

**2021 JOINT TECHNICAL CORRECTIONS**

**HB 1510**

# 2021 JOINT STANDING COMMITTEE MINUTES

## Technical Corrections Committee Pioneer Room, State Capitol

HB 1510  
11/9/2021  
PM

A BILL for an Act to create and enact chapter 14-02.7 of the North Dakota Century Code, relating to discrimination based on vaccination status or possession of an immunity passport; to amend and reenact section 23-07-17.1 of the North Dakota Century Code, relating to childhood immunizations; and to provide an effective date.

Co-Chair Weisz called the hearing to order, Vice Chair Porter, Representative Dockter, Richter, Louser, O'Brian, Roers Jones, Hanson Co-Chair J. Lee, Vice Chair Patten, Senators H. Anderson, Schaible, Dwyer, Kannianen, Vedaa, Bakke, present [6:41]

### Discussion Topics:

- COVID vaccination
- Federal/State law conflicts
- Medicare and Medicaid funding
- Vaccine status discrimination
- Reasonable accommodations
- Business rights regarding vaccine status
- Healthcare provider exceptions and exemptions
- Cost of healthcare
- COVID testing

**Representative Paulson** introduced the bill and provided testimony #12230 [6:42]

**Representative Thomas** testified in favor [6:57]

**Dr. Willie Fielhaber** testified in favor [7:02]

**Scott Wahley** provided testimony in favor #12049 [7:09]

**Dr. Nizar Wehbi**, ND Health Officer, ND Department of Health provided testimony in opposition #12149 [7:13]

**Dr. John Hagen**, State Correctional Health Authority, ND Department of Correction and Rehabilitation provided testimony in opposition #12227 [7:20]

**Melissa Hauer**, General Counsel, ND Hospital Association provided testimony in opposition #12006 [7:24]

**Lisa Johnson**, Vice Chancellor of Academic and Student Affairs for the North Dakota University System provided testimony and an amendment in opposition #12147 and 12148 [7:40]

**Courtney Koebele**, ND Medical Association introduced Dr. Joan Connell [7:42]

**Dr. Joan Connell**, Executive Director, North Dakota Medical Association provided testimony in opposition #12122 [7:43]

**Arik Spencer**, President and CEO of the Greater North Dakota Chamber provided testimony in opposition #12225 [7:47]

**Tim Eissinger**, CEO, and **Myra Quanrud**, MD, Anne Carlson School provided testimony in opposition 12224 [7:52]

**Additional written testimony:**

Jacqueline Muscha submitted testimony in favor #11865.

Kayla Johnson submitted testimony in favor #11869

Kelsey Miller submitted testimony in favor #11877

Gordon Greenstein submitted testimony in favor #11882

Doug Sharbono submitted testimony in favor #11889

Cionda Holter, Walter Kom, Danette Bentle, Jacob Holter, Tanya Watterud, Bridgette Odegaard, Lindsay Presteng, Member, ND Conservative Advocates, Jessica Kunz, Lee Duckworth, Resident, Jeffrey Kunz, Member, Health Freedom North Dakota, Kristi Pederson, Kristi Pederson, Season Parlier, Michae Jurgens, JoAnn Vollrath, Kinsey Albrecht, Leif Pederson, McKenzie L. McCoy submitted testimony in favor #11892, 11895, 11899, 11906, 11932, 11940, 11959, 11963, 11971, 11977, 11981, 12013, 12060, 12074, 12076, 12103, and 12137, respectively.

Melissa Sitton submitted testimony in favor #11908

Scott Grosz submitted testimony in favor #11922

Delores Kleinjan submitted testimony in favor #11943

Lisa Staal, North Dakota Citizen, submitted testimony in favor #11948

Felipe Vazquez de Velasco, submitted testimony in favor #11950 and 11951

Keana Schuler submitted testimony in favor #11952

Jennifer Kohl Fichtner submitted testimony in favor #11956

Kim Muller submitted testimony in favor #11967

Doug Sharbono, Citizen submitted testimony in favor #11974

Jocelyn Backman submitted testimony in favor #11985

Michelle Budeau, Registered Nurse, submitted testimony in favor #11993

Sandra Wade submitted testimony in favor #12002

Stephanie Hager submitted testimony in favor #12005

Sara Williams submitted testimony in favor #12009

Ray Bauer, Self Employed submitted testimony in favor #12021

Terry Peoples submitted testimony in favor #12036

Melissa Gjermundson submitted testimony in favor #12040

Sarah Lepp submitted testimony in favor #12041

Trever Leingang submitted testimony in favor #12043

Jennifer Kadrmas submitted testimony in favor #12044

Jenna Bachman submitted testimony in favor #12052

Dionne Haynes submitted testimony in favor #12064

Robin Johnson submitted testimony in favor #12068

Grace Boehm submitted testimony in favor #12082

Curtis Kadrmas submitted testimony in favor #12084

Anthony Freeman submitted testimony in favor #12087

Saje Backman submitted testimony in favor #12089

Miki L. Thompson, Oilfield revenue concerns, Constituent of District 37, submitted testimony in favor #12096

Rose Greet submitted testimony in favor #12100

Jordon Manthei submitted testimony in favor #12108

Kay Jarratt submitted testimony in favor #12110

Matthew Simon submitted testimony in favor #12113



Kay Jarratt submitted testimony in favor #12114

Jami Littlefield submitted testimony in favor #12116

Matthew Simon submitted testimony in favor #12117

Andrea Leingang submitted testimony in favor #12126

Nathan Pesta, DGA, submitted testimony in favor #12142

Alida Arnegard, Member, NDCA, submitted testimony in favor #12184

Birgit Pruess, submitted testimony in opposition #11854

Kylie Hall submitted testimony in opposition #11871

Michelle Lingle submitted testimony in opposition #11884

Angel Quintero submitted testimony in opposition #11935

Donald Miller, Private citizen, submitted testimony in opposition #12025

Joel Dennis, submitted testimony in opposition #12030

Barbara L. Frydenlund, Rolette County Public Health District, submitted testimony in opposition #12032

Brian Ritter, President, Bismarck Mandan Chamber EDC, submitted testimony in opposition #12051

Brenda Stallman, Traill District Health Unit, submitted testimony in opposition #12057

Cheryl Burckhard submitted testimony in opposition #12066

Shaundi Meyer, Information Desk/Switchboard Specialist, CHI St. Alexius submitted testimony in opposition #12079

Katherine Mastel submitted testimony in opposition #12140

Daniel Reisenauer submitted testimony in neutral #12039

Amy Dennis submitted testimony in neutral #12047

Megan Milbradt submitted testimony in neutral #12106

Co-Chair Weisz adjourned the hearing [8:02]

*Sheldon Wolf, Committee Clerk*

Chairman Weisz, Madame Chair, members of the committee, for the record I am Bob Paulson, and I represent District 3 in Minot.

HB 1510 is a bill modeled after the Montana law, and it makes it unlawful to discriminate based on vaccination status. I believe that this bill provides the best protection for North Dakota citizens making a personal, private medical decision of whether or not to receive the COVID vaccine.

This bill does not prevent an employer from asking, encouraging or even incentivizing someone to get the vaccine. What it does is prevent them from being coerced to get it.

It allows a health care facility to ask an employee to volunteer their immunization status, and if the employee refuses, the health care facility can assume the employee is not vaccinated and implement reasonable accommodations.

It exempts Long Term Care facilities if compliance would violate CMS regulations.

It does not effect current required childhood immunizations, however it does stipulate that the COVID-19 vaccines will not be added to the list of required childhood immunizations.

Given the uncertainty created by the overreach of the federal government and the desire of companies to comply in order to not to be fined, I believe it is imperative that we pass this law to protect the citizens of North Dakota from having to choose between providing for their families and getting a vaccine for which the long term consequences are unknown.

I would respectfully ask for a Do Pass recommendation, and I would stand for any questions.

# 12049

Citizen testimony on HB1510

November 9, 2021

Scott Whaley – Mandan, ND

The core of any discussion regarding vaccine mandates and related bills must be fundamental human rights. Do you agree or disagree that a human being has the right to reject the insertion of a substance into her body?

The Universal Declaration of Human Rights, Article III adopted by the United Nations in 1948 states: "Everyone has the right to life, liberty, and security of person." What is more elemental to liberty and security of person than the right to abstain from injection of a foreign substance into one's body?

No matter how noble the cause suggested, at the most basic level we are talking about forcing substances into others who oppose it with every fiber of their being.

This is not about unjust restrictions on employers' rights as some have suggested. This is about affirming that we as North Dakotans and Americans believe in the most basic of human rights. It is We the People, not we the employees.

A vaccine mandate is not a dress code. It is the injection of manufactured substances into a person's body, potentially against her will.

And the essence of a human right is that it applies to all people – regardless of religion or occupation. Are nurses and long-term care providers less human than lawyers or politicians?

'Take the shots or we take your livelihood' is not a choice. 'Inject your children or they'll be cast aside' is inhumane. 'Show me your private medical information or be exiled' is un-American.

It is a shame that Representative Ertelt's bill 21.1114.02000 was not advanced by the Delayed Bills committee, but it is not too late to embrace the simplicity and the equality for all afforded by that bill which was modeled after North Dakota law that stood for over 50 years. Refer to the 16<sup>th</sup> Assembly Regular Session, Chapter 236 – Vaccination from the year 1919 at the height of the pandemic a century ago.

I implore you to act and to encourage your fellow legislators to affirm that North Dakota is a state that fights for the fundamental human rights of its citizens.

Good morning, Chairmen Weisz and Lee and members of the Joint Technical Corrections Committee. My name is Dr Nizar Wehbi and I am the North Dakota State Health Officer. I am here to provide information on House bill 1510.

Of public health concern, is that this bill appears to limit public health actions that extend to COVID-19 and other vaccine preventable diseases. The bill would not allow employers, schools, childcares, correctional facilities, congregate living facilities, long term care and health care facilities to treat vaccinated and unvaccinated people differently after an exposure to a disease. So close contacts to communicable diseases such as COVID-19, measles, Ebola, would need to be treated the same regardless of vaccination status. An example would be a health care facility may not be able to exclude a susceptible health care worker after an exposure to measles because the bill would not allow vaccinated and unvaccinated people to be treated differently.

Another example would be if a restaurant worker was diagnosed with hepatitis A, which can be spread through contaminated food, and other employees were exposed. Vaccinated contacts would be protected against hepatitis A and would not need quarantine. Unvaccinated close contacts are supposed to be excluded from work for 30 days since exposure. Because a restaurant owner cannot treat vaccinated and unvaccinated employees differently, the owner would have to make a decision to exclude all exposed employees or to let them all work, regardless of vaccination status.

This bill also limits the ability for businesses, group homes, correctional facilities, and the health care industry to choose to offer the safest work environment for its employees and the safest environment for customers, residents and patients. Of major concern is the risk to patients who may be receiving care and are susceptible to infections and at increased risk for complications from infections.

The bill eliminates basic tools used to reduce the risk of disease transmission, especially in health care settings and congregate living settings. These are:

1. The ability to require vaccinations
2. The ability to assess vaccination status
3. The ability to assess or test for immune status
4. The ability to assess post-recovery status.

These tools are basic preventive health principles that form the basis for policies that are used routinely for:

1. Preventing disease, disability and death through vaccination
2. Testing for immunity for hepatitis B after vaccination
3. Checking new employees for immunity against measles, varicella or hepatitis B
4. Checking employees for previous exposure to tuberculosis
5. Evaluating individuals for occupationally acquired infections such as hepatitis B, hepatitis C, tuberculosis, Human immunodeficiency virus and others.

In conclusion, this bill limits the ability of business, sports teams, long term care facilities, congregate care facilities, corrections, and health care facilities to operate in a manner that maximizes the safety of patients, residents, staff, and health care providers. It may also limit institutions of higher education in implementing policies that reduce the risk for serious disease on campuses. These limitations do not extend only to vaccinations but also to the ability to develop policies that could exempt vaccinated people from being excluded from work or school.

I would be happy to answer questions at this time.

November 9, 2021

Joint Technical Committee  
Sixty-seventh Legislative Assembly of North Dakota  
Bismarck, North Dakota

RE: TESTIMONY IN OPPOSITION TO HOUSE BILL 1510

Dear Chairpersons Lee and Weisz,

My name is John Hagan. I am a physician with the ND DOCR and I serve as the State Correctional Health Authority. I stand today in opposition to HOUSE BILL 1510. I offer this information for your consideration.

- ND DOCR currently receives approximately 120 new admissions each month. Arrival COVID testing, quarantine and offer of immunization are performed based upon the individual's prior testing and COVID immunization status.
- This brief quarantine is an essential tool in our COVID mitigation program and has allowed us to minimize infection while continuing to accept admissions during COVID outbreaks.
- During outbreaks in the facilities, decisions regarding further testing and need for quarantine are made based on immunization status of individuals who are close contacts of COVID positive residents.
- These determinations and our mitigation program are designed in accordance with CDC guidelines for correctional facilities and have been reviewed and approved by CDC and State DOH.
- The ND DOCR is not a health care facility. It is, however, a congregate living facility and is considered so by the State DOH. The current exception language in this bill as written does not cover the ND DOCR and its contract facilities, as none of these entities are regulated by the Centers for Medicare and Medicaid Services.

I thank you for your time and attention.

Very Respectfully,



John J. Hagan, M.D.  
State Correctional Health Authority





#### Vision

*The North Dakota Hospital Association will take an active leadership role in major Healthcare issues.*

#### Mission

*The North Dakota Hospital Association exists to advance the health status of persons served by the membership.*

## **2021 House Bill 1510**

### **Joint Technical Corrections Committee**

**Representative Robin Weisz and Senator Judy Lee, Co-Chairmen**

**November 9, 2021**

Chairmen Weisz and Lee and members of the Joint Technical Corrections Committee, I am Melissa Hauer, General Counsel/VP, North Dakota Hospital Association. I am here to testify in opposition to House Bill 1510. I respectfully ask that you give this bill a **Do Not Pass** recommendation.

House Bill 1510 provides it is an unlawful discriminatory practice for an employer to refuse employment to an individual, to bar an individual from employment, or to discriminate against an individual in compensation or in a term, condition, or privilege of employment based on the individual's vaccination status or whether the individual has an immunity passport. The bill will not allow a hospital to ask any employee if he or she is immunized against any infectious disease. For example, a hospital could not ask whether the nurse taking care of you as an inpatient, or the phlebotomist drawing your blood, or the surgeon who is about to perform open heart surgery has been vaccinated against measles, polio, mumps, or influenza or any other communicable disease against which we have immunizations available. Hospitals have long been required to have infection prevention control programs designed to provide a safe environment to help prevent the development and transmission of disease. This bill would be a major step back in that effort.

The bill provides an exception for health care, but only allows a health care facility to ask an employee to "volunteer" the employee's vaccination or immunization status if the inquiry is for the purpose of determining whether the health care facility should implement "reasonable accommodations" to protect the safety and health of employees, patients, visitors, and other individuals from communicable diseases.

The bill exempts nursing homes, long-term care, basic care and assisted living facilities if it would result in a violation of regulations or guidance issued by CMS. It does not, however, exempt hospitals, clinics, or any other health care providers.

This bill will put health care providers in the impossible position of having to choose between complying with federal law and state law. The Centers for Medicare and Medicaid Services (CMS) issued an interim final rule on November 5 which requires all health care employees to be vaccinated against COVID-19. The CMS rule requires health care employers to provide appropriate accommodations for employees who request and receive exemption from vaccination because of a disability, medical condition, or sincerely held religious belief. The rule makes it clear that it preempts any inconsistent state or local laws, including laws that ban or limit an employer's authority to require vaccination.

Health care providers who do not comply may be subject to civil monetary penalties, denial of payment for new admissions, or termination of their Medicare/Medicaid participation. To be clear, the implications of a hospital losing Medicare/Medicaid eligibility would be devastating. More than 60 percent of hospital services in North Dakota are paid for by Medicare and Medicaid.

You may be opposed to the current mandate of the CMS rule but placing additional mandates on employers at the state government level is not a solution. Please vote no on this bill and others that limit an employer's right to do what is in the best interests of their employees and of those to whom they provide services. This bill will force healthcare providers to take a huge step backward in proven infection control practices, hamstringing providers at a time when every hospital in the state is stressed trying to keep up with demand for hospital and emergency care.

I would be happy to stand for any questions.

Respectfully Submitted,

Melissa Hauer  
General Counsel/VP



## PROPOSED AMENDMENTS TO HOUSE BILL NO. 1510

Page 3, line 27, before "**14-02.7-04**" insert:

4. Section 14-02.7-02 does not apply to the state board of higher education, the university system, or institutions under the control of the state board of higher education to the extent that the entity has adopted a policy or procedure governing the receipt and use of immunization information by the entity.
5. Section 14-02.7-02 does not apply to the extent a federal law, rule, or guidance preempts application, or to the extent application would result in a person incurring direct financial losses due to noncompliance with a federal law, rule, or guidance.

Renumber accordingly

**HB1510**

Joint Technical Corrections Committee

November 9, 2021

Lisa A. Johnson, Vice Chancellor of Academic & Student Affairs, NDUS  
701.328.4143 | [lisa.a.johnson@ndus.edu](mailto:lisa.a.johnson@ndus.edu)

Co-Chairs Representative Weisz and Senator Lee and members of the Joint Technical Corrections Committee. My name is Lisa Johnson, and I serve as the Vice Chancellor of Academic and Student Affairs for the North Dakota University System. I am here today on behalf of the University System (but not the State Board of Higher Education, which has not taken a formal position on this proposed legislation).

In short, the North Dakota University System respectfully requests inclusion among the exceptions listed in Section 1 beginning at page 3, line 6 of the bill. Much like our K-12 educational counterparts already exempted in this section, we request the ability to document immunizations for the safety of our students and our larger academic community.

Students and the public are not required to be vaccinated to be present on campus or to attend class, as the NDUS recognizes the broad exemptions offered by the state, including medical, religious, and philosophical exemptions. Students are not required to be vaccinated to attend classes.

Less than 1% of the students enrolled at NDUS colleges and universities have taken advantage of the exemptions currently available to them. A request to be exempt from supplying documentation of immunizations for NDUS students can be requested based on a medical, philosophical and/or religious reason. In the event of an outbreak or a public health emergency, individuals who have not provided immunization records are treated as unprotected and notified of an outbreak. Given the NDUS and institutions' responsibility to our students, including those who reside on campus and so, unlike the stakeholders of other public entities, do not leave public spaces at the end of the day, we respectfully request an exemption that is very similar to the one that exists under current law in N.D.C.C. 23-12-20(4), and that would be added to that law under H.B. 1511 at Section 1, subsection 5, regarding compliance with federal requirements.

We seek the Committee's support in providing an exemption to the institutions of the North Dakota University System consistent with that of the North Dakota



Department of Public Instruction. This concludes my testimony related to HB1510, and I stand for questions from Committee members.



**Joint Technical Corrections Committee**

**HB 1510**

**November 9, 2021**

Chair Lee, Chairman Weisz and Committee Members, my name is Joan Connell. I am a pediatrician in Bismarck and I'm president of the North Dakota Medical Association's 6<sup>th</sup> District Medical Society. I present this testimony on behalf of the North Dakota Medical Association. The North Dakota Medical Association is the professional membership organization for North Dakota physicians, residents, and medical students.

NDMA opposes this bill, which is based on a bill passed in Montana. Although COVID-19 immunizations were probably the source of the bill, it applies to all vaccines, includes those against measles, influenza, pertussis, and hepatitis B. This bill would prohibit hospitals and clinics from mandating any vaccines. In the healthcare setting, mandating vaccines for healthcare workers as a condition of employment is a common policy that was initially prompted by the goals of protecting patients from health care-acquired influenza and to protecting the workplace from the disruption and expense of worker illnesses.

Page 3, line 23 of the bill contains an exemption from compliance if it would result in a violation of regulations or guidance issued by the centers for Medicare and Medicaid services, but only for a licensed nursing home, long-term care facility, basic care facility or assisted living facility. NDMA requests that all healthcare facilities be included in this exemption. Late last week CMS issued details on the emergency regulation requiring COVID-19 vaccination for health workers. The regulation covers what most people would consider traditional health care settings such as Ambulatory Surgery Centers, Community Mental Health Centers, Critical Access Hospitals, Home Health Agencies, Hospices, Hospitals, Clinics, Rural Health Clinics/Federally Qualified Health Centers, and Long Term Care facilities.

NDMA requests a DO NOT PASS recommendation on the bill. Thank you for the opportunity to testify today. I would be happy to answer any questions.

Joan Connell, MD MPH FAAP

701-425-2067

[jmconnell@msn.com](mailto:jmconnell@msn.com)

**Greater North Dakota Chamber  
Comments on  
HB 1510 & HB 1511  
Joint Policy and Technical Corrections Committee  
November 9<sup>th</sup>, 2021**

Chairs and members of the Joint Policy and Technical Corrections Committee, my name is Arik Spencer, President and CEO of the Greater North Dakota Chamber. GNDC is North Dakota's largest statewide business advocacy organization. I'm here today to provide general comments on HB 1510 & HB 1511 regarding vaccination prohibitions.

As background on this issue, during this past legislative session, three vaccine prohibition bills were introduced. HB 1301 and HB 1320 dealt with vaccination as a condition of employment, and HB 1307 dealt with vaccination as a condition of entry. GNDC opposed all three, and our opposition was based on free-market principles that business owners should have the ability to do what's best for their business, workforce, and customers but is also subject to any consequences, good or bad. All three were defeated by wide margins in the House maintaining existing employment at will laws (HB 1301: 32 yeas to 61 nays, HB 1307: 24 yeas to 68 nays, HB 1320: 8 yeas to 84 nays). In the months since then, outside of healthcare, less than a handful of employers (to my knowledge) required the vaccination of their staff.

Then in September, the current administration in Washington announced COVID-19 vaccine mandates for healthcare providers, federal contractors, and employers with over 100 employees. In response, we released the following statement.

"GNDC stands in opposition to President Biden's recent sweeping executive orders to mandate employee vaccination in business. Employers failing to comply would face significant fines. GNDC has long supported the right of employers to determine their policies for their operations and workforce. Businesses know the best course of action for their functions, and it is their choice to determine the policies they enact. In the case of requiring COVID-19 vaccinations, regardless of the level of government, businesses should neither be required nor prevented from requiring their workforce to be vaccinated. These executive orders overreach and dictate decisions eliminating rights and freedom of businesses."

The federal COVID-19 vaccination mandate inserted business owners in the middle of a fight that the vast majority never asked or wanted to be in. Since this announcement, the largest concern employers have expressed about the federal mandate is its impact on workforce. Many employers have told me they won't know what to do if 20% or 30% of their workforce quits due to the federal mandate. This concern about workforce shows that free-market principles are working.

What is truly unfortunate is that in response to the President's executive order, this Legislature and others across the country are now considering bills to punish employers who may have to comply with the federal mandate or decide that a vaccinated workforce is in the best interest of their customers. North Dakota job creators are not the enemy in this fight.

We agree about the need to push back on the federal mandate, which is why GNDC fully supports the many lawsuits against this government overreach, including those filed by the Attorney General. What ND employers don't need are state mandates in addition to federal mandates. Other states have responded by pushing back in different ways, including limiting the state's ability to help enforce the federal vaccine mandate and funding the legal fight against the mandate.

GNDC understands the political reality we face but strongly oppose any state vaccine bill that makes employers choose whether to break state or federal law & regulations, opens up a right of private action for following federal laws & regulations, causes businesses (including health care providers) to lose funding, or has no sunset because this issue may need to be revisited as federal actions change.

I appreciate your consideration, look forward to working with the committee on a reasonable resolution to this issue, and stand for any questions I can answer.





*Anne Carlsen*

Nurturing abilities. Changing lives.

*Position Statement on COVID Vaccine Employer Decision Making  
November 3<sup>rd</sup>, 2021*

Employers in North Dakota, especially those in the health care and human service fields, are in the best position to determine how to keep employees and the people they serve safe. Health care and human services providers are already one of the most highly regulated industries by the state and federal government, and Anne Carlsen opposes additional regulation by the state limiting its ability to implement best practices designed to keep the people they serve and their employees safe.

We provide care for some of the most vulnerable children in the state, and we are currently serving 10 children and young adults who are on ventilators, and others who are immunocompromised. In addition to their medical challenges, many are also ineligible based on age to receive the vaccine, and so have very limited protections. We've shared with our staff that our intent is not to infringe on staff's personal freedoms or medical decision making, however, we have a moral and ethical responsibility to ensure to the best of our abilities that we keep the individuals we serve and those who support them safe, healthy, and protected from this virus. This is best achieved by abiding by the best evidence-based medical practices, including vaccination for highly transmissible diseases like COVID 19.

The state taking away our ability to require our valued and already impacted workforce to get vaccinated compromises our ability to keep the people we serve safe and to keep our remaining workforce healthy. For Anne Carlsen, we must take situations like this very seriously because children's lives hang in the balance with these decisions.

It also likely compromises our ability to participate in the Medicaid program, which is the critical safety net program for nearly all the children and families we serve. Compromising our participation in Medicaid would be devastating to our organization and could seriously jeopardize our ability to continue the work and legacy of this 80-year-old organization.

**Tim Eissinger** | CEO  
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The Anne Carlsen Center exists to make the world a more inclusive place where independence is a gift to all.



# 11865

Forcing a medical experiment upon an individual as a condition to participate in society is illegal, unlawful and immoral and reprehensible and it is a violation of our God-given, Natural, and Common Law rights, as expressed and confirmed in the American Declaration of Independence, and as reflected in the constitution of this state and the constitution of the United States.

It doesn't matter whether vaccines work or not.

It doesn't matter whether this is even a vaccine or not.

What matters is that each individual has sovereignty and authority over their own body.

**Forced vaccination violates the right to privacy**, which is protected, secured and guaranteed by the 4th Amendment of the US and the constitution of this state.

I am concerned for the citizens of North Dakota.

I am concerned for my children.

I am in favor of prohibiting vaccine mandates.

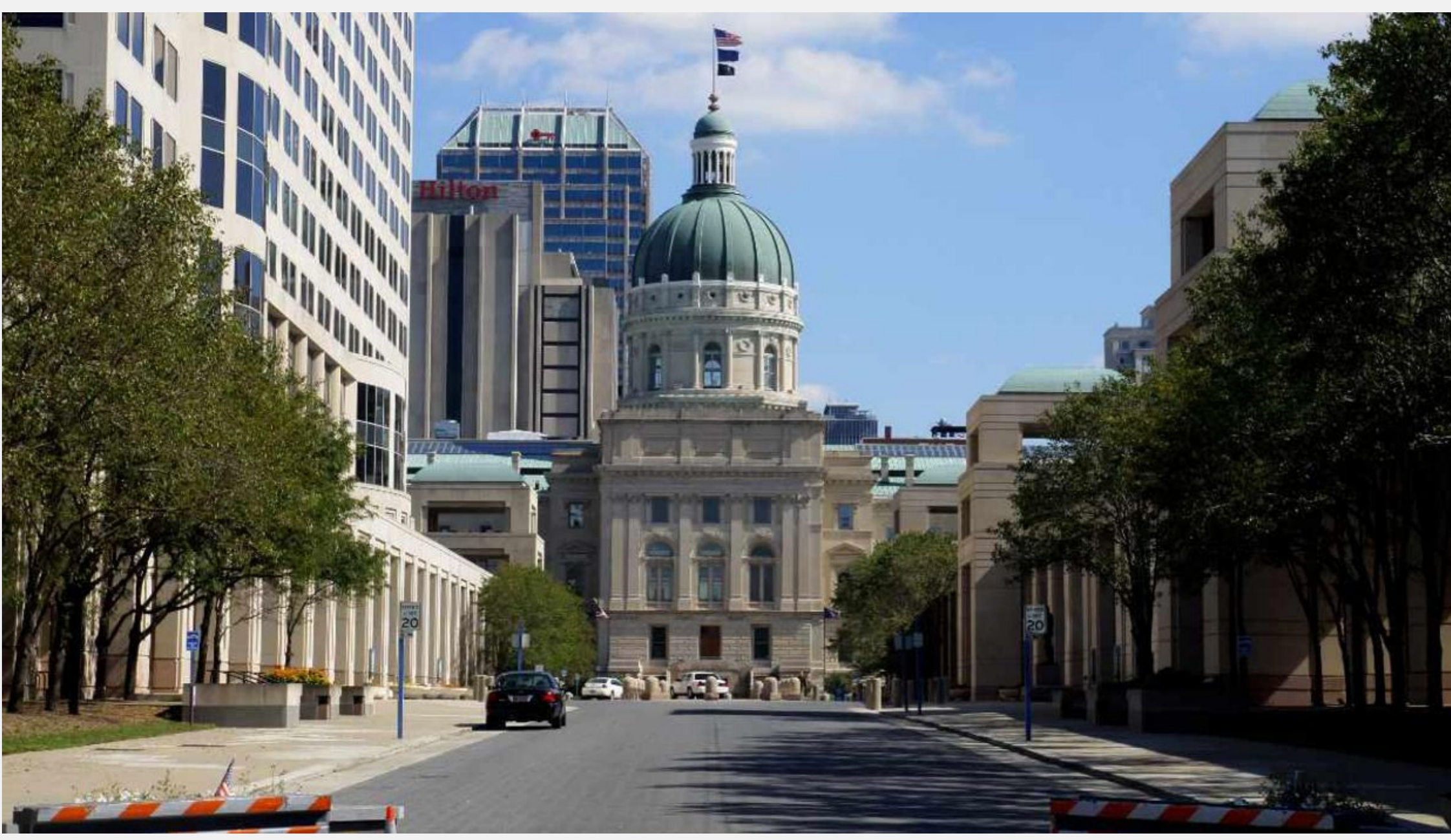
I completely oppose vaccine mandates due to religious and moral reasons.

Mandates are a complete infringement on one's personal freedom and liberties as protected by the Bill of Rights.



# Horowitz: What we expect from state legislators in the war for our own health freedom

DANIEL HOROWITZ | October 22, 2021



Raymond Boyd/Getty Images

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When King George promulgated the "Intolerable Acts," the colonial legislatures played a leading role in organizing the rebellion against the budding tyranny, which eventually led to the creation of our democratic republic. Two and a half centuries later, we have now endured 19 months of unabated tyranny that makes King George look quite tolerable, yet the representatives closest to the people have been stone silent in most cases.

On March 26, 2020, when it was already apparent to those with a modicum of foresight that something much darker than "15 days to flatten the curve" was afoot, I called upon the state legislatures to convene immediately to investigate the virus, how to deal with it properly, and to redirect policies away from the unelected federal and state departments of health. Not only did they fail to convene at the time, but even during the 2021 regular session, most states failed to enact any meaningful limitations on COVID tyranny and redirect the profligate

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**Pelosi stops mid-speech after Republican laughs at claim 'Build Back Better' bill will reduce the debt**  
7h

**Portland man accused of raping 3-year-old child, sexually assaulting a dog and a dead 'or heavily sedated' deer: Report**  
11h

**Mother says 'strong-minded and fearless' daughter, 7, suspended 36 times from school for not wearing a mask may have to repeat second grade**  
07 November

**VIDEO: Boston cops in riot gear quash violence after Antifa targets vaccine mandate protest**  
08 November

**Bill Maher schools panelist who claims parents are 'spooked' because black history is being taught in schools**  
07 November

**BOMBHELL: Did Jan. 6 riot and Ray Epps EXPOSE a corrupt FBI?**  
10h

**New Jersey Democrat who refuses to concede to truck driver claims 12,000 ballots 'recently found'**  
07 November

**Chris Pratt pilloried with bizarre backlash after he gushes over his 'healthy daughter', issues classy, faith-based statements in days following outcry**  
10h

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I am in support of HB 1510. I am a registered nurse and I work fully remote for a health insurance company. I am at risk of being part of a COVID vaccination mandate that will require me to either get the COVID vaccine or lose my career. I should not have to choose my career or a medical treatment. I work from home, by myself and I do not travel for work. I do not have in-person contact with my colleagues or patients. I do not need CPR to do my current job. I do not understand why I could potentially be part of a vaccine mandate when I have zero contact with people other than my family and friends.

The constant fear tactics placed upon me by my current company has caused undue anxiety and anguish over the possibility of losing my livelihood. I never thought that by going into the nursing field that I would not have job security. I remember my parents always telling me, become a nurse, you will always have a job! Not anymore.

I am pro-vaccine; I have gotten all the other childhood vaccines plus I get my flu shot yearly. I also have vaccinated my children and they are up to date with their vaccines as well. This was my choice and my husband's choice. There is no more "choice" with these mandates. My employer or government should not choose what is best for me medically. If we allow these mandates to happen, what's next? Are they going to choose what other medications I should or shouldn't be taking? Are they going to choose what procedures I get or don't get? Since when has America become a place where you no longer have freedom to choose what is best for you and your family?

I am standing up for my medical freedom and that of my family and friends. No one should be coerced into getting a medical treatment against their will.

*I prefer dangerous freedom over peaceful slavery—Thomas Jefferson 1787*

67<sup>th</sup> Legislative Assembly Special 2021 Session

Joint Technical Corrections

In Favor of HB 1510

ND Representatives

My family is in favor of HB 1510, It is good idea to be on offense against a tyrannical federal government. The federal government does not have the constitutional or legal authority to mandate that private businesses require their employees to inject medicine into their bodies as a condition of employment. But this is not merely an issue of legality. The entire rationale for the vaccine mandate is fatally flawed as a matter of both public health and economic policy.

