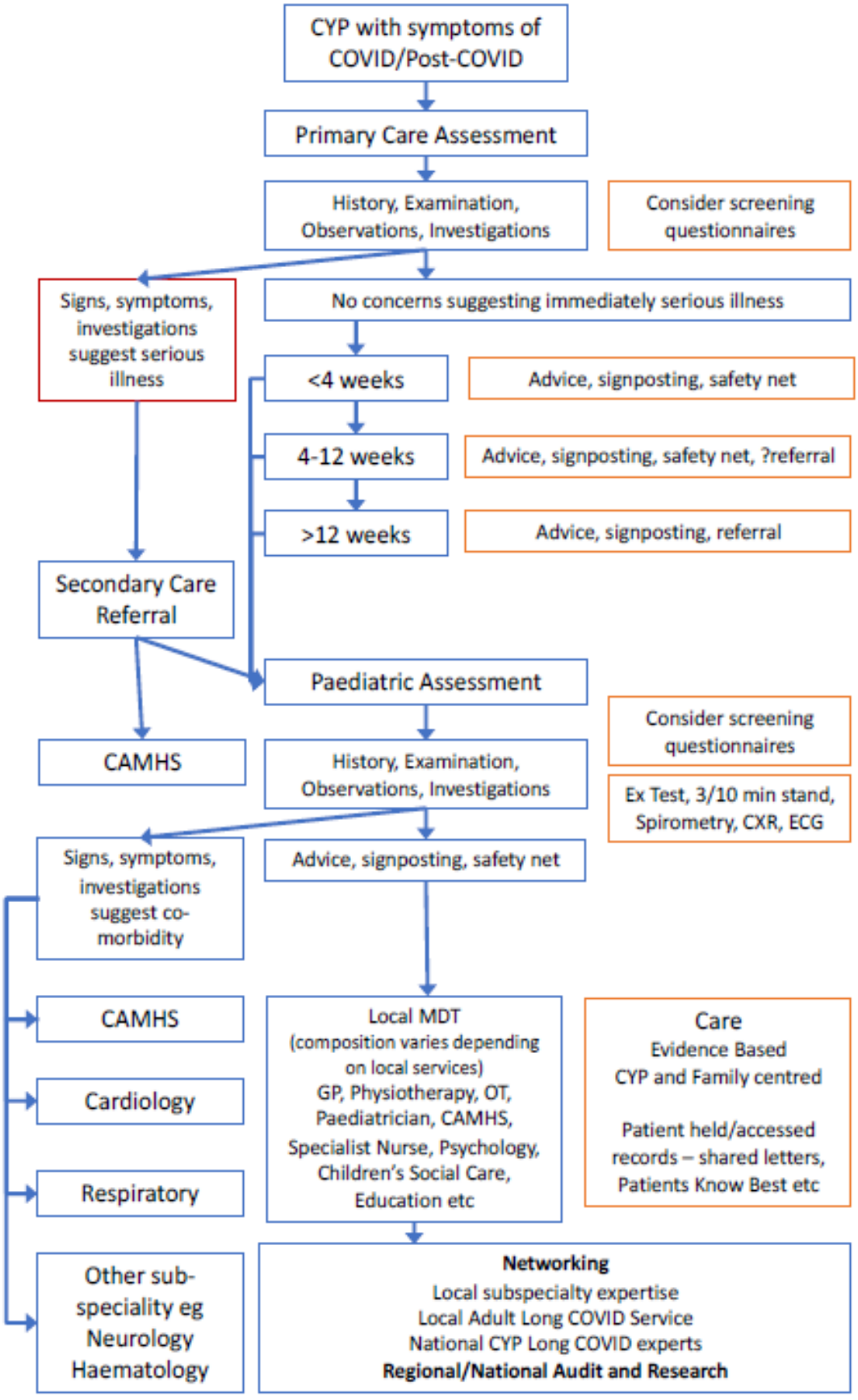
Vaccination 2nd Dose

Age group	Population	Havering		London	England
		Number	%	%	%
0 - 9	34630	0		N/A	N/A
10 - 11	6737	1		N/A	N/A
12 - 15	13014	16		N/A	N/A
16 - 17	6272	558	8.9%	N/A	N/A
18 - 19	5468	2989	54.7%	46.6%	57.2%
20 - 24	15083	8870	58.8%		
25 - 29	18161	10517	57.9%	54.2%	57.6%
30 - 34	20669	12443	60.2%	54.0%	61.0%
35 - 39	20712	13904	67.1%	56.7%	66.2%
40 - 44	18800	13762	73.2%	62.3%	72.4%
45 - 49	17175	13611	79.2%	68.3%	78.6%
50 - 54	18040	15322	84.9%	73.4%	83.9%
55 - 59	17897	15648	87.4%	76.3%	86.5%
60 - 64	15611	13945	89.3%	79.5%	88.5%
65 - 69	12315	11159	90.6%	82.5%	91.1%
70 - 74	12323	11452	92.9%	86.0%	93.6%
75 - 79	9196	8641	94.0%	87.4%	94.8%
80+	13357	12621	94.5%	87.1%	94.5%
Total 16+	221079	165442	74.8%		
London and England percentages for 16-17, 18-19 and 20-24 are not available. They have 18-24 combined.					

