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## RESEARCH ARTICLE

An overview of lockdown measures, vaccination rollout and other treatment strategies used against COVID-19 in the past triennium since the start of the global pandemic in the United Kingdom

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### Abstract

In December 2019 there was a novel outbreak in Wuhan, China where an unknown respiratory disease known as SARS-COV-2 (COVID-19) started to spread rapidly across the world. In March 2020 the World Health Organisation declared a global pandemic. Over the next few years, the United Kingdom began adapting specific lockdown measures to prevent the spread of the disease, where a vaccination programme was started in December 2020 across the country to help prevent severity and reduce the rate of infection. Since the start of the pandemic, health care professionals have continued to work on effective treatment strategies to help relieve the stress on the health systems and manage the symptoms of the disease across the nation.

## Introduction

In December 2019 there was a novel outbreak in Wuhan, China of a respiratory disease known as SARS-COV-2 (COVID-19) where cases rapidly spread around the world, resulting in the World Health Organisation<sup>1</sup> declaring a global pandemic in March 2020. This caused over half of the world's population in more than 90 countries across the world to participate in some form of lockdown, with various strategies in tackling the rate of infection and relieving pressures on the health system. The immense pressure on the world caused scientists to fast track a novel Messenger RNA (mRNA) vaccine to help tackle the virus, where The Food and Drug Administration (FDA) approved the vaccine rollout in December 2020<sup>2</sup>. Over the next two years multiple vaccines were rolled out across the world along with various treatment options to further support an individual infected with Covid-19. According to the Worldometer<sup>3</sup>. Since the start of the global pandemic, from the 12<sup>th</sup> of November 2022 there have been 23,977,637 confirmed coronavirus cases in the United Kingdom (UK) with 196,241 confirmed deaths and 22,954,691 confirmed cases recovered<sup>4</sup>. This article will explore how the UK implemented lockdown measures to protect the public and prevent the National Health Service (NHS) from possible collapse, where a vaccination rollout programme began to help prevent the spread and severity of the disease, and there will be brief overview on other treatment strategies used to tackle COVID-19 with various drug treatments to help manage symptoms.

## Lockdown Measures

On 26<sup>th</sup> March 2020 the UK officially went into lockdown where initially education and non-essential retailers, pubs, restaurants, and gyms were temporarily closed<sup>5</sup>. The government intended to pay up to 80% of wages for workers who were at risk of being laid off under the furlough scheme<sup>6</sup>. In May 2020 up to 100,000 COVID-19 tests were provided on a daily basis, along with the launch of the test and trace system which was there to replace the lockdown system<sup>6</sup>. This allowed for lockdown restrictions to ease in June 2020 starting with key workers children to return to education, non-essential retailers to reopen and individuals shielding could meet in up to groups of six outdoors<sup>6</sup>. In August 2020 A-Level and GCSE students were given their centred assessed grades that was simulated by an algorithm, which was designed to replace exams during the school shutdowns, However, full time education returned in September 2020<sup>6</sup>. In October 2020 the government introduced a new three tier lockdown traffic light system which was designed to simplify local restrictions based on infections rates with the different areas of the country<sup>6</sup>. In March 2021 restrictions started to lift with the government introducing the four-step road map, as it offered a route for the UK people to return to a normal life<sup>5</sup>. Once step 4 of the road map was reached, as many of the legal restrictions were lifted, cautious guidance will remain with continuous guidance being provided over the foreseeable future<sup>7</sup>.

## Vaccine rollout

Dolgin stated since the first discovery of a potential mRNA vaccine can be used for treatments of disease in medicine by Robert Malone, hundreds of scientists have been working on the development for many years prior to the global pandemic bringing a breakthrough<sup>8</sup>. The World Health Organisation Emergency Use Listing Process determines whether a particular product can be recommended based on the available dataset regarding safety and efficacy, where the vaccines are assessed to ensure they meet acceptable standards of quality prior to being administered to the public<sup>9</sup>. Three vaccines were utilised in the primary and booster vaccination campaigns which were Pfizer, AstraZeneca and Moderna where all had been authorised by the Medicines and Healthcare Products Regulatory Agency (MHRA) following a thorough review of safety, efficacy from clinical trials, which started the national immunisation campaign in early December 2020. During the clinical trials involving more than 44,000 participants, Pfizer highlighted the most frequent adverse effects included fatigue, headache, myalgia, chills, and fever which affected more than 1 in 10 people<sup>10</sup>. Whereas the trials involving AstraZeneca which included more than 23,000 participants highlighted the most frequent adverse effects were injection site tenderness, headache, fatigue, myalgia, and nausea which affected more than 1 in 10 people<sup>10</sup>. Moreover, the trials involving Moderna which included over 30,000 participants highlighted the most frequent adverse effects were injection site tenderness, headache, fatigue, myalgia, and

nausea/vomiting and auxiliary swelling tenderness in 1 in 10 people<sup>10</sup>.

