Opening Pandora's Box: The hidden legacy of COVID-19

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Introduction

Throughout the pandemic, minimising deaths has been the immediate goal but as we look ahead to the future, we will have to consider the hidden legacy of COVID for many who were infected: long COVID. The infection has not only had an impact on the physical and mental health of individuals but has also led to social, cultural and economic consequences as well as a sense of loss for many.

Approximately 1.3 million people in the UK, and 100 million worldwide, suffer from the physical effects of Long COVID, which presents with a variety of symptoms: fatigue, depression, breathing problems, join pain. Many people have had greatly different experiences, making uniform treatment impossible. The lecture will cover how it has affected adults and children's physical and mental health whilst also addressing the unseen impact such as the widening inequalities exposed during the pandemic.

Many myths continue to circulate: that it is just feeling tired, that only those who had severe COVID will get long COVID, or that it will only affect those with pre-existing conditions. The reality is very different and we are just beginning to see the full devastation of the virus on individuals and society as a whole. It is time to consider available emerging treatments and therapies whilst recognizing alternative global remedies such as gargling with certain herbal waters which are thought to cure respiratory problems.

Prayer written by presenter at the start of the pandemic in 2020:

I hear the voices of those that die

The souls trapped deep inside

They lived to be released to God

Not thrown and left aside

They believed and prayed all through their lives

So what did they do wrong

They went to pray once more for life

And left us all to cry

Oh God, did they deserve this

What did they do so wrong

But to be poor all through their lives

Yet, alone when left to die

Let's pray for all who left us

During this distressing time

Please give their souls some peace tonight

And take them, where they belong.

COVID-19 Spread and Levels of Impact

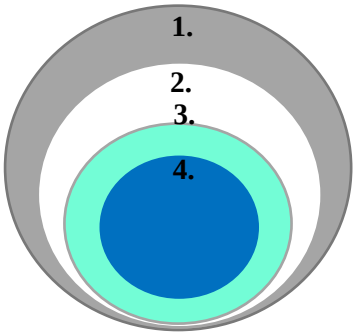
No one has been left untouched by COVID-19. Many individuals have been left with the physical and mental health consequences of the virus - now known as long COVID. Those not physically infected by the virus continue to experience the broader impact of the virus; the increasing social inequalities and loss of employment, education and loved ones.

1. GLOBAL

2. REGIONAL

3. COMMUNITY

4. FAMILY



GLOBAL LEVEL

Globally, as of 7th September 2022, there were 603,711,760 confirmed cases of COVID-19, including 6,484,136 deaths, reported to WHO. (WHO, 2022a)

REGIONAL LEVEL

Significant regional differences also exist. As of 7 September 2022, Europe had the most at 249,105,808, the Americas 176,342,137, Western Pacific 85,868,508, South-East Asia 60,084,208, Eastern Mediterranean

23,011,442 and Africa 9,298,893. (WHO Coronavirus (COVID-19) Dashboard, 2022)

COUNTRY LEVEL

a. COMMUNITIES

A WHO survey one year into the COVID-19 pandemic in April 2021 revealed that substantial disruptions persisted, with about 90% of countries still reporting one or more disruptions to essential health services, marking no substantial global change since the first survey conducted in the summer of 2020. 66% of countries continued to report health workforce-related reasons as the most common causes of service disruptions. Supply chains were also still disrupted in nearly one third of countries, affecting the availability of essential medicines, diagnostics, and the PPE needed to safely and effectively provide care. (WHO, 2021a)

In the UK, the government announced in March 2021 that more than 80 NHS-run long COVID clinics would be opened at a cost of £6.6 billion. (Baraniuk, 2022)

In Chile, as a UNCTAD survey showed, 80% of small and medium-sized business reported having serious insolvency problems by the end of December 2020. (UNCTAD, 2022)

In Africa, 4/5ths of respondents in a UN Economic Commission for Africa survey declared that they were being significantly affected by the pandemic. (UNCTAD, 2022)

In the Philippines, it is estimated that 76% of all small and medium-sized businesses were forced to close by September 2020. (UNCTAD, 2022)

In the UK, the Coronavirus Job Retention Scheme applied from 1 March 2020 and ended on 30 September 2021. The scheme provided grants to employers so they could retain and continue to pay staff during coronavirus related lockdowns, by furloughing employees at up to 80% of their wages. 11.7 million employee jobs were furloughed through the scheme, at a cost of £70 billion. (UK Parliament, 2022)

In Japan, in line with unemployment increases and the impact on particular industries, suicide rates increased significantly. As found in a 2021 study, monthly suicide rates increased by 16% during the second wave (July to October 2020), with a larger increase among females (37%) and children and adolescents (49%). In Japan, the crisis has had a larger effect on female-dominant industries, with stay-at-home orders magnifying the working mother's burden. (Tanaka & Okamoto, 2021)

In South Africa, a 2022 study found that COVID-19 restrictions led to increased experiences of stress and anxiety at home for adolescent girls and young women aged 15-25. Poor mental health was compounded by strained family relationships, increased fear of domestic violence, household unemployment, economic stress and food insecurity. Feelings of loneliness and isolation emerged as salient themes in the narratives of respondents, combined with a sense of disruption to normal social interactions and connections. More than half (51%) reported that they had found it (sometimes/often) harder to get the emotional support they needed during COVID-19 and the lockdown (53.7% in the 20–24 year old group and 48.5% in the 15–19 year old group). 28.2% of all 15-24 year old women surveyed reported that relationships with family members had (sometimes/often) worsened. (Duby et al., 2022)

Long COVID and Inequalities

"COVID has magnified every existing inequality."

Quote from Melinda Gates, Co-Founder of Bill & Melinda Gates Foundation, in 2020

As well as a public health crisis, the COVID-19 pandemic has had a devastating impact on poverty levels and inequality. Women, alongside the poor, elderly, disabled and migrant populations, as well as those working on the frontline in essential services, have borne the brunt of the fallout from the pandemic. (Ford, 2020)

a. ETHNIC DIFFERENCES

Migrants were hit harder by the crisis and are recovering more slowly than the native-born. In the second half of 2020, on average across 28 OECD countries, the employment rate fell relative to the same quarter of the previous year by 3.3 percentage points for the foreign-born and 2.3 percentage points for the native-born. By the second half of 2021, migrants' employment was still 1.3 percentage points lower than two years earlier against 0.6 percentage points for native-born. (OECD, 2022)

In a 2022 UK study, it was found that vaccine uptake remains lowest in ethnic groups with the highest risk of COVID-19 death in all three waves – only 34% of Black Caribbean, 38% of Black African, 38% of Pakistani, and 46% of Bangladeshi adults have had three vaccine doses, compared with 68% of White British adults. (Raleigh, 2022)

In another 2020 UK study, findings showed that per-capita COVID-19 hospital deaths were highest among the black Caribbean population, three times those of the white British majority. Some minority groups – including Pakistanis and black Africans – have seen similar numbers of hospital deaths per capita to the population average, while Bangladeshi fatalities are lower. After removing consideration of age and geography, Bangladeshi hospital fatalities are twice those of the white British group, Pakistani deaths are 2.9 times as high and black African deaths 3.7 times as high. The Indian, black Caribbean and 'other white'

ethnic groups also have excess fatalities, with the white Irish group the only one to have fewer fatalities than white British. (Institute for Fiscal Studies, 2020)

b. POOR HOUSING AND HYGIENE

In the 60 countries identified by UNICEF as having the highest risk of health and humanitarian crises due to the virus, 2 out of 3 people – 1 billion people in total – still lack basic handwashing facilities with soap and water at home. Around half are children. 3 in 4 children lacked basic handwashing service at their school at the start of the outbreak; half of all children lacked basic water service; and more than half lacked basic sanitation services. Some 47 per cent of urban South Africans, for example, or 18 million people, still lack basic handwashing facilities at home with the richest urban dwellers nearly 12 times more likely to have access to handwashing facilities. (UNICEF, 2020)