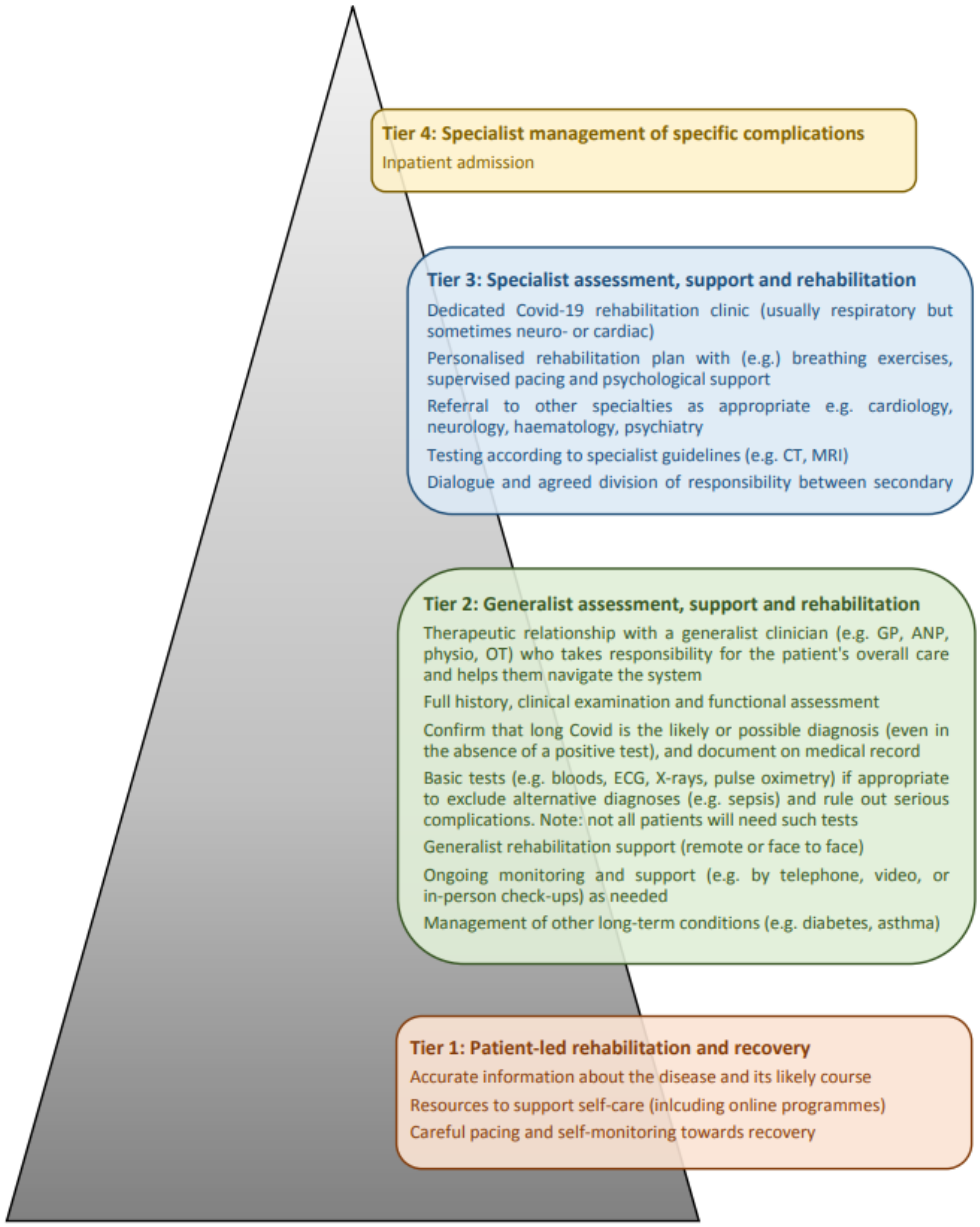
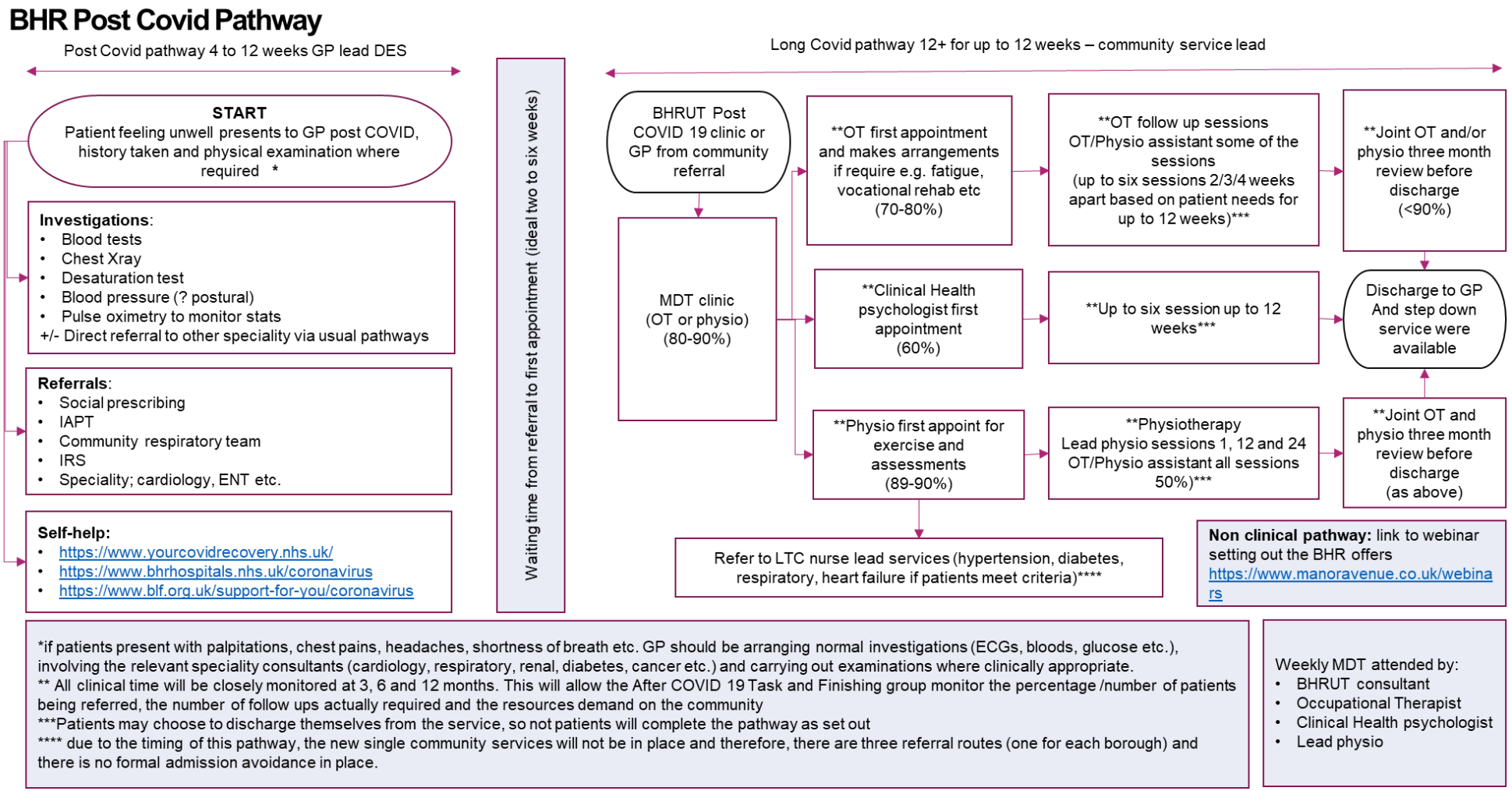
Data source: NIMS Data

