This Document is Supplementary Material to the Mask Evidence Review
Draft Healthcare Personnel Use of N95 Respirators or Medical/ Surgical Masks for Protection Against Respiratory Infections: A Systematic Review and Meta-Analysis [PDF – 80 Pages]
https://www.cdc.gov/hicpac/pdf/HCP-N95Mask-SLR-MainAppendix-2023-11-01-Draft-508.pdf

Author Year	Setting	Location	Category of AE	AE Name and Definition	Surgical Masks n/N (%)	N95 Respirators n/N (%)	Measures of Association
Abdi 2022	Hospital	Iran	Physical	Dermatitis: Self-reported via questionnaire and confirmed by a dermatologist	Severity of dermatitis Very severe: 14/57 (24.56%) Severe: 7/57 (12.28%) Moderate: 11/57 (19.29%) Low: 19/57 (33.33%) None: 6/57 (10.52%)	Severity of dermatitis Very severe: 11/85 (12.94%) Severe: 20/85 (23.52%) Moderate: 12/85 (14.11%) Low: 31/85 (36.47%) None: 11/85 (12.94%)	Severity of dermatitis: p = 0.219
Aliabadi 2022	University hospital	Iran	Occupational	Vocal effort: Perceived exertion during voicing or speaking measured using the Borg CR10 scale Speech spectrum: ND Speech intelligibility: Based on speech discrimination score where the percentage of syllable intelligibility was classified as bad 0–34%; poor 34–48%; fair 48–67%; good 67–90%; and excellent 90–96%			The vocal efforts of nurses when wearing N95 face masks with the filter were increased up to severe exertion. The effect of surgical masks on reducing the transmission of speech spectrum is insignificant compared to N95. Speech intelligibility of nurses from a human speaker wearing N95 with a filter is approximately 10% lower than when using surgcal mask in presence of background noise levels (p < 0.01)
Alizadeh 2022	Hospital	Iran	Physical	Skin adverse events: Skin involvement (e.g., pressure effect, erythema, itching, and burning) on the lower two-thirds of face, which includes the nose, cheek, and chin	6/20 (30.0%)	41/43 (95.3%)	p < 0.001
Alroudhan 2021	Dental	Saudi Arabia	Physical	SpO$_2$: Measured using clinical pulse oximeter before wearing mask and 1, 2, and 3 hours after wearing mask Heart rate: Measured using clinical pulse oximeter before wearing mask, and 1, 2, and 3 hours after wearing mask	SpO$_2$, before: 98.8 (SD 0.4) SpO$_2$, 1 hr after: 98.8 (SD 0.4) SpO$_2$, 2 hr after: 98.8 (SD 0.4) SpO$_2$, 3 hr after: 98.8 (SD 0.4) Heart rate, before: 79.5 (SD 8.8) Heart rate, 1 hr after: 73.1 (SD 10.0) Heart rate, 2 hr after: 81.7 (SD 7.0) Heart rate, 3 hr after: 83.8 (SD 9.3)	SpO$_2$, before: 98.2 (SD 0.7) SpO$_2$, 1 hr after: 97.0 (SD 1.1) SpO$_2$, 2 hr after: 96.6 (SD 1.2) SpO$_2$, 3 hr after: 96.2 (SE 0.9) Heart rate, before: 81.3 (SD 12.6) Heart rate, 1 hr after: 93.1 (SD 12.4) Heart rate, 2 hr after: 95.3 (SD 12.9) Heart rate, 3 hr after: 95.4 (SD 13.3)	SpO$_2$, before: p = 0.12 SpO$_2$, 1 hr after: p < 0.01 SpO$_2$, 2 hr after: p < 0.01 SpO$_2$, 3 hr after: p < 0.01 Heart rate, before: p = 0.9 Heart rate, 1 hr after: p < 0.01 Heart rate, 2 hr after: p < 0.01 Heart rate, 3 hr after: p < 0.01
Altun 2022	University hospital	Turkey	Physical	Acne: Clinical diagnosis of acne vulgaris, acne rosacea, seborrhic dermatitis, and contact dermatitis.	36/67 (53.7%)	20/34 (58.8%)	aOR: Adjusted odds ratio; model included gender, age, profession, dermatological disease history presence, weekly working hours, daily working hours, facial cleanser, mask type, and mask replacement frequency aOR: 7.45 (95% CI: 1.33–41.81), p = 0.023 aOR(backward method): 2.79 (95% CI: 1.00-7.76), p = 0.050 OR: 1.23 (95% CI: 0.53–2.84). p = 0.627
