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# Face Mask Report

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## 1 Our Mission

The mission of The Awareness Foundation is to highlight truths that are hidden in plain sight. We will challenge the global structures and organisations, that are oppressing billions of people around the world every day.

We aim to educate and fight on behalf of all people, that are affected by these unfair structures and systems.

We offer support networks and alternative solutions, to combat the problems that many face every day.

We aim to gather a collective, from all groups fighting for this same cause. A significant proportion of the planet's population, currently live unaware of the structures and organisations that we fight against daily, and which prohibit our abilities to thrive.

Freedom is a right that we are all born with, however we have all been born into systems that form part of our everyday lives, which stop most of us from ever experiencing true freedom.

The Awareness Foundation represents all people. It is a voice for those that do not yet see the oppression that surrounds us and for those that are unable to fight against the systems alone.

We have one clear message that we seek to spread.

# #Enough

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## 2 Introduction

This document is a report that looks to the health effects of mask wearing in general and the health effects on children in particular.

The contents of this report are from extensive Open Source Intelligence (OSInt) only, using a multi-factor methodology for collecting, aggregating, analysing, and utilising publicly available sources. The author has relied exclusively on published data, medical publications, meta-studies, hypotheses, random control trials and opinion pieces by clinicians, dentists, researchers and physicians/surgeons and many other professionals of both medical and non-medically trained backgrounds for this document.

All sources used in this report are catalogued in Appendix A "List of content utilised in this report." There is further reading available on data and information not used in this report, catalogued in Appendix B "List of content not utilised in this report". Although both lists contain a substantial amount of data for subsequent perusal, this constitutes around 20% of the information viewed by the author. The amount of freely available information on the health effects of masks is almost overwhelming.

This same information has been available to the governments and decision makers around the world. Some advised that the wearing of face masks was not initially required, only to reverse that decision further down the line. This then raises the question, did they advise/mandate the public wear face masks as they were unaware of the negative health effects on the wearer. Or, did they knowingly do so, because they were fully aware of both the short and long-term health effects?

There are innumerable instances of conflicting advice and mandates regarding the wearing of face masks. From government and governmental agencies to TV doctor personalities to Non-Governmental Organisations (NGO's) and unqualified journalists offering advice that the wearing of masks is required in order to protect either the wearer, the general public or both.

There are a host of both individuals and organisations that argue the opposite, mask wearing is a health risk, offers little to no protection to either the wearer or the general public and that they are also detrimental to the normal and healthy development of children.

The author of this document has viewed over 200 individual reports, medical studies, meta-analysis, hypotheses, and opinion pieces. Most of which are not included in this report. This report documents the results of dedicated work of many hundreds of medical and other professionals, that have combined training, research and experience that total many hundreds of years.

Please note that sections of this document have been lifted and copied into the text of this report, sometimes verbatim. Therefore, some parts of the narrative and phraseology may not flow or pace as expected. This is because, in essence, this report is a combination of multiple authors, in some sections.

The author would like to take this opportunity to thank them for their dedication to the subject at hand and for allowing the public access to that knowledge. The reader may want to explore this topic further, to that end, Appendix B contains links to other interesting publications (in the authors' opinion) not utilised here.

The author assumes that the reader has little to no medical knowledge and therefore explanations on medical phraseology will be included within the text where deemed appropriate.

All information used in this report has been acknowledged by the author and all copyrighted materials are utilised under the fair use doctrine, under common law. The links to the full documents are available in Appendix A. The contents of an email received by the author, from the UK Government, regarding a petition on the banning of face mask wearing in schools, is in Appendix C.

## 3 Purpose

The purpose of this document is to provide the reader with evidence on the health effects of wearing face mask of the public in general and of children in particular. This document will show the results of the research into the published clinical reports and opinions of clinicians and others regarding this issue.

This document will not show the conflicting advice from differing parties, it will also not highlight the change in advice over time. The author will also not speculate on the reasons for the change in advice, only acknowledge that it has occurred and that some of the persons/organisations have publicly changed their advice over time

This report may be used in full, or in part, howsoever the reader wishes. This may be used in other documents, reports, or legal briefs as deemed necessary. We only request that attribution is given to the author and The Awareness Foundation for those parts used. If this report, or parts therein, are to be utilised by an organisation, corporate body or government department, then we insist that the author and The Awareness Foundation is given full attribution on each and every use of the details contained within this document.

### 3.1 Scope

The scope of this document is to report on the now almost ubiquitous wearing of face masks in the general population of many countries and provinces around the world, and its effect on human health in the short, medium and long-term. Anything else related to face masks, the mandated wearing of them or governmental policies regarding face masks or personal protective equipment, is outside the scope of this document.

### 3.2 Assumptions and Dependencies

It is assumed that the reader of this document has little to no experience of medical terminology, and as such, the author of this document has provided explanatory text where deemed necessary. This report is only available in English at this time. It is assumed that the reader has sufficient comprehension of the English language, in order to sufficiently understand the content.

### 3.3 Responsibilities

The author is responsible for the creation of this report. The document owner, who is not always the author, is responsible for timely updates and published status of this document. The author takes no responsibility for the accuracy, publication status or integrity of the publishers, of the third-party documentation utilised in the creation of this report



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## 5 Executive Summary

The executive summary is utilised to allow a time-deficient person to obtain the gist or précis of a document, within a page or two of text (slightly more in this report). The full text of this section is contained within the rest of this report. To that end, this executive summary is as follows:

Is there a consensus or a majority of medical professionals that have reported/documented or researched the effects of large scale, long- term wearing of masks? This is for the population in general, but this report is focussed on the health effects for children.

Research by the author and other members of The Awareness Foundation has discovered the following:

Face masks are part of non-pharmaceutical interventions providing some breathing barrier to the mouth and nose that have been utilised for reducing the transmission of respiratory pathogens.

Face masks can be medical and non-medical, with two types of medical masks primarily used by healthcare workers. The first is National Institute for Occupational Safety and Health (NIOSH)-certified N95 mask, a filtering face-piece respirator, and the second is a surgical mask. The third type of face masks are non-medical cloth or fabric masks. The non-medical face masks are made from a variety of woven and non-woven materials such as polypropylene, cotton, polyester, cellulose, gauze, wool and silk.

Wearing a face mask mechanically restricts breathing by increasing the resistance of air movement during both inhalation and exhalation. Carbon dioxide is given off as a by-product of cell metabolism, and is carried by the blood through the venous system (veins) to the lungs. Here it is exhaled. The concentration of CO<sub>2</sub> in each breath is ~3.8%, and the "average" person produces approximately two pounds of carbon dioxide each day. More CO<sub>2</sub> is given off during strenuous activity.

### 5.1 COVID-19 - transmission

- Aerosol-based transmission is the primary mode of COVID-19 transmission.
- Social distancing does nothing for airborne or aerosol particles.
- Based on empirical evidence, masks are not an effective means for reducing aerosol-based transmission.

### 5.2 Health Effects - Teeth, Gums and Mouth

It appears that most people, when wearing masks, breathe through their mouths as opposed to their noses, and this results in reduced saliva production and dry mouth, which becomes problematic as saliva is protective against tooth decay and gum disease. Dentist Dr. Justin Russo says: "A lot of people are stressed out. I can just tell by people's mood that they're stressed out. So, they're clenching, grinding their teeth. A lot of people are eating on an irregular basis. Some dentists are experiencing a 25 percent rise of bite-related cases and some have stated that they believe the pandemic could be to blame."

### 5.3 Health Effects - Skin

Clinical teams engaged in all types of the coronavirus care settings are consistently reporting facial skin tears and lesions caused by prolonged use of protective face masks. Loss of facial skin integrity creates a portal for penetration of pathogens, including the coronavirus itself, as well as other hospital-acquired bacterial, viral, or fungal infections. Thus, skin damage can facilitate penetration of coronavirus and other pathogens directly into the blood circulation. The mask materials mechanically indent and damage facial skin, an effect that is further compromised by perspiration (sweat), and moisture, due to the mental stress and workload care teams are experiencing.

### 5.4 Health Effects - Cognitive

When the use of a face mask is maintained for an extended length of time (over eight hours in healthcare professionals) symptoms of hypoxemia (abnormally low level of oxygen in the blood) such as chest discomfort and tachypnoea (respiration rate greater than normal) are presented. These responses could be explained as carbon dioxide (CO<sub>2</sub>) is a respiratory stimulant and, when is accumulated by the mask use, it does increase lung ventilation and respiratory activity; this fact that would explain the symptoms of confusion, impaired cognition, and disorientation, experienced by nurses.

### 5.5 Health Effects - Immunity

Several studies have indeed found significant problems with wearing such a mask. This can vary from headaches, to increased airway resistance, carbon dioxide accumulation, to hypoxia, all the way to serious life-threatening complications. A drop in oxygen levels (hypoxia) is associated with an impairment in immunity. Studies have shown that hypoxia can inhibit the main immune cells used to fight viral infections. People with cancer, especially if the cancer has spread, will be at a further risk from prolonged hypoxia as the cancer grows best in a micro-environment that is low in oxygen. Low oxygen also promotes inflammation which can promote the growth, invasion, and spread of cancers.

Severe hypoxemia may also provoke cardiopulmonary and neurological complications, and is considered an important clinical sign in cardiopulmonary medicine. Low oxygen content in the arterial blood can cause myocardial ischemia (blockage of heart arteries), serious arrhythmias, right or left ventricular dysfunction, dizziness, hypotension (low blood pressure), syncope (loss of conscious), and pulmonary hypertension (high blood pressure). Chronic low-grade hypoxemia and hypercapnia as result of using face masks can exacerbate existing cardiopulmonary, metabolic, vascular, and neurological conditions.

Re-breathing contaminated air with high bacterial and toxic particle concentrations along with low O<sub>2</sub> and high CO<sub>2</sub> levels continuously challenge the body homeostasis, causing self-toxicity and immunosuppression.

### 5.6 Health Effects - Psychological

Psychologically, wearing face masks have negative effects on the wearer and those nearby. Basic human-to-human connectivity through facial expression is compromised, and self-identity is eliminated. These dehumanising movements delete the uniqueness and individuality of the person wearing the face mask, as well as the those in proximity. Social connections and

relationships are basic human needs, which are inherited in all people, whereas reduced human-to-human connections are associated with poor mental and physical health.

Poor social connections are closely related to isolation and loneliness, these are considered significant health-related risk factors. A meta-analysis of 91 studies of approximately 400,000 people, showed a 13% increased mortality risk among people with low compared to high contact frequency. Another meta-analysis of 148 prospective studies (308,849 participants) found that poor social relationships were associated with 50% increased mortality risk. People who were socially isolated or felt lonely had 45% and 40% increased mortality risk, respectively.

## 5.7 Long-term health consequences

Long-term practice of wearing face masks has a strong potential for devastating health consequences. Prolonged hypoxic and/or hypercapnic state compromises normal physiological and psychological balance, deteriorating health, and promotes the developing and progression of existing chronic diseases. For instance, ischemic heart disease caused by hypoxic damage to the myocardium is the most common form of cardiovascular disease and is a number one cause of death worldwide (44% of all non-communicable diseases) with 17.9 million deaths occurred in 2016. Chronic stress, along with hypoxic and hypercapnic conditions, knocks the body out of balance, and can cause headaches, fatigue, stomach issues, muscle tension, mood disturbances, insomnia, and accelerated ageing.

## 5.8 Face mask and physiology alteration during exercise

Exercising with customised tight face masks induces a hypercapnic hypoxia environment (inadequate oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) exchange). This acidic environment, both at the alveolar and blood vessels level, induces numerous physiological alterations when exercising with face masks. Studies of obstructive sleep apnoea provide irrefutable evidence of hypercapnic hypoxemia affecting the postural stability, proprioception, altered gait velocities, and falls. Exercising with face masks might increase pathophysiological risks of underlying chronic disease, especially cardiovascular and metabolic risks.

## 5.9 Toxic Masks

Professor Michael Braungart, director at the Hamburg Environmental Institute and co-founder of the world-renowned Cradle to Cradle environmental standard, has told Ecotextile News that mask wearers unwittingly run the risk of breathing in carcinogens, allergens and tiny synthetic microfibres by wearing both textile and non-woven surgical masks for long periods of time.

“What we are breathing through our mouth and nose is actually hazardous waste,” said Professor Braungart, who ran preliminary tests on used surgical masks that found traces of chemicals such as the known carcinogen aniline as well as formaldehyde and optical brighteners – both heavily restricted on consumer goods by European and US authorities to minute parts per million concentrations.

Initial analytical tests by experts have now thrown into doubt the wisdom of whether people should be wearing certain types of masks for hours on end. Particularly schoolchildren, factory workers, and long-haul flyers who may be at a greater risk from the long-term damage to lungs through exposure to both restricted chemistry and micro-plastics. There is a potential risk of ‘future’ inflammatory/fibrotic lung diseases because we have been inhaling these

materials in the masks for over a year, with no end in sight. These substances might also be highly carcinogenic, not just for us as adults; we must be very concerned about the risks especially to our children since they depend on us as mentors and guides for their decision-making. It is our children that we are very concerned for.

## 5.10 Microbial contamination

Bacteria are, on average, ten times the size of viruses, particularly coronaviruses, and have less penetration through masks. Therefore, at least part of the re-circulated flow of bacteria in aerosolised and droplet exhalation does not escape the vicinity of the oral and nasal environment. Bacteria and other microbes are not only retained in this space, but masks themselves are warm, moist repositories of these microbes. Laboratory testing of used masks from 20 train commuters revealed that 11 of the 20 masks tested contained over 100,000 bacterial colonies. Moulds and yeasts were also found. Three of the masks contained more than one million bacterial colonies.

The mechanism of pathology originating from masks is likely as follows: microbe-carrying droplets, trapped in masks, stay damp while the mask is worn; whereas without a mask, exhaled droplets and aerosol are known to dry quickly. In the continually damp environment of the mask, bacteria start to proliferate, are re-inhaled and then transferred throughout the body. Bacteria are exhaled through masks at an increasing rate over the time of use. Outward penetration of masks by bacteria is made worse by the plosive force of coughing, sneezing, and talking loudly. Scatter mechanics from the mesh of the mask and the resulting chaotic collisions of aerosolised droplets in turn produce a wider contaminated airspace outside the masked mouth than outside the unmasked mouth. Wearers of cloth masks had significantly higher influenza-like illnesses when compared to unmasked.

