

Direct and indirect impacts of COVID-19 on health and wellbeing

Rapid evidence review

July 2020 (Version 2)

Produced on behalf of the Health & Equity in Recovery Plans Working Group under the remit of the Champs Intelligence & Evidence Service

About this report

This rapid evidence review provides a summary of what the evidence tells us about the direct and indirect impacts of COVID-19 on health and wellbeing. It was conducted on behalf of the **Health & Equity in Recovery Plans Working Group** under the remit of the **Champs Intelligence & Evidence Service** provided by the Public Health Institute at Liverpool John Moores University (LJMU), which is commissioned by the Champs Public Health Collaborative Intelligence Network.

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Executive summary

Introduction

This rapid evidence review identifies what the current evidence tells us about the direct and indirect impacts of COVID-19 on health and wellbeing. Rapid searches were carried out of the academic and grey literature. COVID-19 evidence sources (e.g. COVID-END) were primarily searched between 18 May and 8 June 2020 to scope and collate evidence. These sources were analysed and used to prepare this rapid evidence review.

As well as the direct impacts of COVID-19 disease, the social distancing and lockdown measures have had a huge and unequal impact of their own on individuals, households and communities through the restrictions imposed on our everyday social and economic activities. To begin to understand the full extent of the onward impacts on health and wellbeing, we have examined the impacts of COVID-19 on the 'wider determinants of health', as these are the factors that largely determine our opportunities for good health and wellbeing.

Key findings

Impacts on family, friends and communities

The COVID-19 pandemic has had both positive and negative impacts on social and community networks. There is evidence of increased civic participation in response to the pandemic and a positive impact on social cohesion. Thousands of new volunteer groups have been established in communities across the country and the majority of adults believe the country will be more united and kinder following the pandemic.

However, social isolation and loneliness have impacted on wellbeing for many. There are also serious concerns about how the combination of greater stress and reduced access to services for vulnerable children and their families may increase the risk of family violence and abuse. Compounding this, safeguarding issues have been largely hidden from view during lockdown.

Impact on money and resources

The economic impact of the social distancing and lockdown measures has seen an increase in people signing up for Universal Credit and Jobseeker's Allowance benefits. Young workers and low earners have been impacted the most and household incomes have fallen particularly among the lowest earners. The predicted economic downturn will have significant health impacts in the short and longer term.

Impact on education and skills

There are various strands of emerging evidence to suggest that children and young people may be hit hardest by the social distancing and lockdown measures. School closures risk exacerbating existing inequalities in educational attainment. Surveys suggest that the richest households are more likely to be offered active help from school, and that they are spending more hours a day on home learning.

Impact on our surroundings

People have spent far more time at home during lockdown which may play a role in exacerbating the health impacts of poor-quality housing. Further, an estimated 12% of households in England have had no access to a private or shared garden during lockdown. Although access to public parks is more evenly distributed, inequalities exist in access to good quality and safe public green space. Air was cleaner and healthier in early lockdown, but global emissions have since rebounded to close to 2019 levels.

Impact on transport

The impact on transport has been mixed. Falls in road journeys during the early period of lockdown have generally been short-lived and there are concerns about the lasting damage that may be done to public transport systems. A positive impact has been seen with more people cycling, but it remains to be seen whether the changes to cycling infrastructure will have a lasting impact.

Impact on the food we eat

Lockdown has exacerbated food insecurity and food need; particularly among children. The number of adults who are food insecure is estimated to have quadrupled. Food banks have experienced a rapid increase in demand but alongside this have experienced reduced volunteer numbers.

Access to health and social care

The COVID-19 pandemic has both disrupted and changed the delivery of NHS and social care services. Concerns have been raised about significant drops in A&E use and the health care needs of people with long-term conditions have been significantly impacted.

Individual health behaviours

The wider determinants of health both shape the distribution of, and trigger stress pathways associated with the adoption of unhealthy behaviours. Lockdown has impacted on these behaviours in different ways. People who were drinking alcohol the most often before lockdown are also the ones who are drinking alcohol more often and in greater quantities on a typical drinking day. People already drinking alcohol the least often have cut down in the greatest number. The impacts on smoking appear to be more positive, with smokers showing an increased motivation to quit and to stay smoke free during the pandemic.

Findings are less clear in relation to diet. Non-UK studies show decreased physical activity and increased eating and snacking during lockdown. In England, physical activity behaviours among children and adults have been disrupted by lockdown. Although some groups have continued to be physically active, groups that were least active before lockdown are finding it harder.

Health and wellbeing outcomes

General and physical health

It is expected that long-term conditions will have worsened for many people over the course of lockdown and there are particular concerns about the impact of delayed cancer diagnoses

and the knock-on effects as NHS services are resumed. There is also increasing evidence that people who experience mild to moderate COVID-19 disease may experience a prolonged illness with frequent relapses.

Mental health and wellbeing

Experience from previous pandemics and economic shocks suggests that mental ill health will increase widely during the pandemic, although the scale is difficult to predict. A range of factors may be drivers of poor mental health, including those directly related to COVID-19 (e.g. more generally or because of the loss of family and friends to COVID-19) and those indirectly related through the effects of the social distancing and lockdown measures (e.g. through social isolation or because of financial insecurity).

Conclusions

The impacts of COVID-19 have not been felt equally – the pandemic has both exposed and exacerbated longstanding inequalities in society. As we move from the response phase into recovery, the direct and wider impacts of the pandemic on individuals, households and communities will influence their capacity to recover. By providing a summary of what the evidence tells us about the direct and indirect impacts of COVID-19 on health and wellbeing, this review aims to assist with the development of priorities and mitigating actions to support recovery.

Introduction

Governments around the world have introduced social distancing and lockdown measures to control the spread of COVID-19. While these have been effective in reducing COVID-19 infections, the control measures have had a huge impact of their own on individuals, households and communities through the restrictions imposed on our everyday social and economic activities.

The impacts of COVID-19 have also not been felt equally. Neither the direct burden of the disease nor the indirect effects of the control measures are evenly spread across the population, with the greatest impacts falling on the least privileged in society (1, 2). As we move from the response phase into recovery, the direct and wider impacts of the pandemic on individuals, households and communities will influence their capacity to recover. An understanding of these impacts is therefore required to develop priorities and mitigating actions to support recovery.

Purpose of this review

The health and wellbeing impacts of COVID-19 have been characterised as following a series of overlapping waves (as shown in Figure 1). The first wave is the immediate health impact and disease burden of COVID-19. This is followed by a second and third wave of urgent non-COVID conditions and patients with exacerbated chronic disease, respectively, arising from the disruption to health and care services. In a fourth wave, we see the burden that arises from the impact of the COVID-19 control measures on the wider determinants of health.