Poor housing conditions impacted higher-income countries as well lower-income countries. In a 2020 US study, across 3135 counties, the mean percentage of households with poor housing conditions was 14.2% (range 2.7% to 60.2%). With each 5% increase in percent households with poor housing conditions, there was a 50% higher risk of COVID-19 incidence and a 42% higher risk of COVID-19 death. (Ahmad et al., 2020)

c. FRONTLINE WORKERS

Workers in jobs that could not be performed from home and required physical proximity to other people have paid a double price during the COVID-19 crisis in terms of being subjected to a higher risk of both income loss, when their hours were cut or their jobs terminated, and infection when they continued working. These workers were disproportionately young, low educated, migrants, ethnic minorities and employed in low-paid occupations. Examples of these occupations include health care workers, cashiers, personal care workers, food processing workers, building workers and assemblers. (OECD, 2022)

During the crisis, they reported more job insecurity, and lower overall health and mental well-being. Statistics from several countries in the OECD showed that they were indeed much more likely than other workers to become infected with COVID-19 across the 38 member states. (OECD, 2022)

On average across the OECD, a 2022 study found that these at-risk occupations employed more low-wage workers (37% vs 15%), more young workers (12% vs 5%) and a much lower share of workers with tertiary education (on average 34% vs 67%). (OECD, 2022)

In addition, as found in a 2022 study of emergency care (EC) and other frontline healthcare workers (HCW) responding to the COVID-19 pandemic in the Pacific region, key challenges reported by healthcare staff in particular were physical exhaustion and mental health challenges exacerbated by workforce shortages, being stretched well-beyond capacity, limited access to mental health services, lack of appropriate compensation and incentive, and the experience of isolation, stigma and discrimination from colleagues, family and community. Participants spoke of the overlapping personal and professional tensions they faced in protecting their family and local community from COVID-19, versus their duty to serve their patients, profession and country. (Brolan et al., 2022)

d. HEALTH RISKS

In an early pandemic July 2020 study, primary care records of 17278,392 adults in England were pseudonymously linked to 10926 COVID-19-related deaths. COVID-19-related death was most associated with: being male; greater age and deprivation; diabetes; severe asthma; and various other medical conditions. Compared with people of white ethnicity, Black and South Asian people were at higher risk, even after adjustment for other factors such as age. Increasing age was strongly associated with COVID-19 death risk, with people aged 80 or over having a more than 20-fold-increased risk compared to 50–59-year-olds. Men had a higher risk than women. These findings were consistent with patterns observed in multiple smaller studies worldwide and in the UK. (Williamson et al., 2020)

In a 2022 global study, smokers and former smokers were found to have an increased risk of reporting long COVID symptoms, those with a Baseline BMI in the overweight or obese range were associated with an increased risk of persistent symptoms and pre-existing conditions with the largest associations were

chronic obstructive pulmonary disease (COPD), benign prostatic hyperplasia, anxiety, erectile dysfunction, depression, migraine, multiple sclerosis, celiac disease and learning disabilities. (Subramanian et al., 2022)

Cardiometabolic conditions, including type 1 and type 2 diabetes mellitus, were found to be associated with severe COVID-19 and long COVID in a 2021 study. Interventions to target multiple risk factors and novel glucose-lowering agents that improve metabolic function were recommended for treatment by this study team. (Khunti, Davies, Kosiborod & Nauck, 2021)

Families and Long COVID Through the Life Course

a. PREGNANT WOMEN

A 2022 UK study found that women with severe COVID-19 infection were more likely to give birth early (before 32 weeks of pregnancy) (22.6% chance), had a 50 times higher risk of induced birth or caesarean, a higher risk of giving birth by pre-labour caesarean section (76% chance), a higher risk of having stillborn babies (3.3% chance) and had a 12 times increased risk of their baby being admitted to the neonatal intensive care unit. (Vousden et al., 2022)

A 2021 analysis of 95 different studies found that globally pregnant women and mothers were not found to be at a higher risk for COVID-19 infection than people who were not pregnant overall. However, those with symptomatic COVID-19 experienced more adverse birth outcomes and socio-economic consequences. (Kotlar et al., 2021)

Pregnant women in high income and low-and middle-income countries alike were affected severely. Guidelines for labour, delivery, and breastfeeding for COVID-19 positive patients varied and this variability create uncertainty and unnecessary harm. Prenatal care visits decreased and healthcare infrastructure was strained. An increase in maternal mental health problems such as anxiety and depression were reported in many countries. (Kotlar et al., 2021)

b. CHILDREN AGED 0-5 YEARS

For children, studies have defined long COVID as: cases where symptoms (at least 1 physical) have continued post-COVID-19 diagnosis, impact their physical, mental or social well-being, are interfering with their daily living and persist for a minimum of 12 weeks after initial testing. (Stephenson et al., 2022a)

Indirect long-term health impacts on children have also been widespread, even without COVID-19 diagnosis. Due to COVID-19 measures, approximately 80 million children under the age of 1 in at least 68 countries may miss out on receiving life-saving vaccines for diseases such as diphtheria, measles and polio. (WHO & UNICEF, 2022)

Trauma, such as that suffered by children during the pandemic and lockdowns, in childhood is a grave psychosocial, medical, and public policy problem that has serious consequences for its victims and for society. (De Bellis and Zisk, 2014)

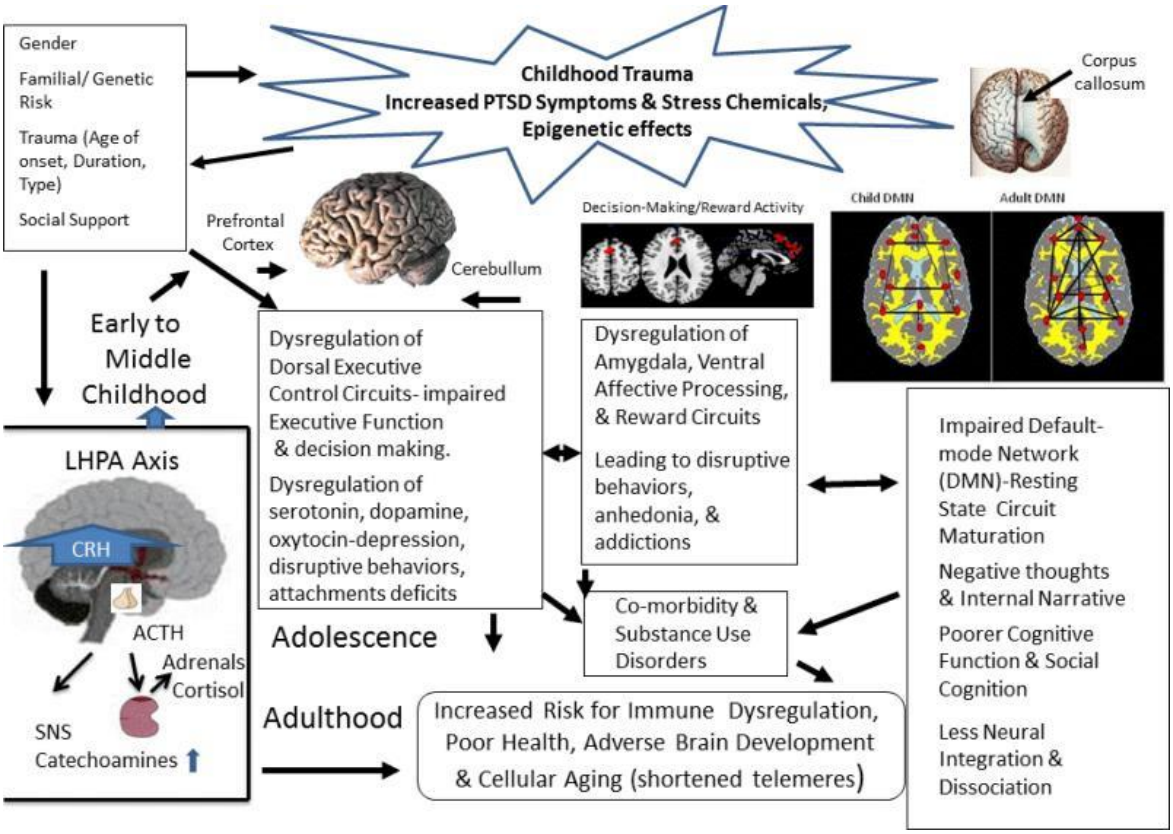


Figure 1: Developmental Traumatology Model of the Biological Effects of Trauma. © De Bellis and Zisk, 2014