When oral bacteria gain access to blood and deep tissues, they may cause pneumonia, abscesses in lung tissue, subacute bacterial endocarditis (life-threatening inflammation of the inner lining of your heart's chambers and valves), sepsis and meningitis. It is important to consider that endocarditis can be a lifelong infection. *Streptococcus pyogenes* (Strep) bacteria has been observed for decades to cause irreversible fibrosis in heart tissue long after the bacteria were no longer found. This bacteria is known by many as "flesh-eating strep". Former *Streptococcus* infections that had seemingly resolved a long time ago may still be positive in an Antistreptolysin O test. For years afterwards, flares of toxins can be released in the body at times of stress or secondary infection, and cause debilitating symptoms.

## 5.11 Face Masks on Children

The results of the first German study on children and teenagers wearing mouth and nose coverings reveal 68% complain of wearing a mask. The average length of time the mask was worn varies greatly with age; it averaged 4.5 hours per day, and was much higher, especially among youth (13-18 years), averaging six hours. In 16,913 children (65.2%) it was reported that fabric masks were worn, followed by surgical masks.

Most common issues were:

- Irritability (60%),
- Headaches (53%),
- Difficulties concentrating (50%),
- Sadness (49%),
- Reluctance to attend school (44%),
- Malaise (42%),

- Impaired learning (38%),
- Fatigue and drowsiness (37%).

Other physical symptoms included rashes and allergies around the mouth, syncope - temporary loss of consciousness usually related to insufficient blood flow to the brain (20%), nausea (16.6%), hyperventilation (12%) fainting spells (2.2%).

In addition, 25% of the children had developed anxieties. Regarding the question as to whether children themselves complain about impairments caused by wearing the mask, 67.7% of the respondents answered yes for their children; 26% answered no. The question as to whether the respondents themselves observed an impairment of the child by wearing the mask was answered yes in 66.1%.

## 5.12 Children's Emotional Development

We've known for decades that children's emotional well-being depends in part on neurological development, which comes from watching faces and recognising emotions. How all this works isn't entirely clear, but as Catherine Herba and Mary Phillips at the London Institute of Psychiatry have explained, there is enough evidence to suggest that normal child development needs children to see people expressing their emotions.

With widespread masking, we may unintentionally be disadvantaging younger children from developing the necessary skills to discern emotions and the neurological changes that make it possible to distinguish one face from another.

For adults, the need to wear a mask can be inconvenient. For children it could be more serious. Masks disguise key cues in our expressions, making it harder to read someone's face, and there is growing evidence that this could be affecting child development. Child carers who wear masks while at work say it is difficult to establish a relationship of trust with children, because they have to conceal their mouths.

Elementary schools in Japan are reporting that masks are having adverse effects on their students, including more unruly behaviour as masks disrupt communication. Professor Masako Myowa says children between four and ten years old are developing the ability to empathise, to imagine what others think, and how to respond. Children normally have ample chances at school to put themselves in someone else's shoes, but masks in classrooms mean the opportunities are much scarcer now.

Changes in face recognition performance and alteration along the processing style of partially occluded faces could have significant effects on children's social interactions with their peers and their ability to form important relationships with educators. Previous research in adults has already demonstrated the detrimental effect of reduced face perception abilities on one's level of social confidence and quality of life.

This concludes the Executive Summary section of this report.

## 6 Carbon Dioxide Study

Normally, humans breathe in air that is approximately 20.95% oxygen, 78.09% nitrogen, 0.93% argon, and 0.04% (400 ppm) of carbon dioxide. Like CO<sub>2</sub>, oxygen also dissolves in the lungs and is transported to the blood via diffusion across the lung tissue (alveoli). Once in the blood, oxygen is carried throughout the body by the arteries, and is used in cell metabolism throughout the body.

Carbon dioxide is given off as a by-product of cell metabolism and is carried by the blood through the venous system (veins) to the lungs. Here it is exhaled. The concentration of CO<sub>2</sub> in each breath is ~3.8%, and the "average" person produces approximately two pounds of carbon dioxide each day. More CO<sub>2</sub> is given off by strenuous activity.

Hypercapnia, hypercarbia, or hypercapnea, is the physiological term for the condition of, and the body's response to, excessive carbon dioxide. When CO<sub>2</sub> is breathed into the lungs, it dissolves in the water there, diffuses across the alveolar-capillary membrane, and enters the bloodstream. As it combines with water, it forms carbonic acid, making the blood acidic. So, CO<sub>2</sub> in the bloodstream lowers the blood pH.

When CO<sub>2</sub> levels become excessive, a condition known as acidosis occurs. This is defined as the pH level of the blood becoming less than 7.35. The body maintains the balance mainly by using bicarbonate ions in the blood. As the body responds to neutralize this condition, an electrolyte imbalance – an increase of plasma chloride, potassium, calcium and sodium, can occur. In the blood stream, CO<sub>2</sub> concentration is also controlled by reversible reactions with two major blood components, plasma proteins and haemoglobin.

In addition, the body uses other specific mechanisms to compensate for the excess carbon dioxide. Breathing rate and breathing volume increase, the blood pressure increases, the heart rate increases, and kidney bicarbonate production (in order to buffer the effects of blood acidosis), occur. Blood vessels in the extremities constrict, restricting blood flow to these body parts. At the same time, arteries in the brain, spinal cord, and heart dilate, so that more blood flow is diverted to maintain the function of these critical organs.

When there is exposure to very high levels of CO<sub>2</sub>, in excess of 5% (50,000 ppm), the body's compensatory mechanisms can become overwhelmed, and the central nervous system (brain and spinal cord) functions are depressed, then fail. Death soon follows.

Hyperventilation (rapid breathing) can cause too little CO<sub>2</sub> and result in alkalosis (pH blood becomes elevated). People at high altitudes that are not acclimated (pilots without supplemental oxygen, travellers to high altitudes), because there is less available oxygen to breathe (lower partial pressure of oxygen because the air is "thinner"), can become unconscious due to lack of oxygen without ever having a sensation of "air hunger".

Fortunately, during the past decade, great strides have been made in developing accurate, rugged, and dependable carbon dioxide sensors at a reasonable cost. These sensors can now be part of a multi-gas monitor, such as those used for confined space entry, be a single gas monitor that is hand-held or worn by the worker, or be installed in a production area to detect high levels of CO<sub>2</sub>. Industry has embraced this technology, using them as a routine part of production work, and trained workers to use them.

Studies by NIOSH in 1976 dispelled the myth that carbon dioxide is an asphyxiant gas and only causes adverse health effects when it displaces oxygen. Symptoms of overexposure by inhalation include dizziness, headache, nausea, rapid breathing, shortness of breath, deeper breathing, increased heart rate (tachycardia), eye and extremity twitching, cardiac arrhythmia, memory disturbances, lack of concentration, visual and hearing disturbances (including photophobia (abnormal intolerance to visual perception of light.), blurred vision, transient blindness, hearing loss and ringing in the ears), sweating, restlessness, vomiting, shaking, confusion, flushed skin, panic, parathesis (a sensation of numbness in the extremities), disorientation, convulsions, unconsciousness, coma, and death.

CO2 Concentration	Duration	Physiological Impact/Health Effect
1,000 ppm	Less than 2 1/2 hrs.	Impairs judgment, decision-making ability, and thinking skills on a short-term basis, even for healthy individuals.
2,500 ppm	Less than 2 1/2 hrs.	Many individuals are rendered cognitively marginal or dysfunctional.
5,000 ppm with 20.9% oxygen		Headache, lethargy, mental slowness, emotional irritation, and sleep disruption.
6%	1-2 mins.	Hearing and visual disturbances
7% (70,000 ppm) with 20.9% oxygen	5 mins.	Death
10% to 15%		Dizziness, drowsiness, severe muscle twitching, unconsciousness and death within a few minutes.
17% to 30%	Within 1 min.	Loss of controlled and purposeful activity, unconsciousness, coma, convulsions, and death
30% carbon dioxide, with 70% oxygen	30 secs.	Unconsciousness, with some subjects having seizures that were characterised as decerebrate (no cerebral functioning).

**Table 1: Carbon Dioxide Levels and Impact**

Even though oxygen is necessary to carry out cell functions, it is not the lack of oxygen that stimulates breathing. Breathing is stimulated by an excess of CO<sub>2</sub>. If an individual breathes too slowly (bradypnea), does not breathe deeply enough, (dyspnea), or is exposed to excessive CO<sub>2</sub> levels, too much CO<sub>2</sub> can build up. This causes increased breathing and the other physiological responses discussed above.

Concentrated CO<sub>2</sub> conditions impact most living organisms. Plant roots can actually be suffocated, which stops the uptake of nutrients and kills the plants.



## 7 What is a Face Mask?

Face masks are part of non-pharmaceutical interventions providing some breathing barrier to the mouth and nose that have been utilised for reducing the transmission of respiratory pathogens.

Face masks can be medical and non-medical, where two types of the medical masks are primarily used by healthcare workers. The first type, considered in this document, is National Institute for Occupational Safety and Health (NIOSH)-certified N95 mask, a filtering face-piece respirator, and the second type is a surgical mask.

The designed and intended uses of N95 and surgical masks are different in the type of protection they potentially provide. The N95's are typically composed of filter media and seal tightly to the face of the wearer, whereas surgical masks are generally loose fitting and may or may not contain filtering media.

The N95's are designed to reduce the wearer's inhalation exposure to infectious and harmful particles from the environment such as dust particulates. In contrast, surgical masks are designed to provide a barrier protection against splash, spittle and other body fluids to spray from the wearer (such as surgeon) to the sterile environment (patient during operation) for reducing the risk of contamination.

The third type of face masks are the non-medical cloth or fabric masks. The non-medical face masks are made from a variety of woven and non-woven materials such as Polypropylene, Cotton, Polyester, Cellulose, Gauze, Wool and Silk. Although non-medical cloth or fabric face masks are neither a medical device nor personal protective equipment, some standards have been developed by the French Standardisation Association (AFNOR Group) to define a minimum performance for filtration and breathability capacity. There is no advice from the British government on any standards for cloth/fabric coverings. This lack of standards does indicate that the wearing of some sort of face covering is in fact the goal of the mandatory face mask diktat, rather than ensuring the wearer is protected from a virus.

The physical properties of medical and non-medical face masks suggest that face masks are ineffective to block viral particles due to their difference in scales. According to the current knowledge, the virus SARS-CoV-2 has a diameter of 60 nm to 140 nm (nanometres - billionth of a metre), while medical and non-medical face masks' thread diameter ranges from 55  $\mu\text{m}$  to 440  $\mu\text{m}$  (micrometres - one millionth of a metre), which is more than 1,000 times larger. Due to the difference in sizes between SARS-CoV-2 diameter and face masks thread diameter (the virus is 1,000 times smaller), SARS-CoV-2 can easily pass through any face mask. In addition, the efficiency filtration rate of face masks is poor, ranging from 0.7% in non-surgical, cotton gauze woven mask to 26% in cotton material. With respect to surgical and N95 medical face masks, the efficiency filtration rate falls to 15% and 58% respectively, when even small gap between the mask and the face exists.

The issues of the general public wearing face masks is well known. These including self-contamination due to hand practice or non-replaced when the mask is wet, soiled, or damaged, development of facial skin lesions, irritant dermatitis or worsening acne and psychological discomfort. Vulnerable populations such as people with mental health disorders, developmental disabilities, hearing problems, those living in hot and humid environments, children and patients with respiratory conditions are at significant health risk for complications and harm.

Wearing face mask mechanically restricts breathing by increasing the resistance of air movement during both inhalation and exhalation process. Although, intermittent (several times a week) and repetitive (10–15 breaths for 2–4 sets) increase in respiration resistance may be adaptive for strengthening respiratory muscles, prolonged and continuous effect of wearing face mask is maladaptive and could be detrimental for health.

A variety of politicians and senior medical advisors have advocated that the general population wear masks in a number of different situations. Different requirements for mandatory mask wearing differs from region to region and country to country. There is no single standard for the wearing of masks or the type of mask to be worn.

There is also no advice on the disposal of worn masks. Given that this is a supposed dangerous and highly contagious virus, the lack of advice on the correct and safe disposal of masks is readily noticeable.

## 8 Face Mask Toxic Materials

There is very little mention or questioning of what goes into the manufacture of face masks. Most people rely on governmental organisations to ensure that they are safe to use, ensuring the public are not put at risk by personal protective equipment. Unfortunately, the evidence shown below tells a different story.

### 8.1 Chemical Cocktail

In the Ecotextile News article (<https://www.ecotextile.com/>) "Exclusive: Chemical cocktail found in face masks", the reporter John Mowbray shows the evidence collated and collected by top German scientists have found that wearing certain types of face masks for long periods of time, could result in potentially hazardous chemicals and harmful micro-plastics being inhaled deep into human lungs.

Professor Michael Braungart, director at the Hamburg Environmental Institute and co-founder of the world-renowned Cradle to Cradle environmental standard has told Ecotextile News, that mask wearers unwittingly run the risk of breathing in carcinogens, allergens and tiny synthetic microfibres by wearing both textile and non-woven surgical masks for long periods of time.

His recent findings have been backed up by another leading industry textile chemist Dr. Dieter Sedlak, managing director and co-founder of Modern Testing Services Augsburg, Germany in partnership with Modern Testing Services Global, Hong Kong, who found elevated concentrations of hazardous fluorocarbons, formaldehyde and other potentially carcinogenic substances on surgical face masks: "I can say 100 per cent that I have similar concerns to Prof. Braungart." Said Dr. Sedlak.

Initial analytical tests by both of these experts have now thrown into doubt the wisdom of whether people should be wearing certain types of masks for hours on end. Particularly school children, factory workers and long-haul flyers who may be at a greater risk from the long-term damage to lungs through exposure to both restricted chemistry and micro-plastics.

"What we are breathing through our mouth and nose is actually hazardous waste," said Professor Braungart, who ran preliminary tests on used surgical masks that found traces of chemicals such as the known carcinogen aniline as well as formaldehyde and optical brighteners – both heavily restricted on consumer goods by European and US authorities to minute parts per million concentrations.

Separate studies by Dr. Sedlak have also shown the presence of compounds such as 2-butanone oxime (carcinogenic), blocked diisocyanates used as cross linkers for perfluorocarbons (PFCs) on face masks. Used in the textile sector as oil and water repellents on fabrics, by-products of PFCs are known to be bio-persistent and their use is heavily restricted by authorities in Europe and the USA. Last year, a group of US scientists called for all per- and poly-fluorinated substances (PFAS) to be treated as one single class of chemistry and said they should be avoided for non-essential uses due to their hazardous toxicological and eco-toxicological profile.

