Adverse Collateral Effects From Wearing Facemasks: >90 Studies Note: This list is by no means exhaustive. Many studies cover multiple topics and so appear in more than one column. Studies in bold are particularly noteworthy in that category.

Respiratory/Cardiovascular Burden Dyspnea, decreased oxygen, increased carbon dioxide, increased respiratory rate, increased airflow resistance, increased blood pressure, and increased heart rate. son, E., et al., [Effect of a surgical mask on six minute walking distance]. Rev Mal Respir, 2018. 35(3): p. 264-26 carano. A., et al., P

Chart Annotated from: Lässing, J., et al., Effects of surgical face masks on cardiopulmonary parameters during steady state exercise. Sci Rep, 2020. 10(1): p. 22363. Control Surgical

		(no mask)	Mask	
		Со	SM	p-value
Forced Expiratory Volume	FEV ₁ (l)	4.66 ± 0.61	4.18 ± 0.69	< 0.01*
Peak Expiratory Flow	PEF (l s ⁻¹)	9.50 ± 1.19	8.07 ± 1.25	< 0.01*
Airway Resistance	R _{AW} (kPa l⁻1)	0.32 ± 0.08	0.58 ± 0.16	< 0.01*
Vital Capacity	VC (l)	6.00 ± 0.72	5.65 ± 0.65	< 0.01*

Valach H et al. Carbon dioxide rises beyond acceptable safety levels in children under nose and mouth covering: Resu

Table 1. Results of body plethysmography. The values are given as means and standard deviations. Co control; SM surgical mask; FEV1 forced expiratory volume in 1 s; PEF peak expiratory flow; RAW airway resistance; VC vital capacity; n_p^2 partial eta-squared. *Significant differences from the control.

Forced Expiratory Volume, Peak Expiratory Flow, and Vital Capacity all experienced significant decline with Surgical mask use while Airway resistance increased.

	Со	SM	p-value	n ² p	DIET
Pulmonary parameters					
$VO_2(ml min^{-1} kg^{-1})$	34.49 ± 5.79	33.05 ± 4.96	0.04*	0.31	44.79 ± 9.12
VCO₂ (ml min ^{−1})	2685 ± 278	2575 ± 310	0.04*	0.30	3958 ± 560
V _E (1 min ⁻¹)	82.42 ± 10.66	77.05 ± 9.26	< 0.01*	0.61	141.83±22.73
$V_E/\dot{V}O_2 (l \min^{-1}/l \min^{-1})$	29.34 ± 4.41	28.50 ± 3.42	0.19	0.14	38.75 ± 7.12
$V_E/\dot{V}CO_2 (l \min^{-1}/l \min^{-1})$	30.80±3.81	30.01±3.33	0.26	0.10	35.90±3.87
V॑ _A (l min ^{−1})	60.88 ± 7.48	57.38±6.55	0.01*	0.42	102,65±17,71
T _i (s)	0.89 ± 0.14	1.01 ± 0.13	< 0.01*	0.73	0.63±0.11
T _e (s)	0.98 ± 0.21	0.95 ± 0.17	0.14	0.17	0.66±0.17
V _T (l)	2.49 ± 0.35	2.45 ± 0.36	0.48	0.04	2.98 ± 0.59
RR (bpm)	34.03 ± 7.29	32.09 ± 5.40	0.02*	0.37	49.08±11.23
Hemodynamic parameters					
SBP (mmHg)	172.3 ± 15.8	177.2 ± 17.6	0.33	0.08	210.4 ± 26.9
DBP (mmHg)	74.6 ± 6.4	72.3 ± 9.1	0.20	0.13	77.5 ± 13.7
CO (l min ⁻¹)	25.93 ± 4.04	28.59 ± 3.94	0.06	0.27	32.06 ± 4.62
SV (ml)	168.4 ± 30.87	178.8 ± 25.67	0.22	0.12	176.02 ± 26.91
HR (bpm)	154.5 ± 11.4	160.1 ± 11.2	< 0.01*	0.59	183.0 ± 11.4
CW (J)	29,049±6165	31,866±6770	0.14	0.17	37,040±6964
avDO ₂ (%)	11.11 ± 1.84	9.59 ± 1.44	0.02*	0.38	11.74 ± 2.13
LAC Δ (mmol l ⁻¹)	4.27 ± 1.46	4.71 ± 1.42	0.26	0.11	9.01 ± 1.79
RER	0.95 ± 0.05	0.95 ± 0.05	0.97	-	1.08 ± 0.11
RPE (1–10)	6.6 ± 1.1	6.9 ± 1.1	0.16	0.16	10
SO ₂ (%)	95.22 ± 0.71	95.32 ± 0.83	0.73	0.01	-
Mean power output (Watt)	202.7 ± 26.0	202.7 ± 26.0	1.0	-	300.71±40.52
Exercise duration (min)	30±0	30±0	1.0		-

Gas exchange
efficiency
declines with
surgical mask use.

