Courts, Governments, Railway Board, Listen Up Everyone:

Description

Wearing masks is harmful to health – a new meta-analysis of a total of 37 studies proves this

Just in time for Christmas, the working group led by Kai Kisielinski and Andreas Sönnichsen has made a meta-analysis available on the preprint server Research Square [1] that clearly proves that mask-wearing has harmful health effects. You should take this into account, dear judges, dear members of governments, regulatory authorities, school administrators, responsible persons at the railways, if you continue to make the wearing of masks compulsory. Because you make yourself liable to prosecution for bodily harm. The meta-analysis shows: *in all studied parameters, which are physiological indicators of health exposure, the wearing of face masks leads to relatively large, significant and harmful effects.*

The wearing of masks became an apotropaic sign [i], that is, an evil-avoiding ritual in times of Corona. It was thought to banish the virus and do something good for the people. Mask-wearing is undoubtedly a ritual of self-efficacy, as I have already explained in detail in my blog on the MWGFD mask symposium report and my mask blog in October. But it is one that comes at a high cost.

These costs are now clearly named and quantified by this meta-analysis. Andreas Sönnichsen had already presented it at the MWGFD's Mask Symposium. After an extensive literature search, the meta-analysis included 54 studies in the review, of which 37 studies were available for a quantitative summary. Before I get to the results, a few *methodological explanations* follow for those readers who are less familiar with the relevant terminology. I have discussed the methodology of meta-analyses in more detail on my methodology blog.

Methodological explanations of the meta-analysis

A **systematic review** is a summary of studies that are already available. It differs from a narrative or non-systematic review primarily in that the search strategy for studies is clearly defined and can thus be reproduced at any time or extended later. A narrative review is what I produced: a summary of important findings that does not necessarily pull all the information together, but pulls the important and methodologically more reliable ones, and gives them weight.

A **meta-analysis** is a quantitative, statistical summary of studies. The idea behind it is simple: individual studies often have unclear results or contradict each other. This may be because they included different numbers of people, because of random error, because a study made a systematic error, and much more. Therefore, a quantitative summary of all studies is always safer and more robust than using only one or a few studies. This is the reason why meta-analyses are at the top of the methodological hierarchy of "Evidence Based Medicine". Because their results are more reliable, at least as a rule and most of the time. There is a long-standing professional discussion about whether single, large and good studies would be better. But in most cases, criticism can be levelled against studies, no matter how large and good they are, which then gives rise to further studies, and so on. Meta-analyses that provide a summary are definitely useful from a pragmatic point of view, even if they rarely put an end to a discussion once and for all. After all, further studies can be added. However, if most studies point in the same direction, the likelihood that a new study will reverse everything is smaller the more studies previously point in one direction. And that is indeed the case here from my point of view.

Adverse effects of mask-wearing – The results of meta-analysis

This meta-analysis summarized studies that measured physiological values when wearing face masks. These values provide information about possible physiological impairment and also symptoms. The metric the authors chose is the so-called standardized mean difference ("smd" or "d" for short). This is a metric that allows comparison of effects across studies. I explained this in my methods blog on meta-analysis, so I will be brief here. This metric expresses in the units of one standard deviation of the standard normal distribution, i.e. dimensionless, how large a difference or effect is in some quantity compared to a control condition.

For estimation purposes, one can remember the following. I also give the so-called "number needed to treat" (NNT), which is the number of people you need to treat to see an effect (as well as published by Kraemer and Kupfer in 2006 [2]):

d < 0.3: about one-third standard deviation difference, small effect; NNT: about 6

d > 0.3 and < 0.6: medium effect; NNT: 3-5

d > 0.6: large effect: NNT < 3

With this information, we are equipped to understand the meta-analysis data. I report the results in the table below. All effect sizes are highly significant, so I will spare you this information. Positive signs indicate an increase, negative signs a decrease in the corresponding value. The first part of the table shows objectively measured variables. This is followed by subjective information on symptoms and complaints, and finally by a compilation of the occurrence or frequency of symptoms. The first is the result of objective measurements. The second is the result of recording lists of complaints in groups with and without masks. The third is the result of diagnostic observations.

Variable	Effect size d	Difference FFP2 & OP mask, comment

Objective measurements		
Blood oxygen saturation	-0. 24	Lower under FFP2
Breathing minute volume	-0.72	Lower under FFP2
Blood carbon dioxide content	0. 64	Higher under FFP2
Heart rate	0.22	Only under FFP2
Syst. blood pressure	0.17	0.21 under surgical mask
Breath rate	0. 01	Very heterogeneous; varies between d = -0.72 and d = 0.68 depending on study
Skin temperature under mask	0.80	Higher under OP mask, only 2 studies
Humidity under mask	2. 24	Only 2 studies
Symptoms and sensations		
Awkward sensation	1.16	More under FFP2
Effort	0. 90	More under FFP2
Itching	2.65	Significant only under FFP2, only 2 studies
Shortness of breath	1. 46	
Symptom frequency		These are averaged frequency data across studies that collected symptoms
Headache	62%	
Acne	38%	
Skin irritation	36%	
Heat sensation	26%	
Itching	26%	
Voice problems	23%	
Dizziness	5%	

Interestingly, 20 of these studies date from before 2020, which means a lot could have been known earlier. But at least we know it now. What's more, it's interesting that we have little to counter these studies on the possible side effects of mask-wearing as far as the usefulness of masks is concerned.