"Honestly, I had not expected PFC's would be found in a surgical mask, but we have special routine methods in our labs to detect these chemicals easily and can immediately identify them. This is a big issue," explained Dr. Sedlak.

"It seems this had been deliberately applied as a fluid repellent – it would work to repel the virus in an aerosol droplet format – but PFC on your face, on your nose, on the mucus

membranes, or on the eyes is not good.” Along with PFCs, he also detected compounds such as formaldehyde and acetaldehyde whereas a GCMS chromatogram showed “100s of peaks from other contaminants.” (Gas chromatography–mass spectrometry is an analytical method that combines the features of gas-chromatography and mass spectrometry to identify different substances within a test sample).

## 8.2 Microfibre concern

Like Sedlak, Braungart noted that surgical masks have been designed to be worn for very specific purposes such as by clinicians or for a short period of time before being discarded. They are not designed to be crumpled up in people’s pockets where the “friction and damp environment promotes both fibre abrasion and encourages bacterial colonisation over time,” he said.

This abrasion can, he says, cause the release of tiny micro-plastics as the polypropylene fibres break down from mechanical wear and tear, finding in tests that some masks shed microfibrils classed as hazardous ‘dust’ by the German Social Accident Insurance (DGUV). Fibres of this type of geometry that meet this dust standard are also referred to as ‘WHO fibres’ after earlier work by the World Health Organisation on asbestos.

According to the Agency for Toxic Substances and Disease Registry (ATSDR), asbestos, or in this case asbestos-like fibres, are classed as a dangerous substance that should be avoided. Breathing in these fibres can cause cancerous and non-cancerous diseases.

## 8.3 Asbestos or asbestos-like fibre related diseases

Breathing asbestos or asbestos-like fibres can cause tiny fibres to get stuck in the lungs and irritate lung tissues.

Scientific studies have shown that the following non-cancer diseases can be caused by breathing these fibres:

Asbestosis is scarring in the lungs caused by breathing asbestos or asbestos type fibres. Oxygen and carbon dioxide do not pass in and out of scarred lungs easily, so breathing becomes harder. Asbestosis usually occurs in people who have had very high exposures over a long time, but years may pass before any symptoms appear.

Pleural disease is a non-cancerous lung condition that causes changes in the membrane surrounding the lungs and chest cavity (pleura). The membrane may become thicker throughout (diffuse pleural thickening) or in isolated areas (pleural plaques), or fluid may build up around the lungs (known as a pleural effusion). Not everyone with pleural disease will have problems breathing, but some may have less efficient lung function.

## 8.4 Asbestos or asbestos-like fibre exposure also increases the risk of developing certain cancers

Lung cancer is a malignant tumour that invades and blocks the lung’s air passages. Smoking tobacco combined with asbestos or asbestos-like fibre exposure greatly increases the chance of developing lung cancer.

Mesothelioma, is a rare cancer of the membrane that covers the lungs and chest cavity (pleura), the membrane lining the abdominal cavity (peritoneum), or membranes surrounding

other internal organs. Signs of mesothelioma may not appear until 30 to 40 years after exposure to asbestos or asbestos-like fibres.

In addition to lung cancer and mesothelioma, asbestos or asbestos-like fibres exposure can also cause cancer of the larynx and ovary. Current evidence also suggests fibre exposure may cause cancer of the pharynx, stomach, and colorectum.

## 8.5 Potential litigation risks?

One unforeseen problem for those mandating the continued and long-term wearing of face masks, such as governments, councils, medical professionals, and businesses, is the potential for future litigation, if they are proven to have any long-term adverse impacts on human health, especially since long-term studies have yet to be undertaken.

Those who have taken upon it themselves to mandate masks, should be wary of the coming backlash, as some chemicals and fibres may have long-term effects and that possibly opens the floodgates of personal injury claims against governments, businesses, institutions, and individuals at some stage in the future.

## 8.6 The dangers of masks - American Institute of Economic Research

In the article, 'The Dangers of Masks', reporter Paul E Alexander covers the issue of potential danger of the chlorine, polyester, and micro-plastic components of the face masks (surgical principally, but any of the mass-produced masks) that have become part of everyone's daily lives due to the COVID-19 pandemic.

Emergent reports, albeit nascent and anecdotal but nevertheless vitally important (and will be clarified and defined in time) regarding the manufacture of masks, where, "many of them (face masks) are made of polyester, so you have a micro-plastic problem, many of the face masks would contain polyester with chlorine compounds. If I have the mask in front of my face, then of course I inhale the micro-plastic directly and these substances are much more toxic than if you swallow them, as they get directly into the nervous system." There are also reports of toxic mould, fungi, and bacteria that can pose a significant threat to the immune system by potentially weakening it.

Of particular concern to us is the recent report of breathing in synthetic fibres in the face masks. This is of serious concern. "Loose particulate was seen on each type of mask. Also, tight and loose fibres were seen on each type of mask. If every foreign particle and every fibre in every face mask is always secure and not detachable by airflow, then there should be no risk of inhalation of such particles and fibre. However, if even a small portion of mask fibres are detachable by inspiratory airflow, or if there is debris in mask manufacture or packaging or handling, then there is the possibility of not only entry of foreign material to the airways, but also entry to deep lung tissue, and potential pathological consequences of foreign bodies in the lungs."

Reports are that "Graphene is a strong, very thin material that is used in fabrication, but it can be harmful to lungs when inhaled and can cause long-term health problems." We argue that there is a risk of potential 'future' inflammatory/fibrotic lung diseases, because the public are inhaling these mask materials for over a year with more potential time for the wearing of masks to come and no end in sight. These substances might also be highly carcinogenic. Not just for us as adults but we must be very concerned about the risks especially to our children

since they depend on us as mentors and guides for their decision-making. It is our children that we are very concerned for.

## 8.7 Masks, false safety and real dangers: Friable mask particulate and lung vulnerability - Primary Doctor Medical Journal (Part 1)

In this paper, the authors, Boris Borovoy, Colleen Huber, Q Makeetai, make the following observations about masks. Optimal oxygen intake in humans has been calculated in the absence of any obstruction to the airways. The US Occupational Safety and Health Administration (OSHA) has determined that the optimal range of oxygen in the air for humans is between 19.5 and 23.5%. In previous times, before the COVID-19 era, OSHA required that any human-occupied airspace where oxygen measured less than 19.5% to be labelled as "not safe for workers." The percentage of oxygen inside a masked airspace generally measures 17.4% within several seconds of wearing.

Both lower ambient oxygen and increased ambient carbon dioxide stimulates ventilation, as the body quickly and steadfastly attempts to acquire more oxygen. As a compensatory mechanism, inspiratory flow is measurably higher in mask-wearers than in controls. The question then arises: If inspiratory flow is increased over normal while wearing a mask, is every fibre attached to one's face mask secure enough not to be inhaled into the lungs of the mask-wearer?

Inhaled cotton fibres have been shown to cause subpleural ground glass opacities (hazy patches on the lung sub-surface), at the surface of the visceral pleura (covers the surface of each lung), as well as centrilobular and peribronchovascular interstitial thickening, as well as fibrous thickening of peribronchiolar interstitium (connective tissue sheath that encloses the bronchi, pulmonary arteries, and lymphatic vessels).

Disposable surgical face masks are made of synthetic fibres, including polymers such as polypropylene, polyurethane, polyacrylonitrile, polystyrene, polycarbonate, polyethylene, or polyester. There is an inner layer of soft fibres and a middle layer, which is a melt-blown filter, as well as a water-resistant outer layer of non-woven fibres. This study shows FT-IR spectra (technique used to obtain an infrared spectrum of absorption or emission of a solid) of the degrading fibres of disposable masks. It found that disposable face masks could be emerging as a new source of micro-plastic fibres, as they can degrade/fragment or break down into smaller size/pieces.

Research on synthetic fibres has shown a correlation between the inhalation of synthetic fibres and various bronchopulmonary diseases, such as asthma, alveolitis, chronic bronchitis, bronchiectasis, fibrosis, spontaneous pneumothorax, and chronic pneumonia. Pulmonary fibrosis is among the worst diseases that can be suffered or witnessed. It kills exceedingly slowly, by ever-thickening matrix formation, a kind of scar tissue, obstructing the alveoli and reducing their air exchange. The illness worsens slowly over time, and suffocates the victim very gradually. Nothing is available to the sufferer from conventional medicine.

Inhaled particles, particularly nanoparticles, can begin the process of pulmonary fibrosis by forming free radicals such as superoxide anions. The resulting oxidative stress promotes inflammatory responses and surface reactivity. Particles of nanometre to micrometre size have been implicated as causative agents in pulmonary fibrosis. Airborne inhaled nano-size particles are especially dangerous for the lungs, but are small enough to undergo transcytosis (process whereby macromolecules are transported across the interior of a cell) across epithelial and endothelial cells to enter blood and lymph, reaching the cardiovascular system, spleen, bone marrow, and have been observed to travel along axons and dendrites of the central nervous system and ganglia, a phenomenon that has been known for decades.

## 9 Face Mask Health Effects

There are some that argue that wearing a mask has no negative health effects, whilst others list a catalogue of issues. We are not going to look at those that espouse no harm in this document. We will be looking at the health issues with wearing a mask in general and the direct issues for children in particular.

The potential harms and risks of wearing face masks are clearly documented. These include self-contamination due to hand practice or non-replacement when the mask is wet, soiled or damaged, development of facial skin lesions, irritant dermatitis or worsening acne and psychological discomfort. Vulnerable populations such as people with mental health disorders, developmental disabilities, hearing problems, those living in hot and humid environments, children and patients with respiratory conditions are at significant health risk for complications and harm.

Due to the significant nature of this section of the report, it has been broken into sections of the body to enable the reader to readily digest the amount of information shown below.

### 9.1 Health Effects - Teeth, Gums and Mouth Issues

This section of the report covers the health issues that affect the mouth.

In the UK national newspaper The Sun, ran an article outlining the concerns from dentists. Dr. Rob Ramondi, dentist and co-founder of One Manhattan Dental in the US, said around 50 per cent of his patients are being impacted by the use of face masks. He said: "We're seeing inflammation in people's gums that have been healthy forever, and cavities in people who have never had them before."

Doctor Marc Sclafan, also from the practice, said the issues are caused by mask wearers breathing out of their mouths more than their nose. Dr. Sclafan said this can cause a dry mouth, which leads to a decrease in saliva — and saliva is what fights the bacteria and cleanses your teeth. He added that people are also drinking less water because they are wearing masks which is leading to dehydration. Dr. Sclafani however added that more patients are coming into the surgery as they are concerned about bad breath.

Saliva works to neutralise acid in the mouth reducing these problems. It appears that most people when wearing masks breathe through their mouths as opposed to their noses, and this results in reduced saliva production and dry mouth, which becomes problematic as saliva is protective against tooth decay and gum disease. This in combination with our tendency to drink less water whilst masked up leads to dehydration.

In an interview with CNS News, a dentist from Raleigh, North Carolina, Justin Russo explained "The bacteria in your mouth will have a more fertile breeding ground, you'll be more likely to have tooth decay, you'll smell bad breath, those sorts of things." What's more, the stress of dealing with the mask and coronavirus can prompt people to grind and clench their teeth, Russo says: "A lot of people are stressed out. I can just tell by people's mood that they're stressed out. So, they're clenching, grinding their teeth. A lot of people are eating irregular. Some dentists are experiencing a 25 percent rise of bite-related cases and some said they believe the pandemic could be to blame."

The following tips are from the dentist:

- Brush your teeth at least twice a day.
- Floss between your teeth every day.

- Don't forget to brush your tongue too.
- Swish your mouth with mouthwash before putting on a mask.
- Drink lots of waters throughout the day. Stay hydrated.
- Avoid alcohol, smoking, marijuana, and vaping because they can cause dry mouth, inflammation, enamel damage, teeth staining, and even oral cancer.
- Avoid sugary foods and acidic drinks.
- Chew sugar-free gum to increase saliva flow.
- Regularly wash your reusable face mask or replace disposable masks.
- Eat a balanced and nutritious diet.

The most effective tip has been missed off this list, end the lockdowns and the mandatory mask wearing for the general public.

In The Daily Mail, another interview with two dentists from New York states - 'We're seeing inflammation in people's gums that have been healthy forever, and cavities in people who have never had them before,' Dr. Rob Raimondi said. About 50 percent of our patients are being impacted by this, [so] we decided to name it "mask mouth" — after "meth mouth". While some Americans have claimed that mask-wearing exacerbates respiratory issues, less attention has been paid to problems plaguing the teeth and gums. Gum disease — or periodontal disease — will eventually lead to strokes and an increased risk of heart attacks, Dr. Marc Sclafani states. "The mouth breathing is causing the dry mouth, which leads to a decrease in saliva — and saliva is what fights the bacteria and cleanses your teeth." He added.

## 9.2 Health Effects - Skin Issues

This section of the report covers the health issues that affect the skin on and around the facial area.

### National Center for Biotechnology Information

The National Center for Biotechnology Information, in the USA, have produced a study aimed at exploring the prevalence and possible risk factors of face mask related adverse skin reactions during the COVID-19 restrictions. This comes after a recommendation of face mask wearing for public use in Thailand. The study publication date is 21<sup>st</sup> October 2020, which included 833 participants and was undertaken between 27<sup>th</sup> May 2020 and 30<sup>th</sup> June 2020.

It is postulated that some adverse skin reactions could occur on the face that might be related to the regular use of face mask wearing. There were several reports of adverse skin reaction related to the personal protective equipment, for example, masks, gloves, etc., during the pandemic. The prevalence of face mask related adverse skin reactions was 54.5%, of which acne was the most frequent (39.9%), followed by rashes on the face (18.4%), and itch symptoms (15.6%). Wearing a surgical mask showed a higher risk of adverse skin reaction compared to a cloth mask. A duration of face mask wearing of more than four hours/day and the reuse of face masks increased the risk of adverse skin reactions compared to changing the mask every day.

Rashes behind the ears were found in 56 cases (6.72%). Majority of them were the result of the skin breakdown from ear straps. The use of ear savers to allow ear straps to rest on these items instead of the ears was addressed as a suggestion for those who suffered with rashes behind the ears.