Blood pressure, Cardiac Output, Stroke Volume and Heart Rate all increase.

Table 2. Mean values with and without SMs during the 30 min continuous tests (n = 13; excluding the warm-up and recovery phase). Values are given as the means and standard deviations. The values are presented as means and standard deviations. *DIET* double incremental exercise test; *Co* control; *SM* surgical mask; *IET* incremental exertion test; VO₂ oxygen uptake; $\dot{V}CO_2$ carbon dioxide production; V_E minute ventilation; V_E/VO_2 refers to the number of liters of ventilation per liter of oxygen consumed; $V_E/\dot{V}CO_2$ refers to the number of liters of ventilation per liter of carbon dioxide \dot{V}_A alveolar ventilation; RR respiratory rate; V_T tidal volume; T_i inspiratory time; T_e expiratory time; *SBP* systolic blood pressure (5-min interval); *DBP* diastolic blood pressure (5-min interval); SV stroke volume; CO cardiac output; HR heart rate; avDO₂ arteriovenous oxygen difference; RER respiratory exchange ratio, LAC blood lactate concentration (5-min interval); SO₂% oxygen saturation *RPE* rating of perceived exertion (5-min interval); n^2_{p} , *Significant differences from control.

Discussion The main finding of this randomized crossover study was that the use of SMs during constant exercise was associated with significant changes in the values of the pulmonary and cardiac parameters as compared without the use of face masks (Figs. 3 and 4). Body plethysmography revealed a two-fold higher R_{AW} when masks were sed. However, the VO_2 and $avDO_2$ was reduced when SMs were used.

Scientific Reports | (2020) 10:22363 |

https://doi.org/10.1038/s41598-020-78643-1



Infection Control Hazard

Infection Control Hazard through cross-contamination, risk compensation, pathogen retention, enhanced bacterial and fungal growth on or under the mask, and/or increased viral viability duration.

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 Monalisa, A.C., et al., Microbial contamination of the mouth masks used by post-graduate students in a private dental institution: An In-Vitro Study. IOSR J Dent Med Sci, 2017. 16: p. 61-7.
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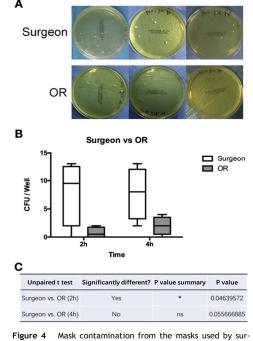
THE LANCET



Supplementary appendix This appendix formed part of the original submission and has been peer reviewed.

We post it as supplied by the authors. upplement to: Chin A W H, Chu J T S, Perera M R A, et al. Stability of SARS-CoV-2 in different environmental conditions. Lancet Microbe 2020; published online April 2. https://doi.org/10.1016/S2666-5247(20)30003-3.

B) Surface	s*									
				Vi	rus titre (Lo	g TCID ₅₀ /r				
Time	Pap	er	Tissue	paper	Wo	od	Clot	:h	Gla	\$\$
	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD
0 min	4.76	0.10	5.48	0.10	5.66	0.39	4.84	0.17	5.83	0.04
30 mins	2.18	0.05	2.19	0.17	3.84	0.39	2.84	0.24	5.81	0.27
3 hrs	U	101	U		3.41	0.26	2.21#	-	5.14	0.05
6 hrs	U	-	U	-	2.47	0.23	2.25	0.08	5.06	0.31
1 day	U	-	U	-	2.07#	-	2.07*	-	3.48	0.37
2 days	U		U	-	U	-	U	-	2.44	0.19
4 days	U		U	-	U	-	U	-	U	-
7 days	U		U	-	U	-	U	-	U	-
Time	Bankr	note	Stainles	s steel	Plas	tic	Mask, inn	er layer	Mask, ou	iter layer
	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD
0 min	6.05	0.34	5.80	0.02	5.81	0.03	5.88	0.69	5.78	0.10
30 mins	5.83	0.29	5.23	0.05	5.83	0.04	5.84	0.18	5.75	0.08
3 hrs	4.77	0.07	5.09	0.04	5.33	0.22	5.24	0.08	5.11	0.29
6 hrs	4.04	0.29	5.24	0.08	4.68	0.10	5.01	0.50	4.97	0.51
1 day	3.29	0.60	4.85	0.20	3.89	0.33	4.21	0.08	4.73	0.05
2 days	2.47	0.23	4.44	0.20	2.76	0.10	3.16	0.07	4.20	0.07
4 days	U	-	3.26	0.10	2.27	0.09	2.47	0.28	3.71	0.50
7 days	U	-	U	-	U	-	U	-	2.79	0.46