In a 2020 Canadian study of 1472 families, only 4.8% (2.8% girls, 6.5% boys) of children and were meeting combined movement behaviour guidelines during COVID-19 restrictions. Children had lower physical activity levels, less outside time and higher screen time (including leisure screen time) during the outbreak. (Moore et al., 2020)

In an Italian study of 104 six-month-old infants before and during the pandemic restrictive social distancing measures between September 2019 and April 2021, results found an association between social distancing measures and reduction in Griffiths Scales of Child Development scores. Significantly lower scores in all areas of development were observed in the children assessed during the pandemic period, observed mainly in “Language and Communication” and “Personal-social-emotional” areas. (Ferrari et al., 2022)

The CHAMPIONS project is a national project looking at the impact of COVID-19 and living through lockdown on children under 5 who are living in temporary accommodation (TA) due to experiencing homelessness. The project team are working alongside families and professionals to co-develop recommendations for future support and best practices. (CHAMPIONS Project Update Report, 2021)

They have developed a SHE Framework for a child's rights to be Safe, Healthy, and Educated and are using this framework within the ecological model to understand child health and development in TA, as well as systems and support around the child that can ensure these three core pillars for their development:

1. Safe - Children experience poor sanitation and hygiene, shared space and overcrowding, poor housing conditions, and noise in TA. Families are also housed with single people, and in unsafe areas.

2. Healthy - There is limited food availability in TA which can be due to lack of storage and a difficulty to keep food clean, which results in poor nutrition. There has also been limited access to services, as well a breakdown in mental health.

3. Educated - Lack of space means no or unsuitable study areas. Digital poverty prevents access to online learning and resources, and culminates in poor educational outcomes. Closure of children's groups has led to a break in relationships, and unfamiliarity with others. (CHAMPIONS Project Update Report, 2021)

The project young person's study with young people aged 10-19 who are living in TA are drawing out narratives around the challenges of overcrowded housing and the isolation of missing friends and family during COVID-19, against a backdrop of young people being conscious that where they're living isn't where they're staying permanently. The COVID-19 pandemic affected all children but some groups and most unheard have been affected the most. The youngest aged 0-5 have been affected by lockdown delays in key developmental milestones such as speech development and walking and emotional regulation due to anxiety etc. It will be extremely hard for them to catch up.

They are also bringing to light stories of the incredible resourcefulness, creativity and positivity of young people and their families in making the best of the circumstances they're in.

(CHAMPIONS Project Update Report, 2021)

The qualitative study is also ongoing. Parents have talked about how the isolation of social distancing, lockdown and the travel ban had affected their child, and particularly the impact if children did not have many opportunities to socialise with other children.

Parents also described how their children were frightened by the risks of the pandemic, especially in shared accommodation where several families shared the kitchen and bathroom and there was hesitance about how clean and safe it was for everyone.

"[My children] wouldn't touch any food, even after washing, first a wash and then give to the kids. They're really scared at that time... five families and we're using one bathroom." (a single parent with 3 children)

Living in an overcrowded flat and having to keep the children indoors and away from their friends and family could affect children's behaviour.

"My child is actually naughty now. I don't know why, I think it's because of the other kids in here as well, like they're all on top of each other... he's not bonding with other children, he's not learning from other children, he's just playing by himself all day." (a single parent with a child aged 18 months)

Home schooling could also be difficult in families with such limited resources, particularly in accommodation where families could not afford or were not allowed to have broadband and where they were relying on costly mobile data.

Participants also talked about how much it helped them to have the comfort and practical support they had received from community and religious organisations. They said this made such a difference to their happiness and ability to cope. (CHAMPIONS Project Update Report, 2021)

The systematic literature review focused on low-and-middle-income countries has also revealed some findings. The research team understood a systematic review of literature published in English from PubMed, MEDLINE, and SCOPUS between Jan 1, 2010, and March 31, 2021. They explored literature focusing on policy, strategy, intervention, and medical, health, and nutrition services including preventive and immunisation services, and outcomes. The target population included homeless and marginalised children. (Sarkar et al., 2021)

They found 53 final articles (47 quantitative and six qualitative) in total. Community-focused and financial interventions were successful in different settings. Financial interventions such as user-fee removal increased health care and service use between 15–309%. Cash transfers increased immunisation coverage, financial security, and nutrition. Mobile health services and the individualised tactics of community midwives and volunteers improved the coverage and use of child health and nutrition services. Community-based savings groups, user-fee removal, and cash transfer policies improved access and utilisation. mHealth applications and capacity building of health workforce increased coverage and quality of these services and improved clinic attendance.

Key conclusions were:

- UK policy makers could adapt and adopt targeted and conditional cash transfer policies to provide greater financial security to homeless families and make child health care more affordable and inclusive;
- Volunteer and mobile-clinic-based community services would increase access and use of these services in the COVID-19 recovery phase. (Sarkar et al., 2021)

Finally, their workshops with families and professionals from the housing, social care, education and health sectors are also ongoing.

Key recommendations that have emerged so far are:

- The need to increase access to support services – e.g., outreach work.
- The need for policymakers to keep track of people as isolation carries risk.
- The need to set up data tracking and notification systems across systems and professionals during moves – to avoid the trauma of repeating challenging experiences.

- The need to improve communication between professionals and build on local networks and relationships.
- The need to identify clearly statutory responsibility (e.g. the NHS, local authorities, schools etc.
- Develop materials to aid and direct families to helpful information and support as many families are unaware of benefits they are entitled to, and of assistance that is available to them such as food and baby banks, moving services, and legal advice.
- Implement a mandatory minimum standards framework for children living in TA, stating clear responsibility of the housing sector as the main contact point. This should include provision of necessities such as mould and vermin-free housing, kitchen appliances, and safe space to play and learn.
- Change the narrative and stigma around families experiencing homelessness, families have reported experiencing stigma from the individuals who are supposed to support and aid them. (CHAMPIONS Project Update Report, 2021)

c. CHILDREN AGED 6-18 YEARS

Young people are another group that have been particularly affected by the pandemic and lockdowns. They have been affected the most by missing school and emotionally in the form of social anxiety.

