



Review Article

Pandemic panic and the culture of complacency

Brian J Ford*

Fellow of Cardiff University, UK

Received: 29 October, 2022

Accepted: 09 November, 2022

Published: 10 November, 2022

*Corresponding authors: Brian J Ford, Fellow of Cardiff University, UK,
E-mail: brianjford@cardiff.ac.uk

Copyright License: © 2022 Ford BJ. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.peertechzpublications.com>



Abstract

The many legacies bequeathed to us by the COVID-19 pandemic have embraced novel approaches to vaccine development, a greater awareness of the principles of hygiene among the general public, the need for governments to take a proactive stance when faced with unfamiliar pathologies, and the role of specialist medical and scientific advisers. However, many of the claimed protocols are medieval in nature and have little scientific evidence to support their introduction. Similarly, we have failed to grasp the importance of the anti-vaccination campaigns, which are always founded on ignorance or willfulness, but on previous examples of duplicitous behavior by those in authority, coupled with our poor understanding of the way virus variants function, have engendered a sense that many of the precautions taken may have been unnecessary (Ford, 2020a). In consequence, I fear that future threats from hemolytic viruses of high transmissibility may be met with complacency. Improved public education, and greater academic transparency concerning the nature of risk, will be necessary if a future pandemic is to be effectively controlled.

The emergence of novel viruses

During the Korean War, sporadic outbreaks of severe viral infection occurred among the American military. It proved to be caused by a Hantavirus contracted from rodents and gave rise to hemorrhagic fever with renal syndrome. It was the first new hemorrhagic viral disease to be recognized [1]. Yellow fever, Crimean-Congo hemorrhagic fever, and severe forms of dengue are among those that were already known, but now we have a lengthy list of extremely hazardous virus infections, from Chapare hemorrhagic fever (first identified in 2003) and Lujo hemorrhagic fever (first recorded in 2008), both with a handful of cases caused by an arenavirus, to the largest outbreak this century, an epidemic of Ebola virus between 2013–2016 in Western Africa, which infected 28,000 persons with 40% mortality [2]. Viruses like Ebola and Lassa fever are still current to fresh outbreaks and they became known to the general public, so the notion that we would be faced with a global pandemic became widely understood [3]. There are no vaccines available for these diseases, though there are early trials taking place for an Ebola vaccine in 2022.

The hemorrhagic fevers are epidemic RNA viruses of the

Filoviridae, Flaviviridae, Rhabdoviridae, and Bunyavirales, all of which remain uninfected to others until symptoms have become apparent. The coronaviruses are also RNA viruses from the Orthocoronavirinae, though remain symptomless for several days. They were first observed by June Almeida in the UK in 1966, using the newly developed Philips EM300 electron microscope [4] and were also studied in the US by Dorothy Hamre, who first published the term coronavirus [5]. These viruses were considered of minor importance and are known to cause various kinds of the common cold along with respiratory syncytial virus, rhinoviruses, and several others yet to be characterized. Four coronaviruses are known to cause relatively mild respiratory infections: human coronaviruses 229E (HCoV-229E), OC43 (HCoV-OC43), NL63 (HCoV-NL63), and HKU1 (HCoV-HKU1) [6].

SARS

Our understanding of coronaviruses changed when the first case of SARS was recorded in Foshan in Guangdong province, China, on November 16, 2002. This novel form of pneumonia-like illness was soon reported to have spread to two more cities, Heyuan and Zhongshan. In March 2003, the World Health



Organization (WHO) announced there was a new, severe form of pneumonia reported from mainland China, Hong Kong, and Vietnam. The outbreak was taken seriously – patients were isolated, their contacts traced and placed in quarantine, and strict hygienic measures (wearing face-masks and hand-washing) were widely introduced. There were eventually over 5,000 cases of SARS in China, almost 2,000 in Hong Kong, several hundred in Taiwan, Canada, and Singapore, and far smaller numbers in some twenty countries around the world (27 in the US, 4 in the UK). However, rigorous quarantine, containment, and hygiene served to halt its spread without a vaccine is available, and the last cases were reported in May 2004 [7]. The natural reservoir remains unknown, but SARS-CoV has been isolated from the Himalayan palm civet *Paguma larvata*, the ferret-badger *Melogale moschata*, and a raccoon dog *Nyctereutes procyonoides*. The virus should have been named HCoV-SARS, in line with well-known coronaviruses, but was instead named was designated severe acute respiratory syndrome coronavirus (SARS-CoV, later SARS-CoV-1).

MERS

In June 2012, a patient in Saudi Arabia developed an unknown form of pneumonia, involving fever, cough, and severe dyspnea which proved fatal. The causative agent was identified as a coronavirus, and some 3,000 cases were subsequently reported without about 1,000 deaths [8]. The disease was eventually found in 27 countries, and given the name Middle East respiratory Syndrome (MERS). There was a further outbreak in 2017 when a single patient (a ‘super-spreader’) caused an outbreak of 44 patients within a fortnight [9]. Once again, the wearing of face-masks, using eye protection in the form of transparent shields, rigorous hand-washing, and meticulous attention to hygiene served to stop its spread, and the last case occurred in December 2020. Like SARS, MERS is caused by a zoonotic virus, in this instance contracted from dromedaries. Infected camels have been identified throughout the Middle East, South Asia, and Africa. It is now believed that the virus originated in bat populations and was transmitted to dromedaries in prehistoric times. The virus, for which there was no vaccine available, was given the name MERS-CoV.

COVID-19

The original virus may have originated in bats or pangolins, and the virus which gave rise to the global pandemic starting in 2019 was originally named 2019-nCoV, while in China it was called NCP (novel coronavirus pneumonia) and elsewhere Wuhan-Hu-1, before the WHO officially named it SARS-CoV-2. It was clearly related to SARS, and the disease the virus caused was given the curious name of COVID-19. The nomenclature is confusing, being an abbreviation of Corona Virus Disease – even though none of the known coronavirus diseases had been given names thus derived. This new SARS virus was twice as infectious as the original SARS, though ten times less likely to prove fatal. It seems likely to have been a laboratory escape from the Wuhan Institute of Virology of the Chinese Academy of Sciences (中国科学院武汉病毒研究所) where gain-of-function research into viruses has been centered, much of it contracted by overseas agencies (including those of the US). Its spread from

China was well documented, yet there was no general agreement on how it should be handled. China focused its energies on lockdown and isolation, enforced by police surveillance via the internet; by contrast, the Swedish government initially limited its action to social distancing, imposing limits only on large gatherings and mass transportation. Most governments insisted that facemasks must be worn in public, even though the WHO initially warned that they were ineffective, and (as global insistence on regular hand-washing revealed) it was clear that contact transmission via fomites was regarded as an important means of infection [10]. There was an immediate rush to produce a vaccine against this new virus, and on June 24, 2020, China released its CanSino vaccine for limited use in the military, followed by Russia, which announced its cheekily-named Sputnik V vaccine on August 11, 2020. The United Arab Emirates and Bahrain soon authorized the emergency use of the Sinopharm COVID-19 vaccine, produced in Beijing, for healthcare professionals.

The British response

The first recorded European death was in France on February 15, 2020, and by April 2022, there had been 1,922,138 deaths across the whole of Europe due to COVID-19. At the outset, the British government instituted a track-and-trace protocol to monitor the spread of the disease, and limit its penetration into the wider community. Persons carrying the infection from around the world continued to flood in by air; as a result, Britain was soon forced to institute a national lockdown, though by that time it was too late. Cases were treated in general hospitals, rather than in isolation (as was always the case with epidemic infections, like typhoid or smallpox). Matt Hancock, the Secretary of State for Health and Social Care, announced: ‘The government has thrown a protective ring around care homes.’ In reality, elderly patients were exposed to the virus in hospitals, then returned to their care homes, so approximately one-quarter of all deaths in such residential establishments were due to COVID-19 [10]. Many of those managing British care homes for the elderly were privately told that hospitals would not accept their patients; their carers had to watch over them as they died because the hospitals were fearful of importing infection. There is a hidden burden of trauma among the surviving staff of those establishments to which no attention is being paid. This was clearly posing a danger; in London the High Court later declared government policy to have been unlawful.