geon and unused masks in the OR. (A) Representative CFUs on the agar plate. (B) Analysis of the CFUs. (C) p values. CFUs = colony-forming units; OR = operating room.

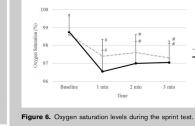
Zhiqing, L., et al., Surgical masks as source of bacterial ination during operative procedures. J Orthop Translat, 2018. 14: p. 57-62. Masks become a source of cross-contamination and reservoir for bacteria, and this effect increases the longer the mask is

1 2 3 4 5 6 0.36 Figure 2. Peak velocity achieved per set in the back squat. Figure 3. Peak velocity achieved per set in the bench press

worn.

Baseline 1 min

Figure 4. Oxygen saturation levels during the back squat.



Out of 25 "healthy resistance-trained men," "Some adverse side effects were reported throughout the

study in relation to wearing the ETM [Elevation Training Mask set to an altitude resistance of 2,743

meters]. Two subjects voluntarily terminated testing reporting that the physiological discomfort

Psychological Harms

Adverse user experiences, anxiety, sleep disturbance, concentration difficulty, interpersonal and relational impairment.

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Headaches

Range from minor to migraine; both *de novo* and exacerbation of pre-existing headaches. Severity increases with mask quality. Includes associated symptoms of nausea, dizziness, tachepynea, palpitation, fatigue, and cognitive impairment.

 Bharatendu, C., et al., Powered Air Purifying Respirator (PAPR) restores the N95 face mask induced cerebral hemodynamic alterations among Healthcare Workers during COVID-19 Outbreak. Journal of the Neurological Sciences, 2020. 417: p. 117078.
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 Kislelinski, K., et al., Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards? International Journal of Environmental Research and Public Health, 2021. 18(8): p. 4344.
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 Rebmann, T., R. Carrico, and J. Wang, Physiologic and other effects and compliance with long-term respirator use among medical intensive care unit nurses. American Journal of Infection Control, 2013. 41(12): p. 1218-1223.
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Skin Damage

Includes physical irritation and trauma (e.g.

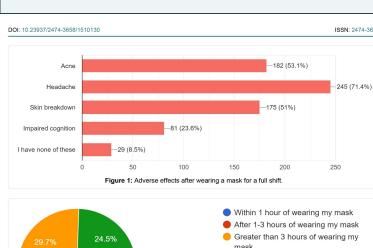
included physical initiation and tradinia (ergi iteri,
ulceration, desquamation, fissure, etc.), allergic
reactions (e.g. contact dermatitis), and exacerbation of
bacteriogenic dermatological issues (e.g. acne, some
types of seborrheic dermatitis)
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 Bothra, A., et al., Retroauricular dermatitis with vehement use of ear loop face masks during COVID-19 pandemic. J Eur Acad Dermatol Venereol, 2020. 34(10): p. e549-e552.
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15. Szepietowski, J.C., et al., Face Mask-induced Itch: A Self-questionnaire Study of 2,315 Responders During the COVID-19 Pandemic. Acta Derm Venereol, 2020. 100(10): p. adv00152.
 Techasatian, L., et al., The Effects of the Face Mask on the Skin Underneath: A Prospective Survey During the COVID-19 Pandemic. Journa Primary Care & Community Health, 2020. 11: p. 215013272096616.
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 Chaiyabutr, C., et al., Adverse skin reactions following different types of mask usage during the COVID-19 pandemic. Journal of the Europea Academy of Dermatology and Venereology, 2021. 35(3).
 Montero-Vilchez, T., et al., Skin adverse events related to personal protective equipment: a systematic review and meta-analysis. Journal of European Academy of Dermatology and Venereology, 2021. 35(10): p. 1994-2006.
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21. Techasatian, L., et al., The Effects of the Face Mask on the Skin Underneath: A Prospective Survey During the COVID-19 Pandemic. Journa Primary Care & Community Health, 2020. 11: p. 215013272096616.