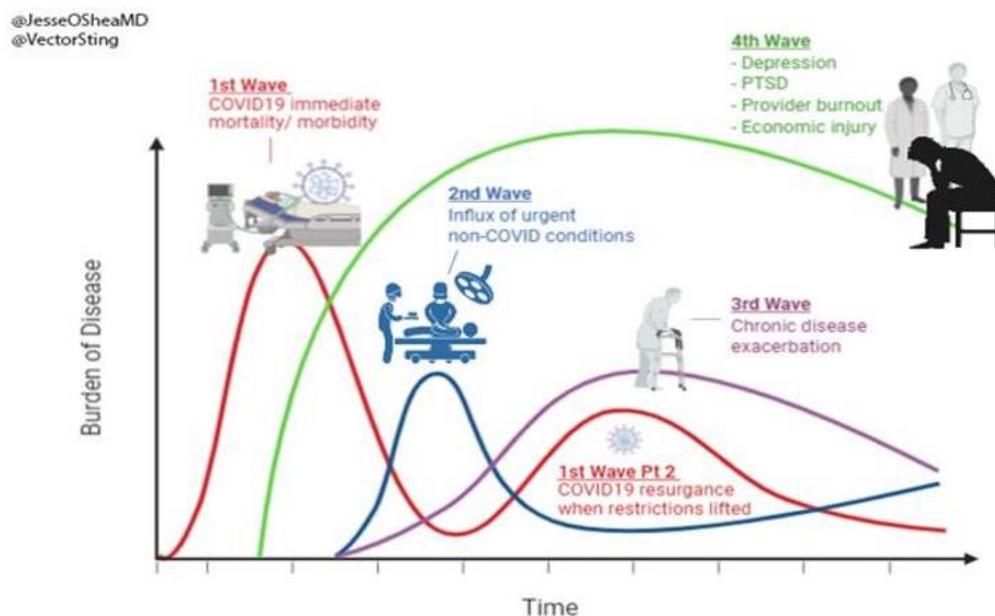


Figure 1. Expected COVID-19 burden of disease over time (credited to Tseng, Victor [@VectorSting])

This review considers both the direct and indirect impacts of the COVID-19 pandemic. First, we discuss the direct health and wellbeing impacts associated with the disease itself (wave 1). Second, we examine the impacts of the COVID-19 control measures on the wider determinants of health and wellbeing (the factors that drive wave 4). Third, we consider what is known at this stage about the indirect health and wellbeing impacts that may arise in the medium to longer term, drawing on what we know about the health and wellbeing impacts of other pandemics and crises (waves 2, 3 and 4).

Methodology

Rapid searches were carried out of the academic and grey literature. COVID-19 evidence sources (e.g. COVID-END) were primarily searched between 18 May and 8 June 2020 to scope and collate evidence. These sources were analysed and used to prepare this rapid evidence review.

This rapid evidence review has been carried out at pace and the evidence presented in this review should not be viewed as final or exhaustive.

Characterisation of indirect impacts

This rapid evidence review draws on health impact assessment (HIA) terminology to describe the evidence available for the collated health and wellbeing impacts of the COVID-19 control measures. We use the following descriptors in the summary tables presented in Section 3 of the report as follows:

Type of impact:

Positive	Impacts that are considered to improve health and/or wellbeing status or that provide an opportunity to do so.
Negative	Impacts that are considered to have a detrimental impact on health and/or wellbeing.
Unclear	The outcome of the impact cannot be determined at this stage.

Likelihood of impact:

Definite	Strong direct evidence (e.g. from a range of sources) or direct evidence from official statistics.
Probable	Good direct evidence to support the impact (e.g. from primary research studies or representative cross-sectional study)
Possible	Direct evidence to support the impact but drawn from limited source(s) (e.g. news articles, blogs or commentaries).
Speculative	No direct evidence but issue raised or reported as a potential impact.

Direct health impacts of COVID-19 infection

COVID-19 illness

Anywhere between 25% to 80% of people with COVID-19 are asymptomatic and unaware that they have coronavirus. The World Health Organization (WHO) (3) report that while most people with COVID-19 develop only mild (40%) or moderate (40%) disease, approximately 15% develop severe disease that requires oxygen support, and 5% have critical disease with complications such as respiratory failure, acute respiratory distress syndrome, sepsis and septic shock, thromboembolism, and/or multiorgan failure, including acute kidney injury and cardiac injury. A BMJ blog reports that there is growing evidence of a number of people who have had mild to moderate COVID-19 disease experiencing a prolonged and relapsing course of illness (4). Children and infants typically experience mild illness. However, a small number of children have been identified who have developed a significant systemic inflammatory response following COVID-19 infection (5, 6).

COVID-19 severe disease and death

WHO report that older age, smoking and underlying long-term conditions (such as diabetes, hypertension, cardiac disease, chronic lung disease and cancer) have been reported as risk factors for severe disease and death (3). At all ages, COVID-19 related hospitalisation in England and intensive care admissions have been higher among men (7). A quarter (25%) of critical care patients with COVID-19 are from the most socioeconomically deprived fifth of areas and 15% are from the least deprived (8). Many of those who leave hospital following treatment for COVID-19 severe disease will need aftercare and ongoing support.

Public Health England (PHE) report that male sex and increasing age are known risk factors for death (9). In England, the majority of excess deaths¹ (75%) have occurred in people aged 75 years and over. Further analysis by PHE (9) shows that there are regional inequalities in deaths from COVID-19. Deaths rates from COVID-19 have been highest in London, the North West, the West Midlands and the North East. In the North West, there have been 1.7 times as many deaths as in the same period in 2019. Rose et al. (10) report that ethnic and socioeconomic inequalities play a large role in explaining regional variations in the impact of COVID-19. Their research (11) has found that local authorities with a greater proportion of residents from ethnic minority backgrounds have higher rates of death from COVID-19, as did places with a greater proportion of residents experiencing deprivation relating to low income.

The PHE analysis (9) also shows that death rates are higher than expected among Black and Asian ethnic groups compared to White ethnic groups (9). Among males, deaths were 4 times higher in Black males, 3 times higher in Asian males and 2 times higher in White males. Among females, deaths were 3 times higher than expected in Black, Mixed and Other

¹ Excess deaths = a measure of the additional deaths within a given period, compared to the number that would usually be expected.

females, and 2 times higher in Asian and White females. Death rates from COVID-19 in the most deprived areas are more than double the least deprived areas (9). The PHE analysis shows that there is greater inequality in death rates from COVID-19 than among deaths from all causes.

Neuropsychiatric consequences of COVID-19

Rogers et al (12) report that if COVID-19 follows a similar course to previous coronavirus epidemics, most people should recover without experiencing a COVID-related mental disorder as a sequelae of brain damage or infection. However, WHO report that COVID-19 is associated with mental and neurological manifestations and that anxiety and depression appear to be common among people hospitalised for COVID-19 (3).