The UK authorities showed little regard for following their own regulations. Mr. Hancock was filmed in an intimate embrace with a staff member when social distancing was in force. Prime Minister Johnson attended several intimate parties, for which behavior members of the public had been fined. His chief adviser Mr. Dominic Cummings continued to make holiday journeys, even though these were prohibited by law. Professor Neil Ferguson, a frequent spokesman on the pandemic, traveled to liaise with his married girl-friend, when such meetings were clearly unlawful, and was obliged to resign from the scientific panel advising ministers on the outbreak [11]. The British response to the pandemic was so contradictory

and confused that 165,780 deaths were recorded from the coronavirus by April 2022, giving Britain the highest number of fatalities from COVID-19 in Western Europe, and one of the highest death rates in the world.

American reactions

Within a year of the first case in the US, some 30 million cases had been recorded with 530,000 deaths. The most conspicuous feature of the American pandemic was a general unwillingness to accept realities. Reports almost daily told of celebrities dying of the virus, after they had refused vaccination or treatment while broadcasting their conviction that the pandemic was a hoax. By September 2021, there were over 100,000 people hospitalized with COVID-19, with over 1,000 dying each day, of whom over 98% had refused to be vaccinated. By April 2022, the total cases in the US topped 30 million, with fatalities close to 1 million, yet almost one-half of Republicans and Evangelical Protestants remained unvaccinated, and a fifth of 18–29-year-olds insisted they would never receive a COVID-19 vaccination [12].

Questions over vaccination

The first reported cases of COVID-19 were in December 2019, and much praise was expressed when the first vaccines were released in June 2020, some six months later. Widespread vaccination began in the UK on December 8, 2020, and in the US one week later. Yet other vaccines had been even faster in development. In 1957 there was a global pandemic of H2N2 influenza, the Asian flu. A virologist from the University of Chicago, Maurice Hilleman, read reports about the outbreak in Hong Kong and developed a world-beating vaccine in just four months. Hilleman has been largely forgotten, but he joined the staff of the Merck Company to study vaccine development and he personally created vaccines against mumps and measles, meningitis and pneumonia, hepatitis A and B, and a host of others. Hilleman eventually worked on the development of over 40 different vaccines [12] Figure 1.

V. *An Account, or History, of the Procuring the SMALL POX by Incision, or Inoculation; as it has for some time been practis'd at Constantinople.*

Being the Extract of a Letter from Emanuel Timonius, Oxon. & Patav. M. D. S. R. S. dated at Constantinople, December, 1713.

Communicated to the Royal Society by John Woodward, M. D. Profef. Med. Græh. and S. R. S.

THE Writer of this ingenious Discourse observes, in the first place, that the *Circassians, Georgians, and other Affricks*, have introduc'd this Practice of procuring the *Small-Pox* by a sort of Inoculation, for about the space of forty Years, among the *Turks* and others at *Constantinople*.

That altho' at first the more prudent were very cautious in the use of this Practice; yet the happy Success it has been found to have in thousands of Subjects for these eight Years past, has now put it out of all suspicion and doubts, since the Operation having been perform'd on Persons of all Ages, Sexes, and different Temperaments, and even in the worst Constitution of the Air, yet none have been found to die of the *Small-Pox*; when at the same time it was very mortal when it seiz'd the Patient the common way, of which half the affected dy'd. This he attests upon his own Observation.

Figure 1: The European origin of immunization was summarized by John Woodward in his paper dated 1713 - *An Account, or History, of the, Procuring the SMALL POX by Incision, or Inoculation; as it has for some time been practiced at Constantinople* [14].

Most people now accept that it is ethical to be vaccinated throughout life, and we owe the survival of society to vaccines. Variolation was used in Constantinople (now Istanbul) in the late seventeenth century and was first introduced into America by Cotton Mather, a Puritan minister who first heard about the African tradition of variolation from a slave named Onesimus. The procedure was reported by the Royal Society [13] and variolation was soon a popular procedure in high society, after being popularized by Lady Mary Montagu, wife of the British ambassador to Turkey, in 1721. British folk-lore had long told of the fair faces of milkmaids, who were believed to be protected from the ravages of variola (smallpox) if they had been previously infected with the virus of vaccinia (cowpox). In 1774, a farmer from the county of Dorset named Benjamin Jesty inoculated his two sons and his wife with pus from a case of cowpox, and all remained free of smallpox during subsequent epidemics. Some 22 years later, the same trial was carried out by Edward Jenner, and – since he was a fellow of the Royal Society – it is his name we now associate with the introduction of vaccination into medical practice. Although his procedures were unethical by modern standards, they served to promulgate vaccination which in 1978 ultimately led to the elimination of smallpox from the toll of diseases that afflict the human population [14].

Anti-vaccination is born

Jenner's success led to the widespread adoption of vaccination, but there were powerful religious and superstitious objections from the start. In 1802, a cartoon entitled 'The Cow-Pock—or—the Wonderful Effects of the New Inoculation!' was published in London by James Gillray. He depicted victims of vaccination horrified to find themselves sprouting bovine extremities, while a young boy sports a cup bearing the legend: 'Vaccine pock, hot from the cow' and a leaflet bears the headline: 'Benefits of the Vaccine Process' [15]. When Pasteur worked on attenuated vaccines in the late nineteenth century he was met with less resistance; he had shown that anthrax, and then rabies, could be prevented by his new vaccines. These were much-feared diseases, which he was believed to have conquered; and objections were not easily raised.

Western society soon accepted vaccination as an essential part of childhood. Babies aged 8 weeks can be given a combined vaccine that protects against diphtheria, hepatitis B, *Hemophilus influenzae* type b, tetanus, poliomyelitis, and pertussis (whooping cough). At 13 weeks it is common for babies to receive vaccines against *Pneumococcus* and rotavirus, followed in later years by vaccines against measles, mumps, and rubella; then against bacterial meningitis, and others ranging from chickenpox to seasonal influenza vaccines. Human papilloma vaccination is now becoming popular among teenagers and this disease is now in sharp decline. Polio has almost been eliminated, though there was a contained outbreak in Malawi in February 2022.

Few object to the ethics of these procedures, though an anti-measles vaccination campaign has emerged in recent years. Measles is the most infectious virus of humans that we know, and the idea put about by anti-vaccine campaigners



– that measles is a mild childhood disease – does not stand scrutiny. Approximately 1 in every 500 children with measles develops encephalitis; a quarter of those would suffer long-term neurological damage, and about 10% of those children die. Some children develop subacute sclerosing panencephalitis (SSPE), and recent research suggests that the rate is as high as one in every 600 for babies with measles. There is no cure for this progressive brain disease and it is almost always fatal. In 2000, the US was declared free of measles; the UK followed in 2017. This enviable status has since been withdrawn, and the disease is recrudescing in both nations as a result of the anti-vaccination campaigns. Children are once more at risk.

Reasons for mistrust

Reassurances about the reliability and safety of vaccines have regularly been issued by the authorities. In the US, the Centers for Disease Control and Prevention (CDC) has said: “Clinical trials of all vaccines must first show they are safe and effective.” Assurances were given by the Food and Drug Administration (FDA) which announced: “COVID-19 vaccine is safe and effective” which National Public Radio (NPR) reported as: “Analysis of Moderna COVID-19 vaccine finds it effective and safe” while John Hopkins Medicine reported COVID-19 vaccination as: “Very safe”. Why were such assurances disregarded by the anti-vaccination campaigners?

Official claims about public safety have been shown to be untrustworthy and unethical. When there was a catastrophic reactor burn at the electricity power plant at Windscale, UK in 1957, the government had copies of its internal report destroyed, and the public was issued with bland reassurances that turned out to be false (nearby beaches have warning signs to this day). As the reactor at Three Mile Island was pouring out radioactive contamination in 1979, Lt. Gov. William Scranton was emphasizing: “Everything is under control. There is, and was, no danger to public health and safety.” When the nuclear reactor at Chernobyl was first commissioned it was claimed by the Soviet authorities to be “totally safe” and when it caught fire and the core melted the public was told: “Measures are being taken to eliminate the consequences of the accident.” In Britain, the National Radiological Protection Board (NRPB) announced that there was “nothing to fear” from Chernobyl’s radiation cloud, though people in Wales 2,000 miles downwind were unable to eat local lamb for decades and some farms were essentially shut down for a quarter-century because of the fallout [1].

Similar attitudes were shown when the teratogenic side-effects of thalidomide were first revealed in 1960. Official statements continued to insist it was safe for pregnant women to take, though over 100,000 children were eventually born with anatomical defects. The drug is still widely used, though now is not prescribed for use in pregnancy; headlines like: “Long-term use of thalidomide: safe and effective” do not initially make comfortable reading [16]. The attempts to sanctify a drug that proved to have serious long-term consequences have led to its being overlooked for decades, in areas where it could have provided therapeutic benefits. Bou’s reassurances can have long-term consequences.