Another factor that caused a higher risk of adverse skin reaction was the duration of face mask wearing of more than four hours per day. The study showed that the longer duration of four to eight hours per day, and more than eight hours per day, revealed a higher risk of an adverse skin reaction. The longer duration of four to eight hours per day, and more than eight hours per day revealed a higher risk of an adverse skin reaction.

Because of a high demand for surgical masks and a situation of a surgical mask crisis during the COVID-19 outbreak, the phenomena of reusing face masks has occurred. Many people reused their masks several times before changing. This factor also increased the risk of having face mask related adverse skin reactions in the Thai population. The risk was increased up to 1.5 times in a group that reused the mask and changed them every two to three days compared to a group that changed the mask every day. The prevalence of face mask related adverse skin reactions during COVID-19 pandemic was 54.5%. The most frequent adverse skin reaction was acne.

## European Pressure Ulcer Advisory Panel

A guest editorial by Professor Amit Gefen, PhD, on the website of the European Pressure Ulcer Advisory Panel, documents a study on skin tears caused by mask wearing. The editorial piece covers the International Consensus Document on Device-related Pressure Injuries (DRPIs), developed over a year of intense work by a global multidisciplinary expert group (of which the professor was chair). It is a comprehensive synthesis of contemporary scientific and clinical knowledge regarding tissue damage that can be caused by medical devices. In this case, it covers the damage to the skin from long-term wearing of medical masks.

The editorial discusses the content of the report from the study, which achieved international consensus, and covered the role of frictional forces in masks in detail. Generally, frictional forces caused by medical devices (or other objects in contact with skin, in this case medical masks) distort cells and tissues, resulting in sustained shear that leads to skin and sub-dermal tissue damage. The document describes the damage cascade in cells and tissues, particularly in the context of ventilation masks, tissue damage similar to that caused by prolonged use of medical face masks. The damage often manifests in the form of skin tears (friction lesions), a form of avulsion (tearing away forcibly) that occurs as a result of static or dynamic frictional forces acting on the skin.

The clinical teams engaged in all types of the coronavirus care settings are consistently reporting facial skin tears and lesions caused by prolonged use of their protective face masks. Loss of facial skin integrity creates a portal for penetration of pathogens, including the coronavirus itself, as well as other hospital-acquired bacterial, viral, or fungal infections. Thus, skin damage can facilitate penetration of coronavirus and other pathogens into the blood circulation directly.

The mask materials mechanically indent and damage facial skin, an effect that is further compromised by perspiration (sweat) and moisture due to the mental stress and workload care teams are experiencing. Specifically, the cause for these widely reported skin tears is that the materials of the mask, which already have a substantial friction coefficient with the skin, do not release the moisture (sweat) that is captured at the mask-skin contact sites, subsequently increasing the friction coefficient even more, and elevating the static frictional forces that eventually tear the skin. The moisture also compromises the mechanical strength of skin; as such, the increased frictional forces and the reduced tissue strength synergistically contribute to the skin tears (i.e. friction lesions), which are becoming increasingly common among the care teams.

Given that masks are now being used throughout the day and under extreme workload conditions in the study, along with the fact that perspiration is profuse due to the mental and

physical stress, a practical solution for clinicians is to use a skin barrier under the contact sites between the face and the mask. Petroleum jelly (PJ), also known as white petrolatum or soft paraffin.

Experimental biotribology work has confirmed that PJ decreases the friction coefficient at the skin interface by approximately 25% immediately post-application; however, the friction coefficient will gradually and monotonically return to baseline after about an hour. Considering all of these factors together from a bio-engineering perspective, applying a thick layer of PJ once every thirty minutes to facial skin under the mask, after a very thorough wash and disinfection of the hands with a hospital-quality sanitary gel product (obviously following removal of the used gloves), and using a new mask each time, should considerably reduce the risk for facial skin tears.

The editorial piece is written from the perspective of medical staff working within a medical environment. Given that most people who now wear masks are not in a medical setting, the washing of hands, reapplication of petroleum jelly to the face and applying a new mask to sit on top of the newly applied PJ every thirty minutes is not practicable or easily realised. It's doubtful that this is even remotely attainable in most hospitals, let alone in schools, supermarkets and building sites.

### 9.3 Health Effects - Body

This section of the report covers the health issues that affect the rest of the body, outside of the two specific areas documented previously.

#### Headache related to mask use of healthcare workers in COVID-19 pandemic

In the published study, 'Headache related to mask use of healthcare workers in COVID-19 pandemic', it documents a new type of headache, sometimes referred to as 'de-novo headache', may develop from wearing face masks. The study is a cross-sectional study carried out on healthcare workers at the Afyonkarahisar Health Sciences University, located in Turkey.

Data was collected from a total of 375 participants. Out of all participants, 6.9% used a filtering mask, 73.1% used a surgical mask and 20.0% of participants used a combination of both masks. The number of participants with pre-existing headache was 30.4% had pre-existing headache. Of those with pre-existing headache, 67.5% healthcare workers had reported an aggravation in their headache after mask use. De-novo headache was observed in 30.9% of participants. De-novo headache characteristics included throbbing in 14.7% participants and pressing in 85.3% participants. In addition, symptoms such as tachypnea (respiration rate greater than normal), sleep disturbance, and fatigue were found to be significantly higher.

This study indicates that healthcare workers develop headaches due to use of masks during the COVID-19 outbreak.

## Cognitive and psychophysiological impact of surgical mask use during university lessons

In the published study 'Cognitive and psychophysiological impact of surgical mask use during university lessons', fifty volunteer university students were analysed in two 150 minute lessons;

- Personal class using a surgical mask
- Online class with student at home without the mask.

Blood oxygen saturation, heart rate and heart rate variability, mental fatigue and reaction time were measured before and immediately after both lectures. The study states, that they found a significant decrease in the blood oxygen saturation after the class with mask use. It seems that the prolonged use of surgical mask (150 minutes) negatively affects blood oxygen saturation.

This data was in line with previous research conducted in surgeons, during a one-to-four hour surgery, where the blood oxygen saturation decreased from 98% to 96%. In this study the researcher also reported a significant increase in Heart Rate (from 85 to 90 bpm), tendency also measured in the present research where a significant 13 bpm was measured with the use of surgical mask. The study does claim that the decrease of blood oxygen saturation after the use of surgical mask, even significant, would not be clinically relevant, since the blood oxygen saturation remained in normal range (90–98%).

However, one of the issues of this report is that this is a short-term study of only 150 minutes. The authors do state that when the use of mask is maintained in time (over eight hours in healthcare professionals) symptoms of hypoxemia (abnormally low level of oxygen in the blood) such as chest discomfort and tachypnoea (respiration rate greater than normal) are presented. These responses could be explained since carbon dioxide (CO<sub>2</sub>) is a respiratory stimulant, and when it is accumulated by the mask, does increase lung ventilation and respiratory activity, this fact that would explain the symptoms of confusion, impaired cognition, and disorientation, experienced by nurses.

The study concludes that the use of surgical mask during a 150 minutes university lesson produced an increased heart rate and a decrease in blood oxygen saturation.

### 9.4 Dr. Russell Blaylock

In an opinion piece written by Dr. Russell Blaylock for the Green Med Info website (his only editorial for that site to date), Dr. Blaylock warns that not only do face masks fail to protect the healthy from getting sick, but they also create serious health risks to the wearer. The bottom line is that if you are not sick, you should not wear a face mask. As this piece was written on 11<sup>th</sup> May 2020, there is a lot of knowledge missing and assumptions made about COVID-19. We now know that asymptomatic spread of the disease is not possible, despite the many assurances from politicians that this unproven theory is in fact very real.

"With the advent of the so-called COVID-19 pandemic, we have seen a number of medical practices that have little or no scientific support as regards reducing the spread of this infection. One of these measures is the wearing of facial masks, either a surgical-type mask, bandana or N95 respirator mask. When this pandemic began and we knew little about the virus itself or its epidemiologic behaviour, it was assumed that it would behave, in terms of spread among communities, like other respiratory viruses. Little has presented itself after intense study of this virus and its behaviour to change this perception.

"Only a very small number of people are at risk of a potentially serious outcome from the infection, mainly those with underlying serious medical conditions in conjunction with advanced age and frailty, those with immune compromising conditions and nursing home patients near the end of their lives. There is growing evidence that the treatment protocol issued to treating doctors by the Center for Disease Control and Prevention (CDC), mainly intubation and use of a ventilator (respirator), may have contributed significantly to the high death rate in these select individuals.

"As for the scientific support for the use of face mask, a recent careful examination of the literature, in which 17 of the best studies were analysed, concluded that, "None of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection."

"Several studies have indeed found significant problems with wearing such a mask. This can vary from headaches, to increased airway resistance, carbon dioxide accumulation, to hypoxia, all the way to serious life-threatening complications.

"While most agree that the N95 mask can cause significant hypoxia and hypercapnia, another study of surgical masks found significant reductions in blood oxygen as well. The longer the duration of wearing the mask, the greater the fall in blood oxygen levels.

"The importance of these findings is that a drop in oxygen levels (hypoxia) is associated with an impairment in immunity. Studies have shown that hypoxia can inhibit the type of main immune cells used to fight viral infections called the CD4+ T-lymphocyte. This occurs because the hypoxia increases the level of a compound called hypoxia inducible factor-1 (HIF-1), which inhibits T-lymphocytes and stimulates a powerful immune inhibitor cell called the Tregs. This sets the stage for contracting any infection, including COVID-19 and making the consequences of that infection much graver. In essence, your mask may very well put you at an increased risk of infections and if so, having a much worse outcome

"People with cancer, especially if the cancer has spread, will be at a further risk from prolonged hypoxia as the cancer grows best in a micro-environment that is low in oxygen. Low oxygen also promotes inflammation which can promote the growth, invasion and spread of cancers. Repeated episodes of hypoxia have been proposed as a significant factor in atherosclerosis (build-up of fats, cholesterol/other substances in and on artery walls) and hence increases all cardiovascular (heart attacks) and cerebrovascular (strokes) diseases.

"There is another danger to wearing these masks on a daily basis, especially if worn for several hours. When a person is infected with a respiratory virus, they will expel some of the virus with each breath. If they are wearing a mask, especially an N95 mask or other tightly fitting mask, they will be constantly re-breathing the viruses, raising the concentration of the virus in the lungs and the nasal passages. We know that people who have the worst reactions to the coronavirus have the highest concentrations of the virus early on. And this leads to the deadly cytokine storm in a selected number.

"Newer evidence suggests that, in some cases the virus can enter the brain. In most instances it enters the brain by way of the olfactory nerves (smell nerves), which connect directly with the area of the brain dealing with recent memory and memory consolidation. By wearing a mask, the exhaled viruses will not be able to escape and will concentrate in the nasal passages, enter the olfactory nerves and travel into the brain."

Dr. Blaylock concludes his editorial by stating the following;

"It is evident from this review that there is insufficient evidence that wearing a mask of any kind can have a significant impact in preventing the spread of this virus. One should not attack and insult those who have chosen not to wear a mask, as these studies suggest that is the wise choice to make."

## 10 Long-Term health consequences of wearing Face Masks

Long-term practice of wearing face masks has a strong potential for devastating health consequences. Prolonged hypoxic and/or hypercapnic state compromises normal physiological and psychological balance, deteriorating health and promotes the developing and progression of existing chronic diseases. For instance, ischemic heart disease caused by hypoxic damage to the myocardium is the most common form of cardiovascular disease and is a number one cause of death worldwide (44% of all non-communicable diseases) with 17.9 million deaths occurred in 2016. Hypoxia also plays an important role in cancer burden. Cellular hypoxia has a strong mechanistic feature in promoting cancer initiation, progression, metastasis, predicting clinical outcomes and usually presents a poorer survival in patients with cancer. Most solid tumours present some degree of hypoxia, which is an independent predictor of more aggressive disease, resistance to cancer therapies and poorer clinical outcomes.

Worth noting, cancer is one of the leading causes of death worldwide, with an estimate of more than 18 million new diagnosed cases and 9.6 million cancer related deaths occurring in 2018. With respect to mental health, global estimates showing that COVID-19 will cause catastrophic collateral psychological damage through quarantine, lockdowns, unemployment, economic collapse, social isolation, violence and suicides.

Chronic stress along with hypoxic and hypercapnic conditions knocks the body out of balance, and can cause headaches, fatigue, stomach issues, muscle tension, mood disturbances, insomnia and accelerated ageing.

The hypoxic and/or hypercapnic state is suppressing the immune system from being able to protect the body from viruses and bacteria, decreasing cognitive function, promoting the developing and exacerbating the major health issues including hypertension, cardiovascular disease, diabetes, cancer, alzheimers, rising anxiety and depression states, causes social isolation and loneliness and increasing the risk for prematurely mortality.

Physiological Effects	Psychological Effect	Health Consequences
Hypoxemia	Activation of "fight or flight" stress response	Increased predisposition for viral and infection illnesses
Hypercapnia	Chronic stress condition	Headaches
Shortness of breath	Fear	Anxiety
Increase lactate concentration	Mood disturbances	Depression
Decline in pH levels	Insomnia	Hypertension
Acidosis	Fatigue	Cardiovascular disease
Toxicity	Compromised cognitive performance	Cancer
Inflammation		Diabetes
Self-contamination		Alzheimer disease
Increase in stress hormones level (adrenaline, noradrenaline and cortisol)		Exacerbation of existing conditions and diseases

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Increased muscle tension		Accelerated aging process
Immunosuppression		Health deterioration
		Premature mortality

**Table 2: Long-term health effects of wearing face masks.**

## 11 Face Masks, false safety and real dangers: Microbial challenges from masks - Primary Doctor Medical Journal (Part 2)

In this second paper on the subject, the authors Boris Borovoy, Colleen Huber and Maria Crisler now turn their attention to microbial contamination from masks and mask use, changes in oral and nasal microbiota (the micro-organisms that typically inhabit a particular environment), and potential risks to the lungs and other organ systems from microbial factors.

Concerns regarding use of masks among the public have been voiced by many medical professionals. Over 2,000 Belgian medical professionals, including hundreds of doctors, have urged prevention of COVID-19 by means of strengthening natural immunity. Their recommendations, among other measures, include specifically to exercise in fresh air without a mask.

There is overwhelming clinical evidence to show that masks have no effect against transmission of viral pathogens. Penetration of cloth masks by viral particles was almost 97% and surgical masks 44%. Even bacteria, approximately ten times the volume of coronaviruses, have been poorly impeded by both cloth masks and disposable surgical masks. Face masks became almost ineffective after two hours of use, and after 150 minutes of use, more bacteria were emitted through the disposable mask than from the same subject unmasked.