In addition to evidence of waning vaccine efficacy, it is clear there are potential side effects of the vaccine for someone who received the shot. These range from such minor issues as fatigue to potentially fatal side effects like blood clots and myocarditis. The Johnson & Johnson vaccine was briefly paused in April 2021 due to 28 documented cases of blood clots. Both the Pfizer and Moderna vaccines have also shown 789 documented myocarditis cases, particularly in younger adults. These numbers only reflect documented patient reports and may not account for unreported side effects.

I am in favor of HB 1510.

Thank You, Gordon Greenstein

US Navy (Veteran)

US Army (Retired)

# 11889

**Do Pass Testimony  
of Doug Sharbono, citizen of North Dakota  
on HB1510  
in 2021 Special Session, Sixty-seventh Legislative Assembly of ND**

Dear Chairs Lee and Weisz and members of the Joint Technical Corrections Committee,

I am writing as a citizen and believe HB1510 is good legislation and ask for a "Do Pass" on it.

My position is very simple. Individual liberty in obtaining or refusing vaccinations should be retained by the people. It is not suitable that in dictator type style, any bureaucrat or politician be able to force-vaccinate us or coerce us to be vaccinated. This is already unlawfully federally mandated, which corporations and governments are following. This right of the people needs to be retained.

Please do pass HB1510 for the benefit of our citizens in North Dakota.

Thank you,

Doug Sharbono  
1708 9<sup>th</sup> St S  
Fargo, ND 58103

Members of the Joint Technical Corrections Committee,

I respectfully request that you implement prohibitions upon all forms of “mandates” as relates to the COVID-19 vaccines, especially in schools and workplaces.

### **Informed Consent**

When employers mandate a medical procedure as a condition of employment they are at worst practicing medicine, and at best they coercively breach the medical ethic of informed consent<sup>1</sup>.

As to any prospective new mandate in a school setting, lawmakers should remember that the first US rollout of the polio vaccine<sup>2</sup> amongst 200K children triggered 40K polio cases, 200 cases of paralysis, and 10 deaths. New vaccine mandates for school admissions should be implemented solely by our legislature. A body of legislators is more likely to use prudence when adding a new vaccine requirement, assessing disease risk to children against a safety track record established over years, while consulting a diverse set of experts and data.

### **Prohibiting Employers’ Mandates Is Not Government Overreach into Private Business.**

North Dakota law is regularly used to maintain a good business climate that balances the rights of business owners (*a property perspective*) and individuals (*a constitutional rights perspective*). N.D.C.C. provides business law governing discrimination, minimum wages, gender wage parity, rest days, child labor, workplace sanitation, family home care exemptions, collective bargaining, environmental quality, and more.

### **Business Climate**

North Dakota’s business community relies upon high-caliber talent. In recent years North Dakota has switched from an inbound state to an outbound state<sup>3</sup>. Talent and businesses are on the move in the US, fleeing states whose public/private environments have degraded quality of life and moving to those with the promise of the pursuit of happiness and continued freedoms.

North Dakota should ensure that health care decisions remain a private matter between the patient and their doctor.

Thank you for your consideration.

---

<sup>1</sup> American Medical Association. (n.d.). *Informed consent*. American Medical Association. Retrieved November 5, 2021, from <https://www.ama-assn.org/delivering-care/ethics/informed-consent>.

<sup>2</sup> Fitzpatrick M. (2006). The Cutter Incident: How America's First Polio Vaccine Led to a Growing Vaccine Crisis. *Journal of the Royal Society of Medicine*, 99(3), 156.

<sup>3</sup> Trattner, E. (2021, April 29). *The states Americans are fleeing (and where they're going)*. MoneyWise. Retrieved November 9, 2021, from <https://moneywise.com/life/lifestyle/states-americans-are-fleeing>.

# 11908

To Whom It May Concern:

I am writing this letter in hopes that it will encourage our representatives to be responsible with their votes on the subject of Vaccine Mandates. We have sent each and every one of you to be our voice. When we hire you, We entrust each of you to show up and be our voice. We trust that each of you will do your Job, with the will of the people as your priority, and not bid against us, putting personal gains ahead of your duties. Special Interest groups that openly promote agendas against Human Rights and Constitutional laws are not what we have sent you to represent. It is your Duty, to Protect and uphold the rights, of every individual in your district, even if

you have personal bias on a subject the answers are easy. How does your vote affect those you represent? For example, by mandating an Invasive Medical Procedure, you will have taken constitutional rights away from those you represent. Who suffers the Consequences of your vote? Does the State, Fed, Pharmaceutical or an Employer suffer the consequences if one dies by these mandates? or, is it the forced Victims who were coerced to choose between supporting their family or losing their jobs? The answer here is simple! This clearly is in violation of the constitution. The only ones to suffer and bear the consequences are the persons being forced to be vaccinated, and their families. Please be responsible with your vote, and approach this with integrity. Many have done alot of bad things because they think we are not



watching. I'm here to tell you we ARE watching.

It's my understanding that there are 2 bills that are being negotiated. It's also my understanding the best course of action would be to merge the two. However, you all need to be more thorough in this bill. Provisions need to be added to protect the Energy Sector employees. It's also my understanding that the Petroleum commission is pushing back on these bills, and would like to see them dropped. This sends huge Red Flags, and comes across malicious at best. Your bills do not protect Subcontractors, and this needs addressed. All Subcontractors in your energy Sector need protections put into place to put a stop to Corporations making up their own rules and end any discrimination. The oil

industry is the largest income for this state. The Energy Sector literally carries this state to prosperity. I can assure you, if these workers are forced and mandated, the majority of the industry's employees will flee, and go to Texas. Companies will relocate where they can thrive without an employee shortage. Many in these jobs are watching you closely. They are already discussing their options, and having plan B's put into motion, for when they face these challenges. When Covid first hit, large corporations made it mandatory for weekly blood test for antibodies, before a Subcontractor was aloud to step foot on a pad. That alone was going to far, but to do our part we made comprises in spite of the fear mongering we endured. However, with forced vaccinations there is no compromise. The vaccinated and their families are the ones to suffer the

consequences whether it be physical disability, illness or worse, death. We dont know the long term consequences to these experiments. Therefore, it is your duty to stop this and kill any opportunities for bad actors who have put money over Life and Liberty. I Trust you will consider what I said here in this letter, and pray you will vote with integrity and protect your citizens and be their voice.

Thank you for your time,

Melissa Sitton

Sent via the Samsung Galaxy Note8, an

AT&T 5G Evolution capable smartphone

As of January 1 of 2022 my place of  
employment will be laying off employees if  
not vaccinated

11922

# 11943

Please support the health freedom bills regarding no mandates and no discrimination for health/vaccine status!

I am voicing my opposition to all covid vaccine mandates. I believe all healthcare and vaccination choices are personal choices and are protected by HIPPA. I believe these mandates are unconstitutional.

We need health freedom to protect peoples' rights to a job!!!

Thank you in advance for representing the protection of my rights and all citizens of ND citizens'!!!

Respectfully,  
Delores Kleinjan

CASE# PND-2021-NAA-0704 NOTICE

FROM: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TO:

Kim Koppelman  
Speaker of The House  
Chairman of The House Judiciary Committee  
Vice Chairman of The House Procedural Committee  
513 First Avenue NW  
West Fargo, ND 58078-1101  
[Kkoppelman@nd.gov](mailto:Kkoppelman@nd.gov)

Randy Burckhard  
President Pro Tempore of The Senate  
Chairman of The Government Administration Committee  
1837 15th Street SW  
Minot, ND 58701-6158  
[Raburckhard@nd.gov](mailto:Raburckhard@nd.gov)

My local Senator \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

My local Representative \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

My local Representative \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## **Notice**

### ***Notice to Agent is Notice to Principal and Notice to Principal is Notice to Agent***

I, \_\_\_\_\_, one of the people (as seen in North Dakota Constitution), Sui Juris, in this Court of Record, present to you the following evidence and request that you and your agents may bring resolution:

Through the *North Dakota Constitution Article XI, Section 4*, and the *14th Amendment of the Constitution of the United States of America*, you have sworn to protect the people and the constitution. Both State and federal constitutions further explain that the people have the right to regulate their internal government. Therefore, when the people may need, there is a guaranteed right to reform, alter or abolish government, which you have thus sworn to support.

It is my will to give notice of the true law set forth by the people. As Stated in *Article I, Section 2*, all governments started with the people and are founded on the people's will. The State of North Dakota is never defined or determined by the desires or will of the government officers. The people gave you the title of trustees and servants and all times you are to be accountable to the people and it is your duty to carry out the wishes of the people who granted authority for you to handle the people's business. Therefore, I am presenting fundamental law and instructions that you may observe and carry out the will of one of the people.

*North Dakota Constitution Article I, Section 5* states that the people have power to require a redress of grievances because the government is created to carry out their will. When the government is functioning in a way that goes against the people's will and authority, the people are to correct their behavior and lead them in ways consistent with the constitution and that redress grievances. This means that the people are not limited by your statutory limits.

I, as one of the People, am in full support of a full forensic audit of every county in the State. Our vote is our voice and the essential expression of our freedom. We must be able to verify that the 1824 Missouri Doctrine "Once free, always free" remains true. It is a right of the people, as laid out in *Section 2 of the Fourteenth Amendment* that each individual member of the people has the express, inalienable right to a single, whole vote. The possibility that our vote has been reduced to something akin to the 1787 Three-fifths Compromise must be addressed.

Accordingly, I as one of the people, give notice that you immediately do all things necessary to bring about the desired public, live streamed, full and complete forensic audit, available to poll watchers, candidates or candidate representatives of any party to witness, analyzing:



---

All paper ballots (from the 2020 General Election and the pre-election system test ballots):

- Kinematic forensic analysis (utilizing high speed, high definition, digital forensic police cameras, and optical character recognition) of paper ballots
- Digital forensic analysis of ballot images both computer and human created, and any and all image codes,
- Forensic analysis of the paper and the print system utilized

All possible ballots:

- How many versions of ballots there were
- How many of each version could be counted
- How many of each version were counted
- How the digital images of each affected the operation of the election equipment
- Whether there was any forensic variation within each ballot version
- Whether the handling of ballots altered the effect of the ballots' interaction with any election equipment

The tabulator tapes:

- Kinematic forensic analysis of the tabulator tapes
- A forensic analysis of their correlation to the equipment used, the software and the paper ballots

All equipment and software utilized before during and after the 2020 General Election:

- IACIS CFCE certified computer forensic analysts to find, extract, analyze and document all electronically stored information found on the counting/tabulator machines, pollbook machines, disability abled machines, routers, thumb drives, SOS laptops, and any other equipment not listed
- Forensic and kinematic analysis of all equipment used

The networks:

- Full forensic network, and packet analysis of all connectivity

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**Credible, verifiable, true elections are the democratic Republic's indispensable political foundation woven throughout our Constitution. If the people of the state of North Dakota cannot question the authenticity and process and outcomes of elections, we cannot trust in the government to provide honest answers. We have the inalienable right to question and seek a redress of grievances. To ignore this is to censor the honest, concerned voice of the people, which you have sworn an oath to protect.**

Please take note, a successful North Dakota Election Audit must seek to provide:

- Verification that every ballot is legal and authentic
- Verification that there are no illegal or inauthentic ballots

- Verification that every legal, authentic ballot was correctly counted
- Verification that the machines have had no changes that would decertify them
- Verification that SOS claims regarding machines are true
- Verification that machines have not communicated with any entity other than SOS employees, voters and SOS thumb drives
- Verification that the election equipment is not hackable, in any manner, either currently or in the future.

If any point is not verified, this fact and the exact reasons for it must be included in the full and complete public release of audit results.

This notice by affidavit is a Court of Record of the actions, abilities, and authorities of the State of North Dakota. Further, this is a legal declaration from the affiant, as one the people of North Dakota regarding your duty as a representative of the people, under oath to protect the people and the Constitution of North Dakota. As servants and trustees of the people, it is your legal duty and hopefully your honor, to serve the people in this way.

If you, as a government official, believe that any of these claims are untrue, please respond within five days with the constitutional provisions, sworn under penalty of perjury, by affidavit, point by point, showing where you have the constitutional authority to ignore the rights of the people. If you do not respond within five days, you agree by acquiescence that you are knowingly, interfering with the rights of one of the people you swore to protect and that this notice shall stand as evidence that you are acting against the people's constitutional interests and that no court shall have the power to again adjudicate these matters and all the Courts of Record shall accept this notice as truth and law.

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Autograph:

---

Date:

# 11950

November 9, 2021

Dear Joint Technical Corrections Committee,

My name is Felipe Vasquez, I am from district 29, and I am writing in support of bill 1510. First, when did we the people give the government the privilege to mandate us to undergo experimental medical procedure? because even though these vaccines have FDA approval, we must remember it is emergency approval and still in the experimental stage, plus according to VEARS data these are some of the most dangerous vaccines to take. Also it is against the Geneva code to force experimental medical procedure on anyone.

My second point is even if these vaccines were safe, they had the usual ten years of testing, few reported deaths, etc., is it legal and/or moral to mandate them? the answer is no. We the people have the right to decide what goes in our bodies respecting medical procedures.

Third, what about the people with natural immunity? if business' mandate the vaccine it will cause additional burden on these people.

Fourth, according to law nobody has to reveal their medical conditions or records to anybody who doesn't have the proper authority, and a greeter at Wal-Mart is not a proper authority.

I urge you to vote yes on this, we will stand behind you, we will support you, because we all want freedom. Even the people who submitted testimony in opposition of freedom to not be discriminated against based on vaccine status were using their freedom of speech.

Thank you for your time!

Felipe Vasquez de Velasco

VAERS is the Vaccine Adverse Event Reporting System put in place in 1990. It is a voluntary reporting system that has been estimated to account for only **1%** (see the **Lazarus Report**) of vaccine injuries. OpenVAERS is built from the HHS data available for download at [vaers.hhs.gov](https://vaers.hhs.gov).

The **OpenVAERS Project** allows browsing and searching of the reports without the need to compose an advanced search (more advanced searches can be done at [medalerts.org](https://medalerts.org) or [vaers.hhs.gov](https://vaers.hhs.gov)).

# 1,697,752

– REPORTS OF VACCINE ADVERSE EVENTS IN VAERS

– 18,078 COVID Vaccine Reported Deaths / 27,155 Total Reported Deaths

– 88,910 Total COVID Vaccine Reported Hospitalizations/167,662 Total Reported Hospitalizations

– 856,917 COVID Vaccine Adverse Event Reports

– Through October 29, 2021



Get the Red Box Report! Every week OpenVAERS will be producing a PDF with the new data and emailing it to your inbox.

(Don't forget to confirm your email. If you don't see a message from us in your inbox, check your spam folder.)

Subscribe

Questions? Comments? Bugs?

[info@openvaers.com](mailto:info@openvaers.com)

Due to the high volume of inquiries, please be patient with response times.

AND PLEASE read the **FAQ** first.

# 11952

Hello,

I am in support of prohibiting the discrimination based on vaccination status, an immunity passport and mandatory childhood immunizations in ND. As shown yesterday by the number of people showing up, ND people do not want the government to determine if we must have a shot to work, attend schools or promote a local business. I ask for a vote to allow ND people freedom of choice.

Keana Schuler  
2433 Atlas Drive  
Bismarck ND, 58503

# 11956

To the State Representatives of North Dakota,

My name is Trina Schweitzer. I live near Moffit ND. I am a wife, mother of 7 children and a business owner. My husband and I employ 5 full time employees and we want to thank you for addressing the un-American and unjust vaccine mandates that we are being plagued with today. We ask that Bill # HB1510 & HB1511 will be written to protect without doubt the religious, philosophical and moral belief exemptions and that no persons, Business, Governing body, Health organization or Educational institution can deny, question or ask for more clarification of or from the employee, student, etc. on these requested exemptions. This is very important to all our citizens that our beliefs are protected. I also ask that this bill will cover all vaccinations not just the Covid-19. Thank you so much for your consideration and your dedication to protecting our freedoms.

Trina Schweitzer  
23881 Moffit Rd.  
Moffit,ND 58560

I am asking for you to support this bill. There should not be any discrimination based on vaccine or immunity status. Also, the covid 19 vaccine should not be a required childhood shot.

**Do Pass Testimony  
of Doug Sharbono, citizen of North Dakota  
on HB1510  
in 2021 Special Session, Sixty-seventh Legislative Assembly of ND**

Dear Chairs Lee and Weisz and members of the Joint Technical Corrections Committee,

I am writing as a citizen and believe HB1510 is good legislation and ask for a "Do Pass" on it.

My position is very simple. Individual liberty in obtaining or refusing vaccinations should be retained by the people. It is not suitable that in dictator type style, any bureaucrat or politician be able to force-vaccinate us or coerce us to be vaccinated. This is already unlawfully federally mandated, which corporations and governments are following. This right of the people needs to be retained.

Please do pass HB1510 for the benefit of our citizens in North Dakota.

Thank you,

Doug Sharbono  
1708 9<sup>th</sup> St S  
Fargo, ND 58103



Dear Joint Technical Corrections Committee:

I am writing in SUPPORT of HB 1510 Relating to discrimination based on vaccination status or possession of an immunity passport; to amend and reenact section 23-07-17.1 of the North Dakota Century Code, relating to childhood immunizations; and to provide an effective date.

Medical interventions are not a one size fits all. Everyone has different genetics, health history, underlying health conditions, etc. Just because 1 person is "fine" from a vaccine doesn't mean everyone will be "fine". I am vaccine injured as well as both of my children. Vaccine injuries are not rare and should not be ignored. We can also discuss the fact that Vaccine Manufactures are not liable if you do get a reaction, which should be known.

There are numerous studies out there that can be reviewed, but I will keep my testimony brief. Please pass this bill to protect ND citizens from being coerced into a one size fits all intervention that no one is liable for if there is a reaction.

Thank you for all your hard work and for your time.

Jocelyn Backman

District 13

I am in support of HB 1510. Discrimination of any kind due to vaccination status of requirements of a vaccine passport are completely against our American freedoms. I am a registered nurse who works from home for a large health insurance company. I am at risk to lose my career and livelihood over a COVID vaccination mandate. I should not be forced to choose my personal health decisions over providing for my family financially.

I was widowed with two young children. Being forced to take an experimental "vaccine" with unknown health risks is against my human rights. The thought of a potential unknown severe physical illness/reaction to this experimental "vaccine" which may take the only healthy parent my children have from them terrifies me. Who will guarantee my health? Who will provide and care for my two young children if I'm physically unable to?

I will add I am not an anti-vaxxer. Myself and my children have been given all other routine vaccinations and I have drawn titers to determine our level of protection. I am educated in the healthcare field and have 15 years of experience as a registered nurse. I believe that this experimental "vaccine" is not safe in the current state and everyone deserves the freedom to choose to take it or refuse it.

# 12002

Hello Senators and Representatives,

I hope you vote yes for all of these bills. They are very important to me.

There has been discrimination against people who have not taken the vaccine and that is wrong. Whether or not to have a vaccine should be a choice and you should not be discriminated for not having it. Having to disclose what vaccines we have had or not had is against HIPPA. We should not be discriminated for not disclosing our medical records.

Thank you,  
Sandra Wade  
1102 Bouyer Pl  
Lincoln, ND 58504

67<sup>th</sup> Legislative Assembly Special 2021 Session

Joint Technical Corrections Committee

My name is Stephanie and I have lived in North Dakota my entire life. I have a 3 year old daughter and another baby girl on the way.

I am in favor of HB1510 and respectfully request that you support this bill.

There is no reason a person should be discriminated against based on vaccine or immunity status of ANY age.

By looking at the number of North Dakotans who showed up to the Capitol yesterday it is clear that We the People do not want the government to decide what is best for ourselves and our families. This is a personal choice, and we are in charge of our bodies and what goes in to them-NOT the government.

Please support this bill.

Thank you,

Stephanie Hager  
Mandan, ND

# 12009

I am in support of the passing of HB 1510.

# 12021

In Support of:

HB 1508

HB 1510

HB 1511

HB 3049

# 12036

I work for a large Power Company in North Dakota. As of three weeks ago 62% of all of our employees have not been vaccinated. No doubt that number has decreased by now. But I've spoken to several employees who will be refusing the vaccine and are at risk of losing their jobs and you losing a portion of your tax base. These employees are heads of departments, supervisors, linemen, electricians, etc. Some of them have large, home-schooled families with a single income. The company intends to achieve a 100% vaccination rate and is choosing to not respond to Religious Accommodations at this time. Please do the right thing and protect the future of your tax base, the reliability of the power system, and stop the vaccine mandates for North Dakota. Acknowledge that human beings have recognized Natural Immunity since the Athenian Plague of 430BC, and stop employer discrimination.

# 12040

North Dakota Legislators,

We have a chance to protect our North Dakota freedoms today and I urge you to **vote to YES** for Bill 1510 and 1511. Vaccinations are a personal choice. Our forefathers created our Spirit written Constitution for America to protect our God Given Rights – and by voting YES to support these bills, YOU will be adding another layer of protection to ALL ND citizens. Let's show the world that we stand for God, Freedom, and our USA Constitution by leading as an example!

**VOTE YES for Measures 1510 and 1511 to protects all residents.**

Thank you,

Melissa Gjermundson



# 12041

Dear Representatives,

I am writing in support of HB 1510.

I agree with this bill wholeheartedly with the exception of healthcare professionals not being included in this bill. I strongly suggest an amendment be added to include healthcare workers within these protected laws.

7th Legislative Assembly Special 2021 Session Joint Technical Corrections

In Favor of HB 1510

As a citizen of ND, I am in support HB1510. It is right of an individual to make educated decisions regarding their own medical state. Educated decisions are made with the help of the United States Healthcare system but no individual should be forced upon the decision to take any medical vaccination to work or partake in a normal lifestyle routine.

Trever Leingang

# 12044

When is it ok for an employer to mandate a pharmaceutical drug into an employee to keep a job? I understand that a business should have the freedom to run it's business the way they would like. BUT it needs to stop at body autonomy. What will be next? Employers never should be able to tell an employee or individual what to put in their bodies.

I am affected by the current federal contract mandate. I might lose my job I had for over 9 years due to not injecting an EUA vaccine in my body. I need to support my family! I know thousands of people in the same boat due to draconian mandates here in North Dakota. When is this ever OK? How many people are affected by this in your community?

It is both unconstitutional and unethical to mandate, force, or coerce someone into doing something they do not want to do. This bill protects people's rights for people in North Dakota. I would like to see an amendment that ALL people in North Dakota are protected. People who work in the medical field and LTC NEED to be included in this as they are an important aspect of the workforce.

What are your morals to protect the residents of North Dakota? Or are you motivated by lobbyists of hospitals, business and pharmaceuticals? Do I have to remind you that we are watching you and know this could've been stopped this spring..

Jennifer Kadrmas  
North Dakota Resident

To the Legislative Assembly:

As a citizen of the great state of North Dakota, I am writing to show my support for HB 1510. As an elected officials holding office to represent, We the People, I am asking you all to vote in support of HB 1510.

Sincerely,  
Jenna Bachman

## **Testimony**

### **House Bill 1510**

**November 8, 2021**

Chairman and members of the committee – I am Dionne Haynes, a North Dakota resident and mother of two. I am submitting this testimony in support of House Bill 1510.

Vaccinations are a personal medical decision. People have various reasons as to why they choose to receive the medical procedure or to not subject themselves to such procedure. These decisions need to be respected, and in my opinion, kept private. To judge someone based on their personal choices is discrimination.

Covid-19 vaccinations and all other vaccinations must not be a requirement for children to attend school. School is important for our next generation and to deny these services for any reason is discrimination. Especially when these services are made available by our tax paying citizens.

I strongly support and recommend a “do pass” on HB 1510.

# 12068

November 9, 2021

Dear Chairman and members of the Joint Technical Corrections Committee:

I urge you to vote YES on HB1510.

My husband is being threatened with the loss of his career of over 25 years in the telecom industry by a very large company that does not even have a home office in North Dakota. I have spoken to the Governor's office and was told "if you **choose** not to get the vaccine you will probably lose your job" Wow! The last time I heard words like that were from the bully on the playground – "if you choose not to give me what I want, I will hurt you!" When I asked if North Dakota unemployment benefits will be paid out to those who are fired for such a reason as refusing to be part of an experimental drug trial, she told me "no." Hmm...who is protecting the rights and economic stability of North Dakotans these days?

It is unbelievable and unconscionable that it has come to the point in our society, especially in North Dakota, where so many good people are deceived into believing that a disease with an extremely low mortality rate for the general population is being used as a tool to destroy our economy. Our society at large is not in danger from this disease nor most diseases.

Please protect the rights of all North Dakotans to live and work and obtain healthcare according to our own needs in peace, without danger of reprisal and codify these protections into law. The threatened termination dates are soon upon us so quick action is extremely important. We're counting on you!

Thank you

Robin Johnson

Hebron ND

November 9, 2021

**Joint Technical Corrections Committee:**

In support of HB 1510.

I'm a nurse at CHI St. Alexius Bismarck and my religious exemption was denied on October 5 with no reason given. The next week, presumably once they realized how many nurses they would lose and how short staffed they would be, they suddenly approved my exemption. If they can change their minds so quickly, they can deny my exemption again in the future and I, along with many others like me, will lose my job.

We need strong legislation to protect our medical freedom and individual liberties. Please pass HB 1510 to ensure that government and other entities do not, and will never, have authority to make personal medical decisions for the people. Doing so sets a dangerous precedent with grave implications for the future.

Sincerely,  
Grace Boehm, RN

Members of the Joint Technical Corrections Committee,

We have been subjected night and day by the media to fear each other because of covid. This has created division and uncertainty spouting the “science shows”. This montra has been shown by science from the non-agenda side to be inaccurate. Not saying that covid does not exist but it would seem the information is being manipulated. As free citizens we have the right to chose for ourselves what or how we chose to take care of ourselves. As parents we are deeply concerned about giving our children a vaccine that as it would seem is driven by an agenda. What are the long term effects? How well does it protect? It is alarming to hear the vaccinated are getting covid? The requirement of a vaccine passport again causes division and profiling among North Dakota citizens for free commerce or free choice.

I respectfully request that you implement prohibitions upon all forms of “mandates” as relates to the COVID-19 vaccines, especially in schools.

Thank you for your consideration.



# 12087

I support H.B. 1510

North Dakotans do not want to be discriminated against based on vaccination status.

We have the right to make our own health decisions, not have them forced on us by employers or the government.

The Covid-19 vaccines have not been proven to be safe, there have been reports of many side effects including heart attacks and death.

Dear Legislators of ND,

I am writing this testimony on behalf of HB 1508, HB 1510, HB 1511, and HCR 3049.

HB 1508-I am currently in support of prohibiting the teaching of critical race theory, I do not believe on these liberal ideals being pushed off on our children, just like I disagree with several sexual education perspectives being pushed. As a parent, it is my job to educate my children how I see fit, and I already feel that liberals are pushing their agenda through the public school system.

HB 1510-I am currently feeling very discriminated against for not getting the vaccine not only from employers in my area, but also from several doctors who are pushing this vaccine on me. I feel like I have lost my freedom of choice, and speech. I have had people comment nasty things on social media about me as a professional simply because of my beliefs in freedom of choice. As a person who has been infected and recovered from covid, I see no need for being forced into a vaccination that has no real approval or research, especially for pregnant women like myself.

HB 1511-This ties into my response to HB 1510, again, as a person who has already been infected and recovered from covid I do not feel the need to be vaccinated. I am fed up with employers, doctors, even my own patients that feel they have a right to my protected health information, or worse yet, feel as if they can impose a forced vaccination which still does not stand up to reinfection like my antibodies do.

HCR 3049- As a person that works with families everyday as a career, I find it troubling that parents right to decide for their children when it comes to ANYTHING is at risk. Parents have the right to make the decision for their children until they are adults and can make the decisions for themselves. This is in regard to aspects such as schooling, vaccinations, and overall health decisions. This is what parents are supposed to do...one could argue that it is their jobs. We are forcing kids to wear masks that affect their overall learning, social skills, and mental health with no regards to these things because "at least they won't get covid" or forcing children to get vaccinated so they can attend school (a vaccine that has no backing until the year 2023, but that doesn't matter to big companies or pharmaceuticals as long as they are making money).

Here is a final statement I would like to leave here, for legislators, governors, and senators alike...don't forget who you work for. WE THE PEOPLE. I pray that you listen to our words, hear our thoughts and vote accordingly since you were chosen to REPRESENT US.

Thanks,  
Saje Backman

Good afternoon,

I am writing this testimony regarding both HB1510 and HB1511. My name is Miki Thompson. My family resides in Dickinson, in District 37 currently. I was at the capital yesterday and had the chance to speak to my representatives personally. My husband works in the oilfield, with a subcontractor and has been in the oilfield for many years. He has weathered two booms and busts. The patch here is set to ramp up once again. And with that comes revenue for our state. I urge you to pass a bill that protects our state's hardworking employees, as well as the rights of our hardworking business owners. I understand the ND Petroleum Council is urging the legislature to focus on the spending bills and redistricting bills and bypassing any policy bills regarding mandated vaccines. I find that decision on the council's part to be rash and ill informed, and without any input from the oilfield employees or subcontractor businesses whatsoever. Without these mandate protections, workers will move to states that have already made protecting their workforce and businesses a priority. North Dakota's main source of revenue is oil extraction and production taxes. Without these workers or subcontracting businesses there will be no oil patch. We want North Dakota's oilfield to be the best in the nation. Not only in production, but in the high quality of life and work we provide here. With that being said, I urge you to pass laws protecting our great state's livelihoods. I suggest combining Representative Paulson's HB 1510, and Representative Meier's proposed bill, into Representative Weisz' bill. Offering the strongest protection for years to come. I also recommend the wording changed to ANY vaccine. And shall allow exemptions be changed to must allow exemptions. We also need hiring protections, as well as termination protection. Job security and stability does play a huge role when workers move to a state. Please protect our oilfield and our state's future revenue that the oilfield will yield. I thank you for your time and your service. Please enjoy this beautiful North Dakota fall day.

Thank You,

Miki Thompson

Dickinson, ND

# 12100

November 9<sup>th</sup> 2021

Please support HB 1510 and HB 1511.

Vaccine mandates diminish our freedom as citizens to make our own health care decisions. The idea of mandating newly developed trial vaccines for children to take part in school is also ludicrous! Please hear our plea for freedom. Those who wish to be vaccinated have every right to do so. Those who don't should have the same right, without being labeled or targeted in any way.

Thank you

Rose Greer

Cleveland ND 58424

# 12108

November 9, 2021

Members of the North Dakota Legislative Assembly,

I am writing to urge you to vote DO PASS on HB 1510. I strongly believe a vaccination is personal choice that should be left to the individual. A government entity of any level, employer, business owner or otherwise have no right to insert into that decision. Stand up for our rights and protect our right to choose. Keep North Dakota a state of freedom and free from senseless mandates.

DO PASS HB 1510.

Thank you for your time and consideration,

Jordan Manthei  
Resident of Fargo, ND

# 12110

November 9, 2021

TO: ND Legislators

RE: HB 1510

As a citizen of North Dakota, I am in support of HB 1510 and I encourage you to vote to pass this bill.

By supporting 1510, you are allowing parents to choose whether or not to vaccinate their children.

Any, and all bills, which protect North Dakota Lecitizen's God-given rights and freedoms are ALWAYS a success!

Thank you for your service to our great state,

Kay Jarratt

November 09, 2021

Joint Technical Corrections Committee  
House Bill No. 1510

Chairs Weisz, Lee and Committee members:

Let the record reflect my support for House Bill No. 1510 ("HB 1510"), with further amendment requested (detailed below), and as introduced by Representatives Paulson, Meier, Steiner, Thomas, and Senators Clemens, Lemm, and Luick.

**Further amendment requested** - strike Section 3, 12-02.7-03 Exceptions in its entirety. None of us should be willing to sacrifice a specific subset of the population for the convenience of the rest. History is replete with examples of how this provides a breeding ground for evil.

Should a disparity between Medicare/Medicaid regulations compliance and the provisions of HB 1510 occur, the state law imposes a higher standard for the protection of civil rights than would the administrative agency regulation. While Article VI, Clause 2 of the United States Constitution is widely presumed to grant primacy to the federal government over state governments, the clause states:

*"This **constitution**, and the **Laws** of the United States which shall be made **in Pursuance thereof**; and all **Treaties** made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding."* (emphases mine).

Medicare/Medicaid regulations are not laws. There can therefore be no conflict between state and federal law under the "Supremacy clause" should HB 1510 pass and contradict future Medicare/Medicaid compliance regulations. If one is to grant these administrative regulations *pari-passu* standing with law under the premise of Chevron deference doctrine, then Article VI, Clause 2 would **still** require these pseudo "laws" to be made in Pursuance thereof with the Constitution. The Fourth Amendment to the United States Constitution reads:

*"The right of the people to be **secure in their persons**, houses, papers, and effects, against **unreasonable searches and seizures**, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched and the persons or things to be seized."* (emphases mine).