One of the most notorious attempts to misrepresent a major threat to public health was the saga of bovine spongiform encephalopathy (BSE) in Britain [17]. Even though there were clear indications of a risk to public safety, repeated statements were made that supported the beef industry while emphasizing that the risks did not exist. Agriculture Minister John Selwyn Gummer appeared on television with an unequivocal statement: “When you’ve got the clear support of the scientists who deal with these matters, the clear support of the Department of Health, the clear action of the government, there is no need for people to be worried and I can say perfectly honestly that I shall go on eating beef, and my children will go on eating beef because there is no need to be worried.” Sir Donald Acheson, the government’s Chief Medical Officer, appeared on BBC television stating: “There is no risk associated with eating British beef,” adding that everyone could be confident that it was assuredly safe to eat.

It soon transpired that eating beef was far from safe; the prion that had been identified as the causative agent in BSE had been isolated from dying human patients. This form was officially designated variant Creutzfeldt-Jacob Disease (vCJD) through the symptomatology that seemed closer to that of kuru, the fatal neurological disease of cannibals found in Papua New Guinea [17]. Genetic susceptibility proved to underlie the development of this invariably fatal new disease, and about 180 people are known to have died from it in Britain. By comparison, some 3,000 have died from sporadic CJD in Britain since 1990. However, this is purely through genetic good fortune; at the time the denials were being broadcast, there was every likelihood that hundreds of thousands of people – even millions – were at risk of death. To dismiss the objections to vaccination as groundless and founded on ignorance cannot be supported when we recall such examples of official dishonesty, which have exposed large populations to hazards that were repeatedly claimed not to exist. Bland statements that a vaccine is safe and effective are clearly unsustainable. The skeptics have reasons to be skeptical.

Questions of safety

The concept of safety is relative, though it is presented by those advocating vaccination as an absolute. No medical procedure is without risk, a self-evident assertion that is obvious to the anti-vaccination protestors. COVID-19 vaccination rarely triggers anaphylaxis (about 5 cases per million, according to the CDC) though it frequently leads to soreness at the site of injection, a headache, general malaise, and tiredness, often accompanied by a rise in body temperature – side-effects that can last for a week. There are also rare cases of thrombocytopenia associated with cerebral venous sinus thromboses (CVST) following the Oxford/AstraZeneca vaccine, with an incidence of about 1 in 100,000 [18]. Raised frequency of thromboses associated with a low platelet count is unusual and counterintuitive. Fewer than 20% of these cases have a fatal outcome. There are also rare cases (usually < 1 per 100,000) of myocarditis reported in younger patients, though Guillain-Barré syndrome (GBS) has yet to be statistically associated with the injections.



What the protestors overlook is that they regularly expose themselves to far greater risks, without demur. In the US, 640,000 people are known to die each year from coronary heart disease, largely related to tobacco smoking, obesity, and the consumption of fatty foods. Close to 600,000 succumb to cancer, often linked to obesity, overindulgence in tobacco and alcohol, and exposure to sunlight. Over 150,000 Americans die from domestic accidents (like falling down stairs), 45,000 are shot dead, and more than 38,000 people in the US die on the roads each year. Few limit their consumption of troublesome foodstuffs, campaign for guns to be withdrawn, reduce automobile use, or take special care in the home in order to avoid fatalities. Compared to these acceptable rates of dying, being vaccinated is factorially less dangerous. It is these relative data people need to digest; being merely assured that a procedure is completely 'safe' is counterproductive.

The effectiveness of vaccines

The unqualified statement that the COVID-19 vaccination program was 'effective' can similarly be questioned. Definitions of a vaccine are frequently misunderstood. Wikipedia [19] states it is: 'A biological preparation that provides active acquired immunity to a particular infectious disease.' The Cambridge online dictionary defines it as a substance that will "protect [people] from a disease" [20]. The definition in *Encyclopaedia Britannica* assures the reader that vaccines "confer immunity from a subsequent infection". None is correct, since no vaccine guarantees to induce immunity in every patient, and efficacy varies. Rabies vaccines, those against tetanus, and the inactivated polio vaccines confer immunity in almost all patients and can be rated close to 100% effective. Vaccination against rubella (German measles) produces immunity in 97% of patients, while vaccination against smallpox confers immunity in more than 95% of persons. Anthrax vaccination (like measles) produces immunity in 93% of patients. While rotavirus vaccine efficacy is approximately 90%. Others are less efficacious: *Pneumococcus* vaccines rate around 70%, influenza no better than 60%, and cholera around 55%. In short, no vaccine is guaranteed to be effective in every case, and the WHO declares that – to be rated as efficacious – a vaccine needs to produce immunity in no more than 50% of patients [21,22]. These facts are unknown to the public and seem rarely understood by those in authority. All vaccines lose potency as the years go by.

When the COVID-19 vaccines were announced, it was with a flurry of exuberance that they were claimed by the authorities to be 'effective'. Data are varied, and definitive results are not yet reliable; but the vaccines against COVID-19 seem to rate around 80% effective, which is significantly less than most of the vaccines with which people are familiar. However, we can be confident that vaccination against COVID-19 significantly reduces the risk of hospitalization, and greatly reduces the severity of infection acquired subsequently. How long the beneficial effects persist remains to be seen.

Reassuring a skeptical public

The authoritative assertion that COVID-19 vaccination

is 'safe and effective' has proved to be counterproductive to those opposed to vaccination. Many have perused the Vaccine Adverse Event Reporting System (VAERS) in the US, the Yellow Card system launched after the thalidomide tragedy by the British government, or the EudraVigilance database in Europe, and have concluded that any fatality following a vaccination must be due to the vaccine.

Is it safe to vaccinate? The skeptics need to be reminded that vaccination against COVID-19 is one of the most innocuous protective procedures we can undergo: far safer than driving cars, walking downstairs, or undergoing the kind of surgery we accept with little hesitation. Are the vaccines effective? Although these are not as reliable as most of those we encounter during childhood, they protect most people against infection and greatly reduce the severity of symptoms in those unfortunate enough subsequently to contract the disease. Their use is entirely ethical. Most of those who protest so vociferously have been protected from the catastrophic epidemics of the past only through their childhood vaccinations; indeed, modern societies owe their existence to the global use of vaccines. Greater openness and balanced objectivity are what the authorities need to embrace; paternalistic pronouncements are out-of-date and counterproductive.

Opportunism and dishonesty

In a world where free enterprise is valued higher than ethical morality, those who would exploit our predicament for personal benefit were soon on the scene. Organizations without a professional track record, or any relevant experience, were soon offering personal protective equipment (PPE) at high prices. Centers offering to test for the virus sprang up claiming to provide diagnostic services with inflated profit margins. Many of those laboratories provided documentation that was bogus, based on results that were fictitious; and forged vaccination certificates became available almost immediately. The new pandemic became a fertile resource for mendacity.

Equipment, protective?

The provision of personal protective equipment (PPE) became a priority. Supplies were customarily obtained from China, though it was believed they were manufactured at camps utilizing forced labor. Businesses in Britain soon announced their ability to provide supplies, and it was reported that many were associated with Conservative members of parliament. Their initial contracts were valued at £1.6 billion, and claims were made that these initiatives were 'engulfed in corruption' [23]. News reports claimed that over £9 billion were written off by the Treasury for PPE that could never be used, and more than \$22 billion were paid to track and trace, all of this money seemingly wasted [24]. The government adopted a policy of borrowing money in unprecedented amounts through international funding, as though heedless of the need for it to be repaid. No ethical considerations are taken into account; in April 2022 the UK national debt was growing at £5,170 per second, almost half a million pounds per day [25], while the British tax burden rose to the highest levels since the 1940s.

Procrastination in the US

Once tests were available, European governments were quick to adopt their use and the WHO reported that tests were being used in over 60 countries worldwide. The US was not among them. By mid-2020, the American government was relying on the restriction of travel between the US and China, in the hope of curtailing the importation of the virus, but US officials still had no idea of how many people were infected, where the disease had spread, or whether there were local hot-spots demanding urgent intervention. When the CDC eventually approved testing, the kits sent out were known to be faulty in at least one-third of cases, but the fact was kept secret and the kits continued to be mailed. By September 2021, testing laboratories were widely available but results were often delayed; 10% of people submitting a sample had to wait more than 10 days for the result, making the tests virtually pointless [26]. Companies providing tests reaped vast profits: Quidel, marketing the QuickVue test, declared profits of \$406 million in the 3rd quarter of 2021. Cue Health, manufacturing their molecular COVID Test, went public at a value of £2.2 billion in September 2021. COVID-19 was a money-spinner.