### 11.1 Microbial contamination of and from masks

Bacteria are on average ten times the size of viruses, particularly corona viruses, and have less penetration through masks. Therefore, at least part of the re-circulated flow of bacteria in aerosolised and droplet exhalation does not escape the vicinity of the oral and nasal environment. Bacteria and other microbes are not only retained in this space, but masks themselves are warm, moist repositories of these microbes.

Laboratory testing of used masks from 20 train commuters revealed that 11 of the 20 masks tested contained over 100,000 bacterial colonies. Moulds and yeasts were also found. Three of the masks contained more than one million bacterial colonies.

The mechanism of pathology originating from masks is likely as follows: Microbe-carrying droplets, trapped in masks, stay damp while the mask is worn, whereas without a mask, exhaled droplets and aerosol are known to dry quickly. In the continually damp environment of the mask, bacteria start to proliferate, are re-inhaled and then transferred throughout the body, as discussed below. Bacteria are exhaled through masks at an increasing rate over the time of use. Outward penetration of masks by bacteria is made worse by the plosive force of coughing, sneezing and talking loudly. Scatter mechanics from the mesh of the mask and resulting chaotic collisions of aerosolised droplets in turn produce a wider contaminated airspace outside the masked mouth than outside the unmasked mouth. Cloth mask wearers had significantly higher influenza-like illness when compared to the unmasked.

Dr. James Meehan reports seeing patients clinically that have facial rashes, fungal infections, bacterial infections. "Reports coming from my colleagues from all over the world, are suggesting that the bacterial pneumonias are on the rise." Dr. Meehan reports that this is "because untrained members of the public are wearing medical masks repeatedly in a non-sterile fashion."

What may be an even more intractable health hazard is the vast range of possibilities where normally colonised strains of oral and nasal bacteria interact with newer virulent strains in the favourable incubating environment of face masks. The possibility of super-strains and their consequences in the population will likely eclipse the effects and the incidence of the relatively mild COVID-19 virus, as we have seen from the autopsies of the 1918-1919 pandemic victims.

Bacteria that live in the mouth and upper respiratory tract may be aspirated and cause infection in the lungs. We know that mask-wearers have greater inspiratory flow than non-mask wearers. This is presumably due to the hypoxic condition of mask obstruction to the airways. As a result, microbes may be more likely to be aspirated while wearing a mask than not wearing one.

When oral bacteria gain access to blood and deep tissues, they may cause pneumonia, abscesses in lung tissue, subacute bacterial endocarditis (an infection that occurs when germs such as bacteria enter the bloodstream and attack the lining of the heart valves), sepsis and meningitis. It is important to consider that endocarditis can be a lifelong infection. Strep pyogenes bacteria has been observed for decades to cause irreversible fibrosis in heart tissue long after the bacteria were no longer found. This bacteria is known by many as "flesh eating strep". Former Streptococcus infections that had seemingly resolved a long time ago may still be positive in an Antistreptolysin O test. For years afterward, flares of toxins can be released in the body at times of stress or secondary infection and cause debilitating symptoms.

Additionally Type 2 diabetes, hypertension, and cardiovascular diseases have been the result of oral bacteria gaining access to deeper tissue. These are among the diseases reported as co-morbidities associated with an increased risk of death attributed to COVID-19. Chronic Obstructive Pulmonary Disease (COPD) and, in this enormous study, cancer can also result simply from the access of oral bacteria to deeper tissue.

One of the risks of mask wearing is that face masks maintain bacteria in greater numbers and for a longer period of time. This increases the risk of those bacteria entering the respiratory system and/or blood stream through micro-wounds.

The following are some of the diseases and conditions that may result. Bacteremia is a condition in which bacteria can travel to internal organs, muscle, bone and prosthetic devices. Toxic shock syndrome is a condition in which some strains of Staphylococcus produce toxins that create high fever, nausea, vomiting and other symptoms. Septic arthritis occurs when staph bacteria infect the joints, which may result in pain, swelling and fever. The risk of pericarditis (swelling and irritation of the thin, saclike tissue surrounding your heart) caused by Staphylococcus has been known since at least 1945. This life-threatening disease has been treated with prolonged antibiotic therapy and aggressive drainage of the pericardium and, in severe cases, surgical resection of the pericardium. Purulent (containing, discharging, or causing the production of pus) pericarditis is the most serious consequence of bacterial pericarditis, and is always fatal if untreated. Even in treated patients the mortality rate is 40%.

Streptococcus is a commensal (symbiotic) organism of the oral mucosa, and is the most common infective agent causing endocarditis (an inflammation of the inner layer of the heart, the endocardium. It usually involves the heart valves.). It is not so unusual for oral Streptococci to gain access to the bloodstream, and oral Streptococci comprise more than half of colonies cultured from blood following dental procedures. "Oral streptococcal bacteremia is frequently associated with the development of septic shock and death".



## 11.2 Infections involving fungi, yeast and moulds

Aspergillosis is an infection of the lungs by the spores of the *Aspergillus fumigatus* fungus. These spores are ubiquitous in the environment, indoors and outdoors, and are usually harmless. It is possible that a warm moist environment, such as a mask worn outdoors or in bathrooms may pick up and harbour fungal spores as well as particulate and/or loose fibres. This is normally not a concern for a healthy person or an unmasked person. When mould spores are inhaled by a healthy person, immune system cells surround and destroy them. Masks provide an alternative environment whereby mould and fungi are held and trapped beyond typical airborne levels. When maintained over the airways, this can create a risk for the mask-wearer. Simply, if the masks retain fungal spores, these may be dislodged with inhalation and transferred.

## 11.3 Conclusion

Masks have been shown consistently over time and throughout the world to have no significant preventative impact against any known pathogenic microbes. Specifically, regarding COVID-19, we have shown in this paper that mask use is not correlated with lower death rates nor with lower positive PCR tests.

Masks have also been demonstrated historically to contribute to increased infections within the respiratory tract. We have examined the common occurrence of oral and nasal pathogens accessing deeper tissues and blood, and potential consequences of such events. We have demonstrated from the clinical and historical data cited herein, we conclude the use of face masks will contribute to far more morbidity and mortality than has occurred due to COVID-19.

## 12 “Exercise with face mask; Are we handling a devil’s sword?” – A physiological hypothesis

In this hypothesis the authors, Baskaran Chandrasekaran\* and Shifra Fernandes, take a look at the potential effects of wearing a face mask during exercise.

### 12.1 Face mask and physiology alteration during exercise

Exercising with customised tight face masks induces a hypercapnic hypoxia environment (inadequate oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) exchange) This acidic environment both at the alveolar and blood vessels level induces numerous physiological alterations when exercising with face masks:

- Metabolic shift,
- Cardiorespiratory stress,
- Excretory system alterations,
- Immune mechanism,
- Brain and nervous system.

### 12.2 Poor immune responses

Exercising with face masks induces an acidic environment, and thus mobility of hypoxic natural killer cells to the target cells would be affected, aggravating the chances of infection. A further change in humidity and temperature in the upper airway causes immotile cilia syndrome (defects in the action of cilia [small tubes, known as microtubules, on cells] lining the respiratory tract) predisposing individuals to lower respiratory tract infections by deep seeding of oropharyngeal flora.

### 12.3 Increased cardiorespiratory stress

The reduced availability of O<sub>2</sub> and CO<sub>2</sub> would increase the heart rate and blood pressure exponentially even at low workloads. This physiological alteration may increase aortic pressure and left ventricular pressures, leading to an upsurge of cardiac overload and coronary demand. Further increased respiratory load against the “valve breathing”, leads to increased respiratory muscle load and pulmonary artery pressure which, in turn, add to the cardiac overload. These changes may be subtle in healthy individuals during exercise. But, in persons with established chronic illness, these changes may aggravate the underlying pathophysiology, leading to hospitalisation or increased use of medication.

### 12.4 Altered renal function

Hypercapnic hypoxia reduces renal blood flow and glomerular filtration rate posing a risk of reduced renal (kidney) functions. Thus, aciduria (the excretion of acid in the urine) and resulting tubular damage may potentially aggravate the compromised renal functions in individuals with established chronic diseases. Further, the autonomic dysfunction and reduced

immune responses, increase the inflammatory substances such as reactive protein, interleukins (IL-6, IL-12) resulting in generalised nephritis (inflammation of the kidney) in chronic kidney failure patients. Additionally, poor renal artery flow causes hypoxemia in nephrons (microscopic structural and functional unit of the kidney) perpetuating the pathophysiology (abnormal states) of poor renal functions.

## 12.5 Brain metabolism and mental health

Acute hypercapnia is, a double-edged sword; on the one hand, elevates intracranial pressure, lowers cerebral perfusion (oxygen delivery to the brain), and triggers cerebral ischemia (insufficient blood flow to the brain); on the other hand, it is found to be neuro protective decreasing the excitatory amino acids and minimising the cerebral metabolism. Studies of obstructive sleep apnoea provide irrefutable evidence of hypercapnic (abnormally elevated carbon dioxide levels in the blood) hypoxemia (low oxygen) affecting the postural stability, proprioception (the body's ability to sense its location, movements, and actions), altered gait velocities and falls. The above findings can be extrapolated to elderly persons as well as individuals with established respiratory diseases exercising with N95 respirator masks.

## 12.6 Can face masks increase the risks of Coronavirus?

Although the masks are perceived to be barriers for preventing aerosol depositions to the respiratory tract, the reality is that masks increase the risk of more in-depth respiratory tract infections. As quoted by Perencevich et al. 2020, "The average healthy person shouldn't be wearing masks as it creates a false sense of security and people tend to touch their face more often when compared to not wearing masks". The surgical masks are thought likely to trap the droplets containing the virus inside, increasing rather than reducing the risk of infection.

## 12.7 Possible mitigatory measures

To avoid the adverse effects of exercising with a face mask, the individual should first be aware of their exercise limit. Low-to-moderate intensity exercise would be beneficial and would help reduce the ill effects of mask breathing (laboured breathing through a mask). When experiencing symptoms of dizziness, imbalance, excessive fatigue, and shortness of breath, it would be advisable to stop and take a break, until symptoms subside. Intermittent atmospheric breathing without the mask would be beneficial to restore the normalcy of breathing and reducing the stress on the cardiopulmonary system, in an area which is not densely occupied by people. Individuals with chronic diseases should avoid venturing outdoors to exercise. Home-based exercises, performed under the supervision of a health professional, would be preferred to avoid any adverse outcomes.

## 12.8 Conclusion

Exercising with face masks might increase pathophysiological risks of underlying chronic disease, especially cardiovascular and metabolic risks. Social exercisers are recommended to do low-to-moderate intensity exercise, rather than vigorous exercise. We also recommend people with chronic diseases to exercise alone at home, under supervision when required, without the use of face masks. Given the identified and hypothesised risks, social distancing and self-isolation appear to be better than wearing face masks while exercising.

## 13 Psychological effects of wearing Face Masks

### 13.1 Dehumanising and isolating

Psychologically, wearing face masks fundamentally has negative effects on the wearer and the nearby person. Basic human-to-human connectivity through facial expression is compromised and self-identity is somewhat eliminated. These dehumanising movements partially delete the uniqueness and individuality of the person wearing the face mask as well as the connected person. Social connections and relationships are basic human needs, which is inherent in all people, whereas reduced human-to-human connections are associated with poor mental and physical health. Despite escalation in technology and globalisation that would presumably foster social connections, scientific findings show that people are becoming increasingly more socially isolated, and the prevalence of loneliness is increasing in last few decades.

Poor social connections are closely related to isolation and loneliness, considered significant health related risk factors. A meta-analysis of 91 studies of about 400,000 people showed a 13% increased mortality risk among people with low compare to high contact frequency. Another meta-analysis of 148 prospective studies (308,849 participants) found that poor social relationships was associated with 50% increased mortality risk. People who were socially isolated or fell lonely had 45% and 40% increased mortality risk, respectively.

These findings were consistent across ages, sex, initial health status, cause of death and follow-up periods. Importantly, the increased risk for mortality was found comparable to smoking and exceeding well-established risk factors such as obesity and physical inactivity. An umbrella analysis of 40 systematic reviews including 10 meta-analyses demonstrated that compromised social relationships were associated with increased risk of all-cause mortality, depression, anxiety suicide, cancer and overall physical illness.

As described earlier, wearing face masks causing hypoxic and hypercapnic state that constantly challenges the normal homeostasis, and activates "fight or flight" stress response, which is an important survival mechanism in human body. The acute stress response includes activation of nervous, endocrine, cardiovascular, and the immune systems. These include activation of the limbic part of the brain, release stress hormones (adrenalin, neuro-adrenalin and cortisol), changes in blood flow distribution (vasodilation of peripheral blood vessels and vasoconstriction of visceral blood vessels) and activation of the immune system response (secretion of macrophages and natural killer cells). Encountering people who are wearing face masks activates innate stress-fear emotion, which is fundamental to all humans in danger or life-threatening situations, such as death or unknown, unpredictable outcomes. While acute stress response (seconds to minutes) is an adaptive reaction to challenges and part of the survival mechanism, chronic and prolonged state of stress-fear is maladaptive and has detrimental effects on physical and mental health. The repeatedly or continuously activated stress-fear response causes the body to operate on survival mode, having sustained increase in blood pressure, pro-inflammatory state and immunosuppression.

### 13.2 The surgical mask is a bad fit for risk reduction

In an article by Shane Neilson, MD, in May of 2016, notes the following;

The widespread misconception about the use of surgical masks, that wearing a mask protects against the transmission of virus, is a problem of the kind theorised by German sociologist

Ulrich Beck. He writes of the “symptoms and symbols of risks” that combine in populations to create a “cosmetics of risk.”

He critiques the cosmetics of risk as measures that are not preventive but rather act as a “symbolic industry and policy of eliminating the increase in risks.” He proposes that the surgical mask is a symbol that protects from the perception of risk by offering non-protection to the public while causing behaviours that project risk into the future. Histories of the surgical mask offer some clues about our contemporary risk profile, a profile that is, according to the nature of risk, future-oriented.

As recently as 2010, the US National Academy of Sciences declared that, in the community setting, “face masks are not designed or certified to protect the wearer from exposure to respiratory hazards.” A number of studies have shown the inefficacy of the surgical mask in household settings to prevent transmission of the influenza virus.