Appendix C – NHS London Paediatric Long COVID Pathway (overview and detailed summary)




CYP with symptoms of COVID/Post-COVID
Primary Care Assessment
History, Examination, Observations, Investigations
Consider screening questionnaires
Signs, symptoms, investigations suggest serious illness
No concerns suggesting immediately serious illness
<4 weeks
Advice, signposting, safety net
4-12 weeks
Advice, signposting, safety net, ?referral
>12 weeks
Advice, signposting, referral
Secondary Care Referral
Paediatric Assessment
CAMHS
History, Examination, Observations, Investigations
Consider screening questionnaires
Ex Test, 3/10 min stand, Spirometry, CXR, ECG
Signs, symptoms, investigations suggest co-morbidity
Advice, signposting, safety net
CAMHS
Cardiology
Respiratory
Other sub-speciality eg Neurology Haematology
Local MDT
(composition varies depending on local services)
GP, Physiotherapy, OT, Paediatrician, CAMHS, Specialist Nurse, Psychology, Children's Social Care, Education etc
Care
Evidence Based
CYP and Family centred
Patient held/accessed records – shared letters, Patients Know Best etc
Networking
Local subspecialty expertise
Local Adult Long COVID Service
National CYP Long COVID experts
Regional/National Audit and Research

Appendix D – Suggested tiered approach for Long COVID services (Greenhalgh et al, 2020)



Appendix E – BHR Post COVID Pathway