Ansari 2022	Three hospitals	Pakistan	Physical	Skin damages: HCP reported dermatological symptoms including acne, pigmentation, indentation and ear pain, itch, rash, scar at nose bridge, dry skin, and peeling skin; collected by face-to-face or telephonic interview	Dermatological symptoms unspecified: 82/212 (38.7%) Acne: 64/212 (29.2%) Pigmentation: 12/212 (5.7%) Indentation and ear pain: 110/212 (51.9%) Itch: 93/212 (43.9%) Rash: 40/212 (18.9%) Scar at nose bridge: 44/212 (20.8%) Dry skin: 50/212 (23.6%) Peeling skin: 11/212 (5.2%)	Dermatological symptoms unspecified: 86/171 (50.3%) Acne: 51/171 (29.8%) Pigmentation: 12/171 (7.0%) Indentation and ear pain: 90/171 (52.6%) Itch: 77/171 (45.0%) Rash: 47/171 (27.5%) Scar at nose bridge: 66/171 (38.6%) Dry skin: 33/171 (19.3%) Peeling skin: 16/171 (9.4%)	Dermatological symptoms unspecified: p = 0.029 Acne: p = 0.938 Pigmentation: p = 0.586 Indentation and ear pain: p = 0.885 Itch: p = 0.820 Rash: p = 0.045 Scar at nose bridge: p < 0.001 Dry skin: p = 0.311 Peeling skin: p = 0.113
Bharatha 2022	Main isolation center for COVID-19	Barbados	Physical	Adverse skin reactions: Skin reactions on cheeks, nose bridge, ear, and/or chin reported via survey	Cheeks: 18.6% Nose bridge: 16.3% Ear: 20.9% Chin: 9.3%	Cheeks: 56.4% Nose bridge: 51.3% Ear: 51.3% Chin: 33.3%	Adverse skin reactions (surgical mask is reference group): OR: 1.358 (95% CI: 0.448 - 4.4117), p = NR

Study	Setting	Country	Type	Outcome definition			
Cigiloglu 2021	Hospital	Turkey	Physical	Headache: Participants were asked whether they had new-onset headaches after regular use of face masks during the pandemic period. Those with headaches were asked to indicate their duration, time of onset and severity (between 0 and 10) on the visual analog scale (VAS).	Headache: 98/224 (43.8%)	Headache: 50/87 (57.5%)	Headache: p = 0.030
Cigiloglu 2021	Hospital	Turkey	Psychological	Sleepiness: The Epworth sleepiness scale consists of eight scenarios that are measured on a scale from 0 to 3 to indicate how likely it would be for the individual to feel sleepy. The sum of each score ranges from 0 to 24 where a score higher than 10 indicates excessive daytime sleepiness	Sleepiness, mean (SD): 6.04±4.41	Filtering facepiece respirator Sleepiness, mean (SD): 8.59±5.48	Sleepiness: p < 0.001
Gelardi 2020	Two university hospitals	Italy	Occupational	Work interference: HCP were asked 'do you feel less productive?' and 'how much has your job activity got worse?" using a scale ranging from 0-10 where 0 indicates absence of any kind of alteration and 10 indicates complete alteration of the item compared to pre-COVID-19 period Reduced concentration: Evaluated using a scale ranging from 0-10 where 0 indicates the absence of reduced concentration and 10 indicates complete reduced concentration compared to pre-COVID-19 period	Work interference: Do you feel less productive? 2±2.9 How much has your job activity got worse? 3.4±2.9 Reduced concentration: 0.9±2.1	Work interference: Do you feel less productive? 0.3±1.4 How much has your job activity got worse? 5.1±3.4 Reduced concentration: 0.8±2.0	Work interference: Do you feel less productive? p < 0.0001 univariate, p = 0.039 multivariate How much has your job activity got worse? p = 0.0036 Reduced concentration: p = 0.3343