An executive order and/or administrative agency regulation requiring a medical procedure be done to a person absent their informed consent not only violates the Nuremberg Codes, but it violates the 4<sup>th</sup> Amendment. In violating the 4<sup>th</sup> Amendment, these actions would also fail the provisions of Article VI, Clause 2, when argued through the lens of Chevron deference doctrine.

The Tenth Amendment to the United States Constitution states:

*The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."*

I challenge any person to show me the enumerated power reserved to the national government within the Constitution that allows forced medical experimentation on the citizenry against, and without, informed consent. It does not exist, and as such, the national government has no supremacy over the State or the People in this regard.

**This is a fight worth having. Be bold.**

Respectfully,

# 12114

November 9, 2021

TO: ND Legislators

RE: HB 1510

As a citizen of North Dakota, I am in support of HB 1510 and I encourage you to vote to pass this bill.

By supporting 1510, you are allowing parents to choose whether or not to vaccinate their children.

Any, and all bills, which protect North Dakota citizen's God-given rights and freedoms are ALWAYS a success!

Thank you for your service to our great state,

Kay Jarratt



November 9, 2021

Joint Technical Corrections Committee

Committee Members,

I am a resident of West Fargo, ND and I am testifying IN FAVOR of HB 1510. I strongly believe residents of this state should not be discriminated against due to their vaccination status or possession of an immunity passport. The COVID 19 vaccine does not prevent infection. The COVID 19 vaccine does not prevent transmission. If a vaccinated individual and an unvaccinated individual can contract and spread COVID 19 all the same; why would the unvaccinated individual be discriminated against? How are they different?

The COVID 19 vaccine is to protect the person taking the vaccine against severe disease, hospitalization, and death. If the COVID 19 vaccines only work if every single person gets one then I think we need to ask ourselves; are they actually working? Why does an unvaccinated individual need to get a vaccine to protect the vaccinated individual from contracting an illness that they have been vaccinated against? THIS DOESN'T MAKE SENSE.

No one should be discriminated against based on their decision not to inject themselves with something that has ZERO long term studies and many reports of adverse events. This is a medical procedure. This is a medical decision. This is not just wearing a mask; you are talking about injecting something into your body that you cannot undo and discriminating against those that don't get injected.

Does our state stand for freedom or discrimination? It is up to you to stop this and protect the people of this state who elected you to represent them!

DO PASS ON HB 1510.

Respectfully,

Jami Littlefield  
West Fargo, ND

November 09, 2021

Joint Technical Corrections Committee  
House Bill No. 1510

Chairs Weisz, Lee and Committee members:

Let the record reflect my support for House Bill No. 1510 ("HB 1510"), with further amendment requested (detailed below), and as introduced by Representatives Paulson, Meier, Steiner, Thomas, and Senators Clemens, Lemm, and Luick.

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An executive order and/or administrative agency regulation requiring a medical procedure be done to a person absent their informed consent not only violates the Nuremberg Codes, but it violates the 4<sup>th</sup> Amendment. In violating the 4<sup>th</sup> Amendment, these actions would also fail the provisions of Article VI, Clause 2, when argued through the lens of Chevron deference doctrine.

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I challenge any person to show me the enumerated power reserved to the national government within the Constitution that allows forced medical experimentation on the citizenry against, and without, informed consent. It does not exist, and as such, the national government has no supremacy over the State or the People in this regard.

**This is a fight worth having. Be bold.**

Respectfully,

# 12126

I am writing in support of HB 1510. Please do not allow discrimination based on vaccination status.

Thank you

Andrea Leingang



uTobian

12142

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## What is the Number Needed to Vaccinate (NNTV) to prevent a single COVID-19 fatality in kids 5 to 11 based on the Pfizer EUA application?

And what are the risks that go along with injecting that many kids?



Toby Rogers

Oct 31 113 73

### NNTV, the standard policy tool that Pharma, the FDA, & CDC no longer want to talk about

A funny thing happened this afternoon. Not funny as in “haha”. More like funny as in, “ohhhhh that’s how the FDA rigs the process.”

I was reading the CDC’s “[Guidance for Health Economics Studies Presented to the Advisory Committee on Immunization Practices \(ACIP\), 2019 Update](#)” and I realized that the FDA’s woeful risk-benefit analysis in connection with Pfizer’s EUA application to jab children ages 5 to 11 violates many of the principles of the CDC’s Guidance document. The CDC “Guidance” document describes 21 things that every health economics study in connection with vaccines must do and the FDA risk-benefit analysis violated at least half of them.

Today I want to focus on a single factor: the Number Needed to Vaccinate (NNTV). In four separate places the CDC Guidance document mentions the importance of coming up with a Number Needed to Vaccinate (NNTV). I did not recall seeing an NNTV in the FDA risk-benefit document. So I checked the FDA’s risk-benefit analysis again and sure enough, there was **no** mention of an NNTV.

Because the FDA failed to provide an NNTV, I will attempt to provide it here.

First a little background. The Number Needed to Treat (NNT) in order to prevent a single case, hospitalization, ICU admission, or death, is a standard way to measure the effectiveness of any drug. It’s an important tool because it enables policymakers to evaluate tradeoffs between a new drug, a different existing drug, or doing nothing. In vaccine

research the equivalent term is Number Needed to Vaccinate (NNTV, sometimes also written as NNV) in order to prevent a single case, hospitalization, ICU admission, or death (those are 4 different NNTVs that one could calculate).

Pharma HATES talking about NNTV and they hate talking about NNTV even more when it comes to COVID-19 vaccines because the NNTV is so ridiculously high that this vaccine could not pass any honest risk-benefit analysis.

Indeed about a year ago I innocently asked on Twitter what the NNTV is for coronavirus vaccines.



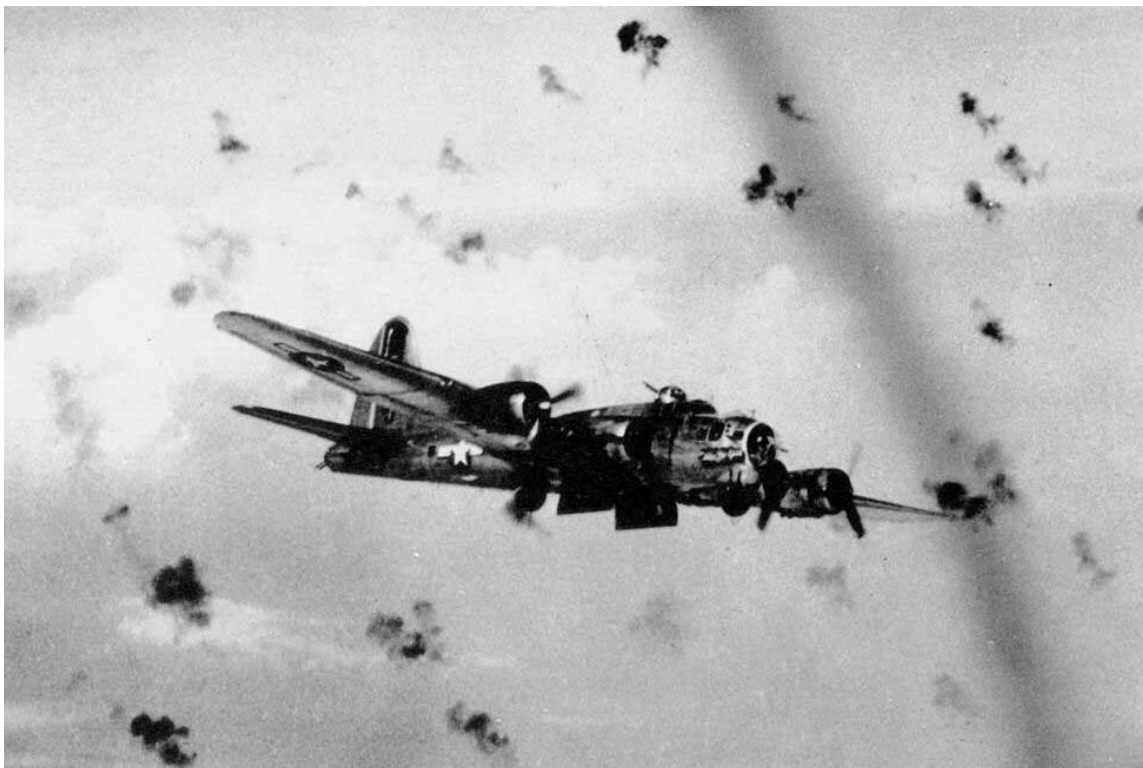
**Toby Rogers PhD, MPP @uTobian** · Sep 24, 2020

Has anyone calculated a **Number Needed to Treat (NNT)** in order to prevent 1 coronavirus death via any of the proposed coronavirus vaccines? It's a very important **number** for rational policymaking but I have yet to see anyone attempt an estimate. Please share if you find a link.

↻ 77

♡ 208

Pharma sent a swarm of trolls in to attack me and Pharma goons published hits pieces on me outside of Twitter to punish me for even asking the question. Of course none of the Pharma trolls provided an estimate of the NNTV for COVID-19 shots. That tells us that we are exactly over the target.



Various health economists have calculated a NNTV for COVID-19 vaccines.

- Ronald Brown, a health economist in Canada, estimated that the NNTV to prevent a single *case* of coronavirus is from 88 to 142.
- Others have calculated the NNTV to prevent a single *case* at 256.
- German and Dutch researchers, using a large (500k) data set from a field study in Israel calculated an NNTV between 200 and 700 to prevent one *case* of COVID-19 for the mRNA shot marketed by Pfizer. They went further and figured out that the “NNTV to prevent one death is between 9,000 and 100,000 (95% confidence interval), with 16,000 as a point estimate.”

You can see why Pharma hates this number so much (I can picture Pharma’s various PR firms sending out an “All hands on deck!” message right now to tell their trolls to attack this article). One would have to inject a lot of people to see any benefit and the more people who are injected the more the potential benefits are offset by the considerable side-effects from the shots.

Furthermore, the NNTV to prevent a single case is not a very meaningful measure because most people, particularly children, recover on their own (or even more quickly with ivermectin if treated early). The numbers that health policy makers should really want to know are the NNTV to prevent a single hospitalization, ICU admission, or death. But with the NNTV to prevent a single case already so high, and with significant adverse events from coronavirus vaccines averaging about 15% nationwide, Pharma and the FDA dare not calculate an NNTV for hospitalizations, ICU, and deaths, because then no one would ever take this product (bye bye \$93 billion in annual revenue).

## Increased all cause mortality in the Pfizer clinical trial of adults

As Bobby Kennedy explains, Pfizer’s clinical trial in adults showed alarming increases in all cause mortality *in the vaccinated*:

In Pfizer’s 6 month clinical trial in adults — there was 1 covid death out of 22,000 in the vaccine (“treatment”) group and 2 Covid deaths out of 22,000 in the placebo group (see Table s4). So NNTV = 22,000. The catch is there were 5 heart attack deaths in the vaccine

group and only 1 in placebo group. So for every 1 life saved from Covid, the Pfizer vaccine kills 4 from heart attacks. All cause mortality in the 6 month study was 20 in vaccine group and 14 in placebo group. So a 42% all cause mortality increase among the vaccinated. The vaccine loses practically all efficacy after 6 months so they had to curtail the study. They unblinded and offered the vaccine to the placebo group. At that point the rising harm line had long ago intersected the sinking efficacy line.

Former NY Times investigative reporter Alex Berenson also wrote about the bad outcomes for the vaccinated in the Pfizer clinical trial in adults ([here](#)). Berenson received a lifetime ban from Twitter for posting Pfizer's own clinical trial data.

Pfizer learned their lesson with the adult trial and so when they conducted a trial of their mRNA vaccine in children ages 5 to 11 they intentionally made it too small (only 2,300 participants) and too short (only followed up for 2 months) in order to hide harms.

## **Estimating an NNTV in children ages 5 to 11 using Pfizer's own clinical trial data**

All of the NNTV estimates above are based on data from adults. In kids the NNTV will be even higher (the lower the risk, the higher the NNTV to prevent a single bad outcome). Children ages 5 to 11 are at extremely low risk of death from coronavirus. In a meta-analysis combining data from 5 studies, Stanford researchers Cathrine Axfors and John Ioannidis found a median infection fatality rate (IFR) of 0.0027% in children ages 0-19. In children ages 5 to 11 the IFR is even lower. Depending on the study one looks at, COVID-19 is slightly less dangerous or roughly equivalent to the flu in children.

So how many children would need to be injected with Pharma's mRNA shot in order to prevent a single hospitalization, ICU admission, or death?

Let's examine Pfizer's EUA application and the FDA's risk-benefit analysis. By Pfizer's own admission, there were zero hospitalization, ICU admissions, or deaths, in the treatment or control group in their study of 2,300 children ages 5 to 11.

So the Number Needed to Vaccinate in order to prevent a single hospitalization, ICU admission, or death, according to Pfizer's own data, is infinity.  $\infty$ . Not the good kind of

infinity as in God or love or time or the universe. This is the bad kind of infinity as in you could vaccinate every child age 5 to 11 in the U.S. and not prevent a single hospitalization, ICU admission, or death from coronavirus **according to Pfizer's own clinical trial data as submitted to the FDA**. Of course Pfizer likes this kind of infinity because it means infinite profits. [Technically speaking the result is "undefined" because mathematically one cannot divide by zero, but you get my point.]

## **Estimating an NNTV and risk-benefit model in children ages 5 to 11 using the limited data that are available**

Everyone knows that Pfizer was not even trying to conduct a responsible clinical trial of their mRNA shot in kids ages 5 to 11. Pfizer could have submitted to the FDA a paper napkin with the words "Iz Gud!" written in crayon and the VRBPAC would have approved the shot. They are all in the cartel together and they are all looking forward to their massive payoff/payday.

But let's not be like Pharma. Instead, let's attempt to come up with a best guess estimate based on real world data. Over time, others will develop a much more sophisticated estimate (for example, [Walach, Klement, & Aukema, 2021](#) estimated an NNTV for 3 different populations based on "days post dose"). But for our purposes here I think there is a much easier way to come up with a ballpark NNTV estimate for children ages 5 to 11.

Here's the benefits model:

- As of October 30, 2021, the CDC [stated](#) that 170 children ages 5 to 11 have died of COVID-19-related illness since the start of the pandemic. (That represents less than 0.1% of all coronavirus-related deaths nationwide even though children that age make up 8.7% of the U.S. population).
- The Pfizer mRNA shot only "works" for about 6 months (it increases risk in the first month, provides moderate protection in months 2 through 4 and then effectiveness begins to wane, which is why all of the FDA modeling only used a 6 month time-frame). So any modeling would have to be based on vaccine effectiveness in connection with the 57 (170/3) children who might otherwise have died of COVID-related illness during a 6-month period.



- At best, the Pfizer mRNA shot might be 80% effective against hospitalizations and death. That number comes directly from the FDA modeling (p. 32). I am bending over backwards to give Pfizer the benefit of considerable doubt because again, the Pfizer clinical trial showed NO reduction in hospitalizations or death in this age group. So injecting all 28,384,878 children ages 5 to 11 with two doses of Pfizer (which is what the Biden administration wants to do) would save, at most, 45 lives (0.8 effectiveness x 57 fatalities that otherwise would have occurred during that time period = 45).
- So then the NNTV to prevent a single fatality in this age group is **630,775** (28,384,878 / 45). But it's a two dose regimen so if one wants to calculate the NNTV per injection the number doubles to **1,261,550**. It's literally the worst NNTV in the history of vaccination.

If you inject that many children, you certainly will have lots and lots of serious side effects including disability and death. So let's look at the risk side of the equation.

Here's the risk model:

- Because the Pfizer clinical trial has no useable data, I have to immuno-bridge from the nearest age group.
- 31,761,099 people (so just about 10% more people than in the 5 to 11 age bracket) ages 12 to 24 have gotten at least one coronavirus shot.
- The COVID-19 vaccine program has only existed for 10 months and younger people have only had access more recently (children 12 to 15 have had access for five months; since May 10) — so we're looking at roughly the same observational time period as modeled above.
- During that time, there are 128 reports of fatal side effects following coronavirus mRNA injections in people 12 to 24. (That's through October 22, 2021. There is a reporting lag though so the actual number of reports that have been filed is surely higher).
- Kirsch, Rose, and Crawford (2021) estimate that VAERS undercounts fatal reactions by a factor of 41 which would put the total fatal side effects in this age-range at **5,248**. (Kirsch et al. represents a conservative estimate because others have put the underreporting factor at 100.)

- With potentially deadly side effects including myo- and pericarditis disproportionately impacting youth it is reasonable to think that over time the rate of fatal side effects from mRNA shots in children ages 5 to 11 might be similar to those in ages 12 to 24.

So, to put it simply, the Biden administration plan would kill 5,248 children via Pfizer mRNA shots in order to save 45 children from dying of coronavirus.

**For every one child saved by the shot, another 117 would be killed by the shot.**

The Pfizer mRNA shot fails any honest risk-benefit analysis in children ages 5 to 11.

Even under the best circumstances, estimating NNTV and modeling risk vs. benefits is fraught. In the current situation, with a new and novel bioengineered virus, where Pfizer's data are intentionally underpowered to hide harms, and the FDA, CDC, & Biden Administration are doing everything in their power to push dangerous drugs on kids, making good policy decisions is even more difficult.

If the FDA or CDC want to calculate a different NNTV (and explain how they arrived at that number) I'm all ears. But we all know that the FDA refused to calculate an NNTV *not* because they forgot, but because they knew the number was so high that it would destroy the case for mRNA vaccines in children this age. Your move CDC — your own Guidance document states that you must provide this number.

**Update: CDC finally mentions NNTV, but . . .**

Toward the end of the six-hour CDC's Advisory Committee on Immunization Practices (ACIP) Nov. 2 meeting where the committee voted to recommend Pfizer's EUA vaccine for children 5 - 11, there was finally a mention of NNTV. It was on slide 36 of a presentation by CDC official D.r Sara Oliver. Unfortunately the CDC estimate was untethered from reality. I'll explain:

Oliver claimed the NNTV to prevent a single case is 10, even though the best lower bound estimate is 88 and other estimates are 200 or higher (see calculations here and here).

Then she claimed the NNTV to prevent a single hospitalization is between 2,213 and 8,187. This is dishonest and a violation of scientific norms.

NNTV is calculated by dividing 1 by the Absolute Risk Reduction. There was no Absolute Risk Reduction in hospitalizations in the Pfizer clinical trial in kids 5 to 11, because no one was hospitalized in either the treatment or control group.  $1/0$  is “undefined” not 8,187.

Oliver made no estimate of NNTV to prevent a single COVID-19-related death because that is also undefined (again, there were no COVID-related deaths in the treatment or placebo group in the trial so the absolute risk reduction was zero).

Oliver also did not model injuries or deaths from the vaccine (she immuno-bridged from an older age group to show benefits but ignored the reported harms from the vaccine in the older age group).

I should also note that my estimates of NNTV were based on CDC data showing 170 deaths from COVID-19-related illness in kids ages 5 to 11 over the last 18 months (I got the number directly from the CDC [COVID tracking website](#)).

However at the ACIP meeting, the CDC said the number of children in this age group who have died of COVID-19-related illness is 94.

If 94 is the correct number to use, then the NNTV to prevent a single death from COVID-19 related illness in this age group would be  $28,384,878 / 31 = 915,641$ . But it's a two-dose regimen, so if one wants to calculate the NNTV-per-injection the number doubles to 1,831,282.

I imagine that at most, half of American parents will be foolish enough to inject this toxic product into their kids. At a 50% uptake rate, the ACIP decision to approve the Pfizer shot will likely kill 2,624 children via adverse reactions in order to potentially save 12 from COVID-19-related illness.

Now you know why the CDC did not release the meeting materials prior to the ACIP meeting — they could not stand up to any public scrutiny.

### Update 11/05/21:

I see that El Gato Malo engaged in a similar set of calculations back in September when Pfizer first released its “results.” He faced the same challenges as I did — namely, there is no usable data from Pfizer and so one has to pull from others sources. He builds a steel man case (the most generous possible defense of the Pfizer product) and yet his results are still in line with mine (my numbers are higher though because I use a lower estimate of vaccine effectiveness and correct for VAERS underreporting). So again, even under the most generous assumptions, the Pfizer mRNA shot fails any honest risk benefit assessment in connection with children 5 to 11.

bad cattitude

#### pfizer says their covid vaccine works in kids 5 to 11. does it?

note: xoo9io in the comments raised a very valid point on hospitalization rates and that CDC surveillance is only about a 10% coverage rate for US population. this changes the numbers from the original and i’m grateful for the peer review. conclusions remain the same...

[Read more](#)

2 months ago · 144 likes · 95 comments · el gato malo

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♥ 113    💬 73



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Write a comment...



**Sigrun** Nov 7 Liked by Toby Rogers

This is utterly gut wrenching. It is so disgusting to keep propping up this novel vax that is so bad the CDC had to change their definition of vaccine. I am a healthcare provider. There has always been "fudged" statistics to justify big pharma's newest creations. But this outright deceit takes big pharma to a whole new level of corruption for me. And on a personal level, I cannot convince my daughters, who are also healthcare providers, to not vax their kids. It is breaking my heart.....literally.

Thank you for your excellent article. I will pass it on.

♡ 6 Reply



**Peter Defty** Nov 7 Liked by Toby Rogers

Thank you!

♡ 1 Reply

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HB 1510

Dear Honorable Technical Committee Member,

Good afternoon! Thank you so much for all you do for this great state that I love. I am praying for wisdom for you and for all the members of this special session and for our Governor who has called it.

Please Do Pass this important bill which thankfully has been wisely approved by the Delayed Bills Committee and please ensure by your green vote that Representative Paulsons Bill passes.

This bill is a well crafted protection for all parents and families in ND who, like myself, do not vaccinate for whatever the reason.

My youngest daughter had a reaction to a vaccine and after that, I began to research vaccines and decided from that point on and thanks to my then Dr., the late Dr. Mayor Eisenstein MD, and his excellent book, Dont vaccinate before you Educate!, that I would not vaccinate and we have taken a philosophical exemption for 20 plus years.

If I am persecuted (along with other family and like-minded friends) for a choice we have made for years, if I am fairly certain we have had Covid 19 and fought it and built up antibodies, can I ask you legislators to do everything in your power to ensure that North Dakota will not fall under hands that do not protect both health freedom, privacy and civil and religious rights? There are also international laws to contend with like the Nuremberg Code which prohibit the mandate of any experimental drug (the current Pfizer vaccine is still technically under emergency authorization only. It is currently a substitute for the recently F.D.A. approved Comirnaty which will not be released or available for several years) without full informed consent. Informed consent is not happening currently as the insert to the Pfizer E.A.U. vaccine has been left blank intentionally.

Like Queen Esther, I feel compelled to be vulnerable before you here on behalf of all my people, all those who, for whatever reason, choose not to receive the Covid 19 vaccine. Please, do not allow us to risk being persecuted in our own state for our strong convictions. This is a special place and there is no place like it in the world with such wonderful people. Western North Dakota is my home! I am so thankful for that bold Legislator who crafted this bill. I respectfully ask you to pass HB 1510. Please do not allow us to lose our freedoms as they have in Australia.

Sincerely,

Alida Arnegard  
District 39  
MCCA  
NDCA  
NDCWA  
Educator

Birgit M Pruess, Ph.D.  
3696 Harrison Str S  
Fargo, ND 58104

November 8, 2021

67<sup>th</sup> Legislative Assembly Special 2021 Session  
Joint Technical Corrections

In opposition of HB1510

Dear North Dakota State legislators,

As HB1510 heads to Joint Technical Corrections, I would like you to consider my interpretation of the controversy around the vaccine mandates. I am a citizen of North Dakota in District 27.

I checked my own vaccine record and was not able to pull it together. I found 20 childhood vaccines, I don't think anybody asked my mother whether I wanted them. Followed up with refreshers, 9 vaccines for a trip to South America, a bunch of vaccines for an assortment of visas, not to talk about annual flu shots. I estimate the total to be in the neighborhood of 70 or 80. Other than the flu shots, these were mandatory. Knowing my own health history, I probably would not have survived childhood without these vaccines. I suspect same might be true for some of those who are reading this letter. It never once occurred to me that my freedom was infringed upon there. Instead, I felt protected and cared for.

So, why is it that so many oppose the vaccines? I don't think it is for any rational reasons. The vaccines are not experimental, they are approved by the FDA, they are safe, research on RNA vaccines has been done across the past 20 years and it was known that the lipid nanoparticle that is used as a carrier to transport the RNA into our cells is safe for a long time. Side effects are as for all vaccines, mild to rare complications. The argument that people don't know what is in there is semi-valid. They may not know, but if they truly wanted to know, the ingredients are published. In fact, these are the only vaccines I ever got where I did know what was in it. From the point of view of a scientist, this is a normal vaccine, like many others. I think the true reason is that back then when vaccines eradicated smallpox and polio, people still believed in science, scientists, medical health professionals, and other experts. So did I. That is why I became a scientist with 9 years of education and by now more than 30 years of experiences on the job. I have personally written three peer-reviewed research papers on Covid-19, one of them being on the vaccines. There is nothing in there that people need to be afraid of. I understand people don't trust scientists and health professionals these days. This is however dangerous and much more likely to kill anyone than the vaccine. As a society, I believe strongly that it is time to stop supporting the virus and start supporting our citizens. All the virus wants is susceptible bodies and we need to stop providing that. Vaccines have gotten us out of smallpox and polio; if we allow it, they will get us out of Covid-19. I would very much appreciate if you could strike down HB1510. This is not discrimination, this is public health. And we still require a long list of other vaccines to get a kid into school. This vaccine is not truly different from any of those.

Birgit Pruess, Microbiologist

Good afternoon, Rep. Weisz, Senator Lee and members of the Technical Corrections Committee.

My name is Kylie Hall, and I am a resident of District 45 in North Fargo. I have a Master's Degree in Public Health and I am a passionate vaccine advocate with more than 6 years of professional public health experience.

I have a number of concerns about the bill before us today. While the undertones of the bill appear to be directed at COVID-19 vaccination, the bill is written in a way that would affect all vaccines, including those against measles, influenza, pertussis and hepatitis B.

I want to start by talking about Montana. Why Montana? Well, Montana has just passed a similar bill in their legislature, and in the few months it has been in effect, it is already causing confusion and frustration.

It is worth noting that there are two challenges to the bill making their way through the court system. Also, thus far, there are two sections of the bill that have been a challenge for the state of Montana. First – the healthcare accommodations section listed in this bill leaves it up to the employer and there is no clear guidance on what is considered “reasonable”. Who decides this? The state? The federal government? The employer? While one facility may require a surgical mask for unvaccinated employees, another may require regular testing and wearing of an N95. One facility may require something completely different. It is confusing and frustrating for those trying to implement the law.

The other area of the bill that has caused confusion and challenges is quarantine requirements for COVID-19. The CDC states that vaccinated individuals do not need to quarantine, but unvaccinated individuals do. So what is a school or workplace to do when someone is a close contact...can you exclude unvaccinated workers from work? Is that discrimination? Under this law, making unvaccinated people quarantine while not making vaccinated people quarantine would be a violation.

This does not just apply to COVID. Another instance this could be an issue is a hepatitis A outbreak in a restaurant. One employee gets hepatitis A and starts an outbreak. To contain the outbreak, it would be best to exclude unvaccinated workers for the time being but allow vaccinated workers to continue their work. However – this bill says you cannot discriminate based on vaccination status. So do you keep the restaurant open and potentially continue to spread hepatitis A, or do you close your restaurant and send your vaccinated and unvaccinated workers home? I can tell you what the public health guidance would be, but based on this bill it might be considered discrimination.

Going back to businesses, I believe that all businesses, not just those in healthcare, should be able to determine if they would like to require vaccinations for employees or patrons, and an employer should be able to deny employment to an individual based on their vaccination status or immunity passport. In the mind of an employer, having a highly vaccinated population may be good for business, as it provides for safer and healthier environments for employees and customers.



For those who are not vaccinated or not immune, you may need to be treated differently. You may need to sit elsewhere in an office. You may need to wear a mask or be tested regularly. If you have not done everything in your power to prevent you from spreading a deadly infectious disease and you are a potential threat to the health of others, you may need to be treated differently. This bill tells businesses that we cannot treat people differently even though they might be posing a threat to the rest of our employees, to the health of our business and bottom line, and to the health of our customers or clients. Does that seem fair?

This bill says that healthcare facilities cannot require their employees to be vaccinated....against ANYTHING. This is a mistake. It will put many of our most vulnerable patients at risk when there are safe and effective vaccines available, and it may lead to unnecessary exposures and cases of vaccine-preventable diseases.

In the healthcare setting, mandating vaccines for healthcare workers as a condition of employment is a common policy that was initially prompted by a dual desire to protect patients from health care-acquired influenza and to protect the workplace from the disruption and expense of worker illnesses. As we now consider COVID-19 vaccination for healthcare workers, you can make an even stronger case for why vaccination is important. COVID is more serious, it spreads easier, it causes significant disruptions in healthcare delivery, the vaccines are much more effective, and ultimately - the vaccines are very safe.

We know that immunization requirements for employees in healthcare help boost immunization rates among staff, they protect our healthcare workers, and that ultimately also protects the patients being served. For COVID-19, we know that vaccinated healthcare workers [are less likely to get COVID-19](#) than unvaccinated healthcare workers.

Other important things to note are that many healthcare systems regularly require influenza vaccination, in addition to proof of immunity to hepatitis B and measles. Some staff members are required to be vaccinated against rabies and meningitis. Tuberculosis testing is also commonplace for healthcare workers. These requirements are not new, but COVID would expand the list of requirements and help protect staff and patients.

What about outside of healthcare? This bill does not allow for workplace vaccination requirements, which is concerning as many employees benefit from vaccination requirements.

There are two examples I want to touch on. 1) Federal OSHA requirements state that police officers and EMTs must be vaccinated against hepatitis B if they are at risk for occupational exposure to blood and other potentially infectious materials. Under this law, we cannot deny employment to a police officer who isn't vaccinated or immune to hepatitis B. What would you suggest we do when a police officer or other high-risk employee has a needlestick? 2) Per this bill, a restaurant owner could not require COVID-19 vaccination or an immunity passport for their employees. But to keep staff and customers safe, the owner would like unvaccinated staff to wear a mask. This bill says you can't do that, as the restaurant worker is not a healthcare worker and it may be considered discrimination.

Here's another example of where this bill falls short: a facility that serves vulnerable populations, such as the Ronald McDonald House, would not be able to deny access to the facility based on someone's vaccination status or immunity passport. Now ask yourself, should we be able to ask about vaccination status (and potentially deny entry) when there's a global pandemic, community transmission is high, and the facility is home to vulnerable patients and their families?

I also want to touch on the economic impact of this mandate. This bill would prevent private businesses from requiring patrons or customers to provide proof of vaccination or an immunity passport to gain entry or receive services. Many events, such as concerts in Fargo, require vaccination or negative tests for attendance. These events have a big impact on our local economy. Not only do events like this include ticket sales, but they bring in people to stay in hotels, eat in our restaurants, ride in our taxi services, and shop in our communities. If this bill were put in place, these events likely would not go forth as planned. The hospitality industry has weathered a pandemic, and to further punish them financially with this law would be very harsh.

In terms of business requirements, shouldn't businesses be able to decide if they want to require vaccinations or immunity passports for customers? If people don't like it, they won't support that business. The free market will determine whether or not that is a sustainable move for the business. It might actually move more people to support a business, or it may harm the business. Regardless, businesses should be able to decide if they want to protect their staff, their business, and their patrons from COVID disruptions. The free market will decide the rest.

Thank you for your time and consideration.

# 11884

I am submitting testimony to speak out against the requirement of a vaccine passport in the the state of North Dakota. Citizens of the state of ND should be discriminated against due to their vaccination status.

Michelle Lingle  
Bismarck, ND

Angel Quintero

500 S 14<sup>th</sup> ST

Bismarck, ND 58504

Email: [angelquintero5@outlook.com](mailto:angelquintero5@outlook.com)

To whom it may concern.

My name is Angel Quintero, I live in Bismarck and have lived here for nearly 4 years now and total of 19 years in the great state of North Dakota. I would love to give a testimony about the vaccine mandate and how it is affecting my life. I currently work at CHI St. Alexius Health (3 years) and on suspension at Augusta Place Skilled Nursing Facility (1.5 years). The reason I am on suspension at Augusta Place is due to me not complying to their current vaccination mandate. I have worked in health care for the last 6 years; I have put in countless hours of overtime for little pay because I love what I do.

I was there when covid first hit the hospital back in 2020. I was also first one in my unit to raise their hand to volunteer to help extra whether it was screening people as they come into the hospital or being a runner in the ICU for covid patients or being a 1 to 1 on covid units. I was out here working 45–60-hour weeks when covid hit, when there were no extra incentives. My coworkers and I were working so hard while there were people without a job but being paid by the government making more money than we could imagine. I am not here to argue how unfair that was for us I'm here to argue against the mandate.