Save the Children set up a free counselling helpline to support children and young people's mental health in India. Calls to the helpline spiked when the country faced record-breaking cases of COVID-19 in spring 2021, with a 7000% increase in calls from March to April 2021. (Farfield, 2022)

In a 2020 Canadian study of 1472 families, only 0.6% (0.8% girls, 0.5% boys) of youth were meeting combined movement behaviour guidelines during COVID-19 restrictions. Young people also had lower physical activity levels, less outside time and higher screen time (including leisure screen time) during the outbreak. (Moore et al., 2020)

On average, students globally are eight months behind where they would have been without the pandemic. (Bryant et al., 2022)

By 2040, the economic impact of pandemic-related learning delays could lead to annual losses of $1.6 trillion worldwide, or 0.9 percent of total global GDP. (Bryant et al., 2022)

The length of school closures varied widely across the world. School buildings in middle-income Latin America and South Asia were fully or partially closed the longest – for 75 weeks or more. Those in high-income Europe and Central Asia were fully or partially closed for less time (30 weeks on average), as were those in low-income sub-Saharan Africa (34 weeks on average). (Bryant et al., 2022)

Access to quality remote and hybrid learning also varied both across and within countries. In Tanzania, while school buildings were closed, a study found that children in just 6 percent of households listened to

radio lessons, 5 percent accessed TV lessons, and fewer than 1 percent participated in online learning. (Oza & Cilliers, 2021)

A survey conducted by the UK Department for Education in March 2021 found that 1780 pupils had a somewhat positive attitude towards wearing face coverings when they did return to school. Pupils generally agreed that face coverings made others (87%) and themselves (70%) feel safe. However, 80% of pupils reported that wearing a face covering made it difficult to communicate, and more than half felt wearing one made learning more difficult (55%). (GOV.UK COVID-19 Parent and Pupil Panel: Technical Report, 2021)

The 2022 CLoCK study, the largest matched global study ongoing at the moment, showed that 40% of 11-17 year olds from the more than 50, 000 surveyed in the UK reported that they were feeling worried, sad, or unhappy, irrespective of COVID-19 diagnosis, demonstrating how widespread the impact of the youth mental health crises is. 29.6% of those surveyed had multiple symptoms. 13% of those diagnosed with COVID-19 were experiencing 5 or more symptoms between September 2020 and March 2021 at 3 months post-diagnosis, the most common being unusual tiredness (39%), headache (23%), unusual shortness of breath (23%), loss of smell/taste (21%) and dizziness (14%). Compared to studies on pre-pandemic levels, only 30% of 11-15 year-olds reported fatigue over a 4-6-month period in 2007 and 19.9% of adolescent participants reported at least one of these - headaches, fatigue or asthma - in 2004. (Stephenson et al., 2022b)

Another 2022 global study of 23,000 children up to 18 years of age found that long COVID was more common in female teenagers and those with pre-existing physical and mental health problems with most common other symptoms reported including cognitive difficulties (3%), sore throat (2%) and sore eyes (2%). Results showed that there was an increase of symptom percentage with child age. (Behnood et al., 2022)

The Co-POWeR (Consortium on Practices for Wellbeing and Resilience in BAME Families and Communities) study, led by the University of Leeds, which is investigating the long-term poor outcomes within UK Black, Asian and Minority Ethnic families and communities, has found evidence related to the greater vulnerability of racially minoritized people to the impact of COVID-19. The study is investigating the reasons for higher infection and death rates, and the resultant increase in racism and discrimination aimed at racially minoritized people perceived as being potential spreaders of the virus. They are also looking at the impact of emergency COVID Act powers, socio-economic and psychosocial impacts on BAME children, young people and families, the impact on care, caring and carers within BAMEFC, focusing on older people, paid and unpaid carers, and the impact of changes in physical activity and nutrition on BAMEFC via a youth engagement panel, semi-structured interviews and focus groups, public and community engagement, stakeholder workshops and co-design and art production sessions with families. (Co-POWeR Study ESRC Report, 2022)

Figure 2: Draft sketch drawn as participant spoke about her experiences. © Co-POWeR Study, 2022

Key challenges highlighted by the study so far include:

1. *Changes in family relationships*

1.Workplace risks and loss of income

2. Disappointment and loss

3. Sharing devices.

Many research participants described the increased financial struggles which they experienced during the pandemic, for example due to job loss or not receiving furlough, as well as difficulties they experienced in accessing support from state institutions and employers. Many of the parents spoke about their financial struggles during the pandemic, to the extent that they were sometimes struggling to pay for food and bills, and the need to share devices that they used to communicate with others. This disproportionately impacted racially minoritized people who were over-represented in populations unable to receive furlough, for example due to being key workers (CITE). In those instances where racially minoritized parents were entitled to furlough or workplace modifications to protect workers from exposure to COVID-19, some parents reported discrimination which meant the process of accessing support was frustrated or denied. Fears about going out and the negative impact of the pandemic were exacerbated by the experiences of losing loved ones which was particularly prevalent in racially minoritized communities. Parents who had caring responsibilities, for children with disabilities or other family members such as parents, were under particular pressure during the pandemic to meet the needs of those they were responsible for. Demarcated gender roles present in the households of some of the participants interviewed often left women and mothers bearing the greatest burdens related to family and the household during the pandemic and resulted in greater feelings of stress. Difficult living conditions within their homes, exacerbated by the pandemic and lockdowns, was a key topic of discussion. Some of the professionals who worked closely with families mentioned the huge impact of the pandemic on family relationships, which sometimes led to domestic abuse and violence. Issues of overcrowding in the home were mentioned by several participants. The cumulative effect of poor housing and overcrowding often also led to further problems with the authorities, exacerbating stress and anxieties experienced by parents. (Co-POWeR Study ESRC Report, 2022)

2. Changes in peer relationships

1. Isolation
2. Shock
3. Shrinking networks
4. Microaggressions.

One of the key areas explored by young people was their mental health and wellbeing throughout the pandemic and lockdowns, and how different aspects of their lives impacted their emotional and physical wellbeing. Some of the key areas mentioned included the anxiety, fear and nervousness around the virus; the sense of isolation; missing school and friends; and the inability to socialise. Participants also reported the difficulties of getting help for coping with mental health issues. The inability to meet friends in person to talk about any issues made participants find it harder to deal with deteriorating mental health. However, the internet was a forum through which young people were able to make new connections to alleviate the isolation of lockdown, for example through social media and gaming. (Co-POWeR Study ESRC Report, 2022)

3. Changes in education

1. Impact of racism on teachers' grading
2. Separation and isolation.

For many young people, having to attend school online instead of in-person proved a major challenge for a range of reasons, including lacking the right digital devices, struggling with internet connections, and experiencing difficulties engaging online without face-to-face teaching. This disruption, combined with the lack of routine, crowded spaces at home, and the inability to talk directly to teachers, meant that many children and young people fell behind or were worried about falling behind. Assessments instead of exams also concerned some of the students who had hoped to make up grades in exams. The lack of routine

often resulted in disruption to their schoolwork, irregular sleeping patterns and watching copious amounts of gaming, Netflix and television. Interviewees had experienced various degrees of support from their schools. Many young people felt unsupported by their schools and teachers. (Co-POWeR Study ESRC Report, 2022)

4. Identity

1. Self-discovery and re-creating identity
2. Physical and emotional wellbeing.

The pandemic became a time of self-discovery for some participants. Several interviewees described experiences of increased creativity or ways in which the pandemic helped them find out more about themselves. For others, self-image and racial or physical identity were reconciled. Another sub theme to emerge was around the fear of going out and exercising, which impacted hugely on participants' physical and mental wellbeing. This was exacerbated further by the sensationalised media coverage which emphasised the greater number of deaths in racially minoritized communities, portraying ethnic minorities as 'carriers' of COVID and allowing stigma, stereotyping, racism and othering to prevail. (Co-POWeR Study ESRC Report, 2022)