Impact of the COVID-19 control measures on the wider determinants of health

Health and wellbeing are largely determined by the complex interaction of individual characteristics, health behaviours and the social, economic and physical (built and natural) environment. Taken together, these are known as the 'wider determinants of health' (Figure 2).

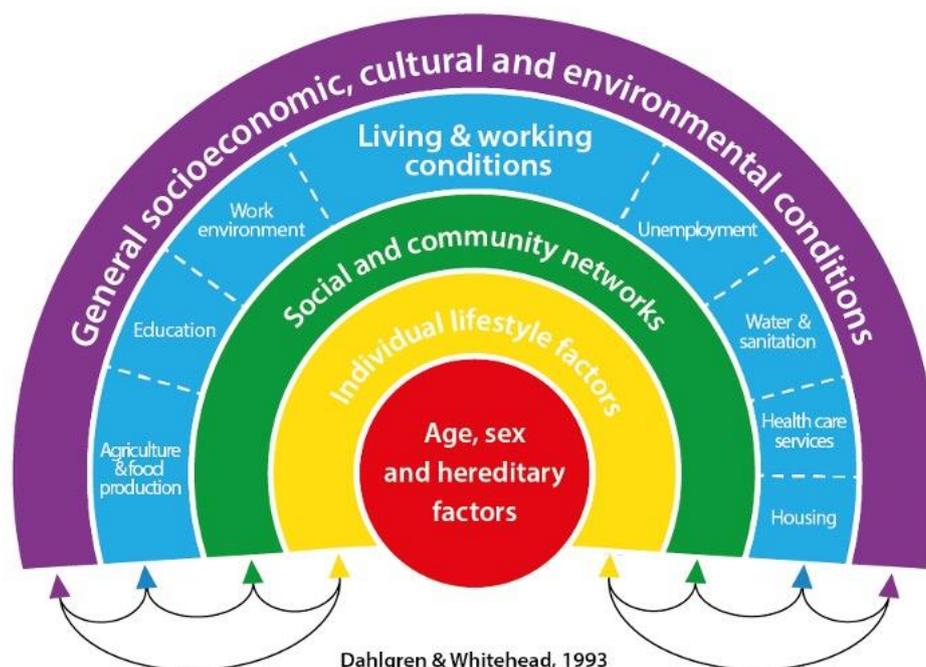


Figure 2. The Dahlgren-Whitehead 'rainbow model' of the determinants of health

Measures taken to control the spread of coronavirus (including the social distancing and lockdown measures, school closures and the cancellation or delay of routine healthcare) have had wide ranging impacts on a number of these wider determinants, including education, household incomes, job security and social contact. The control measures have therefore had their own important consequences for people's ability to lead healthy lives, in addition to the direct impacts of the disease itself on health and wellbeing.

This section examines the impacts of these control measures through their influence on the wider determinants of health, grouped under five domains: **social factors** (impacts on friends, families and communities); **economic factors** (impacts on money, resources and education); **environmental factors** (impacts on our surroundings, transport and the food we eat); **access to health and social care**; and **individual health behaviours**.

Social factors: impacts on friends, families and communities

Social and community networks can have a significant impact on health, and community life is essential for health and wellbeing. The following table summarises the key impacts of COVID-19 on the social determinants of health and wellbeing based on a rapid and limited review of the currently available evidence.

Impact	Type of impact	Likelihood of impact	Findings
Civic participation	Positive	Definite	Thousands of new volunteer groups established (13). Voluntary sector infrastructure report receiving many offers of help.
Social cohesion	Positive	Possible	Majority of adults believe that the country will be more united and kinder once we have recovered from the pandemic (14, 15).
Social isolation and loneliness	Negative	Probable	Wellbeing has been affected by the lockdown measures (16). Young adults, women, people with lower education or income, the economically inactive, people living alone, and urban residents most at risk of being lonely (17). Adults with disabilities are also identified as a group at particular risk of loneliness (18, 19).
Family violence and abuse	Negative	Probable	Domestic and family violence increases following disasters (20, 21). Calls to domestic abuse helplines have increased during lockdown (22).
Social disorder	Unclear	Unclear	Robbery and serious assaults lower than in the same period in 2019 (23). However, risk of criminal gangs recruiting young people out of school possibly increased (24).
Hidden safeguarding issues	Negative	Probable	Access to the safety net of support and supervision of professionals is reduced (25). Vulnerable children and families are likely to be missing out on vital support (26-28).

Civic participation

Since the outbreak of COVID-19, many people have come forward to volunteer, both formally and informally (13). More than 750,000 volunteers have signed up to the NHS Volunteer Responders and volunteer centres, and local voluntary sector infrastructure report being overwhelmed by offers of help. ONS weekly research into the social impacts (14) found early in the lockdown that:

- 64% said other local community members would support them if they needed help during the pandemic;
- 78% thought people are doing more to help others since the pandemic;
- 63% had checked in on neighbours who might need help at least once in the last seven days;
- 38% had gone shopping or done other tasks for neighbours.

The ONS weekly research shows that feelings of community have continued to be high as the stay at home restrictions have been eased (29).

Social cohesion

There has been the sense that “neighbours are connecting and looking out for each other more than usual” (13). The ONS weekly survey showed that 57% of adults believe that Great Britain will be more united and 67% believe it will be kinder once we have recovered from the coronavirus pandemic (14). Polling carried out by ICM for the newly founded /Together campaign found that 60% of people who participated in the survey agreed that with the statement: “Overall, the public’s response to the coronavirus crisis has shown the unity of our society more than its divides” (30).

The All Party Parliamentary Group on Social Integration also reported that the response in communities had demonstrated the importance of the ‘old-fashioned’ ways of communicating (e.g. letters, telephone and knocking on the door) to ensure that no one is excluded (15).

Social isolation and loneliness

During the first month of lockdown, the equivalent of 7.4 million people (14.3% of the entire UK population) said their wellbeing was affected through feeling lonely (termed “lockdown loneliness”² in the Office for National Statistics [ONS] analysis) (16). However, the ONS analysis suggests that “chronic loneliness”³ does not seem to have changed significantly as a result of lockdown. Bu et al. (17) examined risk factors for loneliness, finding them to be similar before and during the pandemic. Young adults, women, people with lower education or income, the economically inactive, people living alone, and urban residents were most at risk of being lonely.

² A measure of the percentage of those who said their well-being had been affected through having felt lonely in the last seven days; this question was only asked to respondents who had already reported that their wellbeing had been affected in the past seven days and that they were “very” or “somewhat worried” about the effect of the coronavirus on their life.

³ A measure of the percentage of those who reported feeling lonely “often or always”.