Problems with UK laboratories

Policies in the UK were haphazard. MPs were told that government decisions were always 'based on the science' but so many contradictory pieces of advice were offered by scientists with differing points of view, or with disparate vested interests, that it was easy for the government to select what seemed politically expedient, contriving to fit it to whatever advice supported their views Figure 2.

Many of the centers for testing were badly run and poorly organized, offering results that were valueless. A leading virologist stated that conditions were 'chaotic and dangerous,' and samples were handled by young and inexperienced staff working 12-hour shifts [27]. When biohazard legislation was originally proposed it was emphasized that levels of containment should be appropriate to the pathogenicity of the agent [28], but it was shown that regulations were not being followed, and the staff testing for SARS-CoV-2 had little comprehension of what they were handling.

Fraudulent documentation

From the moment it was clear that persons would have travel restrictions lifted if they could prove they'd received



Figure 2: Infection with COVID-19 reached Britain in January 2020. The government failed to recognize the potentially serious nature of a global pandemic and issued official instructions that the public should carry on as usual. Not until late March did the British Government Issue formal instructions that public places (bars, restaurants, etc.) and schools close. During those lost weeks, tens of thousands of cases were spread across the country [10].

a vaccine, forged vaccination certificates began to appear. At first, evidence was by way of paper documentation and the earlier versions were simply forged documents created from scanned originals. A German citizen from Saxony was reported to have been vaccinated 90 times, selling the date-stamped certificates to persons wishing to prove their immunity, but without themselves receiving any vaccine. By the end of 2021, governments were issuing online status certificates. In Britain, vaccination records and incidences of COVID infection were recorded in a central database, and the National Health Service (NHS) allowed users of their app to download a date-stamped copy showing their vaccination dates, plus any subsequent episodes of COVID-19. Showing these to the authorities at a dock or airport was sufficient to allow a traveler to board without further delay. However, there was nothing to prevent people from editing an image of the certificate and saving it (with a different name or a changed date) as a digital image that could be shown on their mobile phone to an inspector. Although each digital certificate bore a QR code, these were never invoked. The NHS also provided access to a database in which users could themselves record episodes of infection that would be correlated with evidence of vaccinations. However, the use of the app was voluntary and there was nothing to prevent infected persons from going about their daily routine in defiance of the law by using evidence that had been forged.

Responding to the virus

The diminutive nature of viruses has eluded us; they are widely regarded merely as microbes, and the precautions the public has been advised to adopt – which would be efficacious for bacteria – are of little relevance. For medical professionals, an absolute concept of the dimensions of a coronavirus is difficult to grasp. Few have ever studied virions through an electron microscope, and their relative size is unfamiliar. In a video presentation (<https://youtu.be/VvBGJkU1myY>) I assembled colored scanning electron micrographs that allow us to zoom in from a human hair, with three erythrocytes as an indicator of the size of living cells, past bacteria (including staphylococci, streptococci, and a *Bacillus*) until the screen is dominated by coronaviruses. If a coronavirus were the size of a lentil, the apertures in a surgical mask would be as large as a railway tunnel. Any notion that a facemask could prevent the transmission of virus particles is absurd; we might as well erect railings around a garden to keep out the ants.

The facemask in context

In 2020, a woman in California refused to wear a facemask, on the grounds that the odor of flatus was not trapped by clothing, so a virus would not be stopped by a mask [29]. A year later, Piers Corbyn, a British anti-vaccine campaigner, launched a campaign with the same slogan without attribution of its source [30]. Many people were persuaded by the argument, though it can easily be disproved. The dimensions of a coronavirus suggest it is composed of 300 million atoms; the molecule of hydrogen sulfide (H₂S) comprises just 3 atoms. The comparison is out by a factor of a hundred million.

Origins of facemasks

Facemasks have long been associated with protection



against disease. During the Black Death plague in Europe during the 17th century, beak-like facemasks containing aromatic herbs (like lavender) were worn by physicians. Foul smells were believed to transmit disease – the term malaria is translated as ‘bad air’ – and the floral aroma was considered a safeguard against infection Figure 3.

It is surprising to discover that similar masks are still available online, where they are worn by punks and others as fashion accessories. The wearing of facemasks was not shown to be medically useful until the epidemic of pneumonic plague in Manchuria between 1910–1911. This outbreak cost 60,000 lives and became the first to involve the wearing of modern-day personal protective equipment (PPE). Wu Lien-the, a young physician trained in Cambridge UK, recommended the precautionary wearing of facemasks. His French colleague who was also treating victims, Gérald Mesny, disputed the proposal, refused to wear a facemask, and died from the plague shortly thereafter. Reports from this epidemic ensured that facemasks have been worn *de rigueur* since that time [31]. During the influenza pandemic of 1918, several authorities introduced legal penalties for persons not wearing facemasks in public. In San Francisco, for instance, there was a fine of \$5 for any person seen by the police not wearing a mask. Facemasks were customarily made from fabric (those in the Manchurian outbreak were fashioned from layered bandages) but molded N95 masks are now favored. The earliest facemask filters manufactured from polymers were announced in the Soviet Union in 1956. Inspired air was filtered from airborne particulates by an electrostatic charge that existed on the plastic fibers. In the US, masks originated as brassiere cups, designed around 1960 by Sara Little Turnbull of the 3M company. Inspired by seeing doctors wearing fabric surgical masks, in 1961 she adapted the pressed shape to produce molded polymer facemasks, and N95 masks have since become popular worldwide.

Can facemasks work?

Facemasks could arguably reduce the likelihood of the



Figure 3: Early facemasks were typified by this copper engraving published by Paul Fürst in 1656. It shows Dr. Schnabel [translated as Dr. Beak], a plague physician in Rome. It is accompanied by a satirical poem in rhyming couplets. The beak contained aromatic herbs and spices which were believed to purify the air. The current acceptance of facemasks providing protection from coronavirus infections is rich in resonances of these primitive beliefs.

transmission of bacteria, notably those spread through droplets or aerosols; however, they cannot prevent the passage of viruses. An N95 mask must remove 95% of particulates measuring >0.3 μm, which will trap almost all bacteria, though no virus is as large as those apertures. Over 500 coronaviruses could pack into a single bacterium. A report from the Norwegian Institute of Public Health argued that 200,000 people would need to wear masks for a week to prevent one new case [32]. The problem is not restricted to the filtration imposed by the mask itself; few people wear close-fitting masks, and most prefer conventional surgical masks or colorful facemasks. Breath bypasses these masks and voluminous clouds of exhaled air are produced by the wearer. Schlieren photography allows us to demonstrate this in laboratory conditions, though tests in very cold winter climates permit people to visualize the bypassing of a facemask by exhaled air without any sophisticated apparatus Figures 4,5.

Do facemasks work?

In the past, there have been surprisingly few investigations of mask efficacy, yet governmental authorities around the world have insisted that the wearing of facemasks is essential in preventing the spread of viruses. Yet a randomized trial of facemasks published in 2015 showed they were ineffective in preventing transmission, and their use posed additional problems due to poor filtration and moisture retention. In May 2020 a meta-study of 14 publications carried out by the CDC [34] showed that wearing facemasks evinced no benefits during influenza outbreaks (influenza virions are the same



Figure 4: Schlieren photography allows us to visualize airflow through changes in refractive index resulting from density gradients that depend on temperature, a technique invented by a prolific German physicist and inventor August Töpler in 1864. Viruses are relatively unhindered by a fabric mask. Were a coronavirus envisaged as a lentil, the perforations in a surgical mask are the size of a railway tunnel [33].