According to the British Heart Foundation the risk of an individual contracting an inflammatory heart condition after receiving one of the COVID-19 vaccines was low, as it was reported in August 2022 there was up to 17 cases per million people in the Pfizer booster dose and 68 cases per million people in the Moderna booster in the demographic age group of 18-29 years of age<sup>11</sup>. Whereas the AstraZeneca vaccine has not been linked to an increased risk of an inflammatory heart condition, but it is not recommended for younger age groups due to the link it has to a rare type of blood clot<sup>11</sup>. The yellow card scheme is vital in helping the MRHA monitor safety of the healthcare products in the UK, however, it's important to note the yellow card scheme reporting means that reported events are not always proven side/adverse effects, as some events can happen regardless of taking the vaccine<sup>12</sup>. As of the 26<sup>th</sup> of October 2022, there have been 175,426 yellow cards reported for the Pfizer vaccine, 246,638 yellow cards reported for AstraZeneca and 45,946 yellow cards reported for Moderna 10. Due to the adverse effects reported on the vaccines, there has been an increased concern for individuals to get vaccinated while pregnant<sup>9</sup>. However, it has been recommended for an individual who is pregnant to get vaccinated as there has been a higher risk associated with serious illness and premature delivery from contracting covid, compared to getting vaccinated and while there is less data available on vaccination of pregnant people,

evidence of the safety of the vaccines during pregnancy has been growing<sup>9</sup>. According to the national statistics from Thursday 17<sup>th</sup> November 2022 there have been a total of 151,248,820 vaccinations given with 53,813,491 people given their first dose, 50,762,968 given their second dose and 40,373,987 given their third or booster dose<sup>13</sup>.

### Other Treatments

In May 2020 regulators in the United States of America started to allow the experimental anti-viral drug Remdesivir to be used in the treatment against COVID-19, as studies at the time showed the drug could potentially cut recovery time by 31%<sup>6</sup>. The Early Access to Medicines Scheme and the scientific opinion of the MHRA supported the use of Remdesivir in the UK to be used on a certain criterion of patients, with those at more risk of becoming seriously ill from the Coronavirus to further support their recovery time in hospital<sup>14</sup>. Remdesivir is an antiviral drug that works by stopping the virus from replicating and spreading across the body to help prevent prolonged or more severe symptoms<sup>15</sup>. Beigel et al. published the final report of the use of Remdesivir in the treatment against COVID-19, which showed the use of Remdesivir may have prevented the progression of a more severe respiratory disease, where the benefits of its use were most apparent with patients on low flow supplemental oxygen<sup>16</sup>. According to the UK Research and Innovation (UKRI) international clinical trials have been ongoing in the effectiveness of the antiviral drug Remdesivir with people who are infected with COVID-19, which took place in approximately

75 hospitals around the world where over 1000 patients were recruited for the randomised controlled trial<sup>17</sup>. Results showed an improvement in recovery time of 11 days with patients taking Remdesivir compared to 15 days with patients on placebo<sup>17</sup>. The results also suggested a survival benefit with a mortality rate of 7.1% with the group receiving Remdesivir, compared to 11.9% of people in the placebo group<sup>17</sup>.

In June 2020 a drug trial finds Dexamethasone could potentially reduce mortality among critically ill coronavirus patients<sup>6</sup>. The UK Research and Innovation (UKRI) showed results taken from the RECOVERY trial, which was the worlds largest clinical trial involving treatments for COVID-19, where there were over 40,000 participants across 185 trial sites in the UK<sup>18</sup>. The results of the RECOVERY trial in Dexamethasone – a low-cost steroid reduced deaths in people with severe coronavirus by up to one third<sup>18</sup>. Dexamethasone can inhibit the body's immune response and is primarily used on patients who are ventilated or need oxygen to help them breathe as it has shown to significantly improve the chances of survival<sup>19</sup>. The RECOVERY trial also looked into the drug Hydroxychloroquine which is an antimalaria drug which treats inflammatory conditions in the treatment of patients who have coronavirus, due to the amount of media attention the drug gathered which showed to have no clinical benefits against COVID-19<sup>18</sup>. However, another drug which was trialled as part of the RECOVERY Trial was Tocilizumab which is an immunosuppressive drug used to treat Rheumatoid Arthritis has shown a

significant reduction of deaths in patients hospitalised with COVID-19<sup>18</sup>. According to Moore et al. in March 2020 the French Health Minister warned key health organisations around the world against the use of Ibuprofen in patients who have contracted COVID-19, however, the advice was based on unconfirmed anecdotal reports where severe COVID-19 cases had been exposed to Ibuprofen<sup>20</sup>. Torjen stated later in 2020 UK medicines agencies changed their advice on the use of Ibuprofen to treat patients with COVID-19, which was followed by a review from the Commission on Human Medicines experts working group on COVID-19<sup>21</sup>. Kragholm and Torp-Pederson explained the use of Ibuprofen to treat patients with COVID-19 spurred multiple studies in the upcoming months which provided confirmation for the use on Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) with COVID-19 does not increase the risk of poorer outcomes<sup>22</sup>. This is

supported by a growing body of evidence that points to the same conclusion; however, the advice remains for individuals at home to take paracetamol rather than Ibuprofen to help relieve symptoms<sup>22</sup>.

### Conclusion

Over the past three years there have been updates in guidance and treatment options for the public which have helped in the prevention and treatment of COVID-19. The Vaccines are continuously being rolled out and are providing a strong defence against individuals becoming severe with the infection thus preventing an increased number of hospitalisations. The treatment options that have been attained through clinical trials is further supporting the patients who have been hospitalised and are given at specific times to improve the chances of the patient recovering quicker and reduces the risk of severity and death.

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