ONS have also examined the way that the COVID-19 pandemic is impacting on loneliness in different groups (18, 19). In two reports looking at the impact on adults with disabilities⁴, it was found that they were significantly more likely than adults without disabilities to report spending too much time alone; 35% of adults with disabilities reported this compared to 20% of adults without disabilities (19). Adults with disabilities also more frequently reported that their wellbeing had been affected through feeling lonely in the last seven days (49%) in May 2020 compared with April 2020 (30%) and they were more likely to report this concern than adults without disabilities (29%) (18).

More than 2.2 million people ('clinically extremely vulnerable' individuals) were advised by the government to shield during the pandemic. The ONS Shielding Behavioural Survey found that in the overall sample, 61% reported no difference in their mental health and well-being (31). However, among individuals aged under 50 years and aged between 50–59 years, almost half report worsening mental health (46% and 45% respectively) compared with 26% and 23% of those aged 70–74 years and aged over 75 years respectively. In relation to their physical health, 20% of individuals reported being unable to access certain types of care and a further 10% were unable to access any care since being advised to shield. 20% stated that their existing health condition had got worse.

Family violence and abuse

Internationally, research has shown that domestic and family violence increases following a disaster (20, 21). Greater "toxic stress" among families who are already dealing with adversity may increase the risk of neglect and domestic violence (32).

A 60% increase in emergency calls from women subjected to violence by an intimate partner has been reported in European member states (33). Evidence provided to the Home Affairs Select Committee (22) shows that the UK has also seen a surge in reported violence against women.

Calls to the UK National Domestic Abuse Helpline have risen compared to the average, to an average weekly increase of 66% (22). Further, figures presented in the Home Affairs Select Committee report indicate that at least 14 women and two children were killed in suspected domestic abuse incidents in the first three weeks of lockdown (22). This is the largest number of killings in a three-week period for 11 years and more than double the average rate.

Social disorder

A report by the Children's Commissioner for England (24) states that there is a "real risk" of criminal gangs recruiting young people out of school during the lockdown. However, as part of a BBC news report it has been speculated that the control measures could help teenagers caught up in drug violence turn their lives around (23). This reporting was linked to provisional figures for England and Wales from the National Crime Agency, that show for the four weeks to 12 April, robbery and serious assaults were down by 27% and burglary was

⁴Participants who self-reported a long-standing illness, condition or impairment that reduces their ability to carry out day-to-day activities.

down by 37% compared to the same period in 2019. Leading to the suggestion that crime gangs and dealers had been “forced on to the back foot” by the pandemic. However, ongoing research by the National Centre for Gangs Research suggests that county lines drug gangs are finding new ways of doing business, and that grooming and recruitment may have shifted online (34, 35).

Hidden safeguarding issues

There are concerns that child abuse may be going unreported during lockdown. For children already living in difficult circumstances, access to the safety net of support and supervision of professionals from schools, health and social care is reduced by lockdown and school closures (25). A survey by the NSPCC found that a quarter of British adults would not know where to seek help if they thought a child was being hurt or neglected (36).

In response to the Children’s Commissioner Report (24), the Local Government Association (LGA) has raised concerns that vulnerable children are missing out on vital support during the COVID-19 crisis, warning that some councils are seeing up to a 50% decline in referrals of children to social care (26). Research by the Early Intervention Foundation with heads of early intervention and help services, head teachers and practitioners highlights the biggest challenges may be yet to come (27, 28). There was a widespread assumption among the participants that there would be a significant spike in early help and social care referrals once the social distancing and lockdown measures are eased.

Economic factors: impacts on money, resources and education

Economic hardship is highly correlated with poor health. Increased levels of education are strongly and significantly related to improved health. The following table summarises the key impacts of COVID-19 on the economic determinants of health and wellbeing based on a rapid and limited review of the currently available evidence.

Impact	Type of impact	Likelihood of impact	Findings
Educational attainment	Negative	Possible	Inequalities in home learning activities and time spent on learning have implications for educational attainment (37-39). Inequalities in access to electronic devices for home learning (38).
Job security and opportunity	Negative	Definite	Increase in people signing up for Universal Credit and Jobseeker's Allowance benefits (40). Young workers and low earners have been impacted the most (41). Unemployment is predicted to reach just under 10% in the final quarter of 2020 (42).
Household incomes	Negative	Definite	Household incomes have fallen particularly among the lowest earners, with severe losses for single parents (41). The pay of the youngest and oldest workers has been affected the most (41).
Work environment	Unclear	Unclear	Inequalities in the ability to and accessibility of working from home (43).
Predicted economic impact	Negative	Probable	Predicted economic downturn will have significant health impacts in the short and longer term (44).

Education

Various strands of emerging evidence suggest that children and young people may be hit hardest by the measures taken to control the spread of the virus. The closure of schools may widen existing inequalities in educational achievement (45).

Surveys undertaken by the Institute for Fiscal Studies (37), the Sutton Trust (38) and National Foundation for Educational Research (NFER) (39) all suggest that the impact of school closures will hit families in the least well-off households hardest. For example, the survey by the Institute for Fiscal Studies finds that 64% of secondary pupils in state schools from the richest households are being offered active help from schools, such as online teaching, compared with 47% from the poorest households (37). Further, pupil engagement is lower in schools with the highest levels of deprivation (39). Surveys also suggest that children from better-off families are spending more hours a day on home learning than those from poorer families (37, 38). NFER found that teachers are concerned about the engagement of all their disadvantaged pupils, but in particular about low engagement from pupils with limited access to IT and/or a lack of study space at home (39).

The Sutton Trust report (38) also found that in the most deprived schools, 15% of teachers report that more than a third of their students would not have adequate access to an electronic device for learning from home, compared to only 2% in the most affluent state schools. Inequalities in support are also being reflected in the amount and quality of work received by teachers. Half (50%) of teachers in private schools report they are receiving more than three quarters of work back, compared with 27% in the most advantaged state schools, and just 8% in the most disadvantaged state schools.

Job security and opportunity

There was a 69% increase in the number of claims for Universal Credit and Jobseeker's Allowance between March and April, taking the level to over 2 million. (40). According to the Resolution Foundation (46), every single local authority has experienced an increase in the proportion of working-age residents claiming benefits primarily for the reason of being unemployed. The claimant count rise is strongly correlated with pre-pandemic claimant levels and the strength of local labour markets (46).

Lockdown has increased the gender wage gap, as more women have lost their jobs than men. Of parents who were in paid work prior to lockdown, mothers have been one-and-a-half times more likely than fathers to have either lost their job or quit since the lockdown began (47). Mothers are also more likely to have been furloughed. Women are about one third more likely than men to have worked in a sector that is now shut down (17% of women, compared to 13% of men) (47).