Figure 5: Chad Roy, a moisture control specialist from Vermont, has used cold weather to demonstrate the ease with which breath by-passes a conventional facemask. Much exhaled breath emerges from the sides of the mask or billows up past the nose, as Derrick, et al. has confirmed. Derrick D, Kabaliuk N, Longworth L. Speech airflow with and without face masks. Sci Rep. 2022; 12: 837. <https://doi.org/10.1038/s41598-021-04745-z>



size as coronaviruses). Later that year, no correlation was found between wearing facemasks and infection rates across the American states [35], and there was no evidence of benefit reported from a German study [36]. Evidence presented in favor of wearing masks was often absurd. One widely-quoted example concerns two hairdressers in Missouri who tested positive for COVID-19. They wore facemasks in their salon, and 139 clients did not contract the disease [37]. The most likely reason is the direction of airflow from air-conditioning in the salon; however, no mention of such probable perturbations appears in the published report. Facemasks can obviously reduce droplet spread – particularly during coughing or sneezing – but viruses are far smaller than droplets, and much air spills out the sides of a facemask.

Convincing the public

Authoritative demonstrations have been used to convey an illusory sense of facemask efficacy to an uninformed public. The BBC produced a television program that took exaggeration to extreme heights. They exhibited a network of polymer fibers and used solid plastic balls to demonstrate how aerosols were entrapped. Solid spheres bear little relationship to the behavior of liquid aerosols. A Van der Graaff generator was then used to demonstrate how an electrostatic charge within a mask could attract virions, represented in these experiments by spheres of expanded polystyrene [38]. The voltage in these generators is typically around 100,000 volts, whereas any static within a facemask would be in the hundreds of volts. Polystyrene beads have a density far lower than proteinaceous virions – and of course, since viruses would be present in aqueous aerosols, any static charge initially present would be immediately dispersed through the conductivity of water droplets from exhaled breath. A facemask rapidly becomes damp as breath condenses during exhalation; dampness is anathema to static electricity. These broadcast demonstrations are dishonest in every respect and patronizing to the public. They serve only to distance the authorities from the people they are supposed to inform. Nobody can reasonably claim that facemasks are entirely ineffectual; they exhibit compliance and a desire to benefit others, and the facemasks will certainly entrap some infective droplets. But the popular claim that facemasks allow premises to ensure a ‘COVID-19 environment’ is specious and without scientific merit. There are other problems, too. Wearing facemasks can cause distress in the elderly or those with conditions like chronic obstructive pulmonary disease (COPD). Casually discarded facemasks cause a substantial problem as litter, and it is accepted most were made in China by captive workers under conditions close to slave labor [39]. There are many reasons to question the ethical considerations behind the enforced wearing of facemasks, and we can ponder the possibility that this is deeply rooted in superstitions dating back to the Black Death (*supra*).

Alternatives to facemasks

Throughout the time that facemasks were insisted upon, hand-washing was everywhere considered vitally important. Implicit in this must be the fact that contact transmission was frequently the cause of transmitted infection. For many

months after the pandemic emerged, the WHO continued to insist that fomites were the most important factor in the spread of the virus, and they discouraged the use of facemasks. Their official pronouncements insisted: “There is no specific evidence to suggest that the wearing of masks by the mass population has any potential benefit. In fact, there’s some evidence to suggest the opposite in the misuse of wearing a mask properly or fitting it properly” [40]. There was said to be a ‘compelling case’ to regard hand washing as a ‘central pillar of national COVID-19 prevention strategies’ [22]. Detergents are effective in removing and/or inactivating bacterial and viral pathogens by washing, though alcohol-based gels are most often provided by public premises (including restaurants and stores). Unless these sanitizers contain > 60% ethanol, methanol or isopropanol they may not be effective, and alcohol hand rubs are not as reliable as hand-washing with soap. No matter which alternative is chosen, hands may be reinfected by using the same contaminated door handle to quite a washroom as was used to enter. There are other contra-indications; soap can exacerbate dermatitis, and alcohol can dry the skin and is inflammable.

Even if these precautions are effective in removing pathogens, it is clearly more reasonable to utilize measures that prevent contamination of the hand *ab initio*. I have pointed out that wearing thin cotton gloves of the kind used by specialists handling delicate documents, paintings, or antique artifacts, militates against contamination of the skin. Whereas there are clear arguments against the perceived value of wearing facemasks, there can be none that suggest wearing protective hand coverings could be counterproductive. Wearing cotton gloves would do more to curtail cross-contamination than facemasks [41] yet no authority thought to introduce this precautionary measure.

Customized protocols

The general lack of understanding of viruses led to protocols being introduced that were fragmentary and ill-considered. Passengers aboard cruise ships were told to use facemasks, and were forbidden to pass quiz papers from one to another, in case virus transmission might occur. Yet the same vessels provided tongs for passengers in their self-service buffets, a sure and certain means of horizontal manual transmission of a pathogen. Table surfaces were regularly wiped down with disinfectant sprays, though pepper and salt pots were unhygienically handled by successive customers, and little attention was paid to chair-backs, which were routinely handled each time a client arrived at (or departed from) their seats. Theater seating was limited and carefully spaced, whereas passengers queuing at the buffets were crowded in against each other, and they often shared tables in close proximity to fellow diners. Theaters in cities were different; people sat crowded into rows of seats just as they had always been. Trains were supposed to ensure passenger safety, whereas, in reality, they were often overcrowded, with passengers breathing into each other’s faces. Clearly, there was a general lack of comprehension of risk and little understanding of the principles of virus transmission.

The ethics of lockdown

During the early stages of the pandemic, tracking and



tracing were widely adopted as the most efficacious means of limiting the spread of the virus. Britain had relied on the principle since the pandemic began, but on March 11, 2020, when the WHO officially announced the existence of a global pandemic, the British government responded the next day by abandoning its track and trace program. No attempt was made to close shops, pubs, clubs, or restaurants until the French Prime Minister insisted he would institute travel restrictions unless this was done. The policy of lockdown was not adopted by Sweden, initially with some success, and their hesitancy to disrupt normal life was widely welcomed by those objecting to lockdown. Sweden, however, is different; on average, people leave the parental home aged 18-19 compared with the European average of 26, and a larger proportion of people live alone in Sweden than in other Western countries, while the social behavior of Swedes tends to be more distanced. Permitting greater social interaction was to prove dangerous since the death rates through COVID-19 were 10 times higher in Sweden than in Norway [42]. Lockdown has obvious merits when we are faced with a transmissible disease of high pathogenicity and lack of means of testing, but in principle, it is the virus we need to contain, not the entire population.

Is remote monitoring ethical?

Monitoring the presence of the virus is the alternative to lockdown. Mobile phone apps are the most obvious way to monitor an epidemic and in 2020, many countries introduced apps as a response to the spreading infection. Most states introduced one national system, though India had about 10, and the US had over 15. China adopted rigorous follow-up, with automated warnings if a contaminated individual left their home, while in the UK use of the app was a matter of personal choice and, if an individual chose to ignore its warning messages, they were free to do so. Much was said of the need for personal privacy, though the ethics of this needs to be questioned. More than half of all households in the UK and US use voice-actuated systems in their homes, which continually monitor all conversations taking place as the software awaits the cue of 'Alexa' or 'Siri'. Such installations are targets for bugging. Many of the applications people install on their phones have clauses hidden in their Terms & Conditions that allow them remotely to actuate the camera and/or microphone of a mobile phone, without the user's knowledge. Persons relying on credit cards or other contactless payment systems in their daily lives provide a detailed account of their movements, habits, preferences, and private perversions to commercial enterprises of which they know nothing. In short, the notion of retaining personal privacy has long since been abandoned, and future pandemics of high transmissibility may require the enforced containment of those likely to transmit the pathogen. This would be an intrusion into personal privacy that may be necessary for the survival of a community and is no more revealing than mobile phone users customarily accept. If we experience an outbreak of a severe hemolytic epidemic of high transmissibility this may have to be considered, and a conversation on the ethical considerations is overdue. We should bear in mind that COVID-19 patients become infectious before their symptoms become apparent, whereas the converse

is the case with hemolytic epidemics like Lassa fever and Ebola, where the symptoms are apparent prior to the patient becoming highly infectious. Future pandemics may not be so obliging.