I disagree with the vaccine mandate that is threatening my employment. In 2020 I was considered a hero, now in 2021 I'm considered, and I quote from my denied exemption "*Present an undue burden to the business.*" Those words hurt me deeply and has hurt many others. Every time I walk into the hospital, I'm disappointed in myself for showing up to a work environment who sees me as such. There are many who tell me to quit, and they are right but think about who else is going to do it who is going to take care of patients. We already had a hard time staffing the hospital before the pandemic. There was no one standing up to help when the pandemic hit because they were afraid. The people who were already working in healthcare were not afraid of this virus and still are not afraid. One of the first things I was taught in my CNA class was: Treat everyone as if they have an infectious disease, that is why we do hand hygiene and wear the proper PPE because that is what we are trained to do. When you have healthcare workers who against this vaccine listen to us, we are people too. I have rights too just like everyone else. I understand the risks of this virus and I am not afraid.

My religious exemption was denied. As I said before in the letter it said I was presenting an undue burden to the business. I have worked very hard in the last two years battling this pandemic and those are the words they chose to tell me and many others. This mandate is going to hurt this community and its economy. There will be many amazing healthcare workers leaving the field if we don't stop this **medical tyranny**. I will not stop fighting for my rights, WE THE PEOPLE.

Sincerely,

Angel Quintero

# 12025

**In regard to HB 1510**

I oppose this bill, as I believe the majority of ND citizens do. Covid-19 is the most disruptive public health crisis of our lives. The way to end it is through vaccination of as many people as possible. Further, there is absolutely NO inconvenience to carrying proof of one's vaccination.

# 12030

I am strongly opposed to Covid-19 mandates. Vaccination status is a private matter and a choice that needs to be granted to each individual. Those that choose to be vaccinated are protecting themselves and need not be concerned about others who choose not to be vaccinated, as that non-vaccinated individual is only effecting themselves.

Children are at very little risk from the severe effects of covid, and should not be required to get vaccinated, or wear a mask.

Thank you,  
Joel Dennis  
701-340-3197

**Testimony to the Joint Technical Corrections Committee****Testimony by Barbara Frydenlund Rolette County Public Health District Administrator**

Good afternoon, Chairman Weisz, and members of the Joint Technical Corrections Committee. My name is Barbara Frydenlund, and I am the Nurse Administrator for Rolette County Public Health District. I am offering this testimony today regarding HB 1510 and HB1511.

As a Registered Nurse and a mother of two, I ask policy makers to follow the science of immunology, vaccination, and disease prevention. Our communities, state and nation will be a safer place once everyone has access to science based, competent health care and access to all authorized/approved vaccines.

You are aware that there are several vaccine preventable diseases. Many of these diseases have never been seen by today's healthcare providers and parents, in part because for years we have been actively educating parents and guardians and vaccinating children and adults.

History is said to repeat itself! A very wise man told me years ago that "those who do not remember or recognize the past will surely repeat it!" This wise man was my grandfather who witnessed firsthand the tragedy of the 1918 flu pandemic, as he and the local doctor drove from house to house, via horse and buggy, helplessly witnessing death after death from what is now known as a vaccine preventable disease. Let us not relive the tragedy endured by our ancestors, of the untimely deaths at the hands of what we now know as vaccine preventable diseases.

Groundbreaking medical victories continue to provide American's with this high health standard. Immunizations are among the most cost-effective and successful public health interventions.

This fall we have seen an uptick in the number of children and adults contracting COVID 19. A casual glance around our state demonstrates a significant decrease in COVID mitigation measures including masking. In 2020 and early 2021 we protected our children at a higher level than we are currently.

From a local public health administration view point I strongly believe that it is my responsibility to protect my workforce and our clients from disease including

vaccine preventable diseases. We are already facing workforce challenges and additional loss of employees who are out of the office “ill” further hampers our ability to serve our citizens.

North Dakota Legislation is of extreme importance to Rolette County Public Health District as we continue to work diligently to deliver the highest level of disease protection, promotion of healthy lifestyles and protection of the environment.

Please continue to allow Rolette County Public Health District to retain the authority to set local policy that best suits our environment and culture.

Sincerely,

Barbara Frydenlund, RN  
Nurse Administrator  
Rolette County Public Health District





## **BISMARCK MANDAN** **CHAMBER | EDC**

**Joint Technical Corrections Committee – HB 1510**

**Representative Robin Weisz and Senator Judy Lee, Chairs**

**November 9, 2021**

Chairs Weisz and Lee

My name is Brian Ritter and I am the President of the Bismarck Mandan Chamber EDC. Please accept the following testimony on behalf of our organization's nearly 1,200 members in opposition of HB 1510.

Our organization engages in a number of activities on behalf of our members to support the continued growth and development of our community—all of which have been impacted by the COVID-19 pandemic. As our community and our businesses return to 'normal' they face many new questions, including those surrounding vaccinations and the vaccination status of their employees.

These are incredibly complicated and impactful questions that will require time to fully vet, as will any legislation that seeks to address them. Given the lack of time available during the special session for a comprehensive review of legislation like this, that could impact a private employer's ability to make related determinations for themselves, we oppose HB 1510.

Respectfully,

Brian Ritter, President

Bismarck Mandan Chamber EDC

Good afternoon, Representative Weisz and Members of the Joint Technical Corrections Committee.

My name is Brenda Stallman, and I am the Administrator of Traill District Health Unit. Our local health department serves the communities of Mayville, Portland, Hillsboro, Hatton, Reynolds and Buxton.

I am providing testimony in opposition of HB 1510 and 1511. I am not in favor of diminishing requirements for immunizations that have been an important tool and effective with eliminating highly contagious and life-threatening diseases for decades.

A blanket exclusion, during and in response to a deadly pandemic is not in the best interest of public health, the lives of our citizens, and the ability of our businesses to protect their employees and patrons.

Our vibrant agricultural community in ND largely depends on science to assure a safe and nutrient-rich food supply. We trust our engineers to build roads and bridges based on education and methods proven as safe. Scientists, doctors, and medical experts have devoted lifetimes doing research and conducting studies to prove vaccines are safe and effective at controlling diseases. I am asking you to honor science and allow the best methods we have available to keep our citizens healthy and our businesses going.

Legislative approval is already required before the state can require additional vaccines for employees. These bills infringe on local control and the ability to make decisions that are appropriate for local jurisdictions. Public health is placed in the position of protecting the health and safety of our citizens. These bills impede our already very difficult assignment given the conditions we are facing.

Finally, as a mother of 2 adult children ready to start their own families, I implore you to consider the future of our children and grandchildren. Please afford them the same quality of life and safety measures we have in place that we have benefited from. Thank you for your consideration for opposing House Bills 1510 and 1511.



Review

# Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards?

Kai Kisielinski <sup>1</sup>, Paul Giboni <sup>2</sup>, Andreas Prescher <sup>3</sup>, Bernd Klosterhalfen <sup>4</sup>, David Graessel <sup>5</sup>, Stefan Funken <sup>6</sup>, Oliver Kempfski <sup>7</sup> and Oliver Hirsch <sup>8,\*</sup>

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**Abstract:** Many countries introduced the requirement to wear masks in public spaces for containing SARS-CoV-2 making it commonplace in 2020. Up until now, there has been no comprehensive investigation as to the adverse health effects masks can cause. The aim was to find, test, evaluate and compile scientifically proven related side effects of wearing masks. For a quantitative evaluation, 44 mostly experimental studies were referenced, and for a substantive evaluation, 65 publications were found. The literature revealed relevant adverse effects of masks in numerous disciplines. In this paper, we refer to the psychological and physical deterioration as well as multiple symptoms described because of their consistent, recurrent and uniform presentation from different disciplines as a Mask-Induced Exhaustion Syndrome (MIES). We objectified evaluation evidenced changes in respiratory physiology of mask wearers with significant correlation of O<sub>2</sub> drop and fatigue ( $p < 0.05$ ), a clustered co-occurrence of respiratory impairment and O<sub>2</sub> drop (67%), N95 mask and CO<sub>2</sub> rise (82%), N95 mask and O<sub>2</sub> drop (72%), N95 mask and headache (60%), respiratory impairment and temperature rise (88%), but also temperature rise and moisture (100%) under the masks. Extended mask-wearing by the general population could lead to relevant effects and consequences in many medical fields.

**Keywords:** personal protective equipment; masks; N95 face mask; surgical mask; risk; adverse effects; long-term adverse effects; contraindications; health risk assessment; hypercapnia; hypoxia; headache; dyspnea; physical exertion; MIES syndrome

## 1. Introduction

At the beginning of the spread of the novel pathogen SARS-CoV-2, it was necessary to make far-reaching decisions even without available explicit scientific data. The initial assumption was that the pandemic emergency measures were set in place to reduce the acute threat of the public health system effectively and swiftly.

In April 2020, the World Health Organization (WHO) recommended the use of masks only for symptomatic, ill individuals and health care workers and did not recommend its widespread use.

In June 2020, they changed this recommendation to endorse the general use of masks in, e.g., crowded places [1,2]. In a meta-analysis study commissioned by the WHO (evidence level Ia), no clear, scientifically graspable benefit of moderate or strong evidence was derived from wearing masks [3].

While maintaining a distance of at least one meter showed moderate evidence with regard to the spreading of SARS-CoV-2, only weak evidence at best could be found for masks alone in everyday use (non-medical setting) [3]. Another meta-analysis conducted in the same year confirmed the weak scientific evidence for masks [4].

Accordingly, the WHO did not recommend general or uncritical use of masks for the general population and expanded its risk and hazard list within just two months. While the April 2020 guideline highlighted the dangers of self-contamination, possible breathing difficulties and false sense of security, the June 2020 guideline found additional potential adverse effects such as headache, development of facial skin lesions, irritant dermatitis, acne or increased risk of contamination in public spaces due to improper mask disposal [1,2].

However, under pressure from increasing absolute numbers of positive SARS-CoV-2 tests, many prescribers further extended mask-wearing according to certain times and situations, always justified by the desire to limit the spread of the virus [5]. The media, numerous institutions and most of the population supported this approach.

Among the medical profession and scientists, the users and observers of medical devices, there have been simultaneous calls for a more nuanced approach [6–8]. While there has been a controversial scientific discussion worldwide about the benefits and risks of masks in public spaces, they became the new social appearance in everyday life in many countries at the same time.

Although there seems to be a consensus among the decision makers who have introduced mandatory masks that medical exemptions are warranted, it is ultimately the responsibility of individual clinicians to weigh up when to recommend exemption from mandatory masks. Physicians are in a conflict of interest concerning this matter. On the one hand, doctors have a leading role in supporting the authorities in the fight against a pandemic. On the other hand, doctors must, in accordance with the medical ethos, protect the interests, welfare and rights of their patient's third parties with the necessary care and in accordance with the recognized state of medical knowledge [9–11].

A careful risk–benefit analysis is becoming increasingly relevant for patients and their practitioners regarding the potential long-term effects of masks. The lack of knowledge of legal legitimacy on the one hand and of the medical scientific facts on the other is a reason for uncertainty among clinically active colleagues.

The aim of this paper is to provide a first, rapid, scientific presentation of the risks of general mandatory mask use by focusing on the possible adverse medical effects of masks, especially in certain diagnostic, patient and user groups.

## 2. Materials and Methods

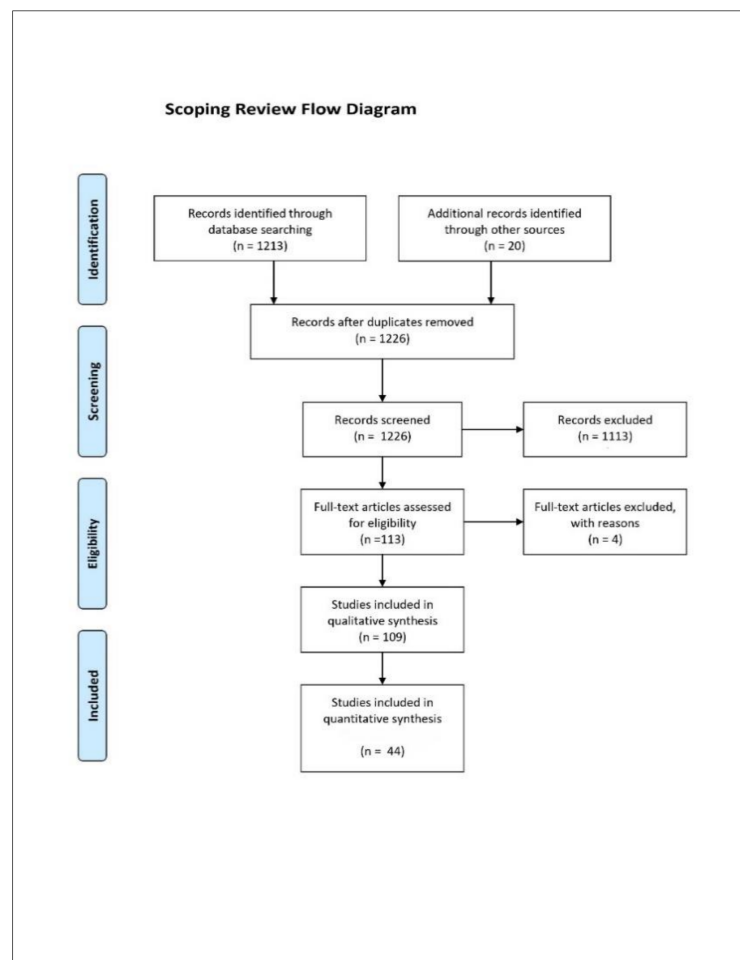
The objective was to search for documented adverse effects and risks of different types of mouth–nose-covering masks. Of interest here were, on the one hand, readymade and self-manufactured fabric masks, including so-called community masks and, on the other hand medical, surgical and N95 masks (FFP2 masks).

Our approach of limiting the focus to negative effects seems surprising at first glance. However, such an approach helps to provide us with more information. This methodology is in line with the strategy of Villalonga-Olives and Kawachi, who also conducted a review exclusively on the negative effects [12].

For an analysis of the literature, we defined the risk of mouth–nose protection as the description of symptoms or the negative effects of masks. Reviews and expert presentations from which no measurable values could be extracted, but which clearly present the research situation and describe negative effects, also fulfill this criterion.

Additionally, we defined the quantifiable, negative effect of masks as the presentation of a measured, statistically significant change in a physiological parameter in a pathological direction ( $p < 0.05$ ), a statistically significant detection of symptoms ( $p < 0.05$ ) or the occurrence of symptoms in at least 50% of those examined in a sample ( $n \geq 50\%$ ).

Up to and including 31 October 2020, we conducted a database search in PubMed/MEDLINE on scientific studies and publications on adverse effects and risks of different types of mouth–nose-covering masks according to the criteria mentioned above (see Figure 1: Review flowchart). Terms searched were “face masks”, “surgical mask” and “N95” in combination with the terms “risk” and “adverse effects” as well as “side effects”. The selection criteria of the papers were based on our above definition of risk and adverse effect of masks. Mainly English- and German-language publications of evidence levels I to III according to the recommendations of the Agency for Healthcare Research and Quality (AHRQ) that were not older than 20 years at the time of the review were considered. The evaluation also excluded level IV evidence, such as case reports and irrelevant letters to the editor that exclusively reflect opinions without scientific evidence.



**Figure 1.** Scoping review flow diagram according to the PRISMA scheme.

After excluding 1113 papers that were irrelevant to the research question and did not meet the criteria mentioned (quantifiable, negative effects of masks, description of symptoms or the negative effects of masks), a total of 109 relevant publications were found for evaluation in the context of our scoping review (see Figure 1: Flow chart).

Sixty-five relevant publications concerning masks were considered being within the scope of the content-related evaluation. These included 14 reviews and 2 meta-analyses from the primary research. For the quantitative evaluation, 44 presentations of nega-

tive effects from the years 2004 to 2020 were eligible. Thirty-one of these studies were experimental (70%), and 13 studies were data collection studies in the sense of simple observational studies, especially in the dermatological field (30%). The observed study parameters and significant results from these 44 publications ( $p < 0.05$  or  $n \geq 50\%$ ) were compiled in an overall display (Figure 2). Based on this data, a correlation analysis of the observed mask effects was performed. This included a correlation calculation of the recorded symptoms and physiological changes (for nominally scaled, dichotomous variables according to Fisher using R, R Foundation for Statistical Computing, Vienna, Austria, version 4.0.2).

| significantly measured mask-induced changes in scientific studies 2004-2020:<br>● = $p < 0.05$<br>■ = $n \geq 50\%$ | Fabric Mask | Surgical Mask | N95-Mask | O <sub>2</sub> | CO <sub>2</sub> | Humidity | Temperature | Breathing Resistance | Respiratory Rate | Blood Pressure | Cerebral Vasodilation | Heart Rate | Respiratory Impairment | Exhaustion & Fatigue | Drowsiness | Dizziness | Headache | Psycho-vegetative Effect | Decrease in Empathy | Itch | Skin Irritation | Acne | Rhinitis | Voice Disorder | False Sense of Security | Bacterial Contamination | Fungal Contamination | Viral Contamination |
|---|-------------|---------------|----------|----------------|-----------------|----------|-------------|----------------------|------------------|----------------|-----------------------|------------|------------------------|----------------------|------------|-----------|----------|--------------------------|---------------------|------|-----------------|------|----------|----------------|-------------------------|-------------------------|----------------------|---------------------|
|   | Beder 2008  |               | X        |                | ●               |          |             |                      |                  |                |                       |            | ●                      |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Bharatendu 2020   |             |               | X        | ●              |                 |          |             |                      |                  |                | ●                     |            |                        |                      |            |           |          | ●                        |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Butz 2005   |             | X             |          | ●              |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Chughtai 2019   |             | X             |          |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      | ●                   |
| Epstein 2020  |             | X             | X        | ●              |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Fikenzler 2020  |             | X             | X        | ●              | ●               | ●        | ●           |                      |                  |                |                       |            | ●                      | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Foo 2006  |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      | ●               | ■    | ■        |                |                         |                         |                      |                     |
| Georgi 2020   | X           | X             | X        | ●              | ●               |          |             |                      | ●                |                |                       |            | ●                      | ●                    |            |           |          |                          |                     |      |                 | ■    | ■        |                |                         |                         |                      |                     |
| Goh 2019  |             |               | X        | ■              |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Heider 2020   |             | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                | ●                       |                         |                      |                     |
| Hua 2020  |             | X             | X        |                | ●               |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 | ■    | ■        |                |                         |                         |                      |                     |
| Jacobs 2009   |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          | ●                   |      |                 |      |          |                |                         |                         |                      |                     |
| Jagim 2018  | X           |               |          | ●              |                 |          |             |                      |                  |                |                       |            |                        | ●                    | ●          |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Kao 2004  |             |               | X        | ●              |                 |          |             |                      | ●                |                |                       |            | ●                      | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Klimek 2020   |             |               |          |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                | ●                       |                         |                      |                     |
| Kyung 2020  |             |               | X        | ●              | ●               |          |             |                      | ●                |                |                       |            | ●                      | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Lan 2020  |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 | ■    | ■        |                |                         |                         |                      |                     |
| Lee 2011  |             |               | X        |                |                 |          |             |                      | ●                |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Li 2005   |             | X             | X        |                | ●               | ●        | ●           |                      | ●                |                |                       | ●          | ●                      | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Lim 2006  |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          | ●                   |      |                 |      |          |                |                         |                         |                      |                     |
| Liu 2020  | X           | X             | X        | ●              | ●               | ●        |             |                      |                  |                |                       |            | ●                      | ●                    | ●          | ●         |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Luckman 2020  | X           | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         | ●                       |                      |                     |
| Luksamijarulkul 2014  |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         | ●                       | ●                    |                     |
| Matusiak 2020   | X           | X             | X        |                | ●               | ●        |             |                      |                  |                |                       |            | ●                      |                      |            |           |          |                          |                     |      |                 | ●    | ●        |                |                         |                         |                      |                     |
| Mo 2020   |             |               | X        |                | ●               |          |             |                      |                  | ●              |                       |            | ●                      |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Monalisa 2017   |             | X             |          |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         | ●                       | ●                    |                     |
| Ong 2020  |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          | ●                   |      |                 |      |          |                |                         |                         |                      |                     |
| Person 2018   |             |               | X        |                |                 |          |             |                      |                  |                |                       |            |                        | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Pifarre 2020  |             | X             | X        | ●              | ●               |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Porcari 2016  | X           |               |          | ●              |                 |          |             |                      |                  |                |                       |            |                        | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Prousa 2020   | X           | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          | ●                   |      |                 |      |          |                |                         |                         |                      |                     |
| Ramirez 2020  |             | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Rebmann 2013  |             | X             | X        | ●              | ●               |          |             |                      |                  |                |                       |            | ●                      | ●                    | ●          |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Roberge 2012  |             | X             |          | ●              | ●               | ●        |             | ●                    |                  |                |                       |            | ●                      | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Roberge 2014  |             |               | X        | ●              | ●               |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Rosner 2020   |             | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 | ■    |          |                |                         | ■                       | ■                    |                     |
| Scarano 2020  |             | X             | X        |                | ●               | ●        |             |                      |                  |                |                       |            | ●                      |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         | ●                    |                     |
| Shenal 2012   | X           | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Smart 2020  |             | X             | X        |                |                 |          |             | ●                    |                  |                |                       |            |                        | ●                    |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Szepietkowski 2020  | X           | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Techasatian 2020  | X           | X             | X        |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Tong 2015   |             | X             |          | ●              | ●               |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Wong 2013   |             | X             |          |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      |                     |
| Zhiqing 2018  |             | X             |          |                |                 |          |             |                      |                  |                |                       |            |                        |                      |            |           |          |                          |                     |      |                 |      |          |                |                         |                         |                      | ●                   |

**Figure 2.** Overview including all 44 considered studies with quantified, significant adverse effects of masks (black dots and black rectangles). Not all studies examined each mentioned parameter, as focused or subject-related questions were often in the foreground. Gray fields correspond to a lack of coverage in the primary studies, white fields represent measured effects. We found an often combination of significant chemical, physical, physiological parameters and complaints. Drowsiness summarizes the symptom for any qualitative neurological deficits described in the scientific literature examined.

In addition, another 64 publications with a neighboring range of topics were consulted in connection with the mask effects we found. These included declarations, guidelines



and legal principles. In order to expand the amount of data for the discussion, we proceeded according to the “snowball principle” by locating citations of selected papers in the bibliographies and including them where appropriate.

Since the findings from the topics presented for discussion were to an unexpected degree subject-related, we decided to divide the results according to the fields of medicine. Of course, there are overlaps between the respective fields, which we point out in detail.

### 3. Results

A total of 65 scientific papers on masks qualified for a purely content-based evaluation. These included 14 reviews and two meta-analyses.

Of the mathematically evaluable, groundbreaking 44 papers with significant negative mask effects ( $p < 0.05$  or  $n \geq 50\%$ ), 22 were published in 2020 (50%), and 22 were published before the COVID-19 pandemic. Of these 44 publications, 31 (70%) were of experimental nature, and the remainder were observational studies (30%). Most of the publications in question were English (98%). Thirty papers referred to surgical masks (68%), 30 publications related to N95 masks (68%), and only 10 studies pertained to fabric masks (23%).

Despite the differences between the primary studies, we were able to demonstrate a statistically significant correlation in the quantitative analysis between the negative side effects of blood-oxygen depletion and fatigue in mask wearers with  $p = 0.0454$ .

In addition, we found a mathematically grouped common appearance of statistically significant confirmed effects of masks in the primary studies ( $p < 0.05$  and  $n \geq 50\%$ ) as shown in Figure 2. In nine of the 11 scientific papers (82%), we found a combined onset of N95 respiratory protection and carbon dioxide rise when wearing a mask. We found a similar result for the decrease in oxygen saturation and respiratory impairment with synchronous evidence in six of the nine relevant studies (67%). N95 masks were associated with headaches in six of the 10 studies (60%). For oxygen deprivation under N95 respiratory protectors, we found a common occurrence in eight of 11 primary studies (72%). Skin temperature rise under masks was associated with fatigue in 50% (three out of six primary studies). The dual occurrence of the physical parameter temperature rise and respiratory impairment was found in seven of the eight studies (88%). A combined occurrence of the physical parameters temperature rise and humidity/moisture under the mask was found in 100% within six of six studies, with significant readings of these parameters (Figure 2).

The literature review confirms that relevant, undesired medical, organ and organ system-related phenomena accompanied by wearing masks occur in the fields of internal medicine (at least 11 publications, Section 3.2). The list covers neurology (seven publications, Section 3.3), psychology (more than 10 publications, Section 3.4), psychiatry (three publications, Section 3.5), gynecology (three publications, Section 3.6), dermatology (at least 10 publications, Section 3.7), ENT medicine (four publications, Section 3.8), dentistry (one publication, Section 3.8), sports medicine (four publications, Section 3.9), sociology (more than five publications, Section 3.10), occupational medicine (more than 14 publications, Section 3.11), microbiology (at least four publications, Section 3.12), epidemiology (more than 16 publications, Section 3.13), and pediatrics (four publications, Section 3.14) as well as environmental medicine (four publications, Section 3.15).

We will present the general physiological effects as a basis for all disciplines. This will be followed by a description of the results from the different medical fields of expertise and closing off with pediatrics the final paragraph.

#### 3.1. General Physiological and Pathophysiological Effects for the Wearer

As early as 2005, an experimental dissertation (randomized crossover study) demonstrated that wearing surgical masks in healthy medical personnel (15 subjects, 18–40 years old) leads to measurable physical effects with elevated transcutaneous carbon dioxide values after 30 min [13]. The role of dead space volume and CO<sub>2</sub> retention as a cause of the significant change ( $p < 0.05$ ) in blood gases on the way to hypercapnia, which was still

within the limits, was discussed in this article. Masks expand the natural dead space (nose, throat, trachea, bronchi) outwards and beyond the mouth and nose.

An experimental increase in the dead space volume during breathing increases carbon dioxide (CO<sub>2</sub>) retention at rest and under exertion and correspondingly the carbon dioxide partial pressure pCO<sub>2</sub> in the blood ( $p < 0.05$ ) [14].

As well as addressing the increased rebreathing of carbon dioxide (CO<sub>2</sub>) due to the dead space, scientists also debate the influence of the increased breathing resistance when using masks [15–17].

According to the scientific data, mask wearers as a whole show a striking frequency of typical, measurable, physiological changes associated with masks.

In a recent intervention study conducted on eight subjects, measurements of the gas content for oxygen (measured in O<sub>2</sub> Vol%) and carbon dioxide (measured in CO<sub>2</sub> ppm) in the air under a mask showed a lower oxygen availability even at rest than without a mask. A Multi-Rae gas analyzer was used for the measurements (RaeSystems®) (Sunnyvale, California CA, United States). At the time of the study, the device was the most advanced portable multivariant real-time gas analyzer. It is also used in rescue medicine and operational emergencies. The absolute concentration of oxygen (O<sub>2</sub> Vol%) in the air under the masks was significantly lower (minus 12.4 Vol% O<sub>2</sub> in absolute terms, statistically significant with  $p < 0.001$ ) at 18.3% compared to 20.9% room air concentration. Simultaneously, a health-critical value of carbon dioxide concentration (CO<sub>2</sub> Vol%) increased by a factor of 30 compared to normal room air was measured (ppm with mask versus 464 ppm without mask, statistically significant with  $p < 0.001$ ) [18].

These phenomena are responsible for a statistically significant increase in carbon dioxide (CO<sub>2</sub>) blood content in mask wearers [19,20], on the one hand, measured transcutaneously via an increased PtcCO<sub>2</sub> value [15,17,19,21,22], on the other hand, via end-expiratory partial pressure of carbon dioxide (PETCO<sub>2</sub>) [23,24] or, respectively, the arterial partial pressure of carbon dioxide (PaCO<sub>2</sub>) [25].

In addition to the increase in the wearer's blood carbon dioxide (CO<sub>2</sub>) levels ( $p < 0.05$ ) [13,15,17,19,21–28], another consequence of masks that has often been experimentally proven is a statistically significant drop in blood oxygen saturation (SpO<sub>2</sub>) ( $p < 0.05$ ) [18,19,21,23,29–34]. A drop in blood oxygen partial pressure (PaO<sub>2</sub>) with the effect of an accompanying increase in heart rate ( $p < 0.05$ ) [15,23,29,30,34] as well as an increase in respiratory rate ( $p < 0.05$ ) [15,21,23,35,36] have been proven.

A statistically significant measurable increase in pulse rate ( $p < 0.05$ ) and decrease in oxygen saturation SpO<sub>2</sub> after the first ( $p < 0.01$ ) and second hour ( $p < 0.0001$ ) under a disposable mask (surgical mask) were reported by researchers in a mask intervention study they conducted on 53 employed neurosurgeons [30].

In another experimental study (comparative study), surgical and N95 masks caused a significant increase in heart rate ( $p < 0.01$ ) as well as a corresponding feeling of exhaustion ( $p < 0.05$ ). These symptoms were accompanied by a sensation of heat ( $p < 0.0001$ ) and itching ( $p < 0.01$ ) due to moisture penetration of the masks ( $p < 0.0001$ ) in 10 healthy volunteers of both sexes after only 90 min of physical activity [35]. Moisture penetration was determined via sensors by evaluating logs (SCXI-1461, National Instruments, Austin, TX, USA).

These phenomena were reproduced in another experiment on 20 healthy subjects wearing surgical masks. The masked subjects showed statistically significant increases in heart rate ( $p < 0.001$ ) and respiratory rate ( $p < 0.02$ ) accompanied by a significant measurable increase in transcutaneous carbon dioxide PtcCO<sub>2</sub> ( $p < 0.0006$ ). They also complained of breathing difficulties during the exercise [15].

The increased rebreathing of carbon dioxide (CO<sub>2</sub>) from the enlarged dead space volume in mask wearers can reflectively trigger increased respiratory activity with increased muscular work as well as the resulting additional oxygen demand and oxygen consumption [17]. This is a reaction to pathological changes in the sense of an adaptation effect. A mask-induced drop in blood oxygen saturation value (SpO<sub>2</sub>) [30] or the blood



oxygen partial pressure (PaO<sub>2</sub>) [34] can in turn additionally intensify subjective chest complaints [25,34].

The documented mask-induced changes in blood gases towards hypercapnia (increased carbon dioxide/CO<sub>2</sub> blood levels) and hypoxia (decreased oxygen/O<sub>2</sub> blood levels) may result in additional nonphysical effects such as confusion, decreased thinking ability and disorientation [23,36–39], including overall impaired cognitive abilities and decrease in psychomotoric abilities [19,32,38–41]. This highlights the importance of changes in blood gas parameters (O<sub>2</sub> and CO<sub>2</sub>) as a cause of clinically relevant psychological and neurological effects. The above parameters and effects (oxygen saturation, carbon dioxide content, cognitive abilities) were measured in a study on saturation sensors (Semi-Tec AG, Therwil, Switzerland), using a Borg Rating Scale, Frank Scale, Roberge Respirator Comfort Scale and Roberge Subjective Symptoms-during-Work Scale, as well as with a Likert scale [19]. In the other main study, conventional ECG, capnography and symptom questionnaires were used in measuring carbon dioxide levels, pulse and cognitive abilities [23]. Other physiological data collection was done with pulse oximeters (Allegiance, MCGaw, USA), subjective complaints were assessed with a 5-point Likert scale and motoric speed was recorded with linear-position transducers (Tendo-Fitrodyne, Sport Machins, Trencin, Slovakia) [32]. Some researchers used standardized, anonymized questionnaires to collect data on subjective complaints associated with masks [37].

In an experimental setting with different mask types (community, surgical, N95) a significant increase in heart rate ( $p < 0.04$ ), a decrease in oxygen saturation SpO<sub>2</sub> ( $p < 0.05$ ) with an increase in skin temperature under the mask (face) and difficulty of breathing ( $p < 0.002$ ) were recorded in 12 healthy young subjects (students). In addition, the investigators observed dizziness ( $p < 0.03$ ), listlessness ( $p < 0.05$ ), impaired thinking ( $p < 0.03$ ) and concentration problems ( $p < 0.02$ ), which were also statistically significant when wearing masks [29].

According to other researchers and their publications, masks also interfere with temperature regulation, impair the field of vision and of non-verbal and verbal communication [15,17,19,36,37,42–45].

The above-mentioned measurable and qualitative physiological effects of masks can have implications in various areas of expertise in medicine.

It is known from pathology that not only supra-threshold stimuli exceeding normal limits have disease-relevant consequences. Subthreshold stimuli are also capable of causing pathological changes if the exposure time is long enough. Examples occur from the slightest air pollution by hydrogen sulfide resulting in respiratory problems (throat irritation, coughing, reduced absorption of oxygen) and neurological diseases (headaches, dizziness) [46]. Furthermore, subthreshold but prolonged exposure to nitrogen oxides and particulate matter is associated with an increased risk of asthma, hospitalization and higher overall mortality [47,48]. Low concentrations of pesticides are also associated with disease-relevant consequences for humans such as mutations, development of cancer and neurological disorders [49]. Likewise, the chronic subthreshold intake of arsenic is associated with an increased risk of cancer [50], subthreshold intake of cadmium with the promotion of heart failure [51], subthreshold intake of lead is associated with hypertension, renal metabolic disorders and cognitive impairment [52] or subthreshold intake of mercury with immune deficiency and neurological disorders [53]. Subliminal UV radiation exposure over long periods is also known to cause mutation-promoting carcinogenic effects (especially white skin cancer) [54].