	Total age group	Age group 0-6 years	Age group 7-12 years	Age group 13-18 years	Test for difference
Headaches	13.811 (53.3%)	960 (24.0%)	7.863 (54.6%)	4.988 (66.4%)	p < 0.0001
Concentration difficulties	12.824 (49.5%)	961 (24.0%)	7.313 (50.8%)	4.550 (60.5%)	p < 0.0001
Discomfort	10.907 (42.1%)	1.040 (26.0%)	6.369 (44.2%)	3.498 (46.5%)	p < 0.0001
Impairment in learning	9.845 (38.0%)	621 (15.5%)	5.604 (38.9%)	3.620 (48.2%)	p < 0.0001
drowsiness / tiredness	9.460 (36.5%)	729 (18.2%)	5.163 (35.8%)	3.568 (47.5%)	p < 0.0001
Tightness under the mask	9.232 (35.6%)	968 (24.2%)	5.427 (37.7%)	2.837 (37.7%)	p < 0.0001
Feeling of shortness of breath	7.700 (29.7%)	677 (16.9%)	4.440 (30.8%)	2.583 (34.4%)	p < 0.0001
Dizziness	6.848 (26.4%)	427 (10.7%)	3.814 (26.5%)	2.607 (34.7%)	p < 0.0001
Dry neck	5.883 (22.7%)	516 (12.9%)	3.313 (23.0%)	2.054 (27.3%)	p < 0.0001
Syncope	5.365 (20.7%)	410 (10.2%)	2.881 (20.0%)	2.074 (27.6%)	p < 0.0001
Unwillingness to move, unwillingness to play	4.629 (17.9%)	456 (11.4%)	2.824 (19.6%)	1.349 (17.9%)	p < 0.0001
Itching in the nose	4.431 (17.1%)	513 (12.8%)	2550 (17.7%)	1.368 (18.2%)	p < 0.0001
Nausea	4.292 (16.6%)	310 (7.7%)	2.544 (17.7%)	1.438 (19.1%)	p < 0.0001
Feeling of weakness	3.820 (14.7%)	300 (7.5%)	2.020 (14.0%)	1.500 (20.0%)	p < 0.0001
Abdominal pain	3.492 (13.5%)	397 (9.9%)	2.292 (15.9%)	803 (10.7%)	p < 0.0001
Accelerated respiration	3.170 (12.2%)	417 (10.4%)	1.796 (12.5%)	957 (12.7%)	p < 0.0001
Disease feeling	2.503 (9.7%)	205 (5.1%)	1.328 (9.2%)	970 (12.9%)	p < 0.0001
Tightness in the chest	2.074 (8.0%)	161 (4.0%)	1.122 (7.8%)	791 (10.5%)	p < 0.0001
Flickering eyes	2.027 (7.8%)	149 (3.7%)	1.047 (7.3%)	831 (11.1%)	p < 0.0001
Loss of appetite	1.812 (%)	182 (4.5%)	1.099 (7.6%)	531 (7.1%)	p < 0.0001
tachycardia, stumbling heart stings	1.459 (5.6%)	118 (2.9%)	766 (5.3%)	575 (7.6%)	p < 0.0001
Noise in the ears	1.179 (4.5%)	107 (2.7%)	632 (4.4%)	440 (5.9%)	p < 0.0001
Short-term impairment of consciousness / fainting spells	565 (2.2%)	39 (1.0%)	274 (1.9%)	252 (3.4%)	p < 0.0001
Vomiting	480 (1.9%)	40 (1.0%)	296 (2.1%)	144 (1.9%)	p < 0.0001

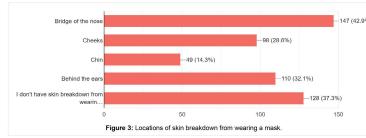
Silke, S., et al., Corona children studies "Co-Ki": First results of a Germany-wide registry on mouth and nose covering (mask) in children. Research Square, 2021.