Following the virus

Testing is the crucial key. December 2020 was a landmark: rapid tests became available. Lateral flow tests (manufactured in China) were authorized for home use in the UK that month, as the Ellume COVID-19 Home Test was introduced in the US. When the tests were launched in Spain at that time, a free music concert in Barcelona was provided for all those who had taken the test, and within weeks widespread testing was underway around the world. At the same time, vaccination programs were being introduced. This had all happened within a year of the virus first emerging. Protests continued, with campaigners insisting that it was their right not to be vaccinated if so they chose. Worthy of ethical consideration is the right to remain capable of spreading a potentially lethal infection to significant numbers of people, in the interest of preserving one's personal proclivities. There are precedents: President George Washington required all American troops to be vaccinated against smallpox during the revolutionary war of 1777. These vaccinations became mandatory in the UK in 1800 and in Italy in 1806, and the London government introduced the Compulsory Vaccination Act in 1853. With the widespread introduction of childhood vaccinations against tuberculosis, measles, mumps & rubella, diphtheria, tetanus, pertussis, polio, rabies, hepatitis B, rotavirus, and *Hemophilus influenzae* B, growing numbers of countries ruled that they be legally enforced. These sensible precautions are accepted as ethical and 90% of countries have mandatory vaccination programs. Once we have vaccines, then the spread of an epidemic can be curtailed. And, when tests are available, any need for a general lockdown is obviated. If we can restrict the virus, there is no ethical case to force everyone to isolate in a mandatory lockdown.

The British government launched an app that utilized Bluetooth to indicate if a person had been less than 2 meters from someone known to be infected for more than 15 minutes. This required everyone to download the app, and faithfully invoke it. It could also be argued that the separation distance (and the direction of airflow in that environment) were considerations open to debate. If it was all functioning correctly, then anyone triggering a response was legally required to go into quarantine. The result was that a person registered as infectious could pass the virus to scores of others, all of whom were subject to mandatory self-isolation. In my view, it would be far more reasonable to mandate that the infected individual is confined; this would prevent all the contacts from being restricted and would have freed up the economy, as well as normal social behavior. The ethics of compulsory confinement need to be considered prior to a future pandemic. Weighing up one's freedom of movement, compared to the greater good, is an ethical question that has yet to be considered.

The case for COVID-21

There have been numerous variants of the SARS-CoV-2



virus, and in November 2021 a variant emerged that embodied over 50 specific mutations, most of them coding for the spike proteins which are linked to infectivity. It was named omicron by the WHO and, along with subvariants like BA.2, manifested different features to those of their predecessors. This was a virus that infected the upper airways, and not the lower respiratory tract. The classical COVID-19 variants all produced fever, rasping, frequent cough, dyspnea, and a loss of olfactory sensation. The omicron variants triggered a different spectrum of symptoms: rhinorrhea, headache, sneezing, and sore throat. Furthermore, it was far more transmissible than its predecessors. In my view, because it was such a very different pathogen, this disease could no longer be categorized as COVID-19; it was COVID-21 [33]. Many episodes of the common cold are caused by coronaviruses of low pathogenicity, and I postulate that we are witnessing the inevitable evolution of this virus from its wild state (fairly infective; likely to produce increased morbidity) to a state like the coronaviruses that human communities have experienced since prehistoric times (highly infective but of low pathogenicity). If the trend continues, there will be further evidence to substantiate my view.

Old protocols and new viruses

When the symptomatology of a novel disease becomes apparent, any protocol must be reconsidered to match the demands of a new situation. There was a recrudescence of infection in China in April 2022, and the authorities responded as they had before – by the immediate lockdown. This means that Shanghai, a city with a population the size of Texas, was placed under curfew. Hundreds of vessels accumulated in the approaches to the docks, as unloading was curtailed. The cost to commerce, personal liberty, and to national morale, was incalculable. Streets were deserted, and apart from medical teams in hazmat suits, citizens were seen escaping to the fresh air on rooftops, while government food deliveries proved unreliable and sporadic. Tens of thousands of cases were reported, though the first death was not notified until April 18. Here is a situation where testing would have been better than lockdown; the disease was of substantially reduced pathogenicity, though believed to be as infectious as measles. The Chinese authorities have repeatedly claimed to have achieved high levels of immunization throughout their urban populations, and it remains possible that these figures do not represent reality. The ethical need to match an enforced protocol to the demands of the disease remains paramount. The Chinese outbreak of April 2022 seems to have been less severe than an influenza epidemic, though was met with stringent curtailment of everyday life. A protocol must fit the pathogen.

Contingencies for future pandemics

Clearly, since we are facing the inevitability of future pandemics [43] we need to ensure that precautionary attitudes prevail. Antigen test kits, like new vaccines, can be produced and released within one year. Attention must be paid to the reliability, efficacy, and proper conduct of those involved, but the ability of modern medicine to respond with such remarkable speed is commendable and a milestone in scientific

progress. The speedy introduction of such measures can allow us to minimize the need for a general lockdown in the future: the aim should be to restrict the pathogen, rather than the people [1]. There are several innovations that, as we move ahead, could minimize disruption.

Isolation units

We need isolation hospitals. They are not new ideas. Leper colonies were set up by the ancients. Isolation hospitals were established in the 1700s in the US to handle victims of epidemics, and there are still 56 high-level isolation units (HLIUs) scattered across the US. Isolation hospitals were introduced in the UK in 1801 (the Liverpool Fever Hospital) and in 1802 (the London Fever Hospital). They became widespread in the UK and played an important role in the management of epidemics. The Catherine-de-Barnes Isolation Hospital in Solihull, West Midlands, established in 1907, was used to nurse Janet Parker in 1968, the last patient in the world to die of smallpox. The hospital closed in 1985. Several HLIUs are maintained within British general hospitals, to handle cases of Ebola and similar infections, though isolation hospitals no longer exist.

During the SARS epidemic, China pioneered the construction of the 'instant hospital'. The Beijing Xiaotangshan Hospital (北京市小汤山康复医院) covering 82 acres (33 hectares) was erected in a week from prefabricated components. In Wuhan, where the outbreak had begun, work started on building the 1,000-bed Huoshenshan Hospital (火神山医院) on January 23, 2020. It was finished on February 2. Leishenshan Hospital (雷神山医院) was to follow, and opened on February 8, 2020, with 1,500 beds. The UK government announced its decision to build 7 such units, named Nightingale Hospitals after the pioneering epidemiologist nurse Florence Nightingale. They were planned to cater to the overflow when regional hospitals became overcome by an excess of patients needing clinical care. The budget was £530 million (\$675 million) and they took as little as 13 days to open. However, although the press was informed that the hospitals had been 'built' (a term still widely used today to discuss the project) they were not. Each was an already-existing establishment, typically an exhibition center, and they had only to be equipped for their change of role. The largest, in London, was the ExCel Exhibition Center, planned to have 4,000 beds and be run by 16,000 staff. In the event, it treated only 54 patients, while other Nightingale Hospitals treated none at all [12]. Each patient costs tens of millions of pounds to treat. About half of them died.

In my view, the enterprise was doomed from the start. These establishments would have been better envisaged as isolation hospitals, treating cases of COVID-19 exclusively. In this way, thousands of infectious patients could have been kept away from general hospitals. Because the converse was the policy, tens of thousands of compromised patients became infected while in hospital and, like the victims in care homes, were doomed to suffer an additional burden. A high proportion was to die as a consequence. To respond adequately to the pandemics of the future, such centers should be designated as isolation units and made ready for speedy conversion to

hospital use. Staff should be trained to be ready to adapt from regular medical care to pandemic management. In this way, we can continue to have isolation hospitals made ready, without any need to maintain empty buildings meanwhile. As a matter of practical policy, those suffering from pandemic infections should go to regular hospitals only as a last resort. Currently, hospitals became a prime source for transmitting infection. Florence Nightingale would have been appalled.

Personal safety

Alcohol and surfactant sprays were widely used from the start of the COVID-19 pandemic. Hypochlorites offer a surer solution. A bowl at home containing dilute bleach will help to ensure sterility; a cloth wipe can disinfect shopping and fomites, inactivating viruses on surfaces, chairbacks, handrails and door handles. Most bleach is sold on the retail market as a thickened gel, though traditional thin bleach would be more useful. Not only are the popular alcohol-based gels inflammable, but they are also toxic and can cause drying of the skin. They are also costly, whereas hypochlorites are inexpensive. If a future pandemic poses a threat through contamination of mail, placing it in a domestic oven at 100°C for 15 minutes would ensure the denaturing of viruses, rendering postage items safe to handle while not causing damage to credit cards, etc. These measures may seem extreme, though a future pandemic may necessitate the adoption of precautions like these.