Employees aged under 25 years are more likely to be affected by sector shut downs and low earners are more likely than high earners work in a sector that is now closed (41, 48, 49). Job vacancies are down to 8% of what they were last year. The fall has been sharpest in the lowest paid jobs (50, 51).

Household incomes

The closure of businesses and places of work has affected the pay of the youngest and oldest workers the most (41). Household earnings have fallen particularly among the lowest earners, with severe losses for single parents. The lowest earners are over five times more likely to report that they had been hungry but not eaten at some time in the last week (52).

Pressure on working parents' time has been immense (47). Differences in working patterns between mothers and fathers have grown. Mothers in paid work used to work an average of 73% of the hours that fathers worked, but this has fallen to 68%.

A Resolution Foundation survey (53) found that while changes in household income have been distributed fairly evenly across income quintiles, living standards are under the most pressure in lower income households. Home confinement is estimated to cost the average energy consumer an extra £16 per month, from increased usage. Impacts on costs is likely to be higher for people living in homes with poor energy standards (54).

Work environment

People who can do their work from home are most likely to be able to get through the pandemic without severe impacts on their health, job security and earnings. The youngest employees (under 25 years) and those aged 55 years and older are the most limited in what work they are able to do from home (41). Furthermore, there is variance in the ability and accessibility of people to work from home in terms of available workspace, the environment they have to work in, functionality and comfort of home and working space, and the ability to “separate work from home” (43).

Predicted economic impact

The health and social effects of the previous decade of austerity means that already disadvantaged groups are even more vulnerable to the socioeconomic impacts of the COVID-19 pandemic. Without mitigation, any recession accompanying the pandemic will lead to spikes in unemployment and lost income (44).

It has been estimated that 1.1 million more people could face poverty at the end of 2020 as a result of the pandemic; bringing the total number of children living in poverty in the UK to 4.5 million, an increase of almost 5%. Unemployment is predicted to reach just under 10% in the final quarter of this year (42).

Environmental factors: impacts on our surroundings, transport and the food we eat

People’s health is influenced by how their surroundings make them feel and the opportunities they provide. The following table summarises the key impacts of COVID-19 on the environmental determinants of health and wellbeing based on a rapid and limited review of the currently available evidence.

Impact	Type of impact	Likelihood of impact	Findings
Housing security	Negative	Possible	Economic impact may escalate homelessness through an increase in housing payment arrears (55).
Housing quality	Negative	Possible	Increased time at home during lockdown may exacerbate the health impacts of poor-quality housing (55, 56).
Access to green space	Negative	Definite	Inequalities in access to private green space (57). Access to public green space is more evenly distributed (57) but inequalities exist in access to good quality and safe green space.
Digital access	Negative	Possible	Digital inequalities may exacerbate impacts related to health literacy and social isolation (58).
Transport	Unclear	Unclear	Significantly reduced number of car journeys and public transport journeys through lockdown (59). Reductions may be short-lived (60) and lasting damage done to public transport systems. Significant increase in cycling at the weekends and increases seen on weekdays (59).
Air pollution	Unclear	Unclear	Big drops in fine particulate matter and NO ₂ resulting in healthier, cleaner air in the early phase of lockdown (60). Emissions have since rebounded to close to pre-pandemic levels (61).
Recycling and waste disposal	Negative	Definite	Increased fly-tipping across the UK following closure of recycling centres (62, 63).
Food security	Negative	Definite	The lockdown has exacerbated food insecurity and food need; particularly among children (64). The number of adults who are food insecure is estimated to have quadrupled (65). Food banks have experienced a rapid increase in demand and reduced volunteer numbers (64).

Housing security

The economic impact of COVID-19 raises serious concerns about the escalation of homelessness (55). Sudden and severe reductions in income may lead to private renters falling behind on their rent payment.

Housing quality

Increased time at home during lockdown may exacerbate the health impacts of poor-quality housing (e.g. poor air quality, mould, asbestos, inadequate space and lacking in adequate space/water heating and cooling) (55, 56).

Access to green space

In the early weeks of lockdown, 35% of adults said that they had visited a public green space in the past seven days, rising to 53% in the week ending 7 June (14, 29). An estimated 12% of households in England have had no access to a private or shared garden during lockdown (57). 28% of households live within a five-minute walk (300m as the crow flies) of a public park, while 72% live fewer than 15 minutes away (900m). According to analysis by the ONS, parks are most accessible in the poorest areas. With people in the most deprived neighbourhoods of England, twice as likely as those in the least deprived to be within a five-minute walk of a public park (34% compared with 18%). However, the quality of public green spaces is as important as quantity (66), and analysis should take account of the inequalities that exist in access to good quality and safe green space.

Digital access

Digital inequalities in access to networks, devices and IT skills, are likely to be exacerbated by the pandemic. Lack of digital access within lockdown may exacerbate inequalities as IT skills are not being developed, or by reducing access to infection control information (health literacy) and social support networks (58).

Transport

Department for Transport statistics showed a significant reduction in the number of car journeys and journeys by public transport through lockdown (59). Daily road traffic was reduced by as much as 65-70% and rail travel was also down by up to 96%. However, falls in road journeys as a result of the lockdown could be short-lived (60) and lasting damage may be done to public transport systems. There has been a notable increase in cycling at the weekends and on weekdays. Research by Sport England shows a significant increase in the number of people cycling; from 8% to 16% in the seven weeks after the start of lockdown (67). Although government funding has been provided to reallocate road space to cyclists and pedestrians, it is yet to be seen whether the changes to cycling infrastructure will have a lasting impact; data from before the pandemic found that 61% of people felt roads were too dangerous to cycle (68).

Air pollution

Lockdown led to big drops in small particulate matter (PM2.5) in the UK's major cities in late March (60). There were also declines seen in nitrogen dioxide (NO₂). Analysis of data by

National Centre for Atmospheric Science, suggests that the air was cleaner and healthier as a result. However, more recent research shows that globally, emissions had rebounded to within 5% of mean 2019 levels (range 1% to 8%) in early June (61).

A British Lung Foundation survey (69) of over 14,000 people living with lung conditions in the UK, reported that 57% of people with lung conditions had noticed a decrease in air pollution since lockdown. 16% had noticed that their symptoms had improved as a result of the fall in air pollution levels since lockdown and 20% of parents of a child with a lung condition said they noticed an improvement to their child's symptoms.

Recycling and waste disposal

It is estimated that 85% of household waste and recycling centres closed during lockdown and councils also reduced waste collection services. The NFU report anecdotal evidence of increased fly-tipping across the UK, and has concerns for the health, time and cost impact to farmers in clearing up fly-tipping (62). The Countryside Alliance also reported a 300% rise in fly-tipping in some areas after local authorities closed recycling centres amid the COVID-19 crisis (63).