	Total age group	Age group 0-6 years	Age group 7-12 years	Age group 13-18 years	Test for difference
The child is more often irritated than usual	11 364 (60.4%)	1 041 (40.0%)	6 566 (62.1%)	3 757 (66.5%)	p < 0.0001
The child is less cheerful	9 286 (49.3%)	959 (36.9%)	5 640 (53.3%)	2 687 (47.6%)	p < 0.0001
The child no longer wants to go to school/kindergarten	8 280 (44.0%)	824 (31.7%)	5 168 (48.9%)	2 288 (40.5%)	p < 0.0001
The child is more restless than usual	5 494 (29.2%)	773 (29.7%)	3 515 (33.2%)	1 206 (21.4%)	p < 0.0001
The child sleeps worse than usual	5 849 (31.1%)	633 (24.3%)	3 507 (33.2%)	1 709 (30.3%)	p < 0.0001
No other abnormalities	7 103 (27.4%)	1 400 (35.0%)	3 834 (26.6%)	1 869 (24.9%)	p < 0.0001
The child has developed new fears	4 762 (25.3%)	713 (27.4%)	2 935 (27.8%)	1 114 (19.7%)	p < 0.0001
The child sleeps more than usual	4 710 (25.0%)	319 (12.3%)	2 183 (20.6%)	2 208 (39.1%)	p < 0.0001
The child plays less	2 912 (15.5%)	400 (15.4%)	1.998 (18.9%)	514 (9.1%)	p < 0.0001
The child has a greater urge to move than usual	1 615 (8.6%)	253 (9.7%)	1.124 (10.6%)	238 (4.2%)	p < 0.0001

Silke, S., et al., Corona children studies "Co-Ki": First results of a Germany-wide registry on mouth and nose covering (mask) in children. Research Square, 2021.







Prousa, D., Studie zu psychischen und psychovegetativen Beschwerden mit den aktuellen Mund-Nasenschutz-Verordnungen [Study of psychological and psycho-vegetative complaints by the current mouth and nose protection regulations in Germany]. 2020.

These are just a few of the open-ended responses to item 22 of the questionnaire asking people about their experiences wearing the MNS (abbreviation for "Mund-Nasenschutz," in English: "Mouth-Nose Protection;" i.e. a mask) • "After removing the MNS, I feel as if I still have the MNS on."

- "Itchy eyes, for hours". "Recurring eye infections
- "Conjunctivitis, high breathing "Contact dermatitis 20 days." "weakness and nausea

· "Dizziness, malaise, visual disturbances." "Coughing."

- "Functional cough, strongly increased since the mask requirement began. Herpes (even on the Nose! several times since the mask requirement began."
- "Throat irritation only subsides after hours." • "To cough. Burning eyes (contact lenses).
- "Sore throat, permanent since then." · "Dry mouth, dry throat, increased heartbeat.
- · "Gag reflex." · "Sweat and panic about the next time."
- · "Fatigue, headaches, attacks of suffocation."
- "The headache comes after approx. 15 minutes and decreases in the fresh air. The Nausea comes after about 10 minutes and lasts for 1-2 hours. The shaky body (...) "Change in breathing behavior 1-5h."

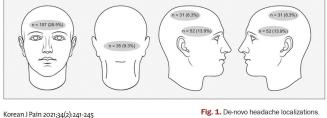
• "Later I still have the feeling that I cannot get enough air." "Shortness of breath, difficulty breathing (although a long-distance runne "Difficult breathing due to fixation on breathing and poor air quality.

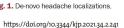
- Depressive mood through social disagreement when everyone looks with a mask. • "As soon as the mask is off, I gasp for air and need about 30 minutes to be around to feel more or less normal again. "
- · "Forgetfulness, tiredness, hunger for breath."
- · "Drowsiness, head pressure, circulatory problems." · "Dizziness, stress, depression, anger."
- · "Sweating, racing heart, feelings of suffocation."
- "Nosebleed: 2 days!"
- "After 1 day of work with a 10h mask, I still have hours after taking off the mask severe headache, dizziness and the nose is closed and I need nasal spray to take."
- · Increased need to drink. Disgust." · "Get herpes around the lips and nose.
- "Herpes (lip)."
- "Rash on the face." • "The heartbeat is slow to calm down. Nightmares, persistent headaches. '
- "Headache all day long." • "Itching in the face, poor sense of taste and smell, being annoyed."
- "Itching, especially with the disposable masks that are currently available, are very smell chemically." · "Exhaustion. Permanent question about meaningfulness. "
- "Mucus formation on the bronchi. Itching of the face with constant touching of the Put. Oppression with what feels like shortness of breath and pressure on the lungs. • "Massive tension in the neck and shoulders, the senses are not awake."
- "Irritation, poor circulation, dizziness, physical fatigue, mental fatigue, Concentration problems, forgetfulness, headaches." • "Alert, high blood pressure."
- · "Mental stress."
- "I am under constant current from this pressure. "Inattentiveness in traffic." · "Panic attacks due to PTSD."
- "Weeping fits."