The mask-induced adverse changes are relatively minor at first glance, but repeated exposure over longer periods in accordance with the above-mentioned pathogenetic principle is relevant. Long-term disease-relevant consequences of masks are to be expected. Insofar, the statistically significant results found in the studies with mathematically tangible differences between mask wearers and people without masks are clinically relevant. They give an indication that with correspondingly repeated and prolonged exposure to physical, chemical, biological, physiological and psychological conditions, some of which are

subliminal, but which are significantly shifted towards pathological areas, health-reducing changes and clinical pictures can develop such as high blood pressure and arteriosclerosis, including coronary heart disease (metabolic syndrome) as well as neurological diseases. For small increases in carbon dioxide in the inhaled air, this disease-promoting effect has been proven with the creation of headaches, irritation of the respiratory tract up to asthma as well as an increase in blood pressure and heart rate with vascular damage and, finally, neuropathological and cardiovascular consequences [38]. Even slightly but persistently increased heart rates encourage oxidative stress with endothelial dysfunction, via increased inflammatory messengers, and finally, the stimulation of arteriosclerosis of the blood vessels has been proven [55]. A similar effect with the stimulation of high blood pressure, cardiac dysfunction and damage to blood vessels supplying the brain is suggested for slightly increased breathing rates over long periods [56,57]. Masks are responsible for the aforementioned physiological changes with rises in inhaled carbon dioxide [18–28], small sustained increases in heart rate [15,23,29,30,35] and mild but sustained increases in respiratory rates [15,21,23,34,36].

For a better understanding of the side effects and dangers of masks presented in this literature review, it is possible to refer to well-known principles of respiratory physiology (Figure 3).

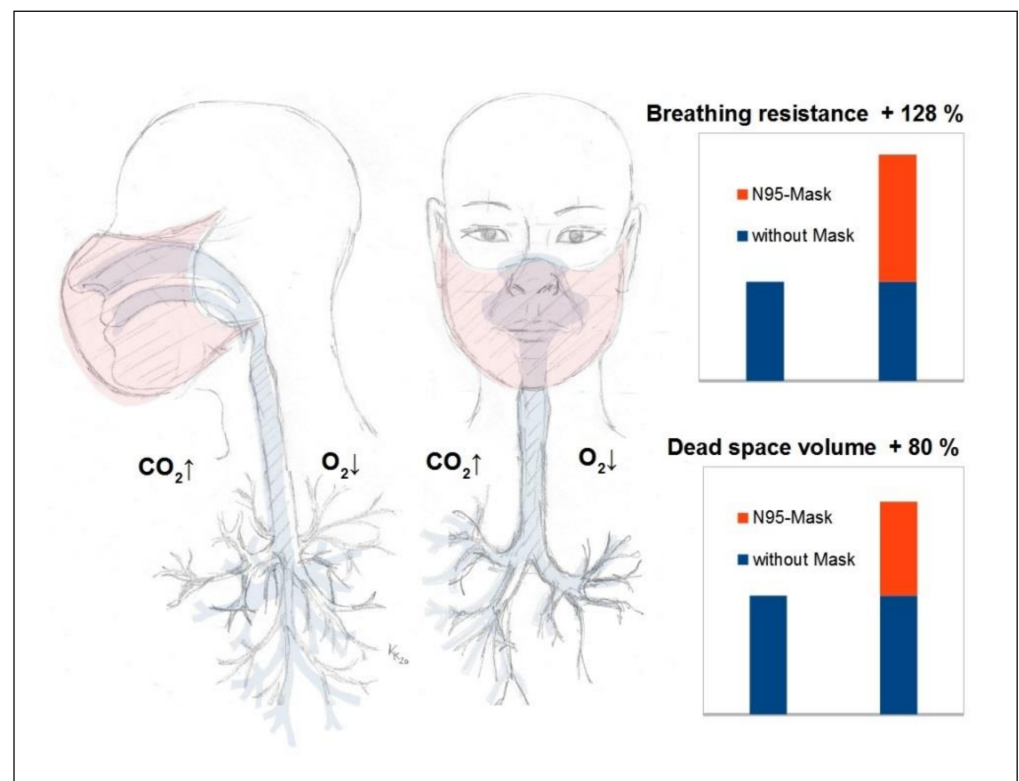
The average dead space volume during breathing in adults is approximately 150–180 mL and is significantly increased when wearing a mask covering the mouth and nose [58]. With an N95 mask, for example, the dead space volume of approximately 98–168 mL was determined in an experimental study [59]. This corresponds to a mask-related dead space increase of approximately 65 to 112% for adults and, thus, almost a doubling. At a respiratory rate of 12 per minute, the pendulum volume respiration with such a mask would, thus, be at least 2.9–3.8 L per minute. Therefore, the dead space amassed by the mask causes a relative reduction in the gas exchange volume available to the lungs per breath by 37% [60]. This largely explains the impairment of respiratory physiology reported in our work and the resulting side effects of all types of masks in everyday use in healthy and sick people (increase in respiratory rate, increase in heart rate, decrease in oxygen saturation, increase in carbon dioxide partial pressure, fatigue, headaches, dizziness, impaired thinking, etc.) [36,58].

In addition to the effect of increased dead space volume breathing, however, mask-related breathing resistance is also of exceptional importance (Figure 3) [23,36].

Experiments show an increase in airway resistance by a remarkable 126% on inhalation and 122% on exhalation with an N95 mask [60]. Experimental studies have also shown that moisturization of the mask (N95) increases the breathing resistance by a further 3% [61] and can, thus, increase the airway resistance up to 2.3 times the normal value.

This clearly shows the importance of the airway resistance of a mask. Here, the mask acts as a disturbance factor in breathing and makes the observed compensatory reactions with an increase in breathing frequency and simultaneous feeling of breathlessness plausible (increased work of the respiratory muscles). This extra strain due to the amplified work of breathing against bigger resistance caused by the masks also leads to intensified exhaustion with a rise in heart rate and increased CO<sub>2</sub> production. Fittingly, in our review of the studies on side effects of masks (Figure 2), we also found a percentage clustering of significant respiratory impairment and a significant drop in oxygen saturation (in about 75% of all study results).

In the evaluation of the primary papers, we also determined a statically significant correlation of the drop in oxygen saturation (SpO<sub>2</sub>) and fatigue with a common occurrence in 58% of the mask use studies with significant results (Figure 2,  $p < 0.05$ ).



**Figure 3.** Pathophysiology of the mask (important physical and chemical effects): Illustration of the breathing resistance\* and of the dead space volume of an N95 mask in an adult. When breathing, there is an overall significantly reduced possible gas exchange volume of the lungs of minus 37% caused by the mask (Lee 2011) [60] according to a decrease in breathing depth and volume due to the greater breathing resistance of plus128%\* (exertion when inhaling greater than when exhaling) and due to the increased dead space volume of plus80%\*\*\*, which does not participate directly in the gas exchange and is being only partially mixed with the environment. (\* = averaged inspiration and expiration according to Lee 2011 [60] including moisture penetration according to Roberge 2010 [61], \*\* = averaged values according to Xu 2015 [59]).

### 3.2. Internistic Side Effects and Dangers

As early as 2012, an experiment showed that walking in the 20 masked subjects compared to the identical activity without masks significantly increased heart rates (average +9.4 beats per minute,  $p < 0.001$ ) and breathing rates ( $p < 0.02$ ). These physiological changes were accompanied by transcutaneous significantly measurable increased transcutaneous carbon dioxide (PtcCO<sub>2</sub>) levels ( $p < 0.0006$ ) as well as respiratory difficulties in the mask wearers compared to the control group [15].

In a recent experimental comparative study from 2020, 12 healthy volunteers under surgical masks as well as under N95 masks experienced measurable impairments in the measured lung function parameters as well as cardiopulmonary capacity (lower maximum blood lactate response) during moderate to heavy physical exertion compared to exertion without masks ( $p < 0.001$ ) [31]. The mask-induced increased airway resistance led to increased respiratory work with increased oxygen consumption and demand, both of the respiratory muscles and the heart. Breathing was significantly impeded ( $p < 0.001$ ) and participants reported mild pain. The scientists concluded from their results that the cardiac compensation of the pulmonary, mask-induced restrictions, which still functioned in healthy people, was probably no longer possible in patients with reduced cardiac output [31].

In another recent study, researchers tested fabric masks (community masks), surgical masks and FFP2/N95 masks in 26 healthy people during exercise on a cycle ergometer. All

masks also showed a measurable carbon dioxide (CO<sub>2</sub>) retention (PtcCO<sub>2</sub>) (statistically significant with  $p < 0.001$ ) and, for N95 masks, a decrease in the oxygen saturation value SpO<sub>2</sub> (statistically significant at 75 and 100 W with  $p < 0.02$  and  $p < 0.005$ , respectively). The clinical relevance of these changes was shown in an increase in breathing frequency with fabric masks ( $p < 0.04$ ) as well as in the occurrence of the previously described mask-specific complaints such as a feeling of heat, shortness of breath and headaches. The stress perception was recorded on a Borg scale from 1 to 20. During physical exertion under an N95 mask, the group with masks showed a significant increase in the feeling of exhaustion compared to the group without with 14.6 versus 11.9 on the scale of 20. During the exposure, 14 of the 24 subjects wearing masks complained of shortness of breath (58%), four of headaches and two of a feeling of heat. Most of the complaints concerned FFP2 masks (72%) [21].

The aforementioned physiological and subjective physical effects of masks on healthy people at rest and under exertion [21,31] give an indication of the effect of masks on sick and elderly people even without exertion.

In an observational study of ten 20 to 50 year-old nurses wearing N95 masks during their shift work, side effects such as breathing difficulties (“I can’t breathe”), feelings of exhaustion, headache ( $p < 0.001$ ), drowsiness ( $p < 0.001$ ) and a decrease in oxygen saturation SpO<sub>2</sub> ( $p < 0.05$ ) as well as an increase in heart rate ( $p < 0.001$ ) were statistically significant in association with an increase in obesity (BMI) [19]. The occurrence of symptoms under masks was also associated with older age (statistically significant correlation of fatigue and drowsiness with  $p < 0.01$  each, nausea with  $p < 0.05$ , an increase in blood pressure with  $p < 0.01$ , headache with  $p < 0.05$ , breathing difficulties with  $p < 0.001$ ) [19].

In an intervention study involving 97 patients with advanced chronic obstructive pulmonary disease (COPD) the respiratory rate, oxygen saturation and exhaled carbon dioxide equivalents (capnometry) changed unfavorably and significantly after the use of N95 masks (FFP2 equivalent) with an initial 10-minute rest and subsequent 6-minute walking. Seven patients discontinued the experiment due to serious complaints with a decrease in the oxygen saturation value SpO<sub>2</sub> and a pathological carbon dioxide (CO<sub>2</sub>) retention as well as increased end-expiratory partial pressure of carbon dioxide (PETCO<sub>2</sub>) [23]. In two patients, the PETCO<sub>2</sub> exceeded the normal limits and reached values of >50 mmHg. An FEV1 < 30% and a modified Medical Research Council (mMRC) Dyspnea Scale Score of  $\geq 3$ , both indicators of advanced COPD, correlated with mask intolerance overall in this study. The most common symptom under mask was breathlessness at 86%. In the dropouts of the study, dizziness (57%) and headaches were also often recorded. In the mask-tolerant COPD patients, significant increases in heart rate, respiratory rate and end-expiratory carbon dioxide partial pressure PETCO<sub>2</sub> could be objectified even at rest, after only 10 min of mask-wearing ( $p < 0.001$ ), accompanied by a decrease in oxygen saturation SpO<sub>2</sub> ( $p < 0.001$ ) [23]. The results of this study with an evidence level IIa are indicative for COPD mask wearers.

In another retrospective comparative study on COPD and surgical masks, examiners were able to demonstrate statistically an increase in arterial partial pressure of carbon dioxide (PaCO<sub>2</sub>) of approximately +8 mmHg ( $p < 0.005$ ) and a concomitant mask-related increase in systolic blood pressure of +11 mmHg ( $p < 0.02$ ) [25]. This increase is relevant in hypertensive patients, but also in healthy people with borderline blood pressure values as pathological value range triggered by mask-wearing can be induced.

In 39 hemodialysis patients with end-stage renal disease, a type N95 mask (FFP2 equivalent) caused a significant drop in blood oxygen partial pressure (PaO<sub>2</sub>) in 70% of patients at rest (on hemodialysis) within only 4 h ( $p = 0.006$ ). Despite a compensatory increased respiratory rate ( $p < 0.001$ ), malaise with chest pain occurred ( $p < 0.001$ ) and even resulted in hypoxemia (drop in oxygen below the normal limit) in 19% of the subjects [34]. The researchers concluded from their findings that elderly or patients with reduced cardiopulmonary function have a higher risk of developing a severe respiratory failure while wearing a mask [34].

In a review paper on the risks and benefits of masks worn during the COVID-19 crisis, other authors provide an equally critical assessment of mandatory mask use for patients with pneumonia, both with and without COVID-19 pneumonia disease [16].

### 3.3. Neurological Side Effects and Dangers

In a scientific evaluation of syncope in the operating theatre, 36 of 77 affected persons (47%) were associated with wearing a mask [62]. However, other factors could not be ruled out as contributory causes.

In their level III evidence review, neurologists from Israel, the UK and the USA state that a mask is unsuitable for epileptics because it can trigger hyperventilation [63]. The use of a mask significantly increases the respiratory rate by about plus 15 to 20% [15,21,23,34,64]. However, an increase in breathing frequency leading to hyperventilation is known to be used for provocation in the diagnosis of epilepsy and causes seizure-equivalent EEG changes in 80% of patients with generalized epilepsy and in up to 28% of focal epileptics [65].

Physicians from New York studied the effects of wearing masks of the surgical-type mask and N95 among medical personnel in a sample of 343 participants (surveyed using standardized, anonymized questionnaires). Wearing the masks caused detectable physical adverse effects such as impaired cognition (24% of wearers) and headaches in 71.4% of the participants. Of these, 28% persisted and required medication. Headache occurred in 15.2% under 1 h of wear, in 30.6% after 1 h of wear and in 29.7% after 3 h of wear. Thus, the effect intensified with increasing wearing time [37].

Confusion, disorientation and even drowsiness (Likert scale questionnaire) and reduced motoric abilities (measured with a linear position transducer) with reduced reactivity and overall impaired performance (measured with the Roberge Subjective Symptoms-during-Work Scale) as a result of mask use have also been documented in other studies [19,23,29,32,36,37].

The scientists explain these neurological impairments with a mask-induced latent drop in blood gas oxygen levels  $O_2$  (towards hypoxia) or a latent increase in blood gas carbon dioxide levels  $CO_2$  (towards hypercapnia) [36]. In view of the scientific data, this connection also appears to be indisputable [38–41].

In a mask experiment from 2020, significant impaired thinking ( $p < 0.03$ ) and impaired concentration ( $p < 0.02$ ) were found for all mask types used (fabric, surgical and N95 masks) after only 100 min of wearing the mask [29]. The thought disorders correlated significantly with a drop in oxygen saturation ( $p < 0.001$ ) during mask use.

Initial headaches ( $p < 0.05$ ) were experienced by up to 82% of 158, 21–35 year-old mask wearers in another study of N95 respiratory protection with one third (34%) experiencing headaches up to four times daily. Participants wore the mask for 18.3 days over a 30-day period with a mean of 5.9 h per day [66].

Significantly increased headache ( $p < 0.05$ ) could be observed not only for N95 but also for surgical masks in participants of another observational study of health care workers [67].

In another study, the researchers classified 306 users with an average age of 43 years and wearing different types of masks, of whom 51% had an initial headache as a specific symptom related exclusively to increased surgical and N95 mask use (1 to 4 h,  $p = 0.008$ ) [68].

Researchers from Singapore were able to demonstrate in a trial involving 154 healthy N95 health service mask wearers that a significant increase in mask-induced blood carbon dioxide levels (measured by end-expiratory partial pressure of carbon dioxide  $PETCO_2$ ) and a measurably greater vasodilatation with an increase in cerebral artery flow in the cerebri media resulted. This was associated with headaches in the trial group ( $p < 0.001$ ) [27].

According to the researchers, the aforementioned changes also contribute to headaches during the prolonged use of masks with a shift towards hypoxia and hypercapnia. Furthermore, stress and mechanical factors such as the irritation of cervical nerves in the neck and head area caused by the tight mask straps pressuring the nerve strands also contribute to headaches [66].



In the analysis of the primary studies, we were able to detect an association between the N95 mask and headaches. In six out of 10 studies, the significant headache appeared in conjunction with the N95 mask (60% of all studies, Figure 2).

#### 3.4. Psychological Side Effects and Dangers

According to an experimental study, wearing surgical masks and N95 masks can also lead to a reduced quality of life owing to reduced cardiopulmonary capacity [31]. Masks, along with causing physiological changes and discomfort with progressive length of use, can also lead to significant discomfort ( $p < 0.03$  to  $p < 0.0001$ ) and a feeling of exhaustion ( $p < 0.05$  to  $0.0001$ ) [69].

Besides the shift in blood gases towards hypercapnia (increase in  $\text{CO}_2$ ) and hypoxia (decrease in  $\text{O}_2$ ), detailed under general physiological effects (Section 3.1), masks also restrict the cognitive abilities of the individual (measured using a Likert scale survey) accompanied by a decline in psycho-motoric abilities and consequently a reduced responsiveness (measured using a linear position transducer) as well as an overall reduced performance capability (measured with the Roberge Subjective Symptoms-during-Work Scale) [29,32,38,39,41].

The mask also causes an impaired field of vision (especially affecting the ground and obstacles on the ground) and also presents an inhibition to habitual actions such as eating, drinking, touching, scratching and cleaning the otherwise uncovered part of the face, which is consciously and subconsciously perceived as a permanent disturbance, obstruction and restriction [36]. Wearing masks, thus, entails a feeling of deprivation of freedom and loss of autonomy and self-determination, which can lead to suppressed anger and subconscious constant distraction, especially as the wearing of masks is mostly dictated and ordered by others [70,71]. These perceived interferences of integrity, self-determination and autonomy, coupled with discomfort, often contribute to substantial distraction and may ultimately be combined with the physiologically mask-related decline in psycho-motoric abilities, reduced responsiveness and an overall impaired cognitive performance. It leads to misjudging situations as well as delayed, incorrect and inappropriate behavior and a decline in the effectiveness of the mask wearer [36,37,39–41].

The use of masks for several hours often causes further detectable adverse effects such as headaches, local acne, mask-associated skin irritation, itching, sensations of heat and dampness, impairments and discomfort predominantly affecting the head and face [19,29,35–37,71–73]. However, the head and face are significant for well-being due to their large representation in the sensitive cerebral cortex (homunculus) [36].

According to a questionnaire survey, masks also frequently cause anxiety and psycho-vegetative stress reactions in children—as well as in adults—with an increase in psychosomatic and stress-related illnesses and depressive self-experience, reduced participation, social withdrawal and lowered health-related self-care [74]. Over 50% of the mask wearers studied had at least mild depressive feelings [74]. Additional fear-inducing and often exaggerated media coverage can further intensify this. A recent retrospective analysis of the general media in the context of the 2014 Ebola epidemic showed a scientific truth content of only 38% of all publicly published information [75]. Researchers classified a total of 28% of the information as provocative and polarizing and 42% as exaggerating risks. In addition, 72% of the media content aimed to stir up health-related negative feelings. The feeling of fear, combined with insecurity and the primal human need to belong [76], causes a social dynamic that seems partly unfounded from a medical and scientific point of view.

The mask, which originally served purely hygienic purpose, has been transformed into a symbol of conformity and pseudo-solidarity. The WHO, for example, lists the advantages of the use of masks by healthy people in public to include a potentially reduced stigmatization of mask wearers, a sense of contribution to preventing the spread of the virus and a reminder to comply with other measures [2].

### 3.5. Psychiatric Side Effects and Dangers

As explained earlier, masks can cause increased rebreathing with an accumulation of carbon dioxide in the wearer due to increased dead space volume [16–18,20] (Figure 3), with often statistically significant measurable elevated blood carbon dioxide (CO<sub>2</sub>) levels in sufferers [13,15,17,19–28] (Figure 2). However, changes that lead to hypercapnia are known to trigger panic attacks [77,78]. This makes the significantly measurable increase in CO<sub>2</sub> caused by wearing a mask clinically relevant.

Interestingly, breath provocation tests by inhaling CO<sub>2</sub> are used to differentiate anxiety states in panic disorders and premenstrual dysphoria from other psychiatric clinical pictures. Here, absolute concentrations of 5% CO<sub>2</sub> already suffice to trigger panic reactions within 15–16 min [77]. The normal exhaled air content of CO<sub>2</sub> is about 4%.

It is obvious from experimental studies on masked subjects that concentration changes in the respiratory gases in the above-mentioned range with values above 4% could occur during rebreathing with prolonged mask use [18,23].

The activation of the locus coeruleus by CO<sub>2</sub> is used to generate panic reactions via respiratory gases [78,79]. This is because the locus coeruleus is an important part of the system of vegetative noradrenergic neurons, a control center in the brainstem, which reacts to an appropriate stimulus and changes in the gas concentrations in the blood by releasing the stress hormone noradrenaline [78].

From the physiological, neurological and psychological side effects and dangers described above (Sections 3.1, 3.3 and 3.4), additional problems can be derived for the use of masks in psychiatric cases. People undergoing treatment for dementia, paranoid schizophrenia, personality disorders with anxiety and panic attacks, but also panic disorders with claustrophobic components, are difficult to reconcile with a mask requirement, because even small increases in CO<sub>2</sub> can cause and intensify panic attacks [44,77–79].

According to a psychiatric study, patients with moderate to severe dementia have no understanding of COVID-19 protection measures and have to be persuaded to wear masks constantly [80].

According to a comparative study, patients with schizophrenia have a lower acceptance of mask-wearing (54.9% agreement) than ordinary practice patients (61.6%) [81]. The extent to which mask-wearing can lead to an exacerbation of schizophrenia symptoms has not yet been researched in detail.

When wearing masks, confusion, impaired thinking, disorientation (standardized recording via special rating and Likert scales,  $p < 0.05$ ) and in some cases a decrease in maximum speed and reaction time (measured with the linear-position transducer,  $p < 0.05$ ) were observed [19,32,36,38–41]. Psychotropic drugs reduce psycho-motoric functions in psychiatric patients. This can become clinically relevant especially with regard to the further reduced ability to react and the additional increased susceptibility to accidents of such patients when wearing masks.

In order to avoid an unintentional CO<sub>2</sub>-triggered anesthesia [39], fixed and medically sedated patients, without the possibility of continuous monitoring, should not be masked according to the criteria of the Centers for Disease Control and Prevention, USA (CDC). This is because of the possible CO<sub>2</sub> retention described above, as there is a risk of unconsciousness, aspiration and asphyxia [16,17,20,38,82,83].

### 3.6. Gynaecological Side Effects and Dangers

As a critical variable, a low blood carbon dioxide level in pregnant women is maintained via an increased respiratory minute volume, stimulated by progesterone [22]. For a pregnant woman and her unborn child, there is a metabolic need for a fetal–maternal carbon dioxide (CO<sub>2</sub>) gradient. The mother's blood carbon dioxide level should always be lower than that of the unborn child in order to ensure the diffusion of CO<sub>2</sub> from the fetal blood into the maternal circulation via the placenta.

Therefore, mask-related phenomena described above (Sections 3.1 and 3.2), such as the measurable changes in respiratory physiology with increased breathing resistance,

increased dead space volume (Figure 3) and the retention of exhaled carbon dioxide (CO<sub>2</sub>) are of importance. If CO<sub>2</sub> is increasingly rebreathed under masks, this manifestation could, even with subliminal carbon dioxide increases, act as a disturbing variable of the fetal–maternal CO<sub>2</sub> gradient increasing over time of exposure and, thus, develop clinical relevance, also with regard to a reduced compensation reserve of the expectant mothers [20,22,28].

In a comparative study, 22 pregnant women wearing N95 masks during 20 min of exercise showed significantly higher percutaneous CO<sub>2</sub> values, with average PtcCO<sub>2</sub> values of 33.3 mmHg compared to 31.3 mmHg than in 22 pregnant women without masks ( $p = 0.04$ ) [22]. The heat sensation of the expectant mothers was also significantly increased with masks, with  $p < 0.001$  [22].

Accordingly, in another intervention study, researchers demonstrated that breathing through an N95 mask (FFP2 equivalent) impeded gas exchange in 20 pregnant women at rest and during exercise, causing additional stress on their metabolic system [28]. Thus, under an N95 mask, 20 pregnant women showed a decrease in oxygen uptake capacity VO<sub>2</sub> of about 14% (statistically significant,  $p = 0.013$ ) and a decrease in carbon dioxide output capacity VCO<sub>2</sub> of about 18% (statistically significant,  $p = 0.001$ ). Corresponding significant changes in exhaled oxygen and carbon dioxide equivalents were also documented with increases in exhaled carbon dioxide (FeCO<sub>2</sub>) ( $p < 0.001$ ) and decreases in exhaled oxygen (FeO<sub>2</sub>) ( $p < 0.001$ ), which were explained by an altered metabolism due to respiratory mask obstruction [28].

In experiments with predominantly short mask application times, neither the mothers nor the fetuses showed statistically significant increases in heart rates or changes in respiratory rates and oxygen saturation values. However, the exact effects of prolonged mask use in pregnant women remain unclear overall. Therefore, in pregnant women, extended use of surgical and N95 masks is viewed critically [20].

In addition, it is unclear whether the substances contained in industrially manufactured masks that can be inhaled over longer periods of time (e.g., formaldehyde as an ingredient of the textile and thiram as an ingredient of the ear bands) are teratogenic [20,84].

### 3.7. Dermatological Side Effects and Dangers

Unlike garments worn over closed skin, masks cover body areas close to the mouth and nose, i.e., body parts that are involved with respiration.

Inevitably, this leads not only to a measurable temperature rise [15,44,85], but also to a severe increase in humidity due to condensation of the exhaled air, which in turn changes the natural skin milieu considerably of perioral and perinasal areas [36,61,82]. It also increases the redness, pH-value, fluid loss through the skin epithelium, increased hydration and sebum production measurably [73]. Preexisting skin diseases are not only perpetuated by these changes, but also exacerbated. In general, the skin becomes more susceptible to infections and acne.

The authors of an experimental study were able to prove a disturbed barrier function of the skin after only 4 h of wearing a mask in 20 healthy volunteers, both for surgical masks and for N95 masks [73]. In addition, germs (bacteria, fungi and viruses) accumulate on the outside and inside of the masks due to the warm and moist environment [86–89]. They can cause clinically relevant fungal, bacterial or viral infections. The unusual increase in the detection of rhinoviruses in the sentinel studies of the German Robert Koch Institute (RKI) from 2020 [90] could be another indication of this phenomenon.

In addition, a region of the skin that is not evolutionarily adapted to such stimuli is subjected to increased mechanical stress. All in all, the above-mentioned facts cause the unfavorable dermatological effects with mask related adverse skin reactions like acne, rashes on the face and itch symptoms [91].

A Chinese research group reported skin irritation and itching when using N95 masks among 542 test participants and also a correlation between the skin damage that occurred and the time of exposure (68.9% at  $\leq 6$  h/day and 81.7% at  $>6$  h/day) [92].



A New York study evaluated in a random sample of 343 participants the effects of frequent wearing of surgical mask type and N95 masks among healthcare workers during the COVID-19 pandemic. Wearing the masks caused headache in 71.4% of participants, in addition to drowsiness in 23.6%, detectable skin damage in 51% and acne in 53% of mask users [37].

On the one hand, direct mechanical skin lesions occur on the nose and cheekbones due to shear force, especially when masks are frequently put on and taken off [37,92].

On the other hand, masks create an unnaturally moist and warm local skin environment [29,36,82]. In fact, scientists were able to demonstrate a significant increase in humidity and temperature in the covered facial area in another study in which the test individuals wore masks for one hour [85]. The relative humidity under the masks was measured with a sensor (Atmo-Tube, San Francisco, CA, USA). The sensation of humidity and temperature in the facial area is more crucial for well-being than other body regions [36,44]. This can increase discomfort under the masks. In addition, the increase in temperature favors bacterial optimization.

The pressure of the masks also causes an obstruction of the flow physiology of lymph and blood vessels in the face, with the consequence of increased disturbance of skin function [73] and ultimately also contributing to acne in up to 53% of all wearers and other skin irritations in up to 51% of all wearers [36,37,82].

Other researchers examined 322 participants with N95 masks in an observational study and detected acne in up to 59.6% of them, itching in 51.4% and redness in 35.8% as side effects [72].

In up to 19.6% (273) of the 1393 wearers of different masks (community masks, surgical, N95 masks), itching could be objectified in one study, in 9% even severely. An atopic predisposition (allergy tendency) correlated with the risk of itching. The length of use was significantly related to the risk of itching ( $p < 0.0001$ ) [93].

In another dermatological study from 2020, 96.9% of 876 users of all mask types (community masks, surgical masks, N95 masks) confirmed adverse problems with a significant increase in itching (7.7%), accompanied by fogging-up of glasses (21.3%), flushing (21.3%), slurred speech (12.3%) and difficulty breathing (35.9%) ( $p < 0.01$ ) [71].

Apart from an increased incidence of acne [37,72,91] under masks, contact eczema and urticaria [94] are generally described in connection with hypersensitivities to ingredients of the industrially manufactured masks (surgical mask and N95) such as formaldehyde (ingredient of the textile) and thiram (ingredient of the ear bands) [73,84]. The hazardous substance thiram, originally a pesticide and corrosive, is used in the rubber industry as a optimization accelerator. Formaldehyde is a biocide and carcinogen and is used as a disinfectant in the industry.

Even isolated permanent hyperpigmentation as a result of post-inflammatory or pigmented contact dermatitis has been described by dermatologists after prolonged mask use [72,91].

### 3.8. ENT and Dental Side Effects and Dangers

There are reports from dental communities about negative effects of masks and are accordingly titled “mask mouth” [95]. Provocation of gingivitis (inflammation of the gums), halitosis (bad breath), candidiasis (fungal infestation of the mucous membranes with *Candida albicans*) and cheilitis (inflammation of the lips), especially of the corners of the mouth, and even plaque and caries are attributed to the excessive and improper use of masks. The main trigger of the oral diseases mentioned is an increased dry mouth due to a reduced saliva flow and increased breathing through the open mouth under the mask. Mouth breathing causes surface dehydration and reduced salivary flow rate (SFR) [95]. Dry mouth is scientifically proven due to mask wear [29]. The bad habit of breathing through the open mouth while wearing a mask seems plausible because such breathing pattern compensates for the increased breathing resistance, especially when inhaling through the masks [60,61]. In turn, the outer skin moisture [71,73,85] with altered

skin flora, which has already been described under dermatological side effects (Section 3.7), is held responsible as an explanation for the inflammation of the lips and corners of the mouth (cheilitis) [95]. This clearly shows the disease-promoting reversal of the natural conditions caused by masks. The physiological internal moisture with external dryness in the oral cavity converts into internal dryness with external moisture.

ENT physicians recently discovered a new form of irritant rhinitis due to N95 mask use in 46 patients. They performed endoscopies and nasal irrigations on mask wearers, which were subsequently assessed pathologically. Clinical problems were recorded with standardized questionnaires. They found statistically significant evidence of mask-induced rhinitis and itching and swelling of the mucous membranes as well as increased sneezing ( $p < 0.01$ ). Endoscopically, it showed an increased secretion and evidence of inhaled mask polypropylene fibers as the trigger of mucosal irritation [96].

In a study of 221 health care workers, ENT physicians objectified a voice disorder in 33% of mask users. The VHI-10 score of 1 to 10, which measures voice disorders, was on average 5.72 higher in these mask users (statistically significant with  $p < 0.001$ ). The mask not only acted as an acoustic filter, provoking excessively loud speech, it also seems to trigger impaired vocal cord coordination because the mask compromises the pressure gradients required for undisturbed speech [43]. The researchers concluded from their findings that masks could pose a potential risk of triggering new voice disorders as well as exacerbating existing ones.

### 3.9. Sports Medicine Side Effects and Dangers

According to the literature, performance-enhancing effects of masks regarding cardiovascular optimization and improvement of oxygen uptake capacity cannot be proven.

For example, in an experimental reference study (12 subjects per group), the training mask that supposedly mimics altitude training (ETM: elevation training mask) only had training effects on the respiratory muscles. However, mask wearers showed significantly lower oxygen saturation values (SpO<sub>2</sub>%) during exercise (SpO<sub>2</sub> of 94% for mask wearers versus 96% for mask-less,  $p < 0.05$ ) [33], which can be explained by an increased dead space volume and increased resistance during breathing. The measured oxygen saturation values were significantly lower than the normal values in the group of mask wearers, which indicates a clinical relevance.

The proven adaptation effect of the respiratory muscles in healthy athletes [33] clearly suggests that masks have a disruptive effect on respiratory physiology.

In another intervention study on mask use in weightlifters, researchers documented statistically significant effects of reduced attention (questionnaire recording, Likert scale) and a slowed maximum speed of movement detectable by means of sensors (both significant at  $p < 0.001$ ), leading the researchers to conclude that mask use in sport is not without risks. As a secondary finding, they also detected a significant decrease in oxygen saturation SpO<sub>2</sub> when performing special weight-lifting exercises ("back squats") in the mask group after only 1 min of exercise compared to the mask-free group ( $p < 0.001$ ) [32]. The proven tendency of the masks to shift the chemical parameter oxygen saturation SpO<sub>2</sub> in a pathological direction (lower limit value 95%) may well have clinical relevance in untrained or sick individuals.