When risk is perceived, readiness and protection for all those at risk becomes a goal, which thereby creates a constant state of preparedness in the universally vulnerable. Wearing a mask reinforces fear. The future pandemic is perceived in the present, but its materiality is not just in our minds, it is literally substantiated by the mask. Thus we have the means for a self-perpetuating system: the mask symbolically protects against infection, just as it represents fear of that infection. This fear surfaces in public policy. The Public Health Agency of Canada (PHAC) does not recommend the use of masks by well individuals in pandemic situations, acknowledging that the mask has not been shown to be effective in such circumstances.

“We act out our collective anxiety about pandemics by wearing masks even when there isn’t a pandemic, but wearing masks reinforces the idea of a possible future of pandemic. The problem of affect in political terms is a contagious one: fear spreads among the public, leading to intensification of risk management — the classic example being 9/11 and the war on terrorism. Fear of infective risk spreading communicably becomes an ironic pun. Pandemics occurred in 1918, 1957, 1968, 2003 and 2009. Because we are currently “between pandemics,” (written in May 2016) our existence is book-ended by the realised threats of the past and the reasonable threats of the future, to our detriment, with this detriment masked by the surgical mask itself.”

## 14 Face Masks on Children

This section shows the results of the studies on the health effects on children when they are forced to wear masks. No child would wear one, all day, of their own volition. The culpability for the negative health effects, which are numerous and pervasive, lay at the feet of one group of people only, adults.

### 14.1 The first German study on children

The results of the first German study on children and teenagers wearing mouth and nose coverings reveal 68% complain of wearing a mask. Researchers (Silke Schwarz, Ekkehart Jenetzky, Hanno Krafft, Tobias Maurer, David Martin) at the University of Witten-Herdecke have set up the first registry to report effects of wearing a mask in children. Three hundred and sixty-three doctors were invited to report their findings and ask parents and teachers to register side effects of masks. They were surprised by the elevated number of reports, as they found complaints affecting 25,930 children were entered in less than six days.

When asked about the situations in which the children wear a mask, 81.1% of the survey participants answered that the child wears the mask at school outside of class, i.e. during breaks and in the corridors, 48.6% also stated that the child also wears the mask in class during lessons. 68.5% of the children recorded wearing the mask in stores and 39% on the way to school 4.6% of the children never wear a mask. A mask exemption certificate had been granted to 6.7% of the registered children and youth. The average length of time the mask was worn varies greatly with age; it averaged 4.5 hours per day, and was much higher, especially among the youth (13-18 years), averaging six hours. In 16,913 children (65.2%) it was reported that fabric masks were worn, followed by surgical masks.

Most common issues were:

- Irritability (60%),
- Headaches (53%),
- Difficulties concentrating (50%),
- Sadness (49%),
- Reluctance to attend school (44%),
- Malaise (42%),
- Impaired learning (38%),
- Fatigue and drowsiness (37%).

Other physical symptoms included rashes and allergies around the mouth, syncope - temporary loss of consciousness usually related to insufficient blood flow to the brain (20%), nausea (16.6%), hyperventilation (12%) and fainting spells (2.2%).

In addition, 25% of the children had developed anxieties. Asked what they were thought about the measures, 41% of the parents estimated they should be milder and 31.6% estimated they were inappropriate. The investigation concludes that high frequency and type of symptoms reported ask for a broader investigation into specific risks for children, and to re-evaluate measures imposing mouth and nose coverings for young people. The "adults need to collectively reflect the circumstances under which they would be willing to take a residual risk upon themselves in favour of enabling children to have a higher quality of life without having to wear a mask".

Regarding the question as to whether children themselves complain about impairments caused by wearing the mask, 67.7% of the respondents answered yes for their children; 26% answered no. The question as to whether the respondents themselves observed an impairment of the child by wearing the mask was answered yes in 66.1% of respondents. Four percent had no opinion when asked about their personal attitude to the German government's corona protection measures, 11.7% of the participants thought that the measures should be more stringent, 11.0% considered the current measures appropriate and good and 41.7% were in favour of milder measures.

## 14.2 Will Wearing Masks Affect Children's Emotional Development?

In the online magazine, Psychology Today, Michael Ungar Ph.D. writes as follows;

"We've known for decades that children's emotional well-being depends in part on neurological development, which comes from watching faces and recognising emotions. How all this works isn't entirely clear, but as Catherine Herba and Mary Phillips at the London Institute of Psychiatry have explained, there is enough evidence to suggest that normal child development needs children to see people expressing their emotions.

So what happens when most of the adult faces surrounding children are masked? In other posts, I have already lamented the way parents put iPads into the hands of toddlers sitting in strollers, removing them from interactions with the people around them during a phase of their development when they should be learning new vocabulary and developing awareness of social cues. With widespread masking, we may unintentionally be disadvantaging younger children from developing the necessary skills to discern emotions and the neurological changes that make it possible to distinguish one face from another.

We are already hearing about a number of ways this pandemic is causing potentially long-term harm to our children. Educators are reporting that children's academic development is being compromised by lengthy periods of time away from the structure of the classroom, with the greatest impact being felt by children who were already in homes where educational achievement is not well supported and schools are chronically underfunded.

Clearly, after this pandemic, we are going to have to work very hard at repairing the damage we have done to children.

That means providing teachers with the extra supports they need to help children return to appropriate grade level performance in reading, writing, and maths. Encouraging children to get very dirty. Other than washing hands before eating, and after using the toilet, we are going to have to make it every child's right to eat food off the floor, roll around in dirt, and generally enjoy a little filth if we are going to ensure they avoid the trappings of excessive cleanliness (and the negative consequences a lack of germs causes to their immune systems and emotional regulation). Reassuring children that they are safe, and that those they love are safe as well. The spike in anxiety disorders among children will need an active campaign of reassurance to be turned around.

We're going to have to look our children in the face and teach them again about a range of emotional expressions. They will need to again understand that people say things with their faces, and that we shouldn't be shy about expressing openly what we feel."

## 14.3 Masks could affect children's development

On the Japanese news website, NHK, the following news article covers the issue of face mask wearing on the development of children.

For adults, the need to wear a mask can be inconvenient. For children it could be more serious. Masks disguise key cues in our expressions, making it harder to read someone's face, and there is growing evidence that this could be affecting child development.

Child carers who wear masks while at work, say it is difficult to establish a relationship of trust with children because they have to conceal their mouths.

## 14.4 Infants need to see faces

Professor Myowa Masako specializes in the human brain and psychological development at Kyoto University Graduate School of Education and Faculty of Education. She says adults must be especially careful about interacting with infants from when they are born until they are about a year old. That's the age at which babies are studying people's faces and learning expressions.

Babies need to see the eyes, nose and mouth to recognise a face. As the months pass, they learn to distinguish emotions such as joy or anger. This ability forms the foundation for understanding other peoples' feelings.

Myowa says that only adults can communicate using just their eyes. She says it's important to give babies opportunities to see peoples' facial expressions. She advises family members to show their faces to their babies at home even more than before.

## 14.5 Adverse effects on elementary school children

Elementary schools in Japan are reporting that masks are having adverse effects on their students, including more unruly behaviour as masks disrupt communication.

Professor Myowa says children between four and ten years old are developing the ability to empathise, to imagine what others think, and how to respond.

Children normally have ample chances at school to put themselves in someone else's shoes, but masks in classrooms mean the opportunities are much scarcer now. She suggests that teachers should consider how to create those opportunities for students in the current situation.

## 14.6 Use of body language

Myowa says body language can compensate to some degree, and recommends that adults express their emotions more physically for children of preschool or elementary school age.

## 14.7 The effect of masks on face perception in children

In the study, 'The effect of masks on face perception in children', the authors (Andreja Stajduhar Tzvi Ganel Galia Avidan R. Shayna Rosenbaum Erez Freud) have documented the following;

"We evaluated whether school-age children demonstrate a similar impairment in face perception abilities caused by face masks as previously found in adults (Carragher & Hancock,



2020; Freud et al., 2020). We have documented quantitative and qualitative changes in face processing abilities for masked faces in children. We found that face masks led to a robust decrease in face processing abilities measured by the reliable and well-established CFMT-K (Cambridge Face Memory Test – Kids). This quantitative reduction was accompanied by a reduced inversion effect for masked faces, suggesting a qualitative change in the way masked faces are processed.

When compared to adults, children showed a greater mask effect (20.1% compared to 13.6% for adults), suggesting greater susceptibility to visual alterations caused by face masks. Together, these results suggest that face processing abilities in children are highly susceptible to the inclusion of face masks.

The current study provides novel evidence for quantitative and qualitative changes in the processing of masked faces in children. Changes in face recognition performance and alteration along the processing style of partially occluded faces could have significant effects on children’s social interactions with their peers and their ability to form important relationships with educators. Previous research in adults has already demonstrated the detrimental effect of reduced face perception abilities on one’s level of social confidence and quality of life (Lane et al., 2018). Given the recent proliferation in mask-wearing due to the COVID-19 pandemic, future research should explore the social and psychological ramifications of wearing masks on children’s performance.”

## 15 An Evidence Based Scientific Analysis of Why Masks are Ineffective, Unnecessary, and Harmful

Dr. Jim Meehan, is an ophthalmologist and preventive medicine specialist with over 20 years of experience and advanced training in immunology, inflammation, and infectious disease. He has performed well over 10,000 surgical procedures. His research experience includes investigating associations between military vaccinations and Gulf War Syndrome. Dr. Meehan is also trained in internal medicine, addiction medicine, endocrinology, integrative medicine, functional medicine, and nutrition.

Dr. Meehan is a former editor of the medical journal, "Ocular Immunology and Inflammation." He has peer-reviewed thousands of medical research studies. With this experience and expertise, Dr. Meehan has dedicated his career to protecting his patients and the public from the fraud, corruption, and pseudoscience so often used by agents and agencies whose motives and interests have resulted in American medicine and pharmaceutical drugs becoming the third leading cause of death in the United States.

"I'm a surgeon who has performed more than 10,000 surgical procedures wearing a surgical mask. However, that fact alone doesn't really qualify me as an expert on the matter. More importantly, I am a former editor of a medical journal.

I know how to read the medical literature, distinguish good science from bad, and fact from fiction. Believe me, the medical literature is filled with bad fiction masquerading as medical science. It is very easy to be deceived by bad science.

Since the beginning of the pandemic, I've read hundreds of studies on the science of medical masks. Based on extensive review and analysis, there is no question in my mind that healthy people should not be wearing surgical or cloth masks. Nor should we be recommending universal masking of all members of the population. That recommendation is not supported by the highest level of scientific evidence.

First, let's be clear. The premise that surgeons wearing masks serves as evidence that "masks must work to prevent viral transmission" is a logical fallacy that I would classify as an argument of false equivalence, or comparing "apples to oranges."

Although surgeons do wear masks to prevent their respiratory droplets from contaminating the surgical field and the exposed internal tissues of our surgical patients, that is about as far as the analogy extends. Obviously, surgeons cannot "socially distance" from their surgical patients (unless we use robotic surgical devices, in which case, I would definitely not wear a mask).

The COVID-19 pandemic is about viral transmission. Surgical and cloth masks do nothing to prevent viral transmission. We should all realize by now that face masks have never been shown to prevent or protect against viral transmission. Which is exactly why they have never been recommended for use during the seasonal flu outbreak, epidemics, or previous pandemics.

The failure of the scientific literature to support medical masks for influenza and all other viruses is also why Fauci, the U.S. Surgeon General, the CDC, WHO, and pretty much every infectious disease expert stated that wearing masks won't prevent transmission of SARS CoV-2. Although the public health "authorities" flipped, flopped, and later changed their recommendations, the science did not change, nor did new science appear that supported the wearing of masks in public. In fact, the most recent systemic analysis once again confirms that masks are ineffective in preventing the transmission of viruses like COVID-19.

If a surgeon were sick, especially with a viral infection, they would not perform surgery as they know the virus would NOT be stopped by their surgical mask.

Another area of “false equivalence” has to do with the environment in which the masks are worn. The environments in which surgeons wear masks minimize the adverse effects surgical masks have on their wearers.

Unlike the public wearing masks in the community, surgeons work in sterile surgical suites equipped with heavy duty air exchange systems that maintain positive pressures, exchange and filter the room air at a very high level, and increase the oxygen content of the room air. These conditions limit the negative effects of masks on the surgeon and operating room staff. And yet despite these extreme climate control conditions, clinical studies demonstrate the negative effects (lowering arterial oxygen and carbon dioxide re-breathing) of surgical masks on surgeon physiology and performance.

Surgeons and operating room personnel are well trained, experienced, and meticulous about maintaining sterility. We only wear fresh sterile masks. We don the mask in a sterile fashion. We wear the mask for short periods of time and change it out at the first signs of the excessive moisture build-up that we know degrades mask effectiveness and increases their negative effects. Surgeons NEVER re-use surgical masks, nor do we ever wear cloth masks.

The public is being told to wear masks for which they have not been trained in the proper techniques. As a result, they are mishandling, frequently touching, and constantly reusing masks in a way that increase contamination and are more likely than not to increase transmission of disease.

Just go watch people at the grocery store or Walmart and tell me what you think about the effectiveness of masks in the community.

If you can't help but believe and trust the weak retrospective observational studies and confused public health “authorities” lying to you about the benefits and completely ignoring the risks of medical masks, then you should at least reject the illogical anti-science recommendation to block only 2 of the 3 ports of entry for viral diseases. Masks only cover the mouth and nose. They do not protect the eyes.”

Dr. Jim Meehan, MD is a physician, entrepreneur, and accomplished leader who provides novel science and solutions that conform to honest, open, transparent, and patient-centred principles.