Food security

The COVID-19 pandemic has led to increased food insecurity and food need in an already critical situation, further exacerbating diet-related health inequalities. A Food Foundation commissioned survey found that more than 3 million people reported that someone in their household has gone hungry in the first three weeks of lockdown (70). The Food Foundation estimate that the number of adults who are food insecure in Britain has quadrupled under lockdown (65). The Food Standards Agency reports that food insecurity remains more of an issue for younger age groups, those in households with a child and those who have a physical or mental health condition (71).

The Trussell Trust (72) reported an 89% increase in need for emergency food parcels during April, compared to the same month last year, including a 107% rise in parcels given to children. Food banks in the Independent Food Aid Network (IFAN) reported a 175% increase in need for the same period (72). Systems such as food charities are fragile and supply chains have been challenged by stockpiling (73).

Access to health and social care

Access to good health and social care is important for health and wellbeing. The following table summarises the key impacts of COVID-19 on access to health and social care services based on a rapid and limited review of the currently available evidence.

Impact	Type of impact	Likelihood of impact	Findings
Delivery of secondary care	Negative	Definite	Secondary care services (74) and community health services (75) have been suspended.
Planned hospital admissions	Negative	Definite	Substantial reduction in planned hospital admissions (76).
Care for long-term conditions	Negative	Definite	Care for long-term conditions has been disrupted, particularly hospital treatment and outpatient care (77, 78).
Cancer screening and treatment	Negative	Definite	Cancer screening in effect paused and reduced treatment activity in some areas (76, 79).
Mental health services	Negative	Probable	Increases in urgent and emergency cases, but also falls in routine appointments (80). Some service users have experienced difficulties in accessing help (81).
Adult social care	Negative	Definite	Care availability and quality has been impacted (82). Many unpaid carers providing more care (83).
Health seeking for urgent care needs	Negative	Definite	Reduction in emergency department attendances (76). Drop in presentations was most marked in 0-6 age group.
Early intervention/help services for children and families	Negative	Definite	Ability of services to support children and families have been seriously affected) (27, 28).
Routine immunisation	Negative	Probable	MMR vaccination counts fell in the first three weeks of lockdown, have improved through mid-April (84).

Delivery of secondary care and community health services

With the onset of lockdown measures many secondary care services considered as non-urgent were suspended as efforts to respond to Covid-19 pandemic were implemented (74). Community health services were also subject to full and partial closures (75).

Planned hospital admissions

Data from NHS England shows a substantial reduction of 68% in elective (planned) hospital admissions (76). There were differences by specialism. Most surgical specialties have seen activity fall by more than 80%. For non-surgical specialties there is greater variation, with gastroenterology down the most.

Care for long-term conditions

There have been significant disruptions to NHS care for people with long-term health conditions (including cancer, cardiovascular disease and diabetes), particularly hospital treatment and outpatient care (77). However, community-based care has remained available to those managing their long-term conditions. In April, 63% of people with long-term health conditions who needed NHS treatment did not receive it because the NHS stopped their treatment and 10% of patients cancelled appointments themselves. For outpatient hospital appointments this was 42% and 7% cancelled by patients themselves. By contrast 98% of those who needed prescription medications were still able to obtain them; 73% who needed treatment via a GP still received the services they required and 65% were able to see a pharmacist. A YouGov survey (78) of 6,005 people with long-term conditions across the UK showed that:

- Access to health services for people with pre-existing conditions was 20% lower (51% to 31%) during the COVID-19 peak period. Some of the largest falls in health service use were for mental health and cancer; with falls of 25% (59% to 34%) and 22% (60% to 38%) respectively.
- Some of this was due to patients not wanting to access services through not wanting to overburden the NHS or being afraid of contracting COVID-19 (22%). This concern was particularly high among those with diabetes, heart disease and mental illness.
- However, 10% of respondents indicated they had wanted to access services but had been unable to get an appointment

Cancer screening and treatment

Preventative services including cancer screening have in effect been suspended. Although screening was not officially stopped in England, the move to having the majority of GP appointments delivered online plus lack of local lab capacity meant that many appointments were cancelled or invitations not sent (79). As around one in five cancers are diagnosed in emergency presentations (85), this is likely to contribute to delayed cancer diagnoses. Analysis shows that chemotherapy and radiotherapy for cancer treatment as well as renal dialysis has seen a small reduction in activity (76).

Mental health services

During lockdown, the Royal College of Psychiatrists reported that 43% of psychiatrists have seen increases in urgent and emergency cases, but also that a similar proportion (45%) have seen falls in routine appointments (80). There are concerns that this will result in a surge of exacerbated and untreated mental illness after the pandemic. A survey by the charity Mind (81), found that almost a quarter of people who tried to access mental health services within a two week period of April 2020 had been unable to access help.

Adult social care services

Adult social care services range from large nursing homes, through to community support services and homecare. In the context of already significant pressures on the sector, the COVID-19 pandemic has threatened care availability and quality (82). A survey by Carers UK with over 4,500 current unpaid carers in April 2020 (83), found that 70% were providing more care for one or more reason, and on average carers were providing an 10 additional hours of unpaid care a week.

Health seeking for urgent care needs

Reduction in emergency department attendances were seen for all causes (apart from pneumonia) in the first week of lockdown (76). The reduction in emergency department presentations has mainly affected less complex cases. However, an estimated 30% reduction in the number of cases entering emergency departments with suspected heart attack and stroke has been observed. Age remains the most important factor for both admissions and deaths. The fall in presentations at emergency departments has been most marked in the 0-6 age group (60% reduction) and less so among older people.

A report by Medact, Migrants Organise and the New Economics Foundation raises concerns about barriers to migrants accessing healthcare during the pandemic (86). The report suggests that language barriers and digital exclusion may be exacerbating problems, particularly as health services and migrant support services are increasingly being delivered remotely.

Early intervention and help services for children and families

Research by the Early Intervention Foundation (EIF) (27, 28) highlights the impacts of the social distancing and lockdown measures on delivery of early intervention and early help services for children and families. They noted that the ability of services to support children and families have been seriously affected at the very time that these families are facing even greater challenges. While, local services have responded flexibly and innovatively, currently, little is known about the effectiveness of adapted service delivery for children and families. As lockdown conditions are eased, schools and early years provision reopen and universal services start to operate more normally, the EIF expect the full extent of the impact on vulnerable children and families to come to light. They anticipate that there is likely to be a rapid increase in referrals to children's social care and other acute services and that there may also be a significant spike in referrals to early help.