5. Black Lives Matter and calling out racism

The global coverage of the murder of George Floyd and resurgence of BLM led to widespread debates on racism and race politics at the beginning of the pandemic in 2020. For many young people, ensuing discussions around race and identity on social media increased their awareness of racism and everyday microaggressions within school, friendship groups and wider society. Social media engagement with BLM and the politics surrounding the murder of George Floyd constituted a point of connection and engagement for many young people interviewed. In addition, many of the practitioners and professionals who worked closely with Black and Asian groups spoke of the need to tackle the biases, stereotyping and stigmatisation of these groups within the existing support systems and structures which had exacerbated the impact of the COVID-19 pandemic on many different aspects of their lives. Many of the parents interviewed described experiences of racism in their neighbourhoods and in public which they felt had increased during the pandemic, as well as the negative impacts of media portrayals of ethnic minorities during COVID and government measures which they felt particularly targeted them. Several participants also raised the way in which the first lockdown coincided with Eid with no warning, feeling that this was a deliberate decision and that the government would have acted differently if the beginning of lockdown had coincided with a Christian holiday. Finally, all face-to-face health services in the UK were reduced due to COVID-19, meaning that GPs implemented a telephone triage to allocate appointments based on urgency. Telephone assessments impacted people who have English as a second language differently and gatekeepers asked questions about ethnicity if the callers' accent did not sound like they were white British. Fears surrounding discrimination, the involvement of social services, or impacts on residency applications, for example, further discouraged study participants from trying to access formal help. (Co-POWeR Study ESRC Report, 2022)

d. i. ADULTS: Non-health

In a 2021 Pew Research Center US study, about half of non-retired adults said the economic impact of the coronavirus outbreak would make it harder for them to achieve their long-term financial goals. Among those who said their financial situation has gotten worse during the pandemic, 44% thought it would take them three years or more to get back to where they were in 2020 – including about one-in-ten who didn't think their finances would ever recover. (Menasce Horowitz, Brown & Minkin, 2021)

Other vulnerable adults such as those who were disabled were affected disproportionally more economically. For example, in a study by disability charity Leonard Cheshire and Cavanta ComRes of 1171 working age disabled adults, it was found that 71% of disabled people who were employed in March 2020 in the UK had their employment impacted in some way by the pandemic: such as being furloughed, losing income, feeling at risk of redundancy, or losing their jobs. Two in five (42%) of employers surveyed said that a barrier to doing so was being able to support them properly during the COVID-19 pandemic, and a fifth (20%) admitted they were less likely to hire a disabled person overall. (Leonard Chesire, 2020)

28.2% of all 15-24 year old women surveyed in a South African study reported that relationships with family members had (sometimes/often) worsened during the pandemic lockdown. (Duby et al., 2022)

A 2020 UK study found that almost a quarter of surveyed UK adults with a partner (23%) said the circumstances of staying at home during COVID-19 were placing pressure on their relationship, and 8% of respondents who had a partner said the experience of lockdown had made them realise they needed to end their relationship. Almost a quarter (24%) of surveyed parents who lived with their children said their children's behaviour had become an issue since staying at home. (Jones, 2020)

As quarantine measures in 2020 and 2021 kept people at home and closed schools and day-care facilities, the burden of unpaid care and domestic work exploded. Even before COVID-19, women spent an average of 4.1 hours per day performing unpaid work, while men spent 1.7 hours – that means women did three times more unpaid care work than men, worldwide. Both men and women reported an increase in unpaid work since the start of the pandemic, but women are continuing to shoulder the bulk of that work. (UN Women, 2020)

d. ii. ADULTS: Multi-system health impact

A 2021 study identified the steps taken by the virus when entering the human body to explain how widespread the impact can be:

1. The virus enters cells via the angiotensin-converting enzyme 2 (ACE2) receptor.
2. Once internalized, the virus undergoes replication and maturation, provoking an inflammatory response that involves the activation and infiltration of immune cells by various cytokines in some patients.
3. The ACE2 receptor is present in numerous cell types throughout the human body, including in the oral and nasal mucosa, lungs, heart, gastrointestinal tract, liver, kidneys, spleen, brain, and arterial and venous endothelial cells, meaning it can cause damage to multiple organs. (Crook et al., 2021)

In addition, though COVID-19 primarily affects the respiratory system, studies have identified associations with a wide range of cardiovascular (CV) manifestations with extremely poor prognosis, such as direct myocardial infection and systemic inflammation resulting in cardiac injury, stroke, myocardial infarction, arrhythmia and thromboembolism. (Thakkar et al., 2020)

For adults, the National Institute for Health and Care Excellence (NICE) defines long COVID as: cases where symptoms are still seen 4-12 weeks after infection; or cases where symptoms of COVID-19, and other symptoms that cannot be explained by an alternative diagnosis, are seen 12 weeks or more after infection. (National Institute for Health and Care Excellence, 2022)

In terms of the physical and mental health impacts on individuals, in a recent study in the UK of non-hospitalized individuals who were diagnosed with COVID-19 between 31 January 2020 and 15 April 2021, the most commonly reported symptoms within 42 days of infection were (in order of incidence): anosmia (loss of sense of smell), hair loss, sneezing, ejaculation difficulty, reduced libido, shortness of breath at rest, fatigue, pleuritic chest pain, hoarse voice and fever. As of 7 April 2022, 2.7% of the UK population were experiencing symptoms beyond 4 weeks and 70% of those beyond 12 weeks. (Subramanian et al., 2022)

A UK study of COVID-19 related death and hospital admission in adults post-vaccination showed that those with the highest risk of hospital admission and death were adults with the following pre-existing conditions: Down's syndrome (12.7 times greater chance) kidney transplantation (8 times greater chance), sickle cell disease (7.7 times greater chance), care home residency (4.1 times greater chance) and chemotherapy (4.3 times greater chance). (Hippisley-Cox et al., 2021)

In terms of long COVID prevalence, a quarter of people who have had the virus in a 2021 study had symptoms that continued for at least a month but as many as 10% were still unwell after 12 weeks. (Rajan et al., 2021)

This has come in the form of a range of overlapping symptoms: generalized chest and muscle pain, fatigue, shortness of breath, and cognitive dysfunction, and the mechanisms affecting multiple systems such as inflammation, thrombosis, and autoimmunity. (Rajan et al., 2021)

Patients globally have reported a range of new, returning and/or ongoing symptoms such as altered smell and taste, cough, myalgia (muscle aches) and diarrhoea. (Routen et al., 2021) Other studies have reported other symptoms: appetite loss and confusion and disorientation. (Jones et al., 2021)

Of greater concern are reports of single or multiple organ impairment, even in non-hospitalized patients (Routen et al., 2021), with impacts on major organs such as the heart, lungs, kidney, liver, pancreas and liver. (Crook et al., 2021)

The Global Registry of COVID-19-Related Diabetes was even established for new-onset diabetes in 2020 due to a large number of people developing diabetes post-diagnosis – the CoviDiab Registry. (Rubino et al., 2020)

Hospital readmittance rates at the follow-up of 140 days were as high as 29.4%, 12.3% of which died. (Ayoubkhani et al., 2021), and, in a 2021 literature review study, 37% patients reported reduced quality of life; 26% of studies mentioning reduced pulmonary function specifically. (Michelen et al., 2021)

Women and health care workers seem to be at greater risk and long COVID has serious impacts on people's ability to go back to work or have a social life. (Rajan et al., 2021)

Another 2021 study identified the key risk predictors of longer-term long COVID: being age 40 years and over, frailty and prior visits to A&E and hospital admission for COVID-19. (Jones et al., 2021)

Finally, as many as 2million people living in private households in the UK (3.1% of population) reported experiencing long COVID symptoms continuing for more than 4 weeks after infection that were not explained by something else) as of 31 July 2022. (Office for National Statistics, 2022)

e. ELDERLY

A 2020 found that increasing age was strongly associated with COVID-19 death risk, with those 80 years old and having a 20 times greater risk compared to 50–59-year-olds. (Williamson et al., 2020)

UCL and the United Nations Population Fund (UNFPA) conducted a survey on loneliness for older people (65-85 years) in six countries/territories in Eastern Europe and Central Asia: Albania, Azerbaijan, Bosnia & Herzegovina, Georgia, Serbia, and Kosovo, in 2021. The survey found that 79 per cent of older people were at least moderately lonely, with 18 per cent being extremely lonely, which was consistent across the six countries/territories. (UCL & UNFPA EECA, 2022)