Sports medicine confirmed an increase in carbon dioxide (CO<sub>2</sub>) retention, with an elevation in CO<sub>2</sub> partial pressure in the blood with larger respiratory dead space volumes [14].

In fact, dead space-induced CO<sub>2</sub> retention while wearing a mask during exercise was also experimentally proven. The effects of a short aerobic exercise under N95 masks were tested on 16 healthy volunteers. A significantly increased end-expiratory partial pressure of carbon dioxide (PETCO<sub>2</sub>) with plus 8 mmHg ( $p < 0.001$ ) was found [24]. The increase in blood carbon dioxide (CO<sub>2</sub>) in the mask wearers under maximum load was plus 14% CO<sub>2</sub> for surgical masks and plus 23% CO<sub>2</sub> for N95 masks, an effect that may well have clinical relevance in the pre-diseased, elderly and children, as these values strongly approached the pathological range [24].

In an interesting endurance study with eight middle-aged subjects (19–66), the gas content for O<sub>2</sub> and CO<sub>2</sub> under the masks was determined before and after exercise. Even at rest, the oxygen availability under the masks was 13% lower than without the masks and the carbon dioxide (CO<sub>2</sub>) concentration was 30 times higher. Under stress (Ruffier test), the oxygen concentration (% O<sub>2</sub>) below the mask dropped significantly by a further 3.7%, while the carbon dioxide concentration (% CO<sub>2</sub>) increased significantly by a further 20% (statistically significant with  $p < 0.001$ ). Correspondingly, the oxygen saturation of the blood (SpO<sub>2</sub>) of the test persons also decreased significantly from 97.6 to 92.1% ( $p < 0.02$ ) [18]. The drop in the oxygen saturation value (SpO<sub>2</sub>) to 92%, clearly below the normal limit of 95%, is to be classified as clinically relevant and detrimental to health.

These facts are an indication that the use of masks also triggers the effects described above leading to hypoxia and hypercapnia in sports. Accordingly, the WHO and Centers for Disease Control and Prevention, GA, USA (CDC) advise against wearing masks during physical exercise [82,97].

### 3.10. Social and Sociological Side Effects and Dangers

The results of a Chilean study with health care workers show that masks act like an acoustic filter and provoke excessively loud speech. This causes a voice disorder [43]. The increased volume of speech also contributes to increased aerosol production by the mask wearer [98]. These experimental data measured with the Aerodynamic Particle Sizer (APS, TSI, model 332, TSI Incorporated, Minnesota, MI, USA) are highly relevant.

Moreover, mask wearers are prevented from interacting normally in everyday life due to impaired clarity of speech [45], which tempts them to get closer to each other.

This results in a distorted prioritization in the general public, which counteracts the recommended measures associated with the COVID-19 pandemic. The WHO prioritizes social distancing and hand hygiene with moderate evidence and recommends wearing a mask with weak evidence, especially in situations where individuals are unable to maintain a physical distance of at least 1 m [3].

The disruption of non-verbal communication due to the loss of facial expression recognition under the mask can increase feelings of insecurity, discouragement and numbness as well as isolation, which can be extremely stressful for the mentally and hearing-impaired [16].

Experts point out that masks disrupt the basics of human communication (verbal and nonverbal). The limited facial recognition caused by masks leads to a suppression of emotional signals. Masks, therefore, disrupt social interaction, erasing the positive effect of smiles and laughter but at the same time greatly increasing the likelihood of misunderstandings because negative emotions are also less evident under masks [42].

A decrease in empathy perception through mask use with disruption of the doctor-patient relationship has already been scientifically proven on the basis of a randomized study (statistically significant, with  $p = 0.04$ ) [99]. In this study, the Consultation Empathy Care Measure, the Patient Enablement Instrument (PEI) Score and a Satisfaction Rating Scale were assessed in 1030 patients. The 516 doctors, who wore masks throughout, conveyed reduced empathy towards the patients and, thus, nullified the positive health-promoting effects of a dynamic relationship. These results demonstrate a disruption of interpersonal interaction and relationship dynamics caused by masks.

The WHO guidance on the use of masks in children in the community, published in August 2020, points out that the benefits of mask use in children must be weighed up against the potential harms, including social and communicational concerns [100].

Fears that widespread pandemic measures will lead to dysfunctional social life with degraded social, cultural and psychological interactions have also been expressed by other experts [6–8,42].

### 3.11. Social and Occupational Medicine Side Effects and Hazards

In addition to mask-specific complaints such as a feeling of heat, dampness, shortness of breath and headache, various physiological phenomena were documented, such as the significant increase in heart and respiratory rate, the impairment of lung function parameters, the decrease in cardiopulmonary capacity (e.g., lower maximum blood lactate response) [15,19,21,23,29–31], as well as the changes in oxygen and carbon dioxide both in the end-expiratory and the air under the mask that was measured in the blood of the individuals [13,15,18,19,21–25,27–34]. The significant changes were measurable after only a few minutes of wearing a mask and in some cases reached magnitudes of minus 13% reduced O<sub>2</sub> concentration and 30-fold increased CO<sub>2</sub> concentration of the inhaled air under masks ( $p < 0.001$ ) [18]. The changes observed were not only statistically significant, but also clinically relevant; the subjects also showed pathological oxygen saturation after exposure to masks ( $p < 0.02$ ) [18].

Shortness of breath during light exertion (6 min walking) under surgical masks has been recorded with statistical significance in 44 healthy subjects in a prospective experimental intervention study ( $p < 0.001$ ) [101]. Here, the complaints were assessed using a subjective, visual analogue scale.

In another study from 2011, all tested masks caused a significantly measurable increase in discomfort and a feeling of exhaustion in the 27 subjects during prolonged usage ( $p < 0.0001$ ) [69].

These symptoms lead to additional stress for the occupational mask wearer and, thus, in relation to the feeling of exhaustion, contribute to the self-perpetuating vicious circle caused by the vegetative sympathetic activation, which further increases the respiratory and heart rate, blood pressure and increased sense of exhaustion [16,20,35,83].

Other studies showed that the psychological and physical effects of the masks can lead to an additional reduction in work performance (measured with the Roberge Subjective Symptoms-during-Work Scale, a Likert scale of 1–5) via increased feelings of fatigue, dissatisfaction and anxiety [58,102,103].

Wearing masks over a longer period of time also led to physiological and psychological impairments in other studies and, thus, reduced work performance [19,36,58,69]. In experiments on respiratory-protective equipment, an increase in the dead space volume by 350 mL leads to a reduction in the possible performance time by approx. –19%, furthermore to a decrease in breathing comfort by –18% (measured via a subjective rating scale) [58]. In addition, the time spent working and the flow of work is interrupted and reduced by putting on and taking off the masks and changing them. The reduced work performance has been recorded in the literature found as described above (especially in Sections 3.1 and 3.2) but has not been quantified further in detail [36,58].

Surgical mask type and N95 protective equipment frequently caused adverse effects in medical personnel such as headaches, breathing difficulties, acne, skin irritation, itching, decreased alertness, decreased mental performance and feelings of dampness and heat [19,29,37,71,85]. Subjective, work performance-reducing, mask-related impairments in users, measured with special survey scores and Likert scales, have also been described in other studies [15,21,27,32,35,43,66–68,72,96,99].

In Section 3.7 on dermatology, we already mentioned a paper that demonstrated a significant temperature increase of 1.9 °C on average (to over 34.5 °C) in the mask-covered facial area ( $p < 0.05$ ) [85]. Due to the relatively larger representation in the sensitive cerebral cortex (homunculus), the temperature sensation in the face is more decisive for the feeling of well-being than other body regions [36,44]. The perception of discomfort when wearing a mask can, thus, be intensified. Interestingly, in our analysis, we found a combined occurrence of the physical variable temperature rise under the mask and the symptom respiratory impairment in seven of eight studies concerned, with a mutual significantly measured occurrence in 88%. We also detected a combined occurrence of significantly measured temperature rise under the mask and significantly measured fatigue in 50% of the relevant primary studies (three of six papers, Figure 2). These clustered associations of

temperature rise with symptoms of respiratory impairment and fatigue suggest a clinical relevance of the detected temperature rise under masks. In the worst case scenario, the effects mentioned can reinforce each other and lead to decompensation, especially in the presence of COPD, heart failure and respiratory insufficiency.

The sum of the disturbances and discomforts that can be caused by a mask also contributes to distraction (see also psychological impairment). These, in conjunction with a decrease in psycho-motoric skills, reduced responsiveness and overall impaired cognitive performance (all of which are pathophysiological effects of wearing a mask) [19,29,32,39–41] can lead to a failure to recognize hazards and, thus, to accidents or avoidable errors at work [19,36,37]. Of particular note here are mask-induced listlessness ( $p < 0.05$ ), impaired thinking ( $p < 0.05$ ) and concentration problems ( $p < 0.02$ ) as measured by a Likert scale (1–5) [29]. Accordingly, occupational health regulations take action against such scenarios. The German Industrial Accident Insurance (DGUV) has precise and extensive regulations for respiratory protective equipment where they document the limitation of wearing time, levels of work intensity and defined instruction obligation [104].

The standards and norms prescribed in many countries regarding different types of masks to protect their workers are also significant from an occupational health point of view [105]. In Germany, for example, there are very strict safety specifications for masks from other international countries. These specify the requirements for the protection of the wearer [106]. All these standards and the accompanying certification procedures were increasingly relaxed with the introduction of mandatory masks for the general public. This meant that non-certified masks such as community masks were also used on a large scale in the work and school sectors for longer periods during the pandemic measures [107]. Most recently, in October 2020, the German Social Accident Insurance (DGUV) recommended the same usage time limits for community masks as for filtering half masks, namely, a maximum of three shifts of 120 min per day with recovery breaks of 30 min in between. In Germany, FFP2 (N95) masks must be worn for 75 min, followed by a 30-minute break. An additional suitability examination by specialized physicians is also obligatory and stipulated for occupationally used respirators [104].

### 3.12. Microbiological Consequences for Wearer and Environment: Foreign/Self-Contamination

Masks cause retention of moisture [61]. Poor filtration performance and incorrect use of surgical masks and community masks, as well as their frequent reuse, imply an increased risk of infection [108–110]. The warm and humid environment created by and in masks without the presence of protective mechanisms such as antibodies, the complement system, defense cells and pathogen-inhibiting and on a mucous membrane paves the way for unimpeded growth and, thus, an ideal growth and breeding ground for various pathogens such as bacteria and fungi [88] and also allows viruses to accumulate [87]. The warm and humid mask microclimate favors the accumulation of various germs on and underneath the masks [86], and the germ density is measurably proportional to the length of time the mask is worn. After only 2 h of wearing the mask, the pathogen density increases almost tenfold in experimental observation studies [87,89].

From a microbiological and epidemiological point of view, masks in everyday use pose a risk of contamination. This can occur as foreign contamination but also as self-contamination. On the one hand, germs are sucked in or attach themselves to the masks through convection currents. On the other hand, potential infectious agents from the nasopharynx accumulate excessively on both the outside and inside of the mask during breathing [5,88]. This is compounded by contact with contaminated hands. Since masks are constantly penetrated by germ-containing breath and the pathogen reproduction rate is higher outside mucous membranes, potential infectious pathogens accumulate excessively on the outside and inside of masks. On and in the masks, there are quite serious, potentially disease-causing bacteria and fungi such as *E. coli* (54% of all germs detected), *Staphylococcus aureus* (25% of all germs detected), *Candida* (6%), *Klebsiella* (5%), *Enterococci* (4%),



Pseudomonads (3%), Enterobacter (2%) and Micrococcus (1%) even detectable in large quantities [88].

In another microbiological study, the bacterium *Staphylococcus aureus* (57% of all bacteria detected) and the fungus *Aspergillus* (31% of all fungi detected) were found to be the dominant germs on 230 surgical masks examined [86].

After more than six hours of use, the following viruses were found in descending order on 148 masks worn by medical personnel: adenovirus, bocavirus, respiratory syncytial virus and influenza viruses [87].

From this aspect, it is also problematic that moisture distributes these potential pathogens in the form of tiny droplets via capillary action on and in the mask, whereby further proliferation in the sense of self- and foreign contamination by the aerosols can then occur internally and externally with every breath [35]. In this regard, it is also known from the literature that masks are responsible for a proportionally disproportionate production of fine particles in the environment and, surprisingly, much more so than in people without masks [98].

It was shown that all mask-wearing subjects released significantly more smaller particles of size 0.3–0.5  $\mu\text{m}$  into the air than mask-less people, both when breathing, speaking and coughing (fabric, surgical, N95 masks, measured with the Aerodynamic Particle Sizer, APS, TS, model 3329) [98]. The increase in the detection of rhinoviruses in the sentinel studies of the German RKI from 2020 [90] could be a further indication of this phenomenon, as masks were consistently used by the general population in public spaces in that year.

### 3.13. Epidemiological Consequences

The possible side effects and dangers of masks described in this paper are based on studies of different types of masks. These include the professional masks of the surgical mask type and N95/KN95 (FFP2 equivalent) that are commonly used in everyday life, but also the community fabric masks that were initially used. In the case of N95, the N stands for National Institute for Occupational Safety and Health of the United States (NIOSH), and 95 indicates the 95 per cent filtering capacity for fine particles up to at least 0.3  $\mu\text{m}$  [82].

A major risk of mask use in the general public is the creation of a false sense of security with regard to protection against viral infections, especially in the sense of a falsely assumed strong self-protection. Disregarding infection risks may not only neglect aspects of source control, but also result in other disadvantages. Although there are quite a few professional positive accounts of the widespread use of masks in the general populace [111], most of the serious and evident scientific reports conclude that the general obligation to wear masks conveys a false sense of security [4,5]. However, this leads to a neglect of those measures that, according to the WHO, have a higher level of effectiveness than mask-wearing: social distancing and hand hygiene [2,112]. Researchers were able to provide statistically significant evidence of a false sense of security and more risky behavior when wearing masks in an experimental setting [112].

Decision makers in many countries informed their citizens early on in the pandemic in March 2020 that people without symptoms should not use a medical mask, as this created a false sense of security [113]. The recommendation was ultimately changed in many countries. At least Germany pointed out that wearers of certain types of masks such as the common fabric masks (community masks) cannot rely on them to protect them or others from transmission of SARS-CoV-2 [114].

However, scientists not only complain about the lack of evidence for fabric masks in the scope of a pandemic [16,110], but also about the high permeability of fabric masks with particles and the potential risk of infection they pose [108,109]. Ordinary fabric masks with a 97% penetration for particle dimensions of  $\geq 0.3 \mu\text{m}$  are in stark contrast to medical-type surgical masks with a 44% penetration. In contrast, the N95 mask has a penetration rate of less than 0.01% for particles  $\geq 0.3 \mu\text{m}$  in the laboratory experiment [108,115].

For the clinical setting in hospitals and outpatient clinics, the WHO guidelines recommend only surgical masks for influenza viruses for the entire patient treatment except for the strongly aerosol-generating measures, for which finer filtering masks of the type N95 are suggested. However, the WHO's endorsement of specific mask types is not entirely evidence-based due to the lack of high-quality studies in the health sector [108,109,116,117].

In a laboratory experiment (evidence level IIa study), it was demonstrated that both surgical masks and N95 masks have deficits in protection against SARS-CoV-2 and influenza viruses using virus-free aerosols [118]. In this study, the FFP2-equivalent N95 mask performed significantly better in protection (8–12 times more effective) than the surgical mask, but neither mask type established reliable, hypothesis-generated protection against corona and influenza viruses. Both mask types could be penetrated unhindered by aerosol particles with a diameter of 0.08 to 0.2  $\mu\text{m}$ . Both the SARS-CoV-2 pathogens with a size of 0.06 to 0.14  $\mu\text{m}$  [119] and the influenza viruses with 0.08 to 0.12  $\mu\text{m}$  are unfortunately well below the mask pore sizes [118].

The filtering capacity of the N95 mask up to 0.3  $\mu\text{m}$  [82] is usually not achieved by surgical masks and community masks. However, aerosol droplets, which have a diameter of 0.09 to 3  $\mu\text{m}$  in size, are supposed to serve as a transport medium for viruses. These also penetrate the medical masks by 40%. Often, there is also a poor fit between the face and the mask, which further impairs their function and safety [120]. The accumulation of aerosol droplets on the mask is problematic. Not only do they absorb nanoparticles such as viruses [6], but they also follow the airflow when inhaling and exhaling, causing them to be carried further. In addition, a physical decay process has been described for aerosol droplets at increasing temperatures, as also occurs under a mask [15,44,85]. This process can lead to a decrease in size of the fine water droplets up to the diameter of a virus [121,122]. The masks filter larger aerosol droplets but cannot retain viruses themselves and such smaller, potentially virus-containing aerosol droplets of less than 0.2  $\mu\text{m}$  and hence cannot stop the spread of virus [123].

Similarly, in an in vivo comparative studies of N95 and surgical masks, there were no significant differences in influenza virus infection rates [124,125]. Although this contrasts with encouraging in vitro laboratory results with virus-free aerosols under non-natural conditions, even with fabric masks [126], it should be noted that under natural in-vivo conditions, the promising filtration functions of fabric masks based on electrostatic effects also rapidly diminish under increasing humidity [127]. A Swiss textile lab test of various masks available on the market to the general public recently confirmed that most mask types filter aerosols insufficiently. For all but one of the eight reusable fabric mask types tested, the filtration efficacy according to EN149 was always less than 70% for particles of 1  $\mu\text{m}$  in size. For disposable masks, only half of all eight mask types tested were efficient enough at filtering to retain 70% of particles 1  $\mu\text{m}$  in size [128].

A recent experimental study even demonstrated that all mask-wearing people (surgical, N95, fabric masks) release significantly and proportionately smaller particles of size 0.3 to 0.5  $\mu\text{m}$  into the air than mask-less people, both when breathing, speaking and coughing [98]. According to this, the masks act like nebulizers and contribute to the production of very fine aerosols. Smaller particles, however, spread faster and further than large ones for physical reasons. Of particular interest in this experimental reference study was the finding that a test subject wearing a single-layer fabric mask was also able to release a total of 384% more particles (of various sizes) when breathing than a person without [98].

It is not only the aforementioned functional weaknesses of the masks themselves that lead to problems, but also their use. This increases the risk of a false sense of security. According to the literature, mistakes are made by both healthcare workers and lay people when using masks as hygienically correct mask use is by no means intuitive. Overall, 65% of healthcare professionals and as many as 78% of the general population, use masks incorrectly [116]. With both surgical masks and N95 masks, adherence to the rules of use is impaired and not adequately followed due to reduced wearability with heat discomfort and skin irritation [29,35,116,129]. This is exacerbated by the accumulation of carbon dioxide

due to the dead space (especially under the N95 masks) with the resulting headaches described [19,27,37,66–68,83]. Increased heart rate, itching and feelings of dampness [15,29,30,35,71] also lead to reduced safety and quality during use (see also social and occupational health side effects and hazards). For this reason, (everyday) masks are even considered a general risk for infection in the general population, which does not come close to imitating the strict hygiene rules of hospitals and doctors' offices: the supposed safety, thus, becomes a safety risk itself [5].

In a meta-analysis of evidence level Ia commissioned by the WHO, no effect of masks in the context of influenza virus pandemic prevention could be demonstrated [130]. In 14 randomized controlled trials, no reduction in the transmission of laboratory-confirmed influenza infections was shown. Due to the similar size and distribution pathways of the virus species (influenza and Corona, see above), the data can also be transferred to SARS-CoV-2 [118]. Nevertheless, a combination of occasional mask-wearing with adequate hand-washing caused a slight reduction in infections for influenza in one study [131]. However, since no separation of hand hygiene and masks was achieved in this study, the protective effect can rather be attributed to hand hygiene in view of the aforementioned data [131].

A recently published large prospective Danish comparative study comparing mask wearers and non-mask wearers in terms of their infection rates with SARS-CoV2 could not demonstrate any statistically significant differences between the groups [132].

#### 3.14. Paediatric Side Effects and Hazards

Children are particularly vulnerable and may be more likely to receive inappropriate treatment or additional harm. It can be assumed that the potential adverse mask effects described for adults are all the more valid for children (see Section 3.1 to Section 3.13: physiological internal, neurological, psychological, psychiatric, dermatological, ENT, dental, sociological, occupational and social medical, microbiological and epidemiological impairments and also Figures 2 and 3).

Special attention must be paid to the respiration of children, which represents a critical and vulnerable physiological variable due to higher oxygen demand, increased hypoxia susceptibility of the CNS, lower respiratory reserve, smaller airways with a stronger increase in resistance when the lumen is narrowed. The diving reflex caused by stimulating the nose and upper lip can cause respiratory arrest to bradycardia in the event of oxygen deficiency.

The masks currently used for children are exclusively adult masks manufactured in smaller geometric dimensions and had neither been specially tested nor approved for this purpose [133].

In an experimental British research study, the masks frequently led to feelings of heat ( $p < 0.0001$ ) and breathing problems ( $p < 0.03$ ) in 100 school children between 8 and 11 years of age especially during physical exertion, which is why the protective equipment was taken off by 24% of the children during physical activity [133]. The exclusion criteria for this mask experiment were lung disease, cardiovascular impairment and claustrophobia [133].

Scientists from Singapore were able to demonstrate in their level Ib study published in the renowned journal "nature" that 106 children aged between 7 and 14 years who wore FFP2 masks for only 5 min showed an increase in the inspiratory and expiratory CO<sub>2</sub> levels, indicating disturbed respiratory physiology [26].

However, a disturbed respiratory physiology in children can have long-term disease-relevant consequences. Slightly elevated CO<sub>2</sub> levels are known to increase heart rate, blood pressure, headache, fatigue and concentration disorders [38].

Accordingly, the following conditions were listed as exclusion criteria for mask use [26]: any cardiopulmonary disease including but not limited to: asthma, bronchitis, cystic fibrosis, congenital heart disease, emphysema; any condition that may be aggravated by physical exertion, including but not limited to: exercise-induced asthma; lower respiratory tract infections (pneumonia, bronchitis within the last 2 weeks), anxiety disorders,



diabetes, hypertension or epilepsy/attack disorder; any physical disability due to medical, orthopedic or neuromuscular disease; any acute upper respiratory illness or symptomatic rhinitis (nasal obstruction, runny nose or sneezing); any condition with deformity that affects the fit of the mask (e.g., increased facial hair, craniofacial deformities, etc.).

It is also important to emphasize the possible effects of masks in neurological diseases, as described earlier (Section 3.3).

Both masks and face shields caused fear in 46% of children (37 out of 80) in a scientific study. If children are given the choice of whether the doctor examining them should wear a mask they reject this in 49% of the cases. Along with their parents, the children prefer the practitioner to wear a face visor (statistically significant with  $p < 0.0001$ ) [134].

A recent observational study of tens of thousands of mask-wearing children in Germany helped the investigators objectify complaints of headaches (53%), difficulty concentrating (50%), joylessness (49%), learning difficulties (38%) and fatigue in 37% of the 25,930 children evaluated. Of the children observed, 25% had new onset anxiety and even nightmares [135]. In children, the threat scenarios generated by the environment are further maintained via masks, in some cases, even further intensified, and in this way, existing stress is intensified (presence of subconscious fears) [16,35,136,137].

This can in turn lead to an increase in psychosomatic and stress-related illnesses [74,75]. For example, according to an evaluation, 60% of mask wearers showed stress levels of the highest grade 10 on a scale of 1 to a maximum of 10. Less than 10% of the mask wearers surveyed had a stress level lower than 8 out of a possible 10 [74].

As children are considered a special group, the WHO also issued a separate guideline on the use of masks in children in the community in August 2020, explicitly advising policy makers and national authorities, given the limited evidence, that the benefits of mask use in children must be weighed up against the potential harms associated with mask use. This includes feasibility and discomfort, as well as social and communication concerns [100].

According to experts, masks block the foundation of human communication and the exchange of emotions and not only hinder learning but deprive children of the positive effects of smiling, laughing and emotional mimicry [42]. The effectiveness of masks in children as a viral protection is controversial, and there is a lack of evidence for their widespread use in children; this is also addressed in more detail by the scientists of the German University of Bremen in their thesis paper 2.0 and 3.0 [138].

### 3.15. Effects on the Environment

According to WHO estimates of a demand of 89 million masks per month, their global production will continue to increase under the Corona pandemic [139]. Due to the composition of, e.g., disposable surgical masks with polymers such as polypropylene, polyurethane, polyacrylonitrile, polystyrene, polycarbonate, polyethylene and polyester [140], an increasing global challenge, also from an environmental point of view, can be expected, especially outside Europe, in the absence of recycling and disposal strategies [139]. The aforementioned single use polymers have been identified as a significant source of plastic and plastic particles for the pollution of all water cycles up to the marine environment [141].

A significant health hazard factor is contributed by mask waste in the form of microplastics after decomposition into the food chain. Likewise, contaminated macroscopic disposable mask waste—especially before microscopic decay—represents a widespread medium for microbes (protozoa, bacteria, viruses, fungi) in terms of invasive pathogens [86–89,142]. Proper disposal of bio-contaminated everyday mask material is insufficiently regulated even in western countries.

## 4. Discussion

The potential drastic and undesirable effects found in multidisciplinary areas illustrate the general scope of global decisions on masks in general public in the light of combating the pandemic. According to the literature found, there are clear, scientifically recorded adverse effects for the mask wearer, both on a psychological and on a social and physical level.

Neither higher level institutions such as the WHO or the European Centre for Disease Prevention and Control (ECDC) nor national ones, such as the Centers for Disease Control and Prevention, GA, USA (CDC) or the German RKI, substantiate with sound scientific data a positive effect of masks in the public (in terms of a reduced rate of spread of COVID-19 in the population) [2,4,5].

Contrary to the scientifically established standard of evidence-based medicine, national and international health authorities have issued their theoretical assessments on the masks in public places, even though the compulsory wearing of masks gives a deceptive feeling of safety [5,112,143].

From an infection epidemiological point of view, masks in everyday use offer the risk of self-contamination by the wearer from both inside and outside, including via contaminated hands [5,16,88]. In addition, masks are soaked by exhaled air, which potentially accumulates infectious agents from the nasopharynx and also from the ambient air on the outside and inside of the mask. In particular, serious infection-causing bacteria and fungi should be mentioned here [86,88,89], but also viruses [87]. The unusual increase in the detection of rhinoviruses in the sentinel studies of the German RKI from 2020 [90] could be an indication of this phenomenon. Clarification through further investigations would therefore be desirable.

Masks, when used by the general public, are considered by scientists to pose a risk of infection because the standardized hygiene rules of hospitals cannot be followed by the general public [5]. On top of that, mask wearers (surgical, N95, fabric masks) exhale relatively smaller particles (size 0.3 to 0.5  $\mu\text{m}$ ) than mask-less people and the louder speech under masks further amplifies this increased fine aerosol production by the mask wearer (nebulizer effect) [98].

The history of modern times shows that already in the influenza pandemics of 1918–1919, 1957–58, 1968, 2002, in SARS 2004–2005 as well as with the influenza in 2009, masks in everyday use could not achieve the hoped-for success in the fight against viral infection scenarios [67,144]. The experiences led to scientific studies describing as early as 2009 that masks do not show any significant effect with regard to viruses in an everyday scenario [129,145]. Even later, scientists and institutions rated the masks as unsuitable to protect the user safely from viral respiratory infections [137,146,147]. Even in hospital use, surgical masks lack strong evidence of protection against viruses [67].

Originally born out of the useful knowledge of protecting wounds from surgeons' breath and predominantly bacterial droplet contamination [144,148,149], the mask has been visibly misused with largely incorrect popular everyday use, particularly in Asia in recent years [150]. Significantly, the sociologist Beck described the mask as a cosmetic of risk as early as 1992 [151]. Unfortunately, the mask is inherent in a vicious circle: strictly speaking, it only protects symbolically and at the same time represents the fear of infection. This phenomenon is reinforced by the collective fear mongering, which is constantly nurtured by main stream media [137].

Nowadays, the mask represents a kind of psychological support for the general population during the virus pandemic, promising them additional anxiety-reduced freedom of movement. The recommendation to use masks in the sense of "source control" not out of self-protection but out of "altruism" [152] is also very popular with the regulators as well as the population of many countries. The WHO's recommendation of the mask in the current pandemic is not only a purely infectiological approach, but is also clear on the possible advantages for healthy people in the general public. In particular, a reduced potential stigmatization of mask wearers, the feeling of a contribution made to preventing the spread of the virus, as well as the reminder to adhere to other measures are mentioned [2].

It should not go unmentioned that very recent data suggest that the detection of SARS-CoV-2 infection does not seem to be directly related to popular mask use. The groups examined in a retrospective comparative study (infected with SARS-CoV-2 and not infected) did not differ in their habit of using masks: approximately 70% of the subjects in both groups always wore masks and another 14.4% of them frequently [143].

In a Danish prospective study on mask-wearing carried out on about 6000 participants and published in 2020, scientists found no statistically significant difference in the rates of SARS-CoV-2 infection when comparing the group of 3030 mask wearers with the 2994 mask-less participants in the study ( $p = 0.38$ ) [132].

Indeed, in the case of viral infections, masks appear to be not only less effective than expected, but also not free of undesirable biological, chemical, physical and psychological side effects [67]. Accordingly, some experts claim that well-intentioned unprofessionalism can be quite dangerous [6].

The dermatological colleagues were the first to describe common adverse effects of mask-wearing in larger collectives. Simple, direct physical, chemical and biological effects of the masks with increases in temperature, humidity and mechanical irritation caused acne in up to 60% of wearers [37,71–73,85]. Other significantly documented consequences were eczema, skin damage and overall impaired skin barrier function [37,72,73].

These direct effects of mask use are an important pointer to further detrimental effects affecting other organ systems.

In our work, we have identified scientifically validated and numerous statistically significant adverse effects of masks in various fields of medicine, especially with regard to a disruptive influence on the highly complex process of breathing and negative effects on the respiratory physiology and gas metabolism of the body (see Figures 2 and 3). The respiratory physiology and gas exchange play a key role in maintaining a health-sustaining balance in the human body [136,153]. According to the studies we found, a dead space volume that is almost doubled by wearing a mask and a more than doubled breathing resistance (Figure 3) [59–61] lead to a rebreathing of carbon dioxide with every breathing cycle [16–18,39,83] with—in healthy people mostly—a subthreshold but, in sick people, a partly pathological increase in the carbon dioxide partial pressure ( $\text{PaCO}_2$ ) in the blood [25,34,58]. According to the primary studies found, these changes contribute reflexively to an increase in respiratory frequency and depth [21,23,34,36] with a corresponding increase in the work of the respiratory muscles via physiological feedback mechanisms [31,36]. Thus, it is not, as initially assumed, purely positive training through mask use. This often increases the subliminal drop in oxygen saturation  $\text{SpO}_2$  in the blood [23,28–30,32], which is already reduced by increased dead space volume and increased breathing resistance [18,31].

The overall possible resulting measurable drop in oxygen saturation  $\text{O}_2$  of the blood on the one hand [18,23,28–30,32] and the increase in carbon dioxide ( $\text{CO}_2$ ) on the other [13,15,19,21–28] contribute to an increased noradrenergic stress response, with heart rate increase [29,30,35] and respiratory rate increase [15,21,23,34], in some cases also to a significant blood pressure increase [25,35].

In panic-prone individuals, stress-inducing noradrenergic sympathetic activation can be partly directly mediated via the carbon dioxide ( $\text{CO}_2$ ) mechanism at the locus coeruleus in the brainstem [39,78,79,153], but also in the usual way via chemo-sensitive neurons of the nucleus solitarius in the medulla [136,154]. The nucleus solitarius [136] is located in the deepest part of the brainstem, a gateway to neuronal respiratory and circulatory control [154]. A decreased oxygen ( $\text{O}_2$ ) blood level there causes the activation of the sympathetic axis via chemoreceptors in the carotids [155,156].

Even subthreshold changes in blood gases such as those provoked when wearing a mask cause reactions in these control centers in the central nervous system. Masks, therefore, trigger direct reactions in important control centers of the affected brain via the slightest changes in oxygen and carbon dioxide in the blood of the wearer [136,154,155].

A link between disturbed breathing and cardiorespiratory diseases such as hypertension, sleep apnea and metabolic syndrome has been scientifically proven [56,57]. Interestingly, decreased oxygen/ $\text{O}_2$  blood levels and also increased carbon dioxide/ $\text{CO}_2$  blood levels are considered the main triggers for the sympathetic stress response [38,136]. The aforementioned chemo-sensitive neurons of the nucleus solitarius in the medulla are considered to be the main responsible control centers [136,154,155]. Clinical effects of prolonged mask-wearing would, thus, be a conceivable intensification of chronic stress re-

actions and negative influences on the metabolism leading towards a metabolic syndrome. The mask studies we found show that such disease-relevant respiratory gas changes ( $O_2$  and  $CO_2$ ) [38,136] are already achieved by wearing a mask [13,15,18,19,21–34].

A connection between hypoxia, sympathetic reactions and leptin release is scientifically known [136].