The authors mention in the introduction that the usefulness of face masks for preventing bacterial infections is beyond doubt. But for viral infections, the evidence is poor. This is because the mesh size of about one micrometre in the smallest case, more likely 5 micrometres or more, is not adequate to keep out viral particles of 300 to 500 nanometres or aerosols of 1 micrometre in diameter. This has been pointed out before. The data showing a positive effect against the transmission of viral infections is therefore conceivably poor. I had already mentioned this in my blogs mentioned above.

I also find the strong effects of skin warming and moisture increase under the mask interesting. This is because this can lead to increased growth of bacteria and fungi in the mask and increased rebreathing of harmful germs. This is an often neglected potential mechanism for additional damage. Apart from that, even this meta-analysis, the authors themselves say, cannot address an important problem – the inhalation of harmful particles – because there is too little data on it.

Between 2020 and 2022, the publication of this paper, there have been just 2 randomized trials of the effectiveness of masks in preventing SARS-CoV-2 infections. One was without clear evidence [3], one provided

weak evidence with many question marks [4]. The authors cite a Bayesian meta-analysis of the efficacy of these two studies. This yields an unconvincing median posterior risk **[ii]**, i.e. a risk measure one has after knowing these data, of 0.91. The 95% confidence interval of this estimate is huge, ranging from 0.63 to 1.33, yielding a 73% probability of a small benefit with extremely limited data. In plain English, wearing masks gives a median advantage of 9% (the true value could be between 37% advantage and 33% disadvantage). This is a tiny effect for which we have extremely poor data.

Now, however, through this meta-analysis, we have very good data for the harm. Therefore, the basic principle of medical (and other) ethics applies here: *Primum nil nocere – first do no harm.*

This principle, dear judges, dear federal government, dear regulatory agencies, dear railway board, dear school boards, this principle has been disregarded in this Corona crisis from the very beginning. And it could have been known before 2020. Now we know it for sure. Therefore, the mischief of masquerading should be stopped as soon as possible, except perhaps at carnival. Because permanent carnival is not funny either.

Sources and literature

1. Kisielinski K, Hirsch O, Wagner S, Wojtasik B, Funken S, Klosterhalfen B, et al. Physio-metabolic and clinical consequences of wearing face masks -Systematic review with meta-analysis and comprehensive evaluation, PREPRINT (Version 1). Research Square. 2022;(22 December 2022,). doi: https://doi.org/10.21203/rs.3.rs-2394501/v1.
2. Kraemer HC, Kupfer DJ. Size of treatment effects and their importance to clinical research and practice. Biological Psychiatry. 2006;59:990-6.
3. Bundgaard H, Bundgaard JS, Raaschou-Pedersen DET, von Buchwald C, Todsen T, Norsk JB, et al. Effectiveness of Adding a Mask Recommendation to Other Public Health Measures to Prevent SARS-CoV-2 Infection in Danish Mask Wearers. Annals of Internal Medicine. 2020;174(3):335-43. doi: https://doi.org/10.7326/M20-6817.
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Footnotes

back [i] Apotropaic signs are magical, ancient signs to avert evil, such as the heads of the defeated that the Celts used to hang outside their settlements or certain amulets to avert the evil eye. The last traces of such heads can often still be found in the bas-reliefs of Romanesque cathedrals. Such apotropaic signs in postmodernity make it clear how little modern we actually are. The word comes from the Greek apotropein – to turn away.
It seems that Dr Agnes Imhof recognized the connection that masks are apotropaic signs in the corona crisis before I did and explained this in two articles: Berliner Zeitung and tkp.at
It is usually a sign that a fact is true when different people from different directions have the same insights.

back [ii] A Bayesian meta-analysis is a meta-analysis that follows Bayesian statistics. The commonly used Fisher's or frequentist statistics is a special case of Bayesian. While ordinary Fisherian statistics assumes that we know nothing and sees a study as a decision about our not knowing, Bayesian statistics assumes that we usually have some prior knowledge, the so-called "prior probability", or "priors" for short, i.e. the initial probability we have before we do a study. Once we have done a study, we have the possibility, based on the study result, to

adjust this “prior probability” and convert it into an empirically obtained “posterior probability”. The Bayes’ theorem tells us exactly how to do this. What we then end up with are the “posteriors”, i.e. the probability that follows a trial. I elaborated on this in my blog on the Bayesian attitude. Based on our initial probability, a study result then has a greater or lesser impact on our opinion.

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