A 2022 EU study found that, among those aged 80 and over in the summer of 2020, one third had not left their home since the pandemic began. (Eurofound, 2022)

The digital generation gap also hindered government efforts to assist the elderly demographic. Low-tech e-healthcare (by phone) facilitated access to healthcare during the COVID-19 in the EU, but half of users in one study of those aged 50 and over reported that it did not fully meet their needs. (Eurofound, 2022)

Unexpected Positives for Families

a. RELATIONSHIPS

Lockdown seems to have afforded some people with more time to spend on activities they value. For example, the majority of the sample in a 2021 Scotland study of 3342 adults reported that they had been able to spend more quality time with their partner. In addition, participants reported that they had been able to spend more time doing enjoyable things, spend more time in nature or the outdoors, and increase their physical activity. Lockdown also seems to have provided participants with the time to reflect and the majority of participants in this study reported that they were now more appreciative of things usually taken

for granted. Groups with higher levels of positive change were females, those from younger age groups, people who were married or living with their partner, those who were employed, and those reporting better health. (Williams et al., 2021)

b. HOME-SCHOOLING

One interesting finding from a survey sent to 8972 adolescents in Swiss high schools was that, during the COVID-19 lockdown, participants not commuting and travelling to school slept significantly longer and had less caffeine and alcohol use than before the pandemic. (Albrecht et al., 2022)

c. MENTAL HEALTH

A 2022 study of 2567 adolescents aged 12 to 24 found that some Chinese adolescents appear to have experienced positive changes in various life outcomes during the COVID-19 pandemic, especially those with high levels of resilience. 3 groups emerged in the study: “limited positive changes” were found in 33.3% of participants. Participants in this profile showed positive changes in only a few aspects of life outcomes, mainly concerning personal health and social responsibility, and such changes were moderate. The second profile was “overall strong positive changes”, with 17.2% of the participants. The third profile was “partial positive changes”, with about half of the participants (49.5%). Participants in this profile showed positive changes in several aspects related to self-care, positive virtues, social responsibility and emotional and psychological well-being. Participants overall showed relatively higher positive changes in life outcomes related to personal health and survival (e.g., paying more attention to physical health) and to social and ideological issues (e.g., becoming more patriotic). (Li, Dou & Liu, 2022)

Prevention and Treatment Around the World

Vaccination has been rolled out worldwide. New therapies and treatments are emerging whilst an increasing number of alternative treatments are being shared globally, some much more effective than others.

a. i. CIRRENT VACCINES

As of 7 September 2022, 67.7% of the world population has received at least one dose of a COVID-19 vaccine.

12.61 billion doses have been administered globally, and 4.67 million are now administered each day.

Only 21% of people in low-income countries have received at least one dose. (Ritchie et al., 2022)

The most popular vaccines available on the EU market at the moment are:

- Pfizer/BioNTech (10 microgram & 30 microgram doses)
- Moderna
- Oxford/AstraZeneca
- Johnson & Johnson
- Sputnik V
- Sinovac
- Sinopharm/Beijing
- Novavax
- Covaxin. (Ritchie et al., 2022)

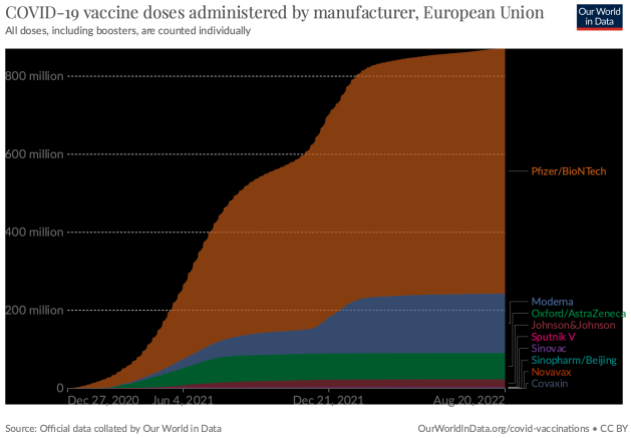


Figure 3: COVID-19 vaccine doses administered by manufacturer as of 20 August 2022, European Union. © Our World In Data, Ritchie et al., 2022

In a 2021 US study of 9667 hospital admissions for severe COVID-19 between April 1 2021 and Oct 26 2021, it was found that vaccine effectiveness declined over time, from 94% at days 50-100 after vaccination to 80.4% by days 200–250 after vaccination. The risk of severe breakthrough infection despite vaccination was most strongly associated with an age older than 80 years, vaccine type, time since vaccination and comorbidities including organ transplantation, cancer and immunodeficiency. (Wright et al., 2022)

Vaccine effectiveness comparison has yielded differing results and there is much global debate over which one works best. A 2021 study ranking by reported efficacy gives relative risk reductions for infection from these vaccines as 95% for Pfizer/BioNTech, 94% for Moderna, 91% for Sputnik V, 67% for J&J and 67% for Oxford/AstraZeneca vaccines. (Olliaro, Torreele & Vaillant, 2021)

However, another 2021 global study found that the Sputnik V vaccine was most effective in preventing symptomatic COVID-19 compared to other vaccines, with Moderna, Novavax, Pfizer/BioNTech, J&J and Sinopharm/Beijing following in terms of effectiveness in that order. (Rotshild et al., 2021).

A 2022 study estimated that vaccination prevented 14.4 millions deaths globally in the 1st year of vaccination rollout, a global reduction of 79% of possible deaths without the vaccine in total. (Watson et al., 2022)

Furthermore, vaccine effectiveness for long COVID risk reduction appears to vary greatly with dosage. In a 2022 study, the 1st dose was associated with an initial 12.8% decrease for long COVID risk, the 2nd with an initial 8.8% decrease, with subsequent decreases by 0.8% per week. (Ayoubkhani et al., 2022)

As outlined by the World Health Organisation, there are 3 main approaches to designing a vaccine: whether they use a whole virus or bacterium; just the parts of the germ that triggers the immune system; or just the genetic material that provides the instructions for making specific proteins and not the whole virus. (WHO Feature, 2022)

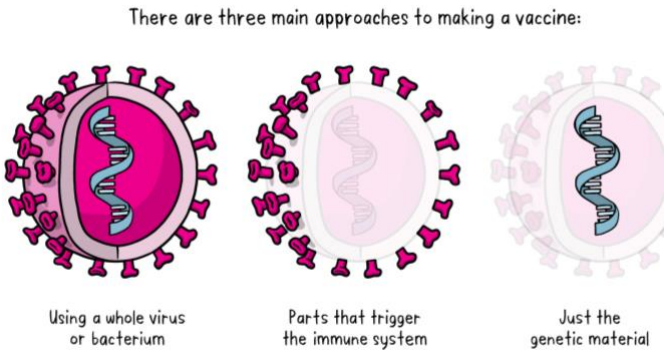


Figure 4: World Health Organisation vaccine illustration. © WHO Feature, 2022

1. WHOLE-MICROBE APPROACH

a. Inactivated vaccine such as Sinovac, Sinopharm Beijing, Johnson & Johnson, Covaxin

This inactivates or kills (using chemicals, heat or radiation) the disease-carrying virus or bacterium. Examples include the flu and polio vaccines. However, it usually requires 2 or 3 doses to be effective. (WHO Feature, 2022)

b. Live-attenuated vaccine (not approved in EU/UK yet)

This uses a living but weakened version of the virus or one that's very similar. Examples include the measles, mumps and rubella (MMR) vaccine and the chickenpox and shingles vaccine. However, it may not be suitable for people with compromised immune systems. (WHO Feature, 2022)

c. Viral vector vaccine such as Oxford AstraZeneca and Sputnik V

This uses a safe virus to deliver specific sub-parts – called proteins – of the germ of interest so that it can trigger an immune response without causing disease. An example is the Ebola vaccine. (WHO Feature, 2022)