Additionally important is the connection of breathing with the influence on other bodily functions [56,57], including the psyche with the generation of positive emotions and drive [153]. The latest findings from neuro-psychobiological research indicate that respiration is not only a function regulated by physical variables to control them (feedback mechanism), but rather independently influences higher-level brain centers and, thus, also helps to shape psychological and other bodily functions and reactions [153,157,158]. Since masks impede the wearer's breathing and accelerate it, they work completely against the principles of health-promoting breathing [56,57] used in holistic medicine and yoga. According to recent research, undisturbed breathing is essential for happiness and healthy drive [157,159], but masks work against this.

The result of significant changes in blood gases in the direction of hypoxia (drop in oxygen saturation) and hypercapnia (increase in carbon dioxide concentration) through masks, thus, has the potential to have a clinically relevant influence on the human organism even without exceeding normal limits.

According to the latest scientific findings, blood-gas shifts towards hypoxia and hypercapnia not only have an influence on the described immediate, psychological and physiological reactions on a macroscopic and microscopic level, but additionally on gene expression and metabolism on a molecular cellular level in many different body cells. Through this, the drastic disruptive intervention of masks in the physiology of the body also becomes clear down to the cellular level, e.g., in the activation of hypoxia-induced factor (HIF) through both hypercapnia and hypoxia-like effects [160]. HIF is a transcription factor that regulates cellular oxygen supply and activates signaling pathways relevant to adaptive responses. e.g., HIF inhibits stem cells, promotes tumor cell growth and inflammatory processes [160]. Based on the hypoxia- and hypercapnia-promoting effects of masks, which have been comprehensively described for the first time in our study, potential disruptive influences down to the intracellular level (HIF-a) can be assumed, especially through the prolonged and excessive use of masks. Thus, in addition to the vegetative chronic stress reaction in mask wearers, which is channeled via brain centers, there is also likely to be an adverse influence on metabolism at the cellular level. With the prospect of continued mask use in everyday life, this also opens up an interesting field of research for the future.

The fact that prolonged exposure to latently elevated  $CO_2$  levels and unfavorable breathing air compositions has disease-promoting effects was recognized early on. As early as 1983, the WHO described "Sick Building Syndrome" (SBS) as a condition in which people living indoors experienced acute disease-relevant effects that increased with time of their stay, without specific causes or diseases [161,162]. The syndrome affects people who spend most of their time indoors, often with subliminally elevated  $CO_2$  levels, and are prone to symptoms such as increased heart rate, rise in blood pressure, headaches, fatigue and difficulty concentrating [38,162]. Some of the complaints described in the mask studies we found (Figure 2) are surprisingly similar to those of Sick Building Syndrome [161]. Temperature, carbon dioxide content of the air, headaches, dizziness, drowsiness and itching also play a role in Sick Building Syndrome. On the one hand, masks could themselves be responsible for effects such as those described for Sick Building Syndrome when used for a longer period of time. On the other hand, they could additionally intensify these effects when worn in air-conditioned buildings, especially when masks are mandatory indoors. Nevertheless, there was a tendency towards higher systolic blood pressure values in mask wearers in some studies [21,31,34], but statistical significance was only found in two studies [25,35]. However, we found more relevant and significant evidence of heart

rate increase, headache, fatigue and concentration problems associated with mask wearers (Figure 2) indicating the clinical relevance of wearing masks.

According to the scientific results and findings, masks have measurably harmful effects not only on healthy people, but also on sick people and their relevance is likely to increase with the duration of use [69]. Further research is needed here to shed light on the long-term consequences of widespread mask use with subthreshold hypoxia and hypercapnia in the general population, also regarding possible exacerbating effects on cardiorespiratory lifestyle diseases such as hypertension, sleep apnea and metabolic syndrome. The already often elevated blood carbon dioxide (CO<sub>2</sub>) levels in overweight people, sleep apnea patients and patients with overlap-COPD could possibly increase even further with everyday masks. Not only a high body mass index (BMI) but also sleep apnea are associated with hypercapnia during the day in these patients (even without masks) [19,163]. For such patients, hypercapnia means an increase in the risk of serious diseases with increased morbidity, which could then be further increased by excessive mask use [18,38].

The hypercapnia-induced effects of sympathetic stress activation are even cycle phase-dependent in women. Controlled by a progesterone mechanism, the sympathetic reaction, measured by increased blood pressure in the luteal phase, is considerably stronger [164]. This may also result in different sensitivities for healthy and sick women to undesirable effects masks have, which are related to an increase in carbon dioxide (CO<sub>2</sub>).

In our review, negative physical and psychological changes caused by masks could be objectified even in younger and healthy individuals.

The physical and chemical parameters did not exceed the normal values in most cases but were statistically significantly measurable ( $p < 0.05$ ) tending towards pathological ranges. They were accompanied by physical impairments (see Figure 2). It is well known that subthreshold stimuli are capable of causing pathological changes when exposed to them for a long time: not only a single high dose of a disturbance, but also a chronically persistent, subthreshold exposure to it often leads to illness [38,46–48,50–54]. The scientifically repeatedly measurable physical and chemical mask effects were often accompanied by typical subjective complaints and pathophysiological phenomena. The fact that these frequently occur simultaneously and together indicates a syndrome under masks.

Figure 2 sums up the significant mask-dependent physiological, psychological, somatic and general pathological changes and their frequent occurrence together is striking. Within the framework of the quantitative evaluation of the experimental studies, we were actually able to prove a statistically significant correlation of the observed side effects of fatigue and oxygen depletion under mask use with  $p < 0.05$ . In addition, we found a frequent, simultaneous and joint occurrence of further undesirable effects in the scientific studies (Figure 2). Statistically significant associations of such co-occurring, adverse effects have already been described in primary studies [21,29]. We detected a combined occurrence of the physical parameter temperature rise under the mask with the symptom respiratory impairment in seven of the nine studies concerned (88%). We found a similar result for the decrease in oxygen saturation under mask and the symptom respiratory impairment with a simultaneous detection in six of the eight studies concerned (67%). We detected a combined occurrence of carbon dioxide rise under N95 mask use in nine of the 11 scientific papers (82%). We found a similar result for oxygen drop under N95 mask use with simultaneous co-occurrence in eight of 11 primary papers (72%). The use of N95 masks was also associated with headache in six of the 10 primary studies concerned (60%). A combined occurrence of the physical parameters temperature rise and humidity under masks was even found 100% within six of the six studies with significant measurements of these parameters (Figure 2).

Since the symptoms were described in combination in mask wearers and were not observed in isolation in the majority of cases, we refer to them as general Mask-Induced Exhaustion Syndrome (MIES) because of the consistent presentation in numerous papers from different disciplines. These include the following, predominantly statistically significantly



( $p < 0.05$ ) proven pathophysiological changes and subjective complaints, which often occur in combination as described above (see also Section 3.1 to Section 3.11, Figures 2–4):

- Increase in dead space volume [22,24,58,59] (Figure 3, Sections 3.1 and 3.2).
- Increase in breathing resistance [31,35,61,118] (Figure 3, Figure 2: Column 8).
- Increase in blood carbon dioxide [13,15,19,21–28] (Figure 2: Column 5).
- Decrease in blood oxygen saturation [18,19,21,23,28–34] (Figure 2: Column 4).
- Increase in heart rate [15,19,23,29,30,35] (Figure 2: Column 12).
- Decrease in cardiopulmonary capacity [31] (Section 3.2).
- Feeling of exhaustion [15,19,21,29,31–35,69] (Figure 2: Column 14).
- Increase in respiratory rate [15,21,23,34] (Figure 2: Column 9).
- Difficulty breathing and shortness of breath [15,19,21,23,25,29,31,34,35,71,85,101,133] (Figure 2: Column 13).
- Headache [19,27,37,66–68,83] (Figure 2: Column 17).
- Dizziness [23,29] (Figure 2: Column 16).
- Feeling of dampness and heat [15,16,22,29,31,35,85,133] (Figure 2: Column 7).
- Drowsiness (qualitative neurological deficits) [19,29,32,36,37] (Figure 2: Column 15).
- Decrease in empathy perception [99] (Figure 2: Column 19).
- Impaired skin barrier function with acne, itching and skin lesions [37,72,73] (Figure 2: Column 20–22).

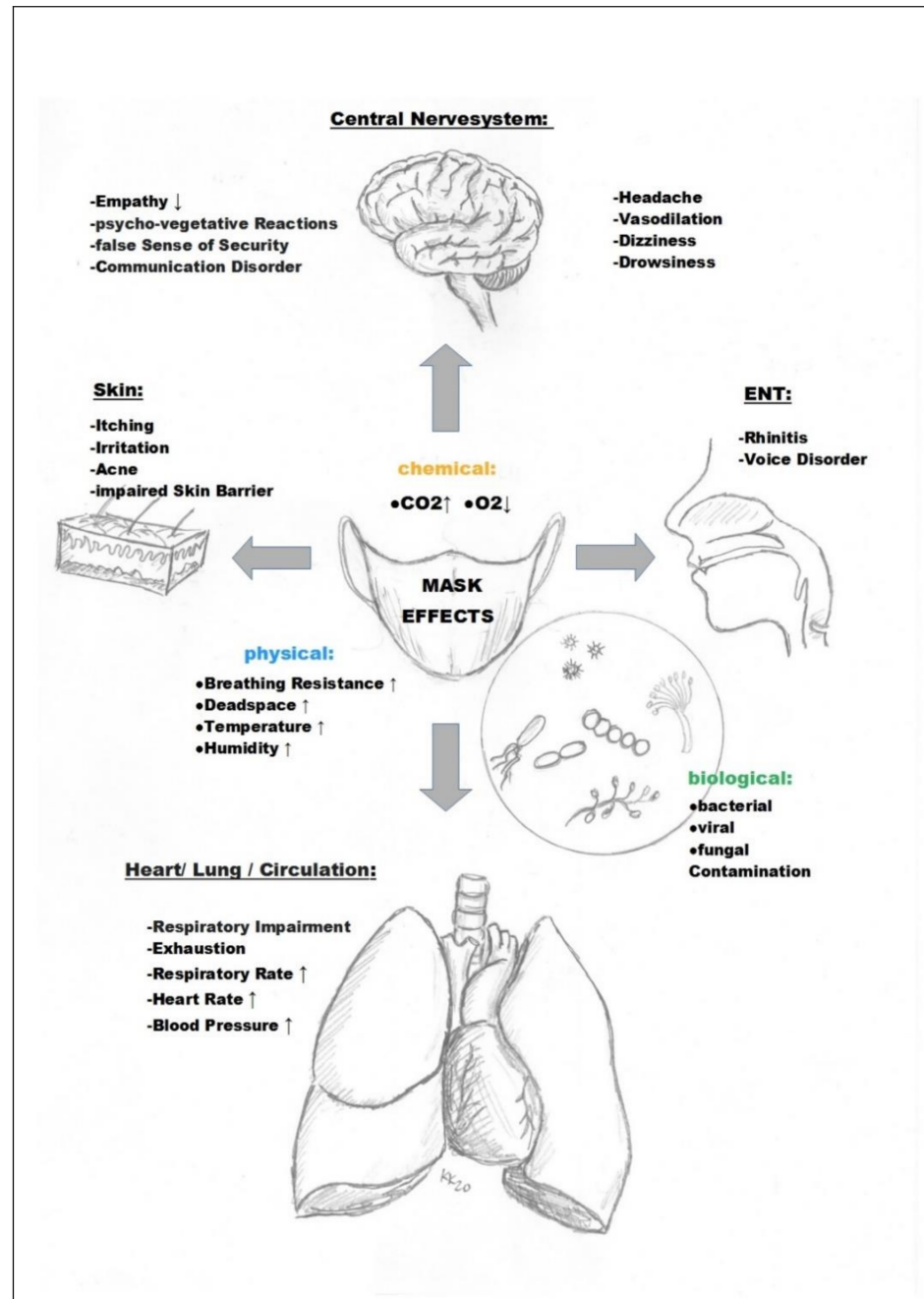
It can be deduced from the results that the effects described in healthy people are all more pronounced in sick people, since their compensatory mechanisms, depending on the severity of the illness, are reduced or even exhausted. Some existing studies on and with patients with measurable pathological effects of the masks support this assumption [19,23,25,34]. In most scientific studies, the exposure time to masks in the context of the measurements/investigations was significantly less (in relation to the total wearing and duration of use) than is expected of the general public under the current pandemic regulations and ordinances.

The exposure time limits are little observed or knowingly disregarded in many areas today as already mentioned in Section 3.11 on occupational medicine. The above facts allow the conclusion that the described negative effects of masks, especially in some of our patients and the very elderly, may well be more severe and adverse with prolonged use than presented in some mask studies.

From a doctor's viewpoint, it may also be difficult to advise children and adults who, due to social pressure (to wear a mask) and the desire to feel they belong, suppress their own needs and concerns until the effects of masks have a noticeable negative impact on their health [76]. Nevertheless, the use of masks should be stopped immediately at the latest when shortness of breath, dizziness or vertigo occur [23,25]. From this aspect, it seems sensible for decision makers and authorities to provide information, to define instruction obligations and offer appropriate training for employers, teachers and other persons who have a supervisory or caregiving duty. Knowledge about first aid measures could also be refreshed and expanded accordingly in this regard.

Elderly, high-risk patients with lung disease, cardiac patients, pregnant women or stroke patients are advised to consult a physician to discuss the safety of an N95 mask as their lung volume or cardiopulmonary performance may be reduced [23]. A correlation between age and the occurrence of the aforementioned symptoms while wearing a mask has been statistically proven [19]. Patients with reduced cardiopulmonary function are at increased risk of developing serious respiratory failure with mask use according to the referenced literature [34]. Without the possibility of continuous medical monitoring, it can be concluded that they should not wear masks without close monitoring. The American Asthma and Allergy Society has already advised caution in the use of masks with regard to the COVID-19 pandemic for people with moderate and severe lung disease [165]. Since the severely overweight, sleep apnea patients and overlap-COPD sufferers are known to be prone to hypercapnia, they also represent a risk group for serious adverse health effects under extensive mask use [163]. This is because the potential of masks to produce additional

CO<sub>2</sub> retention may not only have a disruptive effect on the blood gases and respiratory physiology of sufferers, but may also lead to further serious adverse health effects in the long term. Interestingly, in an animal experiment an increase in CO<sub>2</sub> with hypercapnia leads to contraction of smooth airway muscles with constriction of bronchi [166]. This effect could explain the observed pulmonary decompensations of patients with lung disease under masks (Section 3.2) [23,34].



**Figure 4.** Unfavorable mask effects as components of Mask-Induced Exhaustion Syndrome (MIES). The chemical, physical and biological effects, as well as the organ system consequences mentioned, are all documented with statistically significant results in the scientific literature found (Figure 2). The term drowsiness is used here to summarize any qualitative neurological deficits described in the examined scientific literature.

Patients with renal insufficiency requiring dialysis are, according to the literature available, further candidates for a possible exemption from the mask requirement [34].

According to the criteria of the Centers for Disease Control and Prevention, GA, USA (CDC), sick and helpless people who cannot remove a mask on their own should be exempted from the mask requirement [82].

Since it can be assumed that children react even more sensitively to masks, the literature suggests that masks are a contraindication for children with epilepsies (hyperventilation as a trigger for seizures) [63]. In the field of pediatrics, special attention should also be paid to the mask symptoms described under psychological, psychiatric and sociological effects with possible triggering of panic attacks by CO<sub>2</sub> rebreathing in the case of predisposition and also reinforcement of claustrophobic fears [77–79,167]. The mask-related disturbance of verbal [43,45,71] and non-verbal communication and, thus, of social interaction is particularly serious for children. Masks restrict social interaction and block positive perceptions (smiling and laughing) and emotional mimicry [42]. The proven mask-induced mild to moderate cognitive impairment with impaired thinking, decreased attention and dizziness [19,23,29,32,36,37,39–41,69], as well as the psychological and neurological effects [135], should be additionally taken into account when masks are compulsory at school and in the vicinity of both public and non-public transport, also regarding the possibility of an increased risk of accidents (see also occupational health side effects and hazards) [19,29,32,36,37]. The exclusion criteria mentioned in pediatric studies on masks (see pediatric impairments, Section 3.14) [26,133] should also apply to an exclusion of these children from the general mask obligation in accordance with the scientific findings for the protection of the sick children concerned. The long-term sociological, psychological and educational consequences of a comprehensive masking requirement extended to schools are also unpredictable with regard to the psychological and physical development of healthy children [42,135]. Interestingly, according to the Corona Thesis Paper of the University of Bremen children “are infected less often, they become ill less often, the lethality is close to zero, and they also pass on the infection less often”, according to the Thesis Paper 2.0 of the German University of Bremen on page 6 [138]. Studies conducted under real-life conditions with outcome endpoints showing hardly any infections, hardly any morbidity, hardly any mortality and only low contagiousness in children are clearly in the majority, according to Thesis Paper 3.0 of the German University of Bremen [138]. A recent German observational study (5600 reporting pediatricians) also showed a surprisingly low incidence of COVID-19 disease in children [168]. The infection of adults with SARS-CoV-2 by children has been considered in only one suspected case, but could not be proven with certainty, since the parents also had numerous contacts and exposure factors for viral infections due to their occupation. In this case, the circulating headlines in the public media that children contribute more to the incidence of infection are to be regarded as anecdotal.

In pregnant women, the use of masks during exertion or at rest over long periods of time is to be regarded as critical as little research has been done on this [20]. If there is clear scientific evidence of increased dead space ventilation with possible accumulation of CO<sub>2</sub> in the mother’s blood, the use of masks by pregnant women for more than 1 h, as well as under physical stress, should be avoided in order to protect the unborn child [20,22]. The hypercapnia-promoting masks could act as a confounder of the fetal/maternal CO<sub>2</sub> gradient in this case (Section 3.6) [20,22,28].

According to the literature cited in the Section 3.5 on psychiatric side effects (personality disorders with anxiety and panic attacks, claustrophobia, dementia and schizophrenia), masking should only be done, if at all, with careful consideration of the advantages and disadvantages. Attention should be paid to possible provocation of the number and severity of panic attacks [77–79].

In patients with headaches, a worsening of symptoms can be expected with prolonged mask use (see also Section 3.3., neurological side effects) [27,66–68]. As a result of the increase in blood carbon dioxide (CO<sub>2</sub>) when the mask is used, vasodilatation occurs in the central nervous system and the pulsation of the blood vessels decreases [27]. In this connection, it is also interesting to note radiological experiments that demonstrate an increase in brain volume under subthreshold, but still within normal limits of CO<sub>2</sub> increase



in the blood by means of structural MRI. The blood carbon dioxide increase was produced in seven subjects via rebreathing with resulting median carbon dioxide concentration of 42 mmHg and an interquartile range of 39.44 mmHg, corresponding to only a subthreshold increase given the normal values of 32–45 mmHg. In the experiment, there was a significant increase in brain parenchymal volume measurable under increased arterial CO<sub>2</sub> levels ( $p < 0.02$ ), with a concomitant decrease in CSF spaces ( $p < 0.04$ ), entirely in accordance with the Monroe–Kelly doctrine, according to which the total volume within the skull always remains the same. The authors interpreted the increase in brain volume as an expression of an increase in blood volume due to a CO<sub>2</sub> increase-induced dilation of the cerebral vessels [169]. The consequences of such equally subthreshold carbon dioxide (CO<sub>2</sub>) increases even under masks [13,15,18,19,22,23,25] are unclear for people with pathological changes inside the skull (aneurysms, tumors, etc.) with associated vascular changes [27] and brain volume shifts [169] especially due to longer exposure while wearing a mask, but could be of great relevance due to the blood gas-related volume shifts that take place.

In view of the increased dead space volume, the long-term and increased accumulation and rebreathing of other respiratory air components apart from CO<sub>2</sub> is also unexplained, both in children and in old and sick people. Exhaled air contains over 250 substances, including irritant or toxic gases such as nitrogen oxides (NO), hydrogen sulfide (H<sub>2</sub>S), isoprene and acetone [170]. For nitrogen oxides [47] and hydrogen sulfide [46], pathological effects relevant to disease have been described in environmental medicine even at a low but chronic exposure [46–48]. Among the volatile organic compounds in exhaled air, acetone and isoprene dominate in terms of quantity, but allyl methyl sulfide, propionic acid and ethanol (some of bacterial origin) should also be mentioned [171]. Whether such substances also react chemically with each other underneath masks and in the dead space volume created by masks (Figure 3), and with the mask tissue itself, and in what quantities these and possible reaction products are rebreathed, has not yet been clarified. In addition to the blood gas changes described above (O<sub>2</sub> drop and CO<sub>2</sub> rise), these effects could also play a role with regard to undesirable mask effects. Further research is needed here and is of particular interest in the case of prolonged and ubiquitous use of masks.

The WHO sees the integration of individual companies and communities that produce their own fabric masks as a potential social and economic benefit. Due to the global shortage of surgical masks and personal protective equipment, it sees this as a source of income and points out that the reuse of fabric masks can reduce costs and waste and contribute to sustainability [2]. In addition to the question of certification procedures for such fabric masks, it should also be mentioned that due to the extensive mask obligation, textile (artificial) substances in the form of micro- and nanoparticles, some of which cannot be degraded in the body, are chronically absorbed into the body through inhalation to an unusual extent. In the case of medical masks, disposable polymers such as polypropylene, polyurethane, polyacrylonitrile, polystyrene, polycarbonate, polyethylene and polyester should be mentioned [140]. ENT physicians have already been able to detect such particles in the nasal mucosa of mask wearers with mucosal reactions in the sense of a foreign body reaction with rhinitis [96]. In the case of community masks, other substances from the textile industry are likely to be added to those mentioned above. The body will try to absorb these substances through macrophages and scavenger cells in the respiratory tract and alveoli as part of a foreign body reaction, whereby toxin release and corresponding local and generalized reactions may occur in an unsuccessful attempt to break them down [172]. Extensive respiratory protection in permanent long-term use (24/7), at least from a theoretical point of view, also potentially carries the risk of leading to a mask-related pulmonary [47] or even generalized disorder, as is already known from textile workers chronically exposed to organic dusts in the Third World (byssinosis) [172].

For the general public, from a scientific angle, it is necessary to draw on the long-standing knowledge of respiratory protection in occupational medicine in order to protect children in particular from harm caused by uncertified masks and improper use.

The universal undefined and extended mask requirement—without taking into account multiple predispositions and susceptibilities—contradicts the claim of an increasingly important individualized medicine with a focus on the unique characteristics of each individual [173].

A systematic review on the topic of masks is necessary according to the results of our scoping review. The primary studies often showed weaknesses in operationalization, especially in the evaluation of cognitive and neuropsychological parameters. Computerized test procedures will be useful here in the future. Mask research should also set itself the future goal of investigating and defining subgroups for whom respiratory protection use is particularly risky.

## 5. Limitations

Our approach with a focus on negative effects is in line with Villalonga-Olives and Kawachi [12]. With the help of such selective questioning in the sense of dialectics, new insights can be gained that might otherwise have remained hidden. Our literature search focused on adverse negative effects of masks, in particular to point out risks especially for certain patient groups. Therefore, publications presenting only positive effects of masks were not considered in this review.

For a compilation of studies with harmless results when using masks, reference must, therefore, be made to reviews with a different research objective, whereby attention must be paid to possible conflicts of interest there. Some of the studies excluded by us lacking negative effects have shown methodological weaknesses (small, non-uniform experimental groups, missing control group even without masks due to corona constraints, etc.) [174]. In other words, if no negative concomitant effects were described in publications, it does not necessarily mean that masks have exclusively positive effects. It is quite possible that negative effects were simply not mentioned in the literature and the number of negative effects may well be higher than our review suggests.

We only searched one database, so the number of papers on negative mask effects may be higher than we reported.

In order to be able to describe characteristic effects for each mask type even more extensively, we did not have enough scientific data on the respective special designs of the masks. There is still a great need for research in this area due to the current pandemic situation with extensive mandatory masking.

In addition, the experiments evaluated in this paper do not always have uniform measurement parameters and study variables and, depending on the study, take into account the effect of masks at rest or under stress with subjects having different health conditions. Figure 2, therefore, represents a compromise. The results of the primary studies on mask use partially showed no natural variation in parameters, but often showed such clear correlations between symptoms and physiological changes, so that a statistical correlation analysis was not always necessary. We found a statistically significant correlation of oxygen deprivation and fatigue in 58% of the studies ( $p < 0.05$ ). A statistically significant correlation evidence for other parameters has been previously demonstrated in primary studies [21,29].

The most commonly used personal particulate matter protective equipment in the COVID-19 pandemic is the N95 mask [23]. Due to its characteristics (better filtering function, but greater airway resistance and more dead space volume than other masks), the N95 mask is able to highlight negative effects of such protective equipment more clearly than others (Figure 3). Therefore, a relatively frequent consideration and evaluation of N95 masks within the studies found (30 of the 44 quantitatively evaluated studies, 68%) is even advantageous within the framework of our research question. Nevertheless, it remains to be noted that the community masks sold on the market are increasingly similar to the protective equipment that has been better investigated in scientific studies, such as surgical masks and N95 masks, since numerous manufacturers and users of community masks are striving to approximate the professional standard (surgical mask, N95/FFP2). Recent

study results on community masks indicate similar effects for respiratory physiology as described for medical masks: in a recent publication, fabric masks (community masks) also provoked a measurable increase in carbon dioxide  $P_{tCO_2}$  in wearers during exertion and came very close to surgical masks in this effect [21].

Most of the studies cited in our paper included only short observation and application periods (mask-wearing durations investigated ranged from 5 min [26] to 12 h [19]. In only one study, a maximum observation period of an estimated 2-month period was chosen [37]. Therefore, the actual negative effects of masks over a longer application period might be more pronounced than presented in our work.

## 6. Conclusions

On the one hand, the advocacy of an extended mask requirement remains predominantly theoretical and can only be sustained with individual case reports, plausibility arguments based on model calculations and promising in vitro laboratory tests. Moreover, recent studies on SARS-CoV-2 show both a significantly lower infectivity [175] and a significantly lower case mortality than previously assumed, as it could be calculated that the median corrected infection fatality rate (IFR) was 0.10% in locations with a lower than average global COVID-19 population mortality rate [176]. In early October 2020, the WHO also publicly announced that projections show COVID-19 to be fatal for approximately 0.14% of those who become ill—compared to 0.10% for endemic influenza—again a figure far lower than expected [177].

On the other hand, the side effects of masks are clinically relevant.

In our work, we focused exclusively on the undesirable and negative side effects that can be produced by masks. Valid significant evidence of combined mask-related changes were objectified ( $p < 0.05$ ,  $n \geq 50\%$ ), and we found a clustered and common occurrence of the different adverse effects within the respective studies with significantly measured effects (Figure 2). We were able to demonstrate a statistically significant correlation of the observed adverse effect of hypoxia and the symptom of fatigue with  $p < 0.05$  in the quantitative evaluation of the primary studies. Our review of the literature shows that both healthy and sick people can experience Mask-Induced Exhaustion Syndrome (MIES), with typical changes and symptoms that are often observed in combination, such as an increase in breathing dead space volume [22,24,58,59], increase in breathing resistance [31,35,60,61], increase in blood carbon dioxide [13,15,17,19,21–30,35], decrease in blood oxygen saturation [18,19,21,23,28–34], increase in heart rate [23,29,30,35], increase in blood pressure [25,35], decrease in cardiopulmonary capacity [31], increase in respiratory rate [15,21,23,34,36], shortness of breath and difficulty breathing [15,17,19,21,23,25,29,31,34,35,60,71,85,101,133], headache [19,27,29,37,66–68,71,83], dizziness [23,29], feeling hot and clammy [17,22,29,31,35,44,71,85,133], decreased ability to concentrate [29], decreased ability to think [36,37], drowsiness [19,29,32,36,37], decrease in empathy perception [99], impaired skin barrier function [37,72,73] with itching [31,35,67,71–73,91–93], acne, skin lesions and irritation [37,72,73], overall perceived fatigue and exhaustion [15,19,21,29,31,32,34,35,69] (Figures 2–4).

Wearing masks does not consistently cause clinical deviations from the norm of physiological parameters, but according to the scientific literature, a long-term pathological consequence with clinical relevance is to be expected owing to a longer-lasting effect with a subliminal impact and significant shift in the pathological direction. For changes that do not exceed normal values, but are persistently recurring, such as an increase in blood carbon dioxide [38,160], an increase in heart rate [55] or an increase in respiratory rate [56,57], which have been documented while wearing a mask [13,15,17,19,21–30,34,35] (Figure 2), a long-term generation of high blood pressure [25,35], arteriosclerosis and coronary heart disease and of neurological diseases is scientifically obvious [38,55–57,160]. This pathogenetic damage principle with a chronic low-dose exposure with long-term effect, which leads to disease or disease-relevant conditions, has already been extensively studied and described in many areas of environmental medicine [38,46–54]. Extended

mask-wearing would have the potential, according to the facts and correlations we have found, to cause a chronic sympathetic stress response induced by blood gas modifications and controlled by brain centers. This in turn induces and triggers immune suppression and metabolic syndrome with cardiovascular and neurological diseases.

We not only found evidence in the reviewed mask literature of potential long-term effects, but also evidence of an increase in direct short-term effects with increased mask-wearing time in terms of cumulative effects for: carbon dioxide retention, drowsiness, headache, feeling of exhaustion, skin irritation (redness, itching) and microbiological contamination (germ colonization) [19,22,37,66,68,69,89,91,92].

Overall, the exact frequency of the described symptom constellation MIES in the mask-using populace remains unclear and cannot be estimated due to insufficient data.

Theoretically, the mask-induced effects of the drop in blood gas oxygen and increase in carbon dioxide extend to the cellular level with induction of the transcription factor HIF (hypoxia-induced factor) and increased inflammatory and cancer-promoting effects [160] and can, thus, also have a negative influence on pre-existing clinical pictures.

In any case, the MIES potentially triggered by masks (Figures 3 and 4) contrasts with the WHO definition of health: “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” [178].

All the scientific facts found in our work expand the knowledge base for a differentiated view of the mask debate. This gain can be relevant for decision makers who have to deal with the issue of mandatory mask use during the pandemic under constant review of proportionality as well as for physicians who can advise their patients more appropriately on this basis. For certain diseases, taking into account the literature found in this study, it is also necessary for the attending physician to weigh up the benefits and risks with regard to a mask obligation. With an overall strictly scientific consideration, a recommendation for mask exemption can become justifiable within the framework of a medical appraisal (Figure 5).

| <b>Increased risk of adverse effects when using masks:</b>   |   |   |
|--|---|---|
| <b>Internal diseases</b><br>COPD<br>Sleep Apnea Syndrome<br>advanced renal Failure<br>Obesity<br>Cardiopulmonary Dysfunction<br>Asthma | <b>Psychiatric illness</b><br>Claustrophobia<br>Panic Disorder<br>Personality Disorders<br>Dementia<br>Schizophrenia<br>helpless Patients<br>fixed and sedated Patients | <b>Neurological Diseases</b><br>Migraines and Headache Sufferers<br>Patients with intracranial Masses<br>Epilepsy |
| <b>Pediatric Diseases</b><br>Asthma<br>Respiratory diseases<br>Cardiopulmonary Diseases<br>Neuromuscular Diseases<br>Epilepsy          | <b>ENT Diseases</b><br>Vocal Cord Disorders<br>Rhinitis and obstructive Diseases  | <b>Occupational Health Restrictions</b><br>moderate / heavy physical Work   |
|  | <b>Dermatological Diseases</b><br>Acne<br>Atopic  | <b>Gynecological restrictions</b><br>Pregnant Women   |

**Figure 5.** Diseases/predispositions with significant risks, according to the literature found, when using masks. Indications for weighing up medical mask exemption certificates.

In addition to protecting the health of their patients, doctors should also base their actions on the guiding principle of the 1948 Geneva Declaration, as revised in 2017. According to this, every doctor vows to put the health and dignity of his patient first and, even under threat, not to use his medical knowledge to violate human rights and civil liberties [9]. Within the framework of these findings, we, therefore, propagate an explicitly medically judicious, legally compliant action in consideration of scientific factual reality [2,4,5,16,130,132,143,175–177] against a predominantly assumption-led claim to a general effectiveness of masks, always taking into account possible unwanted individual ef-

fects for the patient and mask wearer concerned, entirely in accordance with the principles of evidence-based medicine and the ethical guidelines of a physician.

The results of the present literature review could help to include mask-wearing in the differential diagnostic pathophysiological cause consideration of every physician when corresponding symptoms are present (MIES, Figure 4). In this way, the physician can draw on an initial complaints catalogue that may be associated with mask-wearing (Figure 2) and also exclude certain diseases from the general mask requirement (Figure 5).

For scientists, the prospect of continued mask use in everyday life suggests areas for further research. In our view, further research is particularly desirable in the gynecological (fetal and embryonic) and pediatric fields, as children are a vulnerable group that would face the longest and, thus, most profound consequences of a potentially risky mask use. Basic research at the cellular level regarding mask-induced triggering of the transcription factor HIF with potential promotion of immunosuppression and carcinogenicity also appears to be useful under this circumstance. Our scoping review shows the need for a systematic review.