Routine immunisation

Whilst the childhood vaccination programme was not suspended, analysis to assess the early impact of the pandemic on routine childhood vaccination in England found that MMR vaccination counts fell from February 2020 and, in the 3 weeks after lockdown, were 20% lower than the same period in 2019, before improving in mid-April (84). A gradual decline in hexavalent vaccination (against diphtheria, tetanus, pertussis, polio, *Haemophilus influenzae* type b and hepatitis B) counts throughout 2020 was not accentuated by the lockdown measures.

Individual health behaviours

Individual health behaviours have a major impact on health and are themselves influenced by the circumstances in which we live. The following table summarises the key impacts of COVID-19 on individual health behaviours based on a rapid and limited review of the currently available evidence.

Impact	Type of impact	Likelihood of impact	Findings
Drinking	Negative	Probable	People who drank the most often before lockdown are drinking more often and drinking more on a typical drinking day (87). People who were already drinking the least often have cut down in the greatest number (87, 88). Evidence on the impact on harmful and dependent drinkers and people in recovery is currently limited (89).
Smoking	Positive	Probable	Increased motivation among smokers to quit and to stay smoke free (90).
Physical activity	Negative	Possible	Physical activity behaviours among children and adults have been disrupted (91, 92). Groups that were least active before lockdown are finding it harder to be physically active (e.g. people on low incomes) (91).
Diet	Negative	Possible	No direct evidence from the UK, but studies from other countries suggest that eating and snacking have increased (93-95).

Alcohol consumption

In the weeks prior to lockdown, alcohol sales were up by 67% (in comparison, overall supermarket sales increased by only 43%). Several surveys have found between a fifth and a third of people report drinking more during lockdown (89). A survey by Alcohol Change UK suggests that changes in drinking habits are happening in two directions (87). The survey showed a high level of consistency, in that most people who stated that they were drinking more often were also drinking more on a typical drinking day, and vice versa. Nearly one in five (18%) daily drinkers had further increased the amount they drank since lockdown. People who were already drinking the least often had cut down the most. Another survey (88) showed similar results, with nearly half of respondents (46%) stating lockdown had not affected the amount of alcohol they drank; a third (37%) stated they were drinking less; 17% that they were drinking more; and 8% had stopped drinking alcohol all together.

Writing on behalf of the Commission on Alcohol Harms and the Alcohol Health Alliance, Finlay & Gilmore (96) identify two groups in particular need of attention in relation to alcohol consumption; people who are already struggling with alcohol dependence and people who are on the brink of dependence. The editorial notes that bereavement, job insecurity, or troubled relationships may tip some drinkers into dependency. Currently, however, there is very limited evidence describing the impact of the COVID-19 lockdown on harmful and dependent drinkers and people in recovery (89).

Smoking

A joint survey by YouGov and the campaign group Action on Smoking and Health (ASH), found that more than 300,000 adults may have quit smoking during the pandemic (90). A further 550,000 have tried to quit, while 2.4 million have cut down. 2% of smokers had quit because of concerns about coronavirus; 8% were trying to quit; 36% had cut down; and 27% were now more likely to quit. A quarter of former smokers said they were less likely to resume smoking while 4% said the pandemic had made them more likely to relapse.

Physical activity and diet

Sport England has conducted weekly surveys with around 2,000 adults through lockdown, finding that physical activity behaviours among children and adults have been disrupted (91). The survey finds that groups that were least active before lockdown found it harder to be physically active (e.g. people on low incomes). Based on a survey of 188 young people, StreetGames found that young people were not finding it easy to stay active, or to get active during lockdown (92), with two-thirds (68%) reporting that their active levels had dropped. The pandemic has led to increased food insecurity and food need in an already critical situation, further exacerbating diet-related health inequalities (see *Environmental determinants*). We did not identify direct evidence on diet from UK studies, but studies of adults and children in other countries (93-95), suggest that that lockdown is having a negative impact on health behaviours such as diet and physical activity among children and adults.

Learning from previous disasters and crises

Social determinants

Examining the social determinants of disaster recovery, Moore et al. (97) report that although a strong collective spirit may be apparent in the immediate aftermath of disasters, feelings may shift in the later phases of the disaster cycle. They note that there may be sequential reactions to disasters, with “a period of heroic unity and mutual support followed by a period of disillusionment and anger”.

Gayer-Anderson et al. (98) reviewed the impacts of social isolation on disadvantaged, marginalised, and vulnerable populations in the context of previous pandemics and other public health crises. They identified papers relevant to health care workers, children and adolescents, older people, people with pre-existing conditions, and disadvantaged and marginalised groups. They found that across all groups, mental health problems were more common in vulnerable and disadvantaged groups. They note that this disparity may be especially pronounced at the intersection of multiple vulnerabilities, with the evidence suggesting that young people with pre-existing conditions may be particularly affected.

Peterman et al. (21) report that pandemics provide an enabling environment that may exacerbate or spark diverse forms of violence. They document nine (direct and indirect) pathways linking pandemics and violence against women and children: (i) economic insecurity and poverty-related stress, (ii) quarantines and social isolation, (iii) disaster and conflict-related unrest and instability, (iv) exposure to exploitative relationships due to changing demographics, (v) reduced health service availability and access to first responders, (vi) inability of women to temporarily escape abusive partners, (vii) virus-specific sources of violence, (viii) exposure to violence and coercion in response efforts, and (ix) violence perpetrated against health care workers.

Economic determinants

Existing evidence on the health impacts of recessions shows that they have significant negative impacts on people’s health and wellbeing (99). Importantly, evidence suggests that periods of economic recession appear to increase overall suicide rates (100, 101). However, as Reeves et al. (100) note, such rises are potentially avoidable. Economic shocks and downturns have also been shown to be important during pregnancy and early childhood (99).

Janke et al. (102) have modelled the impact of economic shocks on chronic health conditions in the UK, finding that employment changes during and after the 2008 financial crisis had a strong adverse effect on chronic health for five broad types of health conditions, with the strongest effects being for mental health conditions. They estimate that a 1% fall in employment leads to a 2% increase in the prevalence of chronic illness. The modelling suggests that people with pre-existing poor mental health will be particularly vulnerable to effects of an economic downturn (102). If the impact of the predicted economic downturn is similar to that after the 2008 financial crisis, the number of people of working age suffering from poor mental health would rise by half a million.

Health and wellbeing outcomes

Having examined the impacts on the wider determinants, this section explores what we currently know (or expect) about the onward impacts of the COVID-19 pandemic on health and wellbeing outcomes.

General and physical health

Gaining a full understanding of the physical health outcomes that may arise from the disruptions to health and social care delivery (see *Access to health and social care*) will be a slow process according to a joint letter by The Health Foundation, The King's Fund and Nuffield Trust (103). They note that it is not clear how many services have been suspended, and that judgements about who gets services and how, have been made locally.