## 16 Proof that Masks Do More Harm than Good

(Truths about Masks that Politicians and the BBC Probably Forgot to Mention)

### 16.1 Dr. Vernon Coleman MB ChB DSc FRSA

1. Face masks have been proven to do harm but not proven to do good. Forcing citizens to wear them is a form of oppression. Support for mask wearing comes from individuals promoting face masks for political rather than health reasons. There is now considerable support for masks to be worn out of doors and even in the home. There is absolutely no scientific reason for this.
2. Over a dozen scientific papers show clearly that masks are ineffective in preventing the movement of infective organisms. They also reduce oxygen levels and expose wearers to increased levels of carbon dioxide.
3. Nine medical authors from Australia and Vietnam studied cloth face masks and concluded that cloth masks should not be recommended for health care workers.
4. Wearing a mask for long periods could cause pulmonary fibrosis. Loose fibres are seen on all types of masks and may be inhaled causing serious lung damage.
5. Researchers in France proved that wearing a surgical mask causes breathlessness.
6. Masks should be changed every couple of hours and old masks should be disposed of safely. If cloth masks are worn, they should be washed at high temperatures twice a day. Disposable masks should be discarded after one use. (Masks thrown down in the street are a serious health hazard.)
7. Evidence proving the danger and ineffectiveness of masks has been banned, blocked or deleted. Discussion and debate about the value of face masks is suppressed.
8. In September 2020, 70 Belgian doctors claimed that mandatory face masks in schools are a major threat to child development.
9. A leading German virologist claims that face masks are a wonderful breeding ground for bacteria and fungi.
10. Dentists in New York have reported that mask wearing causes gum disease and dental cavities. The dentists say that face coverings lead to mouth dryness and an increase in the build-up of bacteria.
11. Exemption certificates/cards can be obtained online for those who are unable to wear a mask.
12. Some face masks may have pores five thousand times larger than virus particles.
13. Masks should never be touched once in place. If a mask is touched it must be replaced immediately.

14. No one should wear a mask while exercising. There have been several reports of masked children dying while exercising. There is evidence showing that mask wearing reduces blood oxygen levels even when the wearer is standing still. Individuals who exercise are likely to sweat. Masks then become damp more quickly and the damp promotes the growth of microorganisms.
15. There is a risk that viruses may accumulate in the fabric of a mask – thereby increasing the amount of the virus being inhaled.
16. Putting a mask on a baby or unconscious patient is dangerous. The mask may result in the wearer choking on vomit.
17. Some of the carbon dioxide exhaled with each breath is trapped behind the mask.
18. One study of health workers wearing masks showed that a third developed headaches requiring painkillers. Another study showed that 81% developed headaches – and their work was affected.
19. A mask can reduce blood oxygenation by up to 20% – leading to a possible loss of consciousness. At least one road crash has been blamed on a driver wearing a mask. Police reported that the driver of a single car crash in New Jersey is believed to have passed out behind the wheel after wearing a mask for too long.
20. Over a dozen studies failed to show that wearing a mask provides protection against infection.
21. Masks are being used as a conditioning tool to make us more compliant.
22. A study of 53 surgeons showed that there were statistically significant falls in blood oxygen levels after masks had been worn for a few hours. It is important to remember that surgeons who wear masks (and not all do) work while standing, rather than walking, and they work in a controlled, air-conditioned environment. They do not touch their masks and they change them regularly.
23. The fact that the rules about mask wearing vary from place to place proves that there is no 'science' behind the advice to wear masks. So, for example, why should the coronavirus spread from person to person in a shop but not in an office?
24. There were no mask requirements in Sweden, and the mortality rate there remained below a bad flu season. The average age of Swedish citizens who died of COVID-19 was well over 80 years.
25. A meta-analysis of controlled trials of face masks published in May 2020 by the Centers for Disease Control in the US, concluded that masks 'did not support a substantial effect on transmission of laboratory confirmed influenza, either when worn by infected persons or by persons in the general community to reduce their susceptibility'.
26. A meta-analysis published in May 2016 concluded that masks did not have any useful effect but that reuse of contaminated masks did transmit infection.
27. In 2019, a paper involving 2,862 volunteers and published in the Journal of the American Medical Association showed that both surgical masks and N95 respirators

`resulted in no significant difference in the incidence of laboratory confirmed influenza’.

28. In 2011, a meta-analysis of 17 separate studies showed that none of the research showed masks to be useful in preventing influenza infection.
29. In 2009, a paper published in the Journal of Occupational Environmental Hygiene concluded that particles passed through masks and that expelled particles were deflected around the edges of masks.
30. Research published in 2005 concluded that there was more transmission of virus laden particles from masked individuals than from unmasked individuals because of `leakage’ jets of air. Backward unfiltered air flow was found to be stronger with mask wearers (suggesting that standing behind someone wearing a mask could be dangerous).
31. A study published in the BMJ in 2015 found that the penetration of cloth masks was almost 97%.
32. N95 masks are made with a 0.3 micron filter. The name comes from the fact that 95% of particles having a diameter of 0.3 microns are filtered by the mask. Unfortunately, corona viruses are approximately 0.125 microns in diameter.

An article entitled `Is a mask necessary in the operating theatre?’, published in the Annals of the Royal College of Surgeons in 1981 found no difference in wound infection rates with or without surgical masks (link to article in Appendix A). A paper published in 1991 showed that the use of masks slightly increased the incidence of infection.

It was proved in 1920 that cloth masks do not stop flu transmission. It was concluded then that the number of layers of fabric required to prevent pathogen spread would be suffocating. It was also recognised that there was a problem with leakage around the edges of masks.

Mask wearers are encouraged to demonise non-mask wearers (even if they are disabled in some way). This is part of the psychological warfare battle being fought.

There have been suggestions from various authorities that mask wearing and social distancing will need to be permanent. It has also been suggested that masks should be worn in the home.

Masks collect fungi, bacteria, and viruses; because of the moist air exhaled they are an excellent breeding ground.

‘We know that wearing a mask outside health care facilities offer little, if any, protection from infection...In many cases the desire for widespread masking is a reflexive reaction to anxiety over the pandemic.’ – New England Journal of Medicine, 2020

Research published in June 2020 suggested that the reduction in blood oxygen and the increase in carbon dioxide, resulting from mask wearing, might cause a strain on the heart and kidneys.

Mask wearers are more likely to develop infection than non-mask wearers. This may be due to the fact that masks reduce blood oxygen levels and adversely affect natural immunity. It is likely that anyone who wears a face mask for long periods will have a damaged immune system – and be more susceptible to infection. Studies have shown that hypoxia can inhibit

immune cells used to fight viral infections. Wearing a mask may make the wearer more likely to develop an infection – and if an infection develops it is likely to be worse.

Masks can cause hypercapnia (increased carbon dioxide). Symptoms of hypercapnia include drowsiness, dizziness, and fatigue.

A mask worn by a child in school was examined in a laboratory. Tests showed 82 bacterial colonies and 4 mould colonies growing on the mask.

In May 2020, Dr. Fauci, the American COVID-19 expert, concluded that masks are little more than symbolic – virtue signalling.

Although they have not been tested extensively, visors are probably just as useless as masks, but they may be less dangerous to wearers.

## 16.2 Conclusion of Dr. Vernon Coleman

Having studied the evidence I believe that mask wearing is likely to do no good but a great deal of harm. The available evidence shows clearly that masks do not work but do have the potential to cause a variety of health problems. Any individual or organisation dismissing the information above as `fake news' is requested to give their name and address. They will then receive a writ for libel. Please note that I am already in the process of planning two libel actions.

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## 17 The historical role of bacteria and mask wearing in a viral pandemic

It is not at all an anomaly for fatal pneumonia to follow coronavirus infections. Indeed, historical data support a correlation between pandemic and bacterial pneumonia. It is thought that the majority of deaths in the 1918-1919 pandemic “likely resulted directly from secondary bacterial pneumonia caused by common upper respiratory-tract bacteria.” Histopathology of lung tissue sections from that time reveal, “in virtually all cases, compelling histologic evidence of severe acute bacterial pneumonia, either as the predominant pathology or in conjunction [with influenza].” Histological evidence revealed presence of bacterial pneumonia, including bronchopneumonia. Lobar consolidation characteristic of pneumococcal pneumonia, as well as pathognomonic characteristics of streptococcal and staphylococcal pneumoniae were found.

In fact, there were no negative lung culture results in any of the specimens. “Bacteria were commonly observed in the sections, often in massive numbers.” In fact, the bacterial damage was extensive. Vasculitis, capillary thrombosis and necrosis surrounding areas of bronchiolar damage were found. And “without this secondary bacterial pneumonia, experts generally believed that most patients would have recovered.” Interestingly the above-cited paper that found a majority of 1918-1919 pandemic deaths to be from bacterial pneumonia was co-authored by Anthony Fauci MD (link to paper in Appendix A), who has been tasked with advising the US on proper response to the 2020 COVID-19 pandemic, yet he has not publicly discussed this precedented risk of bacterial pneumonia in 2020, even having performed extensive research himself.

It is also known that the 1918-1919 pandemic was the last time that human societies experimented with widespread long-term masking. As now, healthy people were made to wear masks, and it is thought by some that there would have been no pandemic in 1918 without masking. Are we repeating known mistakes from our history and what are the consequences?

One historian writes, “The quarantine, isolation and mask-wearing failed to diminish the spread of the influenza. Instead, the practices likely increased fatality and had disastrous economic consequences. The medical policy of 1918 was contrary to the medical science of 1918, and the destructive practices of quarantine, isolation and mask-wearing were largely abandoned.”

The harm extended to the next generation. Subsequent health outcomes included increased prevalence of heart disease in infants born in 1919.



## 18 Conclusion

This report was commissioned by The Awareness Foundation, in order to investigate the health effects of face mask wearing and the health effects on the public in general and children in particular.

After reviewing a relatively small sample of the numerous publicly available reports, studies, meta-studies and hypotheses, which were undertaken by hundreds of medical professionals (and one non-medical professional) over many decades, the data indicates that both medical and non-medical face masks of any type are completely ineffective to prevent human-to-human transmission of a viral and infectious disease such SARS-CoV-2 and COVID-19.

Wearing face masks has been demonstrated to have numerous and substantial adverse physiological and psychological effects, not just from breathing potentially hazardous carcinogenic chemicals, harmful microplastics and microfibres. These include, but are not limited to, adverse skin reactions/skin lesions, hypoxia, hypercapnia, shortness of breath, increased acidity and toxicity, activation of fear and stress response, rise in stress hormones, immunosuppression, sleep apnoea, fatigue, headaches, decline in cognitive performance, predisposition for viral, bacterial, mould and yeast infections and illnesses, chronic stress, anxiety and depression. Long-term consequences of wearing a face mask can cause health deterioration, developing and progression of chronic diseases, including cancer and accelerated secondary cancerous spread to other parts of the body, lung damage, asbestosis, alzheimers and premature death.

Children are particularly affected by the wearing of face masks, including those worn by adults. The report shows that the normal pedagogical, emotional, psychological, behavioural, and physiological progress of a child can be compromised, both in the short and long-term, and in some cases, for life.

This report demonstrates that many Randomised Control Tests (RCT's) and extensive research, into the wearing of face masks by medical professionals, the general public and in particular children, have established that face masks are wholly unnecessary and have been since the inception of mandatory face mask wearing in 2020.

The author presented documented evidence that this has been known about for a very long time, indicating that a century of knowledge has been flagrantly ignored. General efficacy of masks in a surgical environment are also known to be negligible and require further studies to determine whether or not they are of any benefit whatsoever.

Governments, policy makers and health organisations should utilise a proper and scientific evidence-based approach with respect to public health, not just the wearing of face masks, especially when the latter is considered as preventive intervention.

### 18.1 Conflict of interest statement

The author and staff of The Awareness Foundation, who have been instrumental in the research and subsequent production of this report, declare that they have no known competing financial interests or personal relationships that could have, or could have appeared to, influence the work documented in this report.

## 19 Appendix A - List of content utilised in this report.

Only a fraction of the evidence/data/hypotheses and information on the health effects of wearing a face mask has been utilised in this report. The author has attempted to include the most relevant and complete information available at the time of this report's publication. The content within this document is by no means complete, it is merely a snapshot of the many available publications. The reader is encouraged to further their own research, many references are available in Appendix B.

### 19.1 Mask Studies and Papers

1. Carbon dioxide Exposure Effects - Fact Sheet - <https://ethanolrfa.org/wp-content/uploads/2016/02/Module-2-Handout-CO2-Adverse-Health-Effects-Fact-Sheet.pdf>
2. How Inhaled carbon dioxide Affects the Body - Fact Sheet - <https://ethanolrfa.org/wp-content/uploads/2016/02/Module-2-Handout-How-Inhaled-CO2-Affects-the-Body---Fact-Sheet.pdf>
3. WHO - Mask use in the context of COVID-19 - [https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-\(2019-ncov\)-outbreak](https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak)
4. WHO - Coronavirus disease (COVID-19): Children and masks - <https://www.who.int/news-room/q-a-detail/q-a-children-and-masks-related-to-covid-19>
5. Non-pharmaceutical Measures for Pandemic Influenza in Non-healthcare Settings— Personal Protective and Environmental Measures - [https://wwwnc.cdc.gov/eid/article/26/5/19-0994\\_article](https://wwwnc.cdc.gov/eid/article/26/5/19-0994_article)
6. Understanding particle size and aerosol based transmission - <https://web.archive.org/web/20210303231236/https://www.4conference.com/wp-content/uploads/2020/07/Understanding-Particle-Size-and-Aerosol-Based-Transmission.pdf>
7. Health Effects of Asbestos Exposure - <https://www.hse.gov.uk/asbestos/assets/docs/exposure.pdf>

## 19.2 Health Effects - Mouth

1. Dentists warn of rise in stinky side-effect damaging patients' teeth - <https://www.thesun.co.uk/news/12461990/mask-mouth-dentists-warn-rise-side-effect-damaging-teeth/>
2. Dentist: 'Mask Mouth' Is Causing Tooth Decay, Bad Breath, Clenching and Grinding of Teeth - <https://www.cnsnews.com/blog/craig-bannister/dentist-mask-mouth-causing-tooth-decay-bad-breath-clenching-and-grinding-teeth>
3. Dentists declare 'mask mouth' a new phenomenon as they see an explosion in patients suffering from tooth decay and gum disease after wearing face coverings - <https://www.dailymail.co.uk/news/article-8604639/Dentists-says-mask-wearing-causing-tooth-decay-gum-disease.html>

## 19.3 Health Effects - Skin

1. The Effects of the Face Mask on the Skin Underneath: A Prospective Survey During the COVID-19 Pandemic - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7786409/>
2. Skin Tears, Medical Face Masks, and Coronavirus - <https://www.epuap.org/wp-content/uploads/2020/06/2020-gefen-wmp-skin-tears-medical-face-masks-and-coronavirus-no-watermark.pdf>