The described mask-related changes in respiratory physiology can have an adverse effect on the wearer's blood gases sub-clinically and in some cases also clinically manifest and, therefore, have a negative effect on the basis of all aerobic life, external and internal respiration, with an influence on a wide variety of organ systems and metabolic processes with physical, psychological and social consequences for the individual human being.

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Dear Sirs and Madams of the ND Legislator:

Hello, I would like to start by thanking you all for your service in government.

My name is Shaundi Meyer. I have worked in the medical field for 20 years. I feel that in my years of health care work, I have learned a lot, studied more, and always had my ears and eyes open. Wherever I worked, I took it as an opportunity to learn, and I never stopped asking questions. I was a CNA and a Doula (a birthing assistant or coach) when I lived in Oregon. I worked with Certified Nurse Midwives and OB/GYNs. There I studied homeopathy and herbal remedies. I also studied massage and aromatherapy to assist in my work as a Doula. I volunteered to work with addicted moms living in a treatment facility, mothers who had HepC, HepB, and HIV. So I am no stranger to dangerous, infectious diseases. I also completed training for phlebotomy at LCC. We then moved back home to Bismarck. I began working as a phlebotomist at Med Center 1, and continued working there during the whooping cough epidemic in 2004. I began school for Surgical Technology, but an accident in 2005 forced me to drop my courses. I had a complete fracture of my right foot-I tore through 30 ligaments, essentially breaking my foot in half. I had wanted to become a surge tech and hopefully go back to school to become a Critical Care Nurse or work in trauma. But the accident took me off my feet for eight years on and off. After ten surgeries, I was able to get back on my feet. That is when I became an employee at CHI St. Alexius in Bismarck, and have worked there for 7 1/2 years-I started as a CNA, until I injured my shoulder. For the last 6 years I have worked at the switchboard and at the Information Desk. We help a lot of patients, visitors, and staff. As of right now my job is in jeopardy, because my medical exemptions were denied. My doctor wrote both letters on formal letterhead, and included everything they had asked for. The first letter stated due to underlying medical conditions, she was advising against the vaccine. That letter was denied and they demanded a new letter, so she wrote one that said I had anaphylactic responses to the flu vaccine, and it was denied. Both letters are in their third review-every time I get denied I have two weeks to give them more information.

I have worked the frontline from the beginning of this pandemic, and have worked in high-risk exposure situations, so I am no stranger to PPE, and disease. I was told to put a mask on and screen patients and visitors. I was exposed to covid numerous times and I caught covid because CHI St. Alexius did not provide the proper eye gear that would fit over my glasses. The patient had a smokers cough and was not wearing their mask properly when I bent over to hear their question, they coughed into the side of my face-and into my eye. I was told to go to Menards and buy a pair-because they could not give me a pair like Radiology or Surgery would wear (the ones that worked over my glasses) as they claimed they did not have enough. After I came back from having covid, I called Central Supply, told the worker what happened, and I received a pair of eye protection, with a package of extra replacement plastic lenses, that worked over my glasses.

When news came out about a vaccine, my instant reaction-the vaccine would kill me. I am extremely allergic to latex and that the small amount of natural rubber latex in the cap of the vaccine vials would cause an anaphylactic reaction, as I have had before to other medications in the same vials. I was also afraid that my immune system would flare up-I have an autoimmune disorder-arthritis, and a nerve condition called CRPS or by its old name-RSD. My nervous system is in overdrive from an accident years ago, the sympathetic nerves flare up-causing severe pain, tendinitis, temperature changes, swelling, muscle spasms, immobility, and bone loss. Illnesses, stress, and pain or injury all cause flares up. Often times if I'm getting a virus or illness, my nerves and joints flare up first. My fear was that this vaccine would cause my immune system to attack itself, causing my nervous system to attack itself, or to flare up into a Guillén Barres type syndrome. And that fear was validated when I met someone who had the same nerve condition as me and her specialist out East told her not to get this vaccine-it would cause her nervous system to attack itself and shut down, or go into hyperdrive and eventually kill her.

Why do I have these fears-let me explain my other vaccine reactions, and why I believe my vaccines from my youth have caused a lot of the health problems I have now.

I have a lifetime exemption from the flu vaccine due to anaphylactic shock reactions. Although I had an anaphylactic shock response to the regular flu vaccine, I offered to try it without preservatives the next year and I reacted the same way.

When I started working as a phlebotomist at Med Center 1 (now Sanford) I was given a titer for the HepB vaccine. Although I had received this vaccine as a teenager, I had not developed the antibodies. So they gave the series of three shots to me again and we waited. We did another titer-no antibodies. Again I was administered the vaccines. This time though, I developed what they would call complex regional migraines. My co-workers at the time found me confused and lost in the back of the lab. I did not know where or who I was and I was blind in the left eye. The left side of my face was drooping and my left arm was numb. I spent the weekend in the hospital being worked up for strokes, brain tumors, and whatever else they could think to test me for. I had to deal with these “migraines” on and off for two years. When they tested me again-I still hadn’t developed the antibodies. At this time they felt it was enough, and that I probably never would develop the antibodies. Later I would find out that 5-10% of the population does not develop antibodies to vaccines. I would also discover that the symptoms I had directly after the vaccine were considered serious adverse reactions and should have been reported.

When I was six years old I received my vaccines to go to first grade. I developed a fever and a migraine so severe, I can remember it 36 years later. My grandmother gave me a baby aspirin for the fever. Within hours my hands and fingers turned purplish-blue and became so swollen that I could not move them for three days. After the swelling went down, it took weeks before my hands felt normal again, and the pain from the start of the reaction to weeks after was so horrific that I can still remember exactly how it felt today. Since then I have had a reactive type arthritis that causes fever and inflammation when I’m sick or when my body is fighting something. I was a typical tough little farm kid until I had those vaccines. After that “growing pains”, a heightened sensitivity to pain, joint issues, and fevers were a regular part of my life.

I have also felt the discrimination from co-workers, patients and visitors. Many will have no problem telling me that I’m killing them, that I’m the reason covid is still around. These patients and visitors do not know I’m unvaccinated and so it is forgivable and I ignore them, but a co-worker in another department next to where I work does know. And we used to be on the same page-she said numerous times that she agreed with me on the dangers and the mandates. That was until Friday, her supervisor came into my area, and blatantly told me I am not allowed to speak to her staff. I am not allowed to ask them for help with anything, and I will not speak to any of them about “my politics”. This supervisor has had a problem with me since she found out I was against the mandates and against this vaccine. She is nice to my co-workers, both of whom have gotten their vaccines, she jokes and laughs with them. I only get nasty comments and dirty looks from her. I have also been told to get on board with this, because this is the way the world will be. I was full time until hours were cut and I was told to find hours as a greeter/screener. As I fought to get full time hours, with no PTO(I was using it to replace the hours I was losing) I found out my co-workers-both vaccinated-are still getting full time and have 200+hours of PTO each. When the hospital stopped labor pool and bought a tablet to screen people, I was told to get my hours at my other job-while both my co-workers still have full time hours. (The cut in hours for productivity was supposed to be equal to every employee-8 hours each week). This is a complaint that I have fought with them for months now, and this week it will be time to go to HR to start a formal complaint of how I’ve been treated. And perhaps put in my notice.

These mandates are dangerous, not only because of the unknown long term affects of this vaccine, but the short-term and immediate effects are disabling and horrific. These mandates are dangerous, causing people to quit their jobs or have nervous breakdowns-fear of how they will make ends meet. These mandates are dangerous because they are taking away the right of the person to chose what is best for their body and health. These mandates are dangerous because they are a head game-a threat to get everyone to concede to vaccinations. That's what CHI did-they used their survey to get people to answer, they gave religious and medical exemptions-many were denied and got the vaccine because of fear, some of those people are very sick right now. They even developed a new committee to go over the religious exemptions because of the amount they were denying. After all of the-you were denied, we give you two weeks to get us more info, you are denied, two more weeks, denied, two more weeks-but now all of those that got denied can self-test. It is maddening-the back and forth was enough stress to make me physically sick-my health conditions have flared up, and on top of it I'm fighting an ulcer due to all the stress. My job started to become a hostile work environment when this pandemic started-the number of death threats, the incidents of verbal, physical, and emotional abuse that I have dealt with because of the rules of masking and visitation have been astronomical. But today, in my own opinion, my workplace-with the staffing shortages, and with all the traumas and hostilities over the year-it's much worse than a hostile work place. It is not a hospital that receives all as Christ, instead it favors the vaccinated. And has made it apparent that those who fear the vaccine do not get to have a voice.

And finally these mandates are dangerous because if the government can force an experimental, dangerous medicine into its constituents, what is stopping it from complete tyranny? It is not the job of the government to decide what should be decided between a doctor and a patient. Please consider this in your voting today. If vaccines can harm me this much, and the injuries I have seen-what could happen to you, to your loved one, to your child if the vaccine is forced upon them? I pray those that got the vaccine have no side effects, no adverse reactions, and I pray that they understand why I would not want to risk my health or my family's wellbeing for an experimental shot.

My prayers are with you all, and I pray that our voices-the voices of your constituents would be heard. We do not want these mandates, and after all of the months that we spent taking care of the sick, all of the families that I escorted to the rooms of dying patients, all the people I comforted and gave love too, it was not for nothing, it was what I, what we were called to do, to step up and love and care for the sick. And for the last almost two years we all did it without an experimental vaccine, we did not kill anyone, we only accepted all as Christ-we did our job as healthcare workers, and we did it well. Often times on little sleep and without breaks, with fear in the back of our minds-for our own families and loved ones. But we still did it and are still willing too-if we are allowed too.

In Christ,  
Shaundi Marie Meyer proud North Dakota and Patriot Mama

November 9, 2021

**FMWF Chamber Opposition to HB 1510**

Chairman Weisz, Chairwoman Lee, and members of the Joint Technical Corrections Committee,

For the record, my name is Katherine Grindberg and I serve as the Vice President of Public Policy for the Fargo Moorhead West Fargo (FMWF) Chamber of Commerce. The Chamber's mission is to be a catalyst for economic growth and prosperity for businesses, members, and the greater community. Today, on behalf of our over 1,900 members, I offer testimony in opposition to House Bill 1510 as written.

We realize there is an appetite to advance legislation related to COVID-19 vaccinations, among other topics, and strongly urge that business flexibility is prioritized and federal compliance is recognized.

Section one includes language making it unlawful for an employer to refuse employment to an individual based on their vaccination status. The federal mandate for businesses with over 100 employees is to develop, implement, and enforce a mandatory COVID-19 vaccine or allow employees to elect to undergo weekly COVID-19 testing and wear a face covering at the workplace. The federal contractor rule, however, doesn't allow for the testing option. For those with federal contracts, this is a concerning inconsistency, as this bill would seem to subject businesses to liability for discrimination for terminating or not hiring someone who refuses vaccination, which is contrarily required by law. Penalizing employers for complying with federal law is not a fair practice. Additional exemption language regarding a federal law, rule, or guidance is necessary.

The Chamber opposes any legislation that doesn't respect this business flexibility or creates inconsistency with federal compliance. Thus, I respectfully ask this committee to recommend a DO NOT PASS to House Bill 1510 as written.

Thank you for your time and consideration, I will now stand for any questions from the committee.

Respectfully,





**THE CHAMBER**  
FARGO MOORHEAD WEST FARGO

Katherine Grindberg

Vice President of Public Policy

FMWF Chamber of Commerce

[kgrindberg@fmwfchamber.com](mailto:kgrindberg@fmwfchamber.com) | 701.516.2114

# 12039

Comments on House Bill 1510

Dan Reisenauer

9Nov2021

I fully support prohibiting discrimination of a person based on inoculation status. Requiring a person to test periodically or wear a mask to retain their job because they chose to not inoculate is COERCION.

Discrimination and coercion should be illegal.

Studies are showing natural immunity is longer lasting and more effective than the available Covid-19 inoculations. Why would we mandate an inoculation for those who have natural immunity? Furthermore, there are no long-term studies showing the effects for people who have had long term immunity and have later taken a Covid-19 inoculation.

People with Covid-19 inoculations are still getting sick and dying from Covid-19. This shows the ineffectiveness of the inoculations. Reinfection rates for people with natural immunity is much lower than those with Covid-19 inoculations.

Covid-19 inoculation must not be required for children to attend school. My children will NOT take this inoculation regardless of any law. The risk of injury due to Covid-19 inoculation statistically poses a greater risk to children than Covid-19.

Covid-19 inoculation in its currently available form (which is NOT FDA approved) must not be a requirement for employment at ANY job including hospitals and long term care facilities for the following reasons:

- An FDA approved version is not available.
- The Pfizer-BioNTech inoculation which is available is not the same the FDA approved and unavailable Comirnaty because the available inoculation has liability protection.
- Pfizer will make more than \$30 Billion in profit while people injured from the inoculation have no recourse. The drug manufacturers need to be held accountable for pushing a product if it has defects.
- Long term testing of the effectiveness of any Covid-19 inoculation is HAS NOT completed long term clinical studies and won't finish until 2023.
- Long term testing on mRNA inoculations on humans has never been completed – anyone saying otherwise is lying.
- Covid-19 inoculations aren't safe for all people and our health industries haven't identified who's at risk and why.
- It should be illegal to discriminate against people who won't take the Covid-19 inoculation due to health reasons.

I personally know people who have injuries attributed to Covid-19 inoculations with injuries including:

- Blood clots
- Bell's Palsy
- Menstrual problems

In all cases physicians dismissed the possibility of correlation with a Covid-19 inoculation. Something is very wrong with these mRNA inoculations, and everyone is trained to look the other way. Its's time to pause and demand the CDC, FDA, Hospitals, and drug companies to disclose any financial incentives in play and stop pushing and start being transparent so we can be certain this drug push is not causing long-term harm.

Please rewrite this bill so ALL people can be excluded from discrimination or coercion related to Covid-19 inoculations regardless of their place of employment or type of work, at least until there are FDA approved versions of the inoculation available that don't give liability protections to the drug makers.

I am submitting testimony for HB 1510.

To discriminate and limit the ability to travel, enter a business, obtain employment, etc. based on a person's vaccination (or even immunity based on antibodies obtained naturally) status is wrong.

In a nation that is stressing unity and love for one another now more than ever, this divides us even further than we already are. It creates even more judgement, strain and division.

Everyone has their own unique story and health. We are all unique, precious human beings that deserve to be treated as such.

I recognize that COVID-19 and other illnesses are serious and can be deadly especially to vulnerable populations. However, rather than encouraging a label proving 'status', we should be encouraging one another and supporting one another in how we can make health choices that are best for ourselves based on our individuality, whether or not a person chooses to be vaccinated. We need to look at REAL, UNBIASED research to determine the best and healthiest ways to nourish our bodies and souls so we can be more resilient mentally and physically to pathogens, toxins, etc. There is not a one size fits all approach. Requiring proof that a person is or isn't immune to COVID-19 isn't going to solve the health crisis magically. On paper and in real life, this is NOT an ethical approach to making us healthier OR making us feel like loved, individual human beings.

PLEASE, do NOT allow discrimination based on immune status (whether naturally acquired or by vaccination).

Dear Representatives,

In regards to technical corrections to be made to HB150, please consider this:

Allowing further discrimination of people who are unvaccinated by allowing the requirement of masks, routine testing, etc. to be imposed is NOT acceptable. This is still discrimination based on an individual's vaccination status. HB1510 Section 14-02.7-03 b - "reasonable accommodations" must be further defined. Considering an employee nonvaccinated because they choose not to disclose their personal medical status, does NOT protect the individual's fundamental right to choose how to care for their own body. If a vaccinated person can still be infected and can still transmit the disease for which it is created, then a vaccinated person and a nonvaccinated person should NOT be treated differently in any circumstance. If they are, that is blatant discrimination. Please read the data sheets and informational inserts for vaccines; they do not gurarantee full immunity, ever.

Per the Vaccine Adverse Event Reporting System, as of October 29, 2021 there have been 18,078 deaths caused by the COVID vaccines alone. In total, there are 856,917 reports of life altering effects caused by these vaccines. I encourage you to read the reports yourself: <https://openvaers.com/covid-data> There are significant and obvious risks. Where there is risk, there MUST be choice. A person does not have full freedom of choice until they are allowed to do so without having to accept further ramifications.

I expect that you will fully consider these statements as you make corrections to this bill and any other bill that addresses the issue of vaccine mandates for North Dakotans.

Thank you,

Megan Milbradt

# 2021 JOINT STANDING COMMITTEE MINUTES

## Technical Corrections Committee Pioneer Room, State Capitol

HB 1510  
11/11/2021  
PM

A BILL for an Act to create and enact chapter 14-02.7 of the North Dakota Century Code, relating to discrimination based on vaccination status or possession of an immunity passport; to amend and reenact section 23-07-17.1 of the North Dakota Century Code, relating to childhood immunizations; and to provide an effective date.

Co-Chair Weisz called the hearing to order, Vice Chair Porter, Representative Dockter, Richter, Louser, O'Brian, Roers Jones, Hanson Co-Chair J. Lee, Vice Chair Patten, Senators H. Anderson, Schaible, Dwyer, Kannianen, Vedaa, Bakke, present [4:37]

### Discussion Topics:

- Exempt healthcare
- Vaccination Exemptions
- Antibodies and natural immunities
- Moral and philosophical exemptions

**Representative Paulson** provided testimony and submitted an amendment #21.1082.03005 #12254 and 12255 [4:38]

**Representative Roers Jones** moved DO NOT PASS [4:45]

**Senator Lee** seconds

**Co-Chair Weisz** laid aside HB 1510 until after HB1511 is finished [4:47]

**Co-Chair Weisz** took up HB 1510 again for roll call vote [5:30]

| <b>Senators</b>          | <b>Vote</b> |
|--------------------------|-------------|
| Chair Judy Lee           | Y           |
| Vice Chair Dale Patten   | Y           |
| Senator Howard Anderson  | Y           |
| Senator Donald Schaible  | Y           |
| Senator Michael Dwyer    | Y           |
| Senator Jordon Kannianen | Y           |
| Senator Shawn Vedaa      | Y           |
| Senator JoNell Bakke     | Y           |
| <b>Representatives</b>   |             |
| Chair Robin Weisz        | Y           |

|                                    |   |
|------------------------------------|---|
| Vice Chair Todd Porter             | Y |
| Representative Jason Dockter       | Y |
| Representative David Richter       | Y |
| Representative Scott Louser        | Y |
| Representative Emily O'Brien       | Y |
| Representative Shannon Roers Jones | Y |
| Representative Karla Rose Hanson   | Y |

Motion carries 16-0-0

**Senator Dwyer** and **Representative Porter** carries

**Co-Chair Weisz** adjourned the hearing [5:31]

*Sheldon Wolf, Committee Clerk*

**REPORT OF STANDING COMMITTEE**

**HB 1510: Joint Technical Corrections Committee (Rep. Weisz, Co-Chairman)**  
recommends **DO NOT PASS** (16 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING).  
HB 1510 was placed on the Eleventh order on the calendar.



**REPORT OF STANDING COMMITTEE**

**HB 1510: Joint Technical Corrections Committee (Sen. Lee, Co-Chairman)**  
recommends **DO NOT PASS** (16 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING).  
HB 1510 was placed on the Fourteenth order on the calendar.

21.1082.03005

Sixty-seventh  
Legislative Assembly  
of North Dakota

HOUSE BILL NO. 1510

Introduced by

Representatives Paulson, Meier, Steiner, Thomas

Senators Clemens, Lemm, Luick

(Approved by the Delayed Bills Committee)

1 A BILL for an Act to create and enact chapter 14-02.7 of the North Dakota Century Code,  
2 relating to discrimination based on vaccination status or possession of an immunity passport;~~to~~  
3 ~~amend and reenact section 23-07-47.4 of the North Dakota Century Code, relating to childhood~~  
4 ~~immunizations~~; and to provide an effective date.

5 **BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:**

6 **SECTION 1.** Chapter 14-02.7 of the North Dakota Century Code is created and enacted as  
7 follows:

8 **14-02.7-01. Definitions.**

9 As used in this chapter:

- 10 1. "Department" means the division of human rights within the department of labor and  
11 human rights.
- 12 2. "Employee" means an individual who performs services for an employer, who employs  
13 one or more individuals, for compensation, whether in the form of wages, salaries,  
14 commission, or otherwise. The term does not include an individual elected to public  
15 office in the state or political subdivision by the qualified voters thereof, or an individual  
16 chosen by the officer to be on the officer's political staff, or an appointee on the  
17 policymaking level or an immediate adviser with respect to the exercise of the  
18 constitutional or legal powers of the office. However, the term does include an  
19 individual subject to the civil service or merit system or civil service laws of the state  
20 government, governmental agency, or a political subdivision.
- 21 3. "Employer" means a person within the state which employs one or more employees  
22 for more than one quarter of the year and a person wherever situated which employs  
23 one or more employees whose services are to be partially or wholly performed in the  
24 state.

- 1       4. "Immunity passport" means a document, digital record, or software application  
2       indicating an individual is immune to a disease, either through vaccination or through  
3       infection and recovery.
- 4       5. "Public accommodation" means every place, establishment, or facility of whatever  
5       kind, nature, or class which caters or offers services, facilities, or goods to the general  
6       public for a fee, charge, or gratuity. The term does not include a bona fide private club  
7       or other place, establishment, or facility that is by its nature distinctly private; provided,  
8       however, the distinctly private place, establishment, or facility is a "public  
9       accommodation" during the period it caters or offers services, facilities, or goods to the  
10       general public for a fee, charge, or gratuity.
- 11       6. "Reasonable accommodations" means accommodations by an employer which do not:  
12       a. Unduly disrupt or interfere with the employer's normal operations;  
13       b. Threaten the health or safety of the individual seeking reasonable  
14       accommodations or others;  
15       c. Contradict a business necessity of the employer; or  
16       d. Impose undue hardship on the employer, based on the size of the employer's  
17       business, the type of business, the financial resources of the employer, and the  
18       estimated cost and extent of the accommodations.
- 19       7. "Vaccination status" means an indication of whether an individual has received one or  
20       more doses of a vaccine.

21       **14-02.7-02. Discrimination based on vaccination status or possession of immunity**  
22       **passport prohibited.**

23       Except as otherwise provided in section 14-02.7-03, it is an unlawful discriminatory practice  
24       for:

- 25       1. A person to refuse, withhold from, or deny to an individual any local or state services,  
26       goods, facilities, advantages, privileges, licensing, educational opportunities, health  
27       care access, or employment opportunities based on the individual's vaccination status  
28       or whether the individual has an immunity passport.
- 29       2. An employer to refuse employment to an individual, to bar an individual from  
30       employment, or to discriminate against an individual in compensation or in a term.

1 condition, or privilege of employment based on the individual's vaccination status or  
2 whether the individual has an immunity passport.

3 3. A public accommodation to exclude, limit, segregate, refuse to serve, or otherwise  
4 discriminate against an individual based on the individual's vaccination status or  
5 whether the individual has an immunity passport.

6 **14-02.7-03. Exceptions.**

7 1. Section 14-02.7-02 does not apply to a vaccination requirement provided under  
8 section 15.1-23-02 or 23-07-17.1.

9 2. It is not a violation of section 14-02.7-02 for a:

10 a. Person to recommend an employee receive a vaccine.

11 b. Health care facility to ask an employee to volunteer the employee's vaccination or  
12 immunization status if the inquiry is for the purpose of determining whether the  
13 health care facility should implement reasonable accommodations to protect the  
14 safety and health of employees, patients, visitors, and other individuals from  
15 communicable diseases. The health care facility may implement reasonable  
16 accommodations for employees, patients, visitors, and other individuals who are  
17 not vaccinated or not immune to protect the safety and health of employees,  
18 patients, visitors, and other individuals from communicable diseases. The health  
19 care facility may consider an employee to be nonvaccinated or nonimmune if the  
20 employee declines to provide the employee's vaccination or immunization status  
21 to the health care facility for purposes of determining whether reasonable  
22 accommodations should be implemented.

23 3. A health care facility or a licensed nursing home, long-term care facility, basic care  
24 facility, or assisted living facility is exempt from compliance with section 14-02.7-02  
25 during any period of time for which compliance would result in a violation of federal law  
26 addressing Medicare or Medicaid or in a violation of regulations or guidance issued by  
27 the centers for Medicare and Medicaid services. If a facility in this state requires an  
28 individual to be vaccinated under this subsection:

29 a. The facility shall allow the individual to submit proof of applicable antibodies as  
30 an exemption to the vaccination requirement. Such proof is valid for twelve  
31 months from the date of the antibody test.



1 b. The facility shall allow the individual to submit one of the following certificates as  
2 an exemption to the vaccination requirement:

3 (1) A certificate from a licensed physician stating the physical condition of the  
4 individual is such that immunization would endanger the life or health of the  
5 individual; or

6 (2) A certificate signed by the individual stating the individual's religious beliefs  
7 are opposed to such immunization.

8 **14-02.7-04. Investigations - Retaliation prohibited - Actions - Relief - Records.**

9 The department shall receive and investigate complaints alleging violations of this chapter  
10 in the same manner as provided under section 14-02.4-22. Additionally, sections 14-02.4-18,  
11 14-02.4-19, 14-02.4-20, and 14-02.4-21, regarding retaliation, civil actions, relief, and exempt  
12 records apply to this chapter.

13 ~~— **SECTION 2. AMENDMENT.** Section 23-07-17.1 of the North Dakota Century Code is~~  
14 ~~amended and reenacted as follows:~~

15 ~~— **23-07-17.1. Inoculation required before admission to school. (Effective through**~~  
16 ~~**August 31, 2022)**~~

17 ~~— 1. A child may not be admitted to any public, private, or parochial school, or day care~~  
18 ~~center, child care facility, head start program, or nursery school operating in this state~~  
19 ~~or be supervised through home based instruction unless the child's parent or guardian~~  
20 ~~presents to the institution authorities a certification from a licensed physician or~~  
21 ~~authorized representative of the state department of health that the child has received~~  
22 ~~age appropriate immunization against diphtheria, pertussis, tetanus, measles, rubella~~  
23 ~~(German measles), mumps, hepatitis B, haemophilus influenza type b (Hib), varicella~~  
24 ~~(chickenpox), poliomyelitis, pneumococcal disease, meningococcal disease, rotovirus,~~  
25 ~~and hepatitis A. Under this section, a required age appropriate immunization does not~~  
26 ~~include an immunization against severe acute respiratory syndrome coronavirus 2~~  
27 ~~identified as SARS-CoV-2 or any mutation or viral fragments of SARS-CoV-2. In the~~  
28 ~~ease of a child receiving home based instruction, the child's parent or legal guardian~~  
29 ~~shall file the certification with the public school district in which the child resides.~~

30 ~~— 2. A child may enter an institution upon submitting written proof from a licensed physician~~  
31 ~~or authorized representative of the state department of health stating that the child has~~

- 1           ~~started receiving the required immunization or has a written consent by the child's~~  
2           ~~parent or guardian for a local health service or department to administer the needed~~  
3           ~~immunization without charge or has complied with the requirements for certificate of~~  
4           ~~exemption as provided for in subsection 3.~~
- 5     ~~3. Any minor child, through the child's parent or guardian, may submit to the institution-~~  
6           ~~authorities either a certificate from a licensed physician stating that the physical~~  
7           ~~condition of the child is such that immunization would endanger the life or health of the~~  
8           ~~child or a certificate signed by the child's parent or guardian whose religious,~~  
9           ~~philosophical, or moral beliefs are opposed to such immunization. The minor child is~~  
10          ~~then exempt from the provisions of this section.~~
- 11     ~~4. The enforcement of subsections 1, 2, and 3 is the responsibility of the designated~~  
12          ~~institution authority.~~
- 13     ~~5. The immunizations required, and the procedure for their administration, as prescribed~~  
14          ~~by the state department of health, must conform to recognized standard medical~~  
15          ~~practices in the state. The state department of health shall administer the provisions of~~  
16          ~~this section and shall promulgate rules and regulations in the manner prescribed by~~  
17          ~~chapter 28-32 for the purpose of administering this section.~~
- 18     ~~6. When, in the opinion of the health officer, danger of an epidemic exists from any of the~~  
19          ~~communicable diseases for which immunization is required under this section, the~~  
20          ~~exemptions from immunization against such disease may not be recognized and~~  
21          ~~children not immunized must be excluded from an institution listed in subsection 1~~  
22          ~~until, in the opinion of the health officer, the danger of the epidemic is over. The~~  
23          ~~designated institution authority shall notify those parents or guardians taking legal~~  
24          ~~exception to the immunization requirements that their children are excluded from~~  
25          ~~school during an epidemic as determined by the state department of health.~~
- 26     ~~7. When, in the opinion of the health officer, extenuating circumstances make it difficult or~~  
27          ~~impossible to comply with immunization requirements, the health officer may authorize~~  
28          ~~children who are not immunized to be admitted to an institution listed in subsection 1~~  
29          ~~until the health officer determines that the extenuating circumstances no longer exist.~~  
30          ~~Extenuating circumstances include a shortage of vaccine and other temporary~~  
31          ~~circumstances.~~



~~— Inoculation required before admission to school. (Effective after August 31, 2022)~~

~~1. A child may not be admitted to any public, private, or parochial school, or day care center, child care facility, head start program, or nursery school operating in this state or be supervised through home based instruction unless the child's parent or guardian presents to the institution authorities a certification from a licensed physician or authorized representative of the department of health and human services that the child has received age appropriate immunization against diphtheria, pertussis, tetanus, measles, rubella (German measles), mumps, hepatitis B, haemophilus influenza type b (Hib), varicella (chickenpox), poliomyelitis, pneumococcal disease, meningococcal disease, rotavirus, and hepatitis A. Under this section, a required age appropriate immunization does not include an immunization against severe acute respiratory syndrome coronavirus 2 identified as SARS-CoV-2 or any mutation or viral fragments of SARS-CoV-2. In the case of a child receiving home based instruction, the child's parent or legal guardian shall file the certification with the public school district in which the child resides.~~

~~2. A child may enter an institution upon submitting written proof from a licensed physician or authorized representative of the department of health and human services stating that the child has started receiving the required immunization or has a written consent by the child's parent or guardian for a local health service or department to administer the needed immunization without charge or has complied with the requirements for certificate of exemption as provided for in subsection 3.~~

~~3. Any minor child, through the child's parent or guardian, may submit to the institution authorities either a certificate from a licensed physician stating that the physical condition of the child is such that immunization would endanger the life or health of the child or a certificate signed by the child's parent or guardian whose religious, philosophical, or moral beliefs are opposed to such immunization. The minor child is then exempt from the provisions of this section.~~

~~4. The enforcement of subsections 1, 2, and 3 is the responsibility of the designated institution authority.~~

~~5. The immunizations required, and the procedure for their administration, as prescribed by the department of health and human services, must conform to recognized~~

1           ~~standard medical practices in the state. The department of health and human services~~  
2           ~~shall administer the provisions of this section and shall promulgate rules and~~  
3           ~~regulations in the manner prescribed by chapter 28-32 for the purpose of~~  
4           ~~administering this section.~~

5     ~~6. When, in the opinion of the health officer, danger of an epidemic exists from any of the~~  
6           ~~communicable diseases for which immunization is required under this section, the~~  
7           ~~exemptions from immunization against such disease may not be recognized and~~  
8           ~~children not immunized must be excluded from an institution listed in subsection 1~~  
9           ~~until, in the opinion of the health officer, the danger of the epidemic is over. The~~  
10          ~~designated institution authority shall notify those parents or guardians taking legal~~  
11          ~~exception to the immunization requirements that their children are excluded from~~  
12          ~~school during an epidemic as determined by the department of health and human~~  
13          ~~services.~~

14     ~~7. When, in the opinion of the health officer, extenuating circumstances make it difficult or~~  
15          ~~impossible to comply with immunization requirements, the health officer may authorize~~  
16          ~~children who are not immunized to be admitted to an institution listed in subsection 1~~  
17          ~~until the health officer determines that the extenuating circumstances no longer exist.~~  
18          ~~Extenuating circumstances include a shortage of vaccine and other temporary~~  
19          ~~circumstances.~~

20           **SECTION 2. EFFECTIVE DATE.** This Act becomes effective upon its filing with the  
21   secretary of state.



21.1082.03005  
Title.

Prepared by the Legislative Council staff for  
Representative Paulson  
November 10, 2021

PROPOSED AMENDMENTS TO HOUSE BILL NO. 1510

Page 1, line 2, remove "; to"

Page 1, remove line 3

Page 1, line 4, remove "immunizations"

Page 3, line 23, after "A" insert "health care facility or a"

Page 3, line 25, after "of" insert "federal law addressing Medicare or Medicaid or in a violation of"

Page 3, line 26, after the underscored period insert "If a facility in this state requires an individual to be vaccinated under this subsection:"

- a. The facility shall allow the individual to submit proof of applicable antibodies as an exemption to the vaccination requirement. Such proof is valid for twelve months from the date of the antibody test.
- b. The facility shall allow the individual to submit one of the following certificates as an exemption to the vaccination requirement:
  - (1) A certificate from a licensed physician stating the physical condition of the individual is such that immunization would endanger the life or health of the individual; or
  - (2) A certificate signed by the individual stating the individual's religious beliefs are opposed to such immunization."

Page 4, remove lines 1 through 31

Page 5, remove lines 1 through 31

Page 6, remove lines 1 through 30

Page 7, remove lines 1 through 8

Renumber accordingly