The aseptic environment

To militate against virus transmission we should consider airflow. There have been many cases of infectivity wafting on air currents. The last fatal case of smallpox in Birmingham in 1968 resulted from virions being carried to the next floor of a laboratory block by drifting air, and viruses can be transported great distances by such imperceptible currents. I would recommend containment wards should be constructed with negative air pressure and vented through heat or u/v to ensure the exhaust air is sterile. Many hospitals have pneumatic tube systems installed, and adapting this air pressure supply to maintain centripetal airflow inwards should not be problematic [1].

Alternatives to facemasks

However useful facemasks might (or might not) be is impossible for the public to judge since official pronouncements are so often groundless or deliberately dishonest (*vide supra*). N-95 facemasks are claimed to be effective, notably by their manufacturers, but they are rarely if ever seen in use by the public. Most people buy the so-called surgical masks, widely worn by paramedical staff, while colorful fabric facemasks also became popular with the public. At best, these have minimal effect on virus transmission. The wearing of facemasks has medieval associations, and the practice indicates compliance; however, nobody should be persuaded that they provide a 'COVID-safe' situation. They cannot do so (Figure 6a, 6b).

Cotton gloves prevent pathogens from coming into contact with the skin. Emphasizing the need for hand-washing has been widely repeated throughout the pandemic, heedless of the fact that hands and fingers can immediately become contaminated

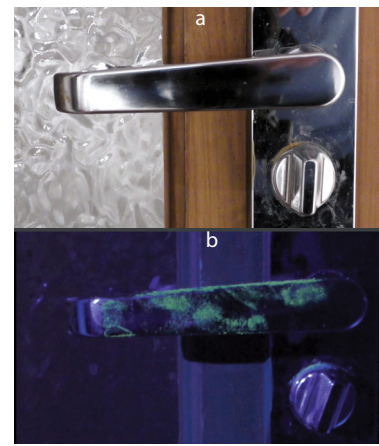


Figure 6: a: Hand washing was widely promoted in the early days of the pandemic through reliance on the dubious merits of facemasks soon came to predominate. Masks indicated compliance and helped to confer a sense of safety to the public. However, even aerosol deposits of virions can eventually precipitate onto surfaces where they contaminate hands. No matter how frequently the handle of a washroom is cleaned and disinfected, subsequent use by a contaminated person can deposit virus particles.

b: Drinking vessels were dusted with ultraviolet phosphors, in imitation of contaminated fomites. After handling, depositions soon built up on the washroom handle. Although facemasks became globally accepted and are still endorsed, there is a case for considering contact transmission. Cotton gloves in daily use could be effective in limiting virus transmission [41].

thereafter. Donning cotton gloves would minimize contamination, and would certainly be an improvement over wearing a facemask [41]. In a future pandemic, gloves could save the day.

Low-impact PPE

Barrier nursing using hazmat suits is highly impersonal and nurses lose their sense of patient contact while wearing headgear. Patients feel isolated and medical staff seem remote. I envisage flexible bonnets or hoods fed with positive-pressure air from cylinders or a wall-mounted supply [1]. The bonnet could be manufactured from polycarbonate film or thin high-density polyethylene, providing 100% protection from airborne pathogens while only slightly interfering with person-to-person visibility, thus reassuring the patient and increasing the nurse's freedom of movement.

Pooled sampling

Virus sampling in schools, factories, colleges, offices, etc., is both time-consuming and costly. The pooling of samples would permit the screening of scores of individuals using a handful of tests. For example, combining 50 swab samples into one small tube of buffer solution would allow one to identify in which of 2 groups an individual tested positive. Two pooled tests of that group would signify which of the 25 people included the single individual with the virus. A third test would narrow it down to 12 people, the fourth to six, and the fifth to three. Using pooled sampling would allow a single carrier to be identified out of 100 people with 5 tests, a considerable saving in cost [1]. Pooling of samples should be introduced in future pandemics.

Community monitoring

Lingering infections within a community could trigger a



recrudescence of an epidemic. Monitoring entire communities will become important as an infection dies down. I proposed the screening of sewage effluent from offices, schools, colleges, and similar establishments [1]. Small (sub-milliliter) samples could be automatically collected at regular intervals, and the results would indicate the virus population of the entire community. Several such systems have since been analyzed; the European experience now shows clearly that wastewater monitoring is feasible [44].

Ethics and surveillance

The answer to controlling a pandemic lies in controlling the pathogen, not in restricting an entire nation. The principle of the lockdown, adopted as a necessary measure, should be abandoned; it is the virus we need to follow. Currently, as we have seen, the behavior and preferences of the public in a digital environment are ceaselessly monitored. The ubiquity of the mobile phone offers an opportunity to survey the spread of infection through digital databases. An infected person must in the future be identified. Rather than using voluntarily downloaded apps to inform individuals if they have likely been exposed to an infectious individual, that person must be identified, notified, and their movements curtailed by mandate. Protestations of infringing civil liberty are of less importance – we need to retain our personal liberty at all costs, but this does not extend to allowing persons the freedom to infect others. We do not permit people to expose others to dangerous dogs, to drive at excessive speeds that can threaten survival, or to scatter poisons in public. We must now address the ethics of surveillance and restricted movement since nobody should claim the right to broadcast a dangerous virus that can cause a pandemic to spread. Lives depend upon that principle. Apart from the risk of infection, millions of people were recorded as enduring poor mental health as a consequence of the lockdown and the threat of infection [45–47]. This is an unacceptable state of affairs and future pandemics must be handled differently. Out-dated concepts of personal freedom cannot threaten entire nations with societal and commercial collapse.

Pandemic apathy

The evolution of the SARS-CoV-2 virus from low infectivity to a highly infectious variant of relatively low pathogenicity [33] allowed governments to lift burdensome controls on movement and abandon their insistence on wearing facemasks. Many members of the public have been left wondering whether the original policies were simply an overreaction: since restrictions are no longer necessary, perhaps they never were. The public may not fully appreciate the importance of vaccination, and we know that vaccine hesitancy is higher among Asian and Afro-Caribbean communities, and is overall more evident in the US and in Europe than in the UK. There is a residual tendency to feel that COVID-19 was never as bad as it was painted. When the next pandemic strikes, governments, and other regulatory authorities need to be prepared for complacency. Viruses can pose an existential threat to humanity, and the COVID-19 pandemic has offered lessons that we have not learned. The next pandemic may be worse. We must be forewarned.