Responding to the impact of COVID-19 on the delivery of services for people with long-term conditions (104), the Chief Executive of the Health Foundation has raised concerns that many people's needs may have gone unmet during the lockdown. They note that for many people this will mean that their long-term condition and consequently physical health may have worsened over the course of lockdown.

An editorial in *The Lancet Oncology*, raises particular concerns about the impact of delayed cancer diagnoses and the knock-on effects of these, related to a surge in demand for cancer-related services in later stages of the pandemic. There is a real concern that such a surge could overwhelm health services and contribute to an excess in cancer-related deaths in the coming years (105).

Mental health and wellbeing

It is expected that mental ill health will increase widely as a result of the both the direct impact of COVID-19 infection and through its impacts on the wider determinants (103). An early analysis of mental health outcomes within the first two months of lockdown suggests that the effects have been large, with young people and women (groups with worse pre-pandemic mental health) experiencing the largest declines (106). There are also concerns that there be a surge of exacerbated and untreated mental illness following the pandemic (80). Reviewing the impact of the SARS outbreak, Holmes et al. (107) found that it was associated with a 30% increase in suicide among people aged over 65 years, while around 50% of recovered patients remained anxious and 29% of healthcare workers experienced emotional distress. People who survived severe illness were at risk of post-traumatic stress disorder and depression. A review of studies that examined the psychological consequences of the Canterbury earthquakes found that they were associated with widespread but not universal adverse effects on mental health (108).

Writing for the Centre for Mental Health, Duncan et al. (109) suggest that based on experiences from previous epidemics and the aftermath of the 2008 banking crisis, around half a million more people in the UK may experience a mental health difficulty over the next

year as a result of the pandemic. If a second wave of COVID-19 occurs and the economy is damaged further, then they suggest that the effects on mental health will be even greater and longer lasting.

Findings from two large longitudinal population cohort studies (the Avon Longitudinal Study of Parents and Children and Generation Scotland: Scottish Family Health Study) suggest increases in anxiety and lower wellbeing that may be directly and indirectly related to the COVID-19 pandemic (110). In both cohorts, depression and anxiety were greater in younger populations, women, those with pre-existing mental and physical health conditions, those living alone and in socio-economic adversity.

Worry and anxiety about COVID-19

Data from the ONS Opinions and Lifestyle Survey found that half of the population (50%) had high levels of anxiety as the country went into lockdown (20 March to 30 March) (14). Anxiety levels have however fallen over the period of lockdown and levels of happiness have increased over time. The UCL COVID-19 Social Study of 90,000 UK adults has identified similar patterns (111). Levels of anxiety and depression fell in early June as lockdown measures were eased, but remained highest among young people, those with lower household income, people with a diagnosed mental illness, people living with children, and people living in urban areas. Wright et al. (112) report that poor mental health during the early stages of the lockdown was associated with both worries about, and experiences of adversities (including COVID-19, employment, accessing food or medication, and threats to personal safety).

Almost half (45%) of adults with disabilities reported being very worried about the effects of the pandemic, compared with around a third (30%) of adults without disabilities (19). Almost two-thirds (65%) of adults with disabilities said COVID-19-related concerns were affecting their well-being. All adult respondents were concerned about the impact on their wellbeing, but this was higher (65%) among respondents with disabilities compared to those without disabilities (55%).

Quarantine and home isolation

Multiple reviews of the psychological impact of quarantine and home isolation show that negative psychological effects, including post-traumatic stress symptoms, confusion, and anger (113-115). Studies included across these reviews report a high burden of mental health problems among patients, informal caregivers, and healthcare providers. Adverse mental health outcomes may include depression, anxiety, mood disorders, psychological distress, posttraumatic stress disorder, insomnia, fear, stigmatization, low self-esteem, and lack of self-control.

White and Van der Boor (116) investigated the mental health and wellbeing impact in a convenience sample of 600 UK adults finding that higher depression scores were associated with participants having to self-isolate prior to lockdown due to symptoms of COVID19, feeling more isolated than usual during lockdown, or agreeing that the COVID19 was threatening their livelihood. Agreeing that people's kindness towards others

had increased, agreeing that he/she felt more connected to people in the local community, or working in an essential job was associated with significantly lower depression scores.

Informed by surveys of the public and an expert panel, Holmes et al. (107) warn of major adverse consequences of the COVID-19 control measures, including increased social isolation and loneliness, which are “strongly associated with anxiety, depression, self-harm, and suicide attempts across the lifespan”. The research highlights specific concerns among respondents about increased anxiety, the fear of becoming mentally unwell, and not having access to mental health services for existing and new conditions (107).

A survey with 2,111 young people with a history of mental health needs by Young Minds (117) found that the lockdown and social distancing measures had created additional anxiety and uncertainty, as well as increased difficulties in accessing support for some.

Financial insecurity

A report by the Mental Health Foundation (118) highlights the mental health effects of financial inequalities, noting that employment is one of the most strongly evidenced determinants of mental health. Modelling research by Janke et al. (102) (see also *Economic determinants*) shows that each 10% increase in the number of unemployed men was significantly associated with a 1.4% (0.5% to 2.3%) increase in male suicides. Longitudinal research on mental health during the pandemic by the Mental Health Foundation shows that 21% of people surveyed were worried about losing their job (118). Among people who identified as unemployed, 20% had had suicidal thoughts and feelings in the last week and 26% said they were not coping well with the stress of the pandemic (compared to 9% and 12% of people in employment, respectively). 45% of people surveyed who are unemployed (compared to 29% in employment) were worried about having enough food to meet their basic needs in the past two weeks.

Loss of friends and family

Mayland et al. (119) identify that the COVID-19 pandemic and resulting social distancing measures are likely to have a major impact on the individual and societal experiences of grief and mourning. They note that no previous research studies have focused on outcomes and support for bereaved people during a pandemic. Eisma et al. (120) highlight that the pandemic may cause a rise in cases of prolonged or complicated grief.

Conclusions

The evidence reviewed supports expectations that the impacts of COVID-19 have not been felt equally. The pandemic has both exposed and exacerbated longstanding inequalities in society. Men, older people, those with existing health conditions, ethnic minority communities, so-called 'low skilled' workers and those from poorer areas are all at a greater risk of infection, serious illness and of dying from COVID-19.

As the evidence shows, the unequal impacts of the COVID-19 pandemic go further than the direct impacts of the disease itself. The unintended consequences of lockdown, social distancing and other measures designed to control the spread of infection – isolation at home, economic shutdown, school closures and reduced access to services – have had and will continue to have their own unequal impacts on health and wellbeing outcomes.

As we move from the response phase of the pandemic and into recovery, the direct and wider impacts on individuals, households and communities will influence their capacity to recover. By providing a summary of what the evidence tells us about the direct and indirect impacts of COVID-19 on health and wellbeing, this review aims to assist with the development of priorities and mitigating actions to support recovery.

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