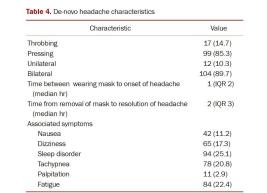
Table I. Clinical features of skin damage among first-line health care workers Participants with skir damage (N = 526), No. (%) 370 (70.3) Dryness/tightness 299 (56.8) Tenderness Itching 276 (52.5) Burning/pain 200 (38.0) Skin lesions 327 (62.2) Desquamation 260 (49.4) Erythema 210 (39.9) Maceration 204 (38.8) Fissure Papule 173 (32.9) Erosion and ulcer 53 (10.1) 7 (1.3) Vesicle Wheal 2 (0.4) Site 437 (83.1) Nasal bridge 414 (78.7) Cheek 392 (74.5) Hands 301 (57.2) Forehead

*With overlaps.

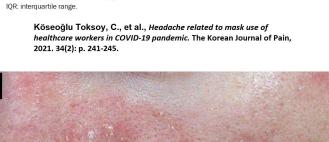
Lan, J., et al., Skin damage among health care workers managing coronavirus disease-2019. Journal of the American Academy of Dermatology, 2020. 82(5): p. 1215-1216.







Values are presented as number (%),





- associated with the breathing restriction of the ETM hindered the ability to complete the testing sessions. In addition, one subject experienced severe dizziness and lightheadedness while wearing the
- (8.6%) (9.7%) (10.6%) (4.2%)

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(s: Thermal Infrare 13): p. 4624.

ering (mask) in Pandemic. Acta Pandemic. Journal

2020. 19(10): p. 2464 rnal of the Europe nalysis. Journal of

Heightened Fatigue

Includes increased exertion, more rapid fatigue, dizziness, drowsiness, and outright exhaustion.

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9. Liu, C., et al., Effects of wearing masks on human health and comfort during the COVID-19 pandemic. IOP Conference Series: Earth and Environmental Science, 2020. 531: p. 012034.
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Scarano, A., et al., Protective F Public Health, 2021. 18(5). Ike, S., et al., Cor Driver, S., et al., Effects of wearing a cloth face mask on pe

Other

Includes other adverse secondary effects such as: communication impairment; rhinitis and vocal disorder; local changes to skin humidity and temperature; opthalmic Irritation and intraocular pressure increases; increased COVID-19 case fatality rate.

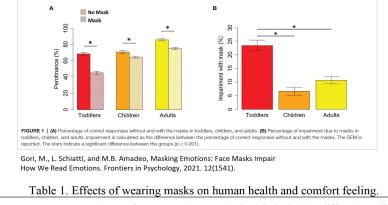
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significantly measured mask- induced changes in scientific studies 2004-2020: • = p<0.05 • = n≥50 %	Fabric Mask	Surgical Mask	N95-Mask	021	co21	Humidity↑	Temperature†	Breathing Resistance†	Respiratory Rate†	Blood Pressure1	Cerebral Vasodilation	Heart 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 Conatmination
Beder 2008		X		•								•																
Bharatendu 2020			х		•						•						•											
Butz 2005		X			•																							
Chughtai 2019		X																										•
Epstein 2020		X	X		•																							
Fikenzer 2020		X	х	•		•	•	•					•	•						•								
Foo 2006			х																									
Georgi 2020	х	х	х	•	•				•				•	•														
Goh 2019			Х																									
Heider 2020		х	х																					•				
Hua 2020		X	х			•															•							
Jacobs 2009		X															•											
Jagim 2018	х			•										•	•													
Kao 2004			X	•					•				•	•														
Klimek 2020																							•					
Kyung 2020			x	•	•				•			•	•															
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Lee 2011			x					•																				
Li 2005		X	X			•	•	•		•		•	•	•						•								
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Luckman 2020	х	x	X																						•			
Luksamijarulkul 2014		x																								•	•	
Matusiak 2020	х	X	x			•	•				\square		•							•	•			•				
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Monalisa 2017		X																								•	•	
Ong 2020			X														•											
Person 2018		x											•													\square		
Pifarre 2020		x	x		•																					\square		
Porcari 2016	х													•												\square		
Prousa 2020	х	x	x								\square							•								\square		
Ramirez 2020		X	x														•											
Rebmann 2013		X	X		•								•	•	•													
Roberge 2012		X				•	•		•			•																
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Rosner 2020		x	x														•				•							
Scarano 2020		X	X			•	•						•								•							
Shenal 2012	х	X	X											•														
Smart 2020		x	X				•						•															
Szepietkowski 2020	х	X	X	-															-	•								
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Wong 2013		x	Â	1	1						\vdash	1																
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.