References

1. Bray M. Viral Hemorrhagic Fever (Crimean-Congo, Ebola, Lassa, Marburg, Rift Valley, Yellow Fever), Antimicrobe website. 2010. <http://www.antimicrobe.org/new/v39.asp>
2. CDC. 2022. What are Viral Hemorrhagic Fevers (VHFs). <https://www.cdc.gov/vhf/about.html>
3. Ford BJ. The Changing Face of Disease. 2004; https://www.brianjford.com/a04-changing_disease.pdf. DOI doi.org/10.4324/9780203300183
4. Ford BJ. Forgotten women who Led the Way. *The Microscope*. 2020; 68 (3/4) 139–150. <https://www.brianjford.com/CF41.pdf>
5. Hamre D, Beem M. Virologic studies of acute respiratory disease in young adults. V. Coronavirus 229E infections during six years of surveillance. *Am J Epidemiol*. 1972 Aug;96(2):94-106. doi: 10.1093/oxfordjournals.aje.a121445. PMID: 4626012; PMCID: PMC7109916.
6. Li YD. Coronavirus vaccine development: from SARS and MERS to COVID-19. *Journal of Biomedical Science*. 2020; 27: 104. DOI <https://doi.org/10.1186/s12929-020-00695-2>
7. CDC. 2022. SARS Response Timeline. <https://www.cdc.gov/about/history/sars/timeline.htm>
8. Al-Omari A, Rabaan AA, Salih S, Al-Tawfiq JA, Memish ZA. MERS coronavirus outbreak: Implications for emerging viral infections. *Diagn Microbiol Infect Dis*. 2019 Mar;93(3):265-285. doi: 10.1016/j.diagmicrobio.2018.10.011. Epub 2018 Oct 18. PMID: 30413355; PMCID: PMC7127703.
9. Amer H, Alqahtani AS, Alzoman H, Aljerian N, Memish ZA. Unusual presentation of Middle East respiratory syndrome coronavirus leading to a large outbreak in Riyadh during 2017. *Am J Infect Control*. 2018 Sep;46(9):1022-1025. doi: 10.1016/j.ajic.2018.02.023. Epub 2018 Apr 13. PMID: 29661625; PMCID: PMC7115299.
10. Ford BJ. *Nonscience Returns*, Yarmouth UK: Curtis Press. 2020.
11. Day M. Covid-19: Nightingale hospitals set to shut down after seeing few patients. *BMJ*. 2020 May 7;369:m1860. doi: 10.1136/bmj.m1860. PMID: 32381503.
12. Hart R. By the numbers, who is refusing covid vaccinations and why. *Forbes Magazine*. September 5, 2021.
13. Timonius E. An account, or history, of the procuring the smallpox by incision, or inoculation; as it has for some time been practiced at Constantinople, *Philosophical Transactions of the Royal Society of London*. 1714; 29: 72–82, January 1. DOI <https://doi.org/10.1098/rstl.1714.0010>
14. Ford BJ. Stop Covid beyond the Mask. *Microscope*. 2020; 68 (2) 59–70. <https://www.brianjford.com/CF40.pdf>
15. Ford BJ. Vaccines, sickness or salvation? *The Microscope*. 2019; 76 (3) 111–121. <https://www.brianjford.com/CF37.pdf>
16. Sharma A, Raina V, Uppal G, Kumar R, Grover J. Long term use of thalidomide: safe and effective. *Indian J Cancer*. 2007 Jul-Sep;44(3):108-10. doi: 10.4103/0019-509x.38942. PMID: 18250532.
17. Ford BJ. *BSE the Facts*, London: Corgi books. 1966.
18. UK Health. Information for healthcare professionals on blood clotting following COVID-19 vaccination, UK Health Security Agency. 2022. <https://www.gov.uk/government/publications/covid-19-vaccination-blood-clotting-information-for-healthcare-professionals>.
19. Wikipedia. 2022; <https://en.wikipedia.org/wiki/Vaccine>.
20. Cambridge. 2022 <https://dictionary.cambridge.org/dictionary/english/vaccine>.
21. WHO. Vaccine efficacy, effectiveness, and protection, WHO Health Topics. 2021. <https://www.who.int/news-room/feature-stories/detail/vaccine-efficacy-effectiveness-and-protection>.
22. WHO. State of the World's Hand Hygiene, New York: World Health Organization and UNICEF. 2021b. <https://www.who.int/publications/i/item/9789240036444>
23. Wise J. COVID-19: Ten Conservative MPs and peers referred companies to “VIP lane” that won £1.6bn of PPE contracts. *BMJ*. 2021; 375. <https://www.bmj.com/content/375/bmj.n2825>. DOI <https://doi.org/10.1136/bmj.n2825>



24. Parliament. "Unimaginable" cost of Test & Trace failed to deliver central promise of averting another lockdown, UK Parliament report, Public Accounts Committee. 2021. <https://publications.parliament.uk/pa/cm5801/cmselect/cmpublicacc/932/93203.htm>
25. National Debt Clock. 2022. <https://www.nationaldebtclock.co.uk/>
26. Mervosh S, Fernandez M. 'It's Like Having No Testing': Coronavirus Test Results Are Still Delayed, New York Times. 2020. <https://www.nytimes.com/2020/08/04/us/virus-testing-delays.html>
27. Bloch-Budzier S. Coronavirus testing lab 'chaotic and dangerous', scientist claims. BBC News. 2020; October 16. <https://www.bbc.co.uk/news/health-54552620#>
28. Ford BJ. Call for biohazard legislation, Nature. 1974; 250: 364-365, August 02. <https://www.nature.com/articles/250364a0>. DOI <https://doi.org/10.1038/250364a0>
29. Lemon J. Woman refuses to wear mask, compares it to pants not stopping 'fart' smell, Newsweek July 21. 2020; <https://www.newsweek.com/1519497>
30. Courtney-Guy S. Piers Corbyn leads anti-maskers in bizarre song about farts and Covid on Tube train, Metro. 2021. November 29. <https://metro.co.uk/2021/11/29/piers-corbyn-leads-anti-maskers-in-song-about-farts-and-covid-on-tube-15684067/>
31. Christos L. Plague Masks: The Visual Emergence of Anti-Epidemic Personal Protection Equipment. Medical Anthropology. 2018; 37 (5) 1-16. DOI: 10.1080/01459740.2017.1423072
32. Iversen BG, Vestreim DF, Flottorp S, Denison E, Oxman AD. Should individuals in the community without respiratory symptoms wear facemasks to reduce the spread of COVID-19? Oslo: Norwegian Institute of Public Health. 2020; <https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2020/should-individuals-in-the-community-without-respiratory-symptoms-wear-facemasks-to-reduce-the-spread-of-covid-19-report-2020.pdf>
33. Ford BJ. Are we now faced with COVID-21? British Medical Journal online. 2022; 376. DOI <https://doi.org/10.1136/bmj.n3145>
34. Xiao J, Shiu E, Gao H, Wong J, Fong MW, Ryu S, Cowling BJ. Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Personal Protective and Environmental Measures. Emerging Infectious Diseases. 2020; 26(5): 967-975. DOI <https://doi.org/10.3201/eid2605.190994>
35. Guerra DD, Guerra DJ. Mask mandate and use efficacy for COVID-19 containment in US States. International Research Journal of Public Health. 2021; 5: 55. DOI 10.28933/irjph-2021-08-1005
36. Kappstein I. Mund-Nasen-Schutz in der Öffentlichkeit: Keine Hinweise für eine Wirksamkeit, Krankenhaushygiene up2date. 2020; 15 (03): 279-295. DOI 10.1055/a-1174-6591
37. Hendrix MJ, Walde C, Findley K, Trotman R. Absence of Apparent Transmission of SARS-CoV-2 from Two Stylists After Exposure at a Hair Salon with a Universal Face Covering Policy – Springfield, Missouri. MMWR Morbidity and Mortality Weekly Report. 2020; 69: 930-932. DOI <http://dx.doi.org/10.15585/mmwr.mm6928e2external.icon>.
38. Van-Tamm J. The Perfect Storm, BBC Royal Institution Lecture, December 29, 2021. <https://www.bbc.co.uk/iplayer/episode/m0012tz5/royal-institution-christmas-lectures-2021-2-the-perfect-storm>
39. Turkel N, Carr J. Was your Face Mask made using Forced Labor in China? The Diplomat, August 26. 2020. <https://thediplomat.com/2020/08/was-your-face-mask-made-using-forced-labor-in-china/>
40. Howard J. WHO stands by recommendation to not wear masks if you are not sick or not caring for someone who is sick, CNN News Report. 2020. <https://edition.cnn.com/2020/03/30/world/coronavirus-who-masks-recommendation-trnd/index.html>
41. Ford BJ. Coronavirus contact transmission - answering a neglected hazard. British Medical Journal. 2020. DOI <https://doi.org/10.1136/bmj.m4358>
42. Brusselaers N, Steadson D, Bjorklund K, Breland S, Stilhoff Sørensen J, Ewing A, Bergmann S, Steineck G. Correction: Evaluation of science advice during the COVID-19 pandemic in Sweden. Humanit Soc Sci Commun. 2022;9(1):239. doi: 10.1057/s41599-022-01254-w. Epub 2022 Jul 15. Erratum for: doi: 10.1057/s41599-022-01097-5. PMID: 35856700; PMCID: PMC9284503.
43. Ford BJ. 2004, What Next after SARS? Special report, Encyclopaedia Britannica Yearbook, 204-205, Chicago: Encyclopaedia Britannica. 2004; <https://www.brianjford.com/b04-sars.pdf>
44. JRC. SARS-CoV-2 Surveillance employing Sewage - Towards a Sentinel System, European Union: Publications Office. 2021; <https://publications.jrc.ec.europa.eu/repository/handle/JRC125065> DOI <http://dx.doi.org/10.2760/300580>
45. COVID-19 Mental Disorders Collaborators. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet. 2021 Nov 6;398(10312):1700-1712. doi: 10.1016/S0140-6736(21)02143-7. Epub 2021 Oct 8. PMID: 34634250; PMCID: PMC8500697.
46. MacIntyre CR, Seale H, Dung TC, Hien NT, Nga PT. A cluster randomized trial of cloth masks compared with medical masks in healthcare workers, Infectious Diseases Research. 2015; <https://bmjopen.bmj.com/content/5/4/e006577>
47. WHO. Handwashing an effective tool to prevent COVID-19, other diseases. WHO news release SEAR/PR/1744. 2020; <https://www.who.int/southeastasia/news/detail/15-10-2020-handwashing-an-effective-tool-to-prevent-covid-19-other-diseases>.

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.