## 19.4 Health Effects - Body

1. Headache related to mask use of healthcare workers in COVID-19 pandemic - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8019959/pdf/kjp-34-2-241.pdf>
2. Cognitive and psychophysiological impact of surgical mask use during university lessons - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7844352/>
3. Dr. Blaylock: Face Masks Pose Serious Risks to the Healthy - <https://www.greenmedinfo.com/blog/dr-blaylock-face-masks-pose-serious-risks-healthy11>
4. Proof that Masks Do More Harm than Good - Dr. Vernon Coleman MB ChB DSc FRSA - <https://www.vernoncoleman.com/proofthatmasks.htm>
5. "Exercise with facemask; Are we handling a devil's sword?" – A physiological hypothesis - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7306735/>

6. The surgical mask is a bad fit for risk reduction - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4868614/>
7. Exclusive: Chemical cocktail found in face masks - <https://www.ecotextile.com/2021040127603/dyes-chemicals-news/exclusive-chemical-cocktail-found-in-face-masks.html>
8. The Dangers of Masks - <https://www.aier.org/article/the-dangers-of-masks/>
9. Masks, false safety and real dangers, Part 1: Friable mask particulate and lung vulnerability - [https://pdmj.org/papers/masks\\_false\\_safety\\_and\\_real\\_dangers\\_part1/](https://pdmj.org/papers/masks_false_safety_and_real_dangers_part1/)
10. Masks, false safety and real dangers, Part 2: Microbial challenges from masks - [https://pdmj.org/papers/masks\\_false\\_safety\\_and\\_real\\_dangers\\_part2/](https://pdmj.org/papers/masks_false_safety_and_real_dangers_part2/)

## 19.5 Health Effects - Face Masks on Children

1. Corona children studies "Co-Ki": First results of a Germany-wide registry on mouth and nose covering (mask) in children - <https://assets.researchsquare.com/files/rs-124394/v2/bdeb04c9-7a3e-4bb4-997a-0dce53145ac7.pdf>
2. Will Wearing Masks Affect Children's Emotional Development? - <https://www.psychologytoday.com/us/blog/nurturing-resilience/202012/will-wearing-masks-affect-children-s-emotional-development>
3. Is wearing a mask affecting our children's development? - <https://www3.nhk.or.jp/nhkworld/en/news/backstories/1475/>
4. Face Masks Disrupt Holistic Processing and Face Perception in School-Age Children - <https://psyarxiv.com/fygjq/>

## 19.6 Health Effects - The Doctors

1. 'Is a mask necessary in the operating theatre?' Royal College of Surgeons 1981 - <http://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC2493952&blobtype=pdf>
2. An Evidence Based Scientific Analysis of Why Masks are Ineffective, Unnecessary, and Harmful - <https://ratical.org/PandemicParallaxView/mp3s/An-Evidence-Based-Scientific-Analysis-of-Why-Masks-are-Ineffective-Unnecessary-and-Harmful-10-12-2020.pdf>

3. Predominant Role of Bacterial Pneumonia as a Cause of Death in Pandemic Influenza: Implications for Pandemic Influenza Preparedness (Dr. Antony Fauci) - <https://academic.oup.com/jid/article/198/7/962/2192118>

## 20 Appendix B - List of content not utilised in this report

There are constraints within any report. The largest constraint in this instance is knowing when to stop the research. The amount of evidence/data/hypotheses and information on the negative effects of wearing a face mask is almost overwhelming. Therefore, although the following links to subject matter may have been viewed by the author as informative, a decision has been made to exclude most of the other reports. This list is not exhaustive, there is a lot more available, however time and space constraints rule that only a fraction of available evidence can be documented in this appendix.

1. Masks, false safety and real dangers, Part 3: Hypoxia, hypercapnia and physiological effects - [https://pdmj.org/papers/masks\\_false\\_safety\\_and\\_real\\_dangers\\_part3/](https://pdmj.org/papers/masks_false_safety_and_real_dangers_part3/)
2. Masks, false safety and real dangers, Part 4: Proposed mechanisms by which masks increase risk of COVID-19 - [https://pdmj.org/papers/masks\\_false\\_safety\\_and\\_real\\_dangers\\_part4/](https://pdmj.org/papers/masks_false_safety_and_real_dangers_part4/)
3. Masks are neither effective nor safe: A summary of the science - [https://pdmj.org/papers/masks\\_are\\_neither\\_effective\\_nor\\_safe/](https://pdmj.org/papers/masks_are_neither_effective_nor_safe/)
4. The dangers of masks - <https://www.aier.org/article/the-dangers-of-masks/>
5. Masks 'don't work,' are damaging health and are being used to control population: Doctors panel - <https://www.lifesitenews.com/news/masks-dont-work-are-damaging-health-and-are-being-used-to-control-population-doctors-panel>
6. The health risks of prolonged face mask wearing - [https://www.researchgate.net/publication/343994082\\_THE\\_HEALTH\\_RISKS\\_OF\\_PROLONGED\\_FACE-MASKS\\_WEARING](https://www.researchgate.net/publication/343994082_THE_HEALTH_RISKS_OF_PROLONGED_FACE-MASKS_WEARING)
7. Face masks for the public during the COVID-19 crisis - <https://www.bmj.com/content/369/bmj.m1435>
8. COVID-19: Important potential side effects of wearing face masks that we should bear in mind - <https://www.bmj.com/content/369/bmj.m2003> & <https://www.bmj.com/content/369/bmj.m1435/rr-40>
9. Long term effects of wearing masks - [https://www.thedesertreview.com/news/long-term-effects-of-wearing-masks/article\\_ba5f0b66-97be-11ea-ac54-8b25e4f89b0c.html](https://www.thedesertreview.com/news/long-term-effects-of-wearing-masks/article_ba5f0b66-97be-11ea-ac54-8b25e4f89b0c.html)

10. Mask Facts (Association of American Physicians and Surgeons) - A meta study of analyses - <https://aapsonline.org/mask-facts/>
11. Review of scientific reports of harms caused by face masks, up to February 2021 - <https://masksickness.ca/reports/2021/02/22/review-scientific-reports-harms-caused-face-masks-february-2021>
12. The Consequences of Wearing a Mask: A Scientific Review - <https://healthmasters.com/consequences-wearing-mask-scientific-review>
13. Physiological Effects of N95 FFP and PPE in Healthcare Workers in COVID Intensive Care Unit: A Prospective Cohort Study - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7775948/>
14. SAGE - NERVTAG paper: face mask use in the community - [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/890043/S0127-nervtag-face-mask-use-in-the-community-130420-sage25.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/890043/S0127-nervtag-face-mask-use-in-the-community-130420-sage25.pdf)
15. Face coverings in education - [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/967285/Face\\_coverings\\_in\\_education-March-2021.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/967285/Face_coverings_in_education-March-2021.pdf)
16. How masks could affect speech and language development in children - <https://www.cbc.ca/news/technology/children-masks-language-speech-faces-1.5948037>
17. Wearing Face Masks Strongly Confuses Counterparts in Reading Emotions - <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.566886/full>
18. "I'm smiling back at you": Exploring the impact of mask wearing on communication in healthcare - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7675237/>
19. An empirical and theoretical investigation into the psychological effects of wearing a mask - [https://pure.strath.ac.uk/ws/portalfiles/portal/21286550/1999\\_PhD\\_thesis\\_public.pdf](https://pure.strath.ac.uk/ws/portalfiles/portal/21286550/1999_PhD_thesis_public.pdf)
20. Effect of Face Masks on Interpersonal Communication During the COVID-19 Pandemic - <https://www.frontiersin.org/articles/10.3389/fpubh.2020.582191/full>
21. Many consumer products emit formaldehyde, which can cause cancer. - <https://ww2.arb.ca.gov/resources/fact-sheets/formaldehyde>

22. Headaches Associated With Personal Protective Equipment – A Cross-Sectional Study Among Frontline Healthcare Workers During COVID-19 - <https://headachejournal.onlinelibrary.wiley.com/doi/full/10.1111/head.13811>
23. Hypoxia Enhances Immunosuppression by Inhibiting CD4+ Effector T Cell Function and Promoting Treg Activity - <https://www.karger.com/Article/FullText/464429>
24. Hypoxia-driven immunosuppression contributes to the pre-metastatic niche - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3583916/>
25. Moderate and severe hypoxia elicit divergent effects on cardiovascular function and physiological rhythms - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6068225/>
26. Hypercapnia Alters Expression of Immune Response, Nucleosome Assembly and Lipid Metabolism Genes in Differentiated Human Bronchial Epithelial Cells - <https://www.nature.com/articles/s41598-018-32008-x.pdf>
27. Simple Respiratory Protection - Evaluation of the Filtration Performance of Cloth Masks and Common Fabric Materials Against 20–1000 nm Size Particles - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7314261/>
28. Cough aerosol in healthy participants: fundamental knowledge to optimize droplet-spread infectious respiratory disease management - <https://bmcpulmed.biomedcentral.com/articles/10.1186/1471-2466-12-11>
29. A cluster randomised trial of cloth masks compared with medical masks in healthcare workers - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4420971/>
30. Optical microscopic study of surface morphology and filtering efficiency of face masks - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6599448/>
31. Unmasking the surgeons: the evidence base behind the use of face masks in surgery - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4480558/>
32. Evaluation of N95 Respirator Use with a Surgical Mask Cover: Effects on Breathing Resistance and Inhaled carbon dioxide - <https://academic.oup.com/annweh/article/57/3/384/230992>
33. Effects of wearing N95 and surgical facemasks on heart rate, thermal stress and subjective sensations - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7087880/>



34. Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4868605/>
35. Effects of long-duration wearing of N95 respirator and surgical facemask: a pilot study - <http://medcraveonline.com/JLPRR/JLPRR-01-00021.pdf>
36. COVID-19: Electrophysiological mechanisms underlying sudden cardiac death during exercise with facemasks - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7417258/>
37. Brain Damage From Masks CANNOT BE REVERSED... Stop Wearing Yours! - <https://catholictruthblog.com/2020/10/20/brain-damage-from-masks-cannot-be-reversed-stop-wearing-yours/>

## 21 Appendix C - Response from the UK Government, to the author, on the petition "Ban the use of face masks in schools"

Recently, the author signed an online UK Government and Parliament petition, to ban the use of face masks in schools. The petition, started by David Glover, runs until the deadline of 1<sup>st</sup> October 2021. At the time of writing, this petition has just over 37,000 and is a long way off getting to the 100,000 required to be debated in the UK Parliament.

In his petition, Mr Glover states "Face coverings should be banned in schools as they can inhibit communication which could restrict learning and could create social stigma. I don't believe there is enough research about the effect that face masks can have on children in a school, so they should be banned until there is. The 'precautionary principle' should be applied."

He may not have known it at the time, but Mr Glover was indeed correct in his assertions. The petition can be viewed here:- <https://petition.parliament.uk/petitions/577831>

The following email was received by the author, from the UK Government.

Received 30th April 2021, 01:52 am.

Dear Graham French,

The Government has responded to the petition you signed – "Ban the use of face masks in schools".

Government responded:

Following a review of the latest evidence, in line with public health advice, the DfE recommend face coverings continue to be worn in accordance with our guidance, unless an individual is exempt.

The safety of teachers, staff, students and pupils is of the utmost importance to the Department for Education. We all want to get back to face covering-free classrooms as soon as the scientific advice allows while balancing the interests of students, teachers and the wider community.

Based on the available evidence, PHE has advised that the system of controls is the best way to reduce risk in education settings, this includes wearing face coverings where recommended. The best available scientific evidence is that, when used correctly, wearing a face covering may reduce the spread of coronavirus (COVID-19) droplets in certain circumstances, helping to protect others.

Taking the available scientific evidence and educational intelligence into account, our guidance provides the following recommendations on wearing face coverings in schools and colleges:

- In secondary schools and FE colleges, where pupils and students in year 7 and above are educated, face coverings should be worn by staff, adults and pupils (including visitors) when moving around the premises, outside of classrooms, such as in corridors and communal areas where social distancing cannot easily be maintained.
- In those schools and FE colleges, face coverings should be worn by staff, adults and pupils in classrooms or during activities unless social distancing can be maintained. This does not apply in situations where wearing a face covering would impact on the ability to take part in exercise or strenuous activity, for example in PE lessons. Face coverings do not need to be worn by pupils when outdoors on the premises.

- In primary schools and early years settings, face coverings should be worn by staff and adults (including visitors) in situations where social distancing between adults is not possible (for example, when moving around in corridors and communal areas). Children in primary school and early years settings should not wear face coverings.

Subject to the roadmap process, as part of step 3, we expect that face coverings will no longer be required in classrooms or by students in communal areas. This will be no earlier than 17th May, and will be confirmed with one week's notice.

As part of the ongoing face covering review, the Department for Education worked with Public Health England to consider a range of evidence, balancing both the health and educational considerations. This included the latest public health advice and the most recent scientific evidence, as well as polling data from parents and students and intelligence the Department for Education gathered from schools and colleges across the country on their experiences of wearing face coverings in classrooms, and any impacts on teaching, education and communication.

We recognise that the wearing of face coverings may impact communication and mental health. Schools have done a great job in adapting to Covid secure guidance and are working hard to reduce the impact on education. The Secretary of State for Education made this decision based on the latest public health advice balanced with intelligence on the impacts of face coverings on education and children's mental health and wellbeing. The decision to continue the current policy is a cautious approach that will help limit the risk of transmission and enable a close monitoring of school and college returns. We will seek to remove face coverings at the first safe opportunity, given the negative impact face coverings may have on communication in the classroom.

Some individuals are exempt from wearing face coverings. This applies to individuals who:

- cannot put on, wear or remove a face covering because of a physical impairment or disability, illness or mental health difficulties
- speak to or provide help to someone who relies on lip reading, clear sound or facial expression to communicate.

The same exemptions should be applied in schools, and we would expect teachers and other staff to be sensitive to those needs, noting that some people are exempt from wearing face coverings and the reasons for this may not be visible to others.

No pupil or student should be denied education on the grounds that they are not wearing a face covering.

Department for Education

Click this link to view the response online:

[https://petition.parliament.uk/petitions/577831?reveal\\_response=yes](https://petition.parliament.uk/petitions/577831?reveal_response=yes)

The Petitions Committee will take a look at this petition and its response. They can press the government for action and gather evidence. If this petition reaches 100,000 signatures, the Committee will consider it for a debate.

The Committee is made up of 11 MPs, from political parties in government and in opposition. It is entirely independent of the Government. Find out more about the Committee: <https://petition.parliament.uk/help#petitions-committee>

Thanks,

The Petitions team

UK Government and Parliament

**The Awareness Foundation**

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