2. SUB-UNIT APPROACH *such as Novavax*

Uses specific parts (the subunits) of a virus or bacterium that the immune system needs to recognize. Examples include the childhood whooping cough, tetanus, diphtheria and meningococcal meningitis vaccines. (WHO Feature, 2022)

3. GENETIC APPROACH (NUCLEIC ACID VACCINE) *such as Moderna and Pfizer BioNTech*

This uses a section of genetic material that provides the instructions for specific proteins, not the whole microbe. A nucleic acid vaccine delivers a specific set of instructions to our cells, either as DNA or mRNA, for them to make the specific protein that we want our immune system to respond to. Before the COVID-19 pandemic, none had yet been through the full approvals process for use in humans. (WHO Feature, 2022) (British Society for Immunology, 2021)

a. ii. VACCINES IN THE FUTURE

Manufacturers such as Pfizer/BioNTech, Moderna and AstraZeneca are currently modifying vaccines for further variants and easier administration and transportation. Key challenges include: maintaining finances, running trials, ensuring efficient and transparent authorisation and monitoring effectiveness. (Vagnoni, 2022)

Pfizer/BioNTech and Moderna have started clinical-trials for Omicron-specific vaccines, for example. (Vagnoni, 2022)

Furthermore, current COVID-19 vaccines are injected in the muscle and generate antibodies that circulate mainly in the blood – this administration route is not optimised to generate antibodies in the airways, which are the entry point.

Mucosal vaccines (either intranasal or oral) therefore have the potential to trigger a robust immune response at the entry site; the WHO's vaccine tracker states that 8 intranasal COVID-19 vaccines are currently in clinical trials, including the University of Oxford/AstraZeneca vaccine. (Vagnoni, 2022)

Other administration routes are also being explored globally, including oral vaccines and skin-patches. (Vagnoni, 2022)

Other vaccine types are being explored, these include adjuvant-based vaccines aiming to enhance the immune system response, vaccines focused on T-cell response because T-cells are able to easily

recognise the part of the virus less likely to mutate, multivalent vaccines able to provide protection against different variants at the same time as well as universal coronavirus vaccines which could be able to recognise all coronaviruses or subfamilies of them such as those causing COVID-19 and the common cold simultaneously. (Vagnoni, 2022)

b. COMMON TREATMENTS

Several therapies and drug treatments are now common and available worldwide to treat people at home or at hospital with COVID-19, or to prevent infections in vulnerable people becoming more serious. (National Institute for Health & Care Excellence, 2022) (Kanja & Bunn, 2022)

These include:

- *Respiratory support*

Non-invasive respiratory support is thought to alleviate respiratory distress, improve oxygenation, and reduce need for invasive mechanical ventilation in critically-ill patients. (Zampieri & Ferreira, 2022)

Side-effects: delay tracheal intubation and increase in patient self-inflicted lung injury. (Zampieri & Fereira, 2022)

Evidence on respiratory support effectiveness is mixed. A 2022 study found that non-invasive support, utilized with vigilance and under appropriate conditions, is an acceptable alternative to early invasive support in the management of mild to moderate acute hypoxemic respiratory failure due to COVID-19. (Sullivan et al., 2022)

Another study found that, although non-invasive support improved patient oxygenation, stresses and strains inside the lung could still be increased to potentially damaging levels. (Weaver et al., 2022)

- *Antiviral medicine*

Molnupiravir is an antiviral medicine that works by stopping COVID-19 from growing and spreading. Used as early as possible after infection, it is thought to help prevent more severe symptoms developing. Molnupiravir is conditionally recommended for non-severe patients at highest risk of hospitalization, although possible risks for young and healthy patients, including children, and pregnant and breastfeeding women have been identified, and it is currently not recommended for these groups. (BMJ Newsroom, 2020)

Side effects: dizziness, headaches and diarrhea. (NHS, 2021)

2020 studies have shown that molnupiravir reduces risk of hospital admission (43 fewer admissions per 1,000 patients at highest risk) and time to symptom resolution (average 3.4 fewer days). (BMJ Newsroom, 2020)

2020 global studies have also found that both antiviral medicine remdesivir and convalescent plasma were associated with improved outcomes for specifically hospitalized COVID-19 patients. (Kim, An, Kim & Hwang, 2020)

- *Monoclonal antibody therapy*

Monoclonal antibodies (nMAb) are thought to help manage symptoms and reduce risk of becoming seriously ill for those at high-risk by targeting viral spike protein, which prevents viral entry. (NHS, 2022) (Brobst & Borger, 2022) (BMJ Newsroom, 2021a)

Side effects: acute anaphylaxis, serum sickness and organ-specific adverse events such as cardiotoxicity. (Hansel et al., 2010) (Brobst & Borger, 2022)

A 2021 study found that monoclonal antibodies reduce the risk of disease progression among high-risk patients with mild-to-moderate symptoms. (Gupta et al., 2021)

The 2021 monoclonal antibody treatment AZD7442/Evusheld, a combination of 2 long acting antibodies (LAABs) tixagevimab and cilgavimab, was found to reduce the risk of developing symptomatic COVID-19 by 83% vs. the placebo when taken as a preventive measure by those with low immunity. (Mahase, 2021) When used within 3 days, there was a 88% reduced risk of severe COVID-19 or death. The EU, however, has not yet purchased doses for the entire bloc, although Germany, France and Spain have bought doses for use for vulnerable patients in their countries directly from developer AstraZeneca. (Collis, 2022)

c. EMERGING TREATMENTS

Emerging treatments becoming more widely tested and used globally include (National Institute for Health and Care Excellence, 2022) (Kanja & Bunn, 2022):

- *Systemic corticosteroid therapy*

Systemic corticosteroid therapy is thought to reduce mortality in hospitalized patients with COVID-19 who require supplemental oxygen by mitigating systemic inflammatory response that can lead to lung injury and multisystem organ dysfunction. It can come in multiple forms: tablets, inhalers, injections, creams etc. (National Institutes of Health, 2022)

Side effects: increased appetite, mood changes and difficulty sleeping. (NHS, 2020)

Early 2020 global studies found such anti-inflammatory agents (corticosteroids, tocilizumab, anakinra) were associated with improved outcomes for hospitalized COVID-19 patients specifically. (Kim, An, Kim & Hwang, 2020)

A 2021 study found that corticosteroid therapy was associated with reduction in mortality of severe COVID-19 patients, especially when administered early. (Li et al., 2021)

- *Convalescent plasma*

Convalescent plasma contains antibodies from patients who have recovered from COVID-19. High-titre convalescent plasma (i.e., plasma with high antibody titres) was early in the pandemic granted emergency-use only authorisation in the US for treatment of hospitalised patients early in the disease course and for use for low-immunity patients only. (U.S. Food and Drug Administration, 2021a)

Side effects: severe allergic reactions, anaphylaxis and phlebitis. (Nagoba et al., 2020)

Current evidence shows no significant improvement in survival and other important measures so the World Health Organization now advises against its use even for those most at risk. (BMJ Newsroom, 2021b)

- *Antiparasitic drugs*

Ivermectin has approved for human use to treat infections from parasitic worms, head lice and skin conditions like rosacea. It is not officially authorized for use in preventing or treating COVID-19 in a country yet. (U.S. Food and Drug Administration, 2021b)

Side effects for overdose can be quite severe: nausea, vomiting, diarrhea, hypotension, allergic reactions dizziness, seizures, coma and even death. (U.S. Food and Drug Administration, 2021b)