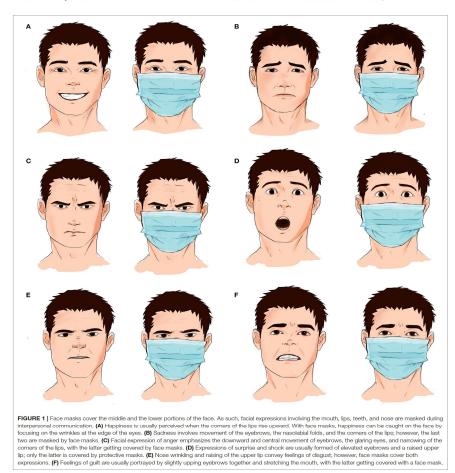
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Kisielinski, K., et al., Is a Mask That Covers the Mouth and Nose Free from Undesirable Side Effects in Everyday Use and Free of Potential Hazards? International Journal of Environmental Research and Public Health, 2021. 18(8): p. 4344.



	Degree of symptoms (mean (standard deviation)) at different conditions												
	No mask	Disposable medical mask	Medical surgical mask	KN95 mask	Sponge mask	Disposable civilian masks	Gauze mask	р					
Headache	0.25±0.45a	0.35±0.49	0.58±0.79	0.75±0.87	0.5±0.52	0.33±0.49	0.5±0.67	0.427					
Dry mouth	0.58±0.51	0.75±0.45	1.08 ± 1.08	1.58±1.51	0.75±0.97	0.83±0.72	1.42±1.16	0.034					
Eye irritation	0.0 ± 0.0	0.0 ± 0.0	0.08±0.29	0.17±0.39	$0.0{\pm}0.0$	0.0±0.0	0.17±0.39	0.195					
Listlessness	0.75 ± 0.45	1.08 ± 0.67	1.17±1.03	1.33 ± 1.07	0.92±0.67	1.17±0.39	1.33±0.49	0.038					
Dry skin	0.5±0.52	0.58±0.51	0.67±0.49	0.92±0.9	0.5±0.52	0.83±0.72	1.08 ± 0.9	0.047					
Dizziness	0.5±0.52	1.33±0.98	1.25±0.97	1.92±0.67	1.08±0.79	1.0 ± 0.6	1.42±0.67	0.025					
Hard to think	0.75±0.45	0.92±0.79	1.33±0.98	1.75±0.87	0.83±0.83	1.17±0.39	1.5 ± 0.9	0.026					
Nasal congestion	0.08±0.29	0.0 ± 0.0	0.08±0.29	0.17±0.39	0.17±0.39	0.0 ± 0.0	0.17±0.39	0.503					
Difficult to concentrate	1.0 ± 0.74	1.08 ± 0.67	1.42±0.67	1.83±0.83	1.25±0.45	1.08±0.29	1.58±0.67	0.018					
Poor breathing	0.5±0.52	0.83±0.39	0.92±0.79	1.83±0.94	0.92±0.29	0.83±0.39	0.75±0.45	0.002					
unpleasant smell in the air	0.33±0.49	0.5±0.52	0.67±0.65	0.58±0.51	0.58±0.51	0.42±0.51	0.75±0.45	0.183					
^a The lightest symptoms are	underlined, '	The most se	evere are bo	ld.									

Liu, C., et al., Effects of wearing masks on human health and comfort during the COVID-19 pandemic. IOP Conference Series: Earth and Environmental Science, 2020. 531:



Mheidly, N., et al., Effect of Face Masks on Interpersonal Con During the COVID-19 Pandemic, Frontiers in Public Health, 2020, 8,