However, the US Food & Drug Administration has received multiple reports of patients hospitalized after self-medicating with ivermectin intended for livestock due to misinformation about its effectiveness against COVID-19. (U.S. Food and Drug Administration, 2021b)

- *Serine protease inhibitors*

Serine protease inhibitors are thought to be effective in inhibiting inflammation, coagulopathies and multiple organ failure from COVID-19. (Sagawa, Inoue & Takano, 2020)

Side effects: gastrointestinal problems, rash and metabolic disturbances. (Manchanda, 2002)

A 2020 study of serine protease inhibitor camostat found that it was effective in blocking entry of COVID-19 in vitro to the high-risk areas of the upper respiratory tract and lungs. (Hoffmann et al., 2020)

- *Mesenchymal stem cell therapy*

Mesenchymal stem cells, including those from human umbilical cords, are thought to reduce pathological changes that occur in the lung due to COVID-19, and inhibit the cell-mediated immune inflammatory response. (Musiał-Wysocka, Kot & Majka, 2019)

Side effects can be serious: tumorigenesis, genetic instability and chromosomal aberrations. (Musiał-Wysocka, Kot & Majka, 2019)

A 2022 study found that mesenchymal stem cell administration improved in whole-lung lesion volume compared with the placebo group by day 10 in patients with severe COVID-19, and reduced the proportion of solid component lesion volume at 3 month follow-up as well. (Shi et al., 2022)

d. ALTERNATIVE MEDICINE

Around 80% of the world's population are estimated to be using traditional medicine. 170 of the 194 WHO members have reported use of traditional medicine, for instance. (WHO, 2022b) Popular examples used in India include: drinking herbs and spices such as kada (ayurveda), turmeric, ginger, coriander, neem, giloy tea leaves etc., nasal application of medicated oil and cow's ghee for immunity boosting and cold symptoms, and yoga for overall health benefits.

"Alternative" remedies are also being used to prevent or treat COVID-19 globally. But there is mixed evidence regarding the success of these alternative remedies in preventing, alleviating or curing COVID-19. In fact, some of them may not be safe to consume. There is a critical need to tackle such misinformation on a global scale and the belief that, although many herbal or dietary supplements come from natural sources, them being "natural" does not always mean that these products are a safer or better option. (National Center for Complementary and Integrative Health, 2022)

Some commonly use alternative remedies include:

- *Herbal therapies and teas*

A 2022 study found that Traditional Chinese Medicine or TCM (herbal therapy and acupuncture) showed good results in decreasing the rate of COVID-19 progression, time to the resolution of fever from COVID-19 and the rate of progression to severe COVID-19 cases. (Jeon et al., 2022)

- *Vitamin D*

In 2020, the UK National Institute for Health and Care Excellence (NICE), in collaboration with Public Health England and the Scientific Advisory Committee on Nutrition, advised taking vitamin D supplements to maintain bone and muscle health. (The Lancet Diabetes & Endocrinology, 2021)

In 2021, extremely clinically vulnerable people were also advised by the NICE to opt-in to receive a free 4-month supply of daily vitamin D supplements. However, the report emphasised that there is insufficient evidence to support vitamin D supplementation in COVD-19 prevention or treatment directly. (The Lancet Diabetes & Endocrinology, 2021)

- *Silver products*

Silver nanoparticles such as AgNPs are thought to interact with structural proteins on surface of viruses to inhibit infection in the early phase. (Almanza-Reyes et al., 2021)

A small 2021 study found that mouth and nasal rinsing with AgNPs helped with the prevention of COVID-19 in health personnel exposed to patients diagnosed with COVID-19 in Mexico. (Almanza-Reyes et al., 2021)

Policy Recommendations

a. ADDRESSING HEALTH IMPACTS

The World Health Organisation has issued the following key global policy recommendations for governments in terms of addressing the health impacts resulting from long COVID:

1. Leverage the current response to strengthen both pandemic preparedness and health systems.
2. Invest in essential public health functions including those needed for all-hazards emergency risk management.
3. Build a strong primary health care foundation.
4. Invest in institutionalized mechanisms for whole-of-society engagement.
5. Create and promote enabling environments for research, innovation and learning.
6. Increase domestic and global investment in health system foundations and all-hazards emergency risk management. (WHO, 2021b)

In addition, Routen et al. (2021) have recommended that governments and research institutions focus on multidisciplinary research collaboration with patients at the core, as well as co-producing the research as equal partners, in order to develop a comprehensive approach to unravelling the complexity and heterogeneity of long COVID. (Routen et al., 2021)

Finally, Rajan et al. (2021) wrote about the critical need for multidisciplinary, multispecialty approaches to assessment and management focused on reducing long COVID impacts in particular, this including the development, in association with patients and their families, of new care pathways and contextually appropriate guidelines for health professionals, especially in primary care to enable case management to be tailored to the manifestations of disease and involvement of different organ systems; the creation of appropriate services, including rehabilitation and online support tools; action to tackle the wider consequences of long COVID, including attention to employment rights, sick pay policies, and access to benefit and disability benefit packages; involving patients both to foster self-care and self-help and in shaping awareness of long COVID and the service (and research) needs it generates; implementing well-functioning patient registers and other surveillance systems; creating cohorts of patients; and following up those affected as a means to support the research which is so critical to understanding and treating long COVID. (Rajan et al., 2021)

b. ADDRESSING INEQUALITIES

The Co-POWeR (Consortium on Practices for Wellbeing and Resilience in BAME Families and Communities) study, led by the University of Leeds, recommends the following be implemented in terms of addressing the long-term health, social and economic impact of COVID-19 on particularly vulnerable communities in the UK:

1. Recognise institutional racism exists in social care and health services. Strengthen reporting mechanisms, anti-racism training and care workers' rights to counter this. Engage with community organisations to ensure culturally sensitive access to information and services.

2. Recognise importance of the work of both paid and unpaid carers. Implement living wage - £15/ hour for care workers; replace unpaid carers' allowance system with equitable and structured compensation system, including pay and health & safety training.

3. Reintroduce face-to-face GP appointments, with provision of translation and interpretation support. Improve mobility transport for older people and carers to hospitals and community groups – to improve mental health.

4. To enhance trust in public authorities, the police should not have any role in enforcement or monitoring of compliance with public health law and guidance, which should be developed through consultation with people of all ages across B.A.M.E families and communities and translated into relevant community languages as they appear.

5. Improve dissemination of information about support, with appropriate language translation and interpretation; a 'care start' hub where all information is available.

6. Carer's allowance to be increased for unpaid carers so they can sustainably look after older people and themselves.

(Solanke et al., 2022)

The CHAMPIONS project is a national project looking at the impact of COVID-19 and living through lockdown on children under 5 who are living in temporary accommodation (TA) due to experiencing homelessness. Their workshops with families and professionals from the housing, social care, education and health sectors have highlighted the following policy recommendations:

1. The need to increase access to support services – e.g., outreach work.
2. The need for policymakers to keep track of people as isolation carries risk
3. The need to set up data tracking and notification systems across systems and professionals during moves – to avoid the trauma of repeating challenging experiences.

4. The need to improve communication between professionals and build on local networks and relationships.
5. The need to identify clearly statutory responsibility (e.g. the NHS, local authorities, schools etc.
6. Develop materials to aid and direct families to helpful information and support as many families are unaware of benefits they are entitled to, and of assistance that is available to them such as food and baby banks, moving services, and legal advice.
7. Implement a mandatory minimum standards framework for children living in TA, stating clear responsibility of the housing sector as the main contact point. This should include provision of necessities such as mould and vermin-free housing, kitchen appliances, and safe space to play and learn.
8. Change the narrative and stigma around families experiencing homelessness, families have reported experiencing stigma from the individuals who are supposed to support and aid them. (CHAMPIONS Project Update Report, 2021)

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