Gelardi 2020	Two university hospitals	Italy	Physical	Adverse events: HCP were asked if they had facemask-linked blurred vision, sneezing, rhinorrhea, dry nose, facial pain, itching, nausea, headache, and dizziness using a scale ranging from 0-10 where 0 indicates absence of any kind of alteration and 10 indicates complete alteration of the item compared to pre- COVID-19 period	Blurred vision: 1.05±2.3 Sneezing: 2.0±3.1 Rhinorrhea: 1.5±2.7 Dry nose: 2.4±2.7 Facial pain: 1.6±2.8 Itching: 3.7±3.6 Nausea: 0.8±2.1 Headache: 2±3.5 DIzziness: 0.7±2.1	Blurred vision: 0.4±1.5 Sneezing: 1.5±2.5 Rhinorrhea: 1.0±2 Dry nose: 2.8±3.1 Facial pain: 2.9±2.8 Itching: 2.8±2.9 Nausea: 0.1±1.0 Headache: 2.4±0.3 DIzziness: 0.1±0.06	Blurred vision: p = 0.0328 Sneezing: p = 0.1792 Rhinorrhea: p = 0.1279 Dry nose: p = 0.2388 Facial pain: p = 0.0125 univariate, p = 0.007 multivariate Itching: p = 0.0792 Nausea: p = 0.0135 Headache: p = 0.2797 Dizziness: p = 0.0173
Hajjij 2020	University hospital	Morocco	Physical	De novo headache: Reported as a headache never experienced before Aggravated headache: Reported as an aggravation of pre-existing headache	De novo: 4/7 Aggravated: 3/7	De novo: 47/148 Aggravated: 42/148	De novo: p = 0.22 Aggravated: p = 0.41
Ipek 2021	University hospital, tert	Turkey	Occupational	Concentrating difficulty: HCP answered 'yes' if observed after using mask via questionnaire Attention deficit: HCP answered 'yes' if observed after using mask via questionnaire	Concentrating difficulty: 21/34 (61.8%) Attention deficit: 5/34 (14.7%)	Concentrating difficulty: 6/34 (17.6%) Attention deficit: 17/34 (50.0%)	Concentrating difficulty: p < 0.001 Attention deficit: p < 0.001
Ipek 2021	University hospital, tert	Turkey	Psychological	Fatigue: ND Drowsiness: ND	Fatigue: 6/34 (17.6%) Drowsiness, n/N (%): 2/34 (5.9%)	Fatigue: 21/34 (61.8%) Drowsiness, n/N (%): 16/24 (47.1%)	Fatigue: p < 0.001 Drowsiness: p = 0.001

Study	Setting	Country	Domain	Outcome measures	Results (Group 1)	Results (Group 2)	Comparison
Ipek 2021	University hospital, terti	Turkey	Physical	pCO_2: Measured after wearing mask Headache: HCP reported via questionnaire Dizziness: HCP reported via questionnaire Respiratory distress: HCP reported via questionnaire Sweating: HCP reported via questionnaire experiencing sweating on face after mask use Facial itching: HCP reported via	pCO_2: 37.33 ± 8.81 Headache: 5 (14.7%) Dizziness: 2/34 (5.9%) Respiratory distress: 8 (24%) Sweating: 18 (53%) Facial itching: 8 (23.5%) Drowsiness: 2 (5.9%) Fatigue: 5 (14.7%) Difficulty breathing: 8 (23.5%)	pCO_2: 28.46 ± 7.77 Headache: 20 (58.8%) Dizziness: 8/34 (23.8%) Respiratory distress: 27 (80%) Sweating: 9 (27%) Facial itching: 9 (26.5%) Drowsiness: 16 (47.1%) Fatigue: 21 (61.8%) Difficulty breathing: 27 (79.4%)	pCO_2: $p < 0.001$ Headache: $p = 0.001$ Dizziness: $p = 0.070$ Respiratory distress: $p = 0.001$ Sweating: $p = 0.022$ Facial itching: $p = 1.0$ Drowsiness: $p = 0.001$ Fatigue: $p < 0.001$ Difficulty breathing: $p = 0.001$
Liu 2022	12 hospitals	China	Physical	Adverse reactions: Facemask wearing-related adverse reaction including shortness of breath, upper respiratory symptoms, damaged skin on nose, damaged facial skin, face pain, nose pain, ear pain, and eczema collected via online survey	Shortness of breath: 363/954 (38.1%) Upper respiratory symptoms: 73/954 (7.65%) Damaged skin on nose: 136/954 (14.26%) Damaged facial skin: 57/954 (5.97%) Face pain: 358/954 (37.53%) Nose pain: 217/954 (22.75%) Ear pain: 754/954 (79.04%) Eczema: 209/954 (21.91%)	Shortness of breath: 57/136 (41.9%) Upper respiratory symptoms: 16/136 (11.76%) Damaged skin on nose: 22/136 (16.18%) Damaged facial skin: 12/136 (8.82%) Face pain: 47/136 (34.56%) Nose pain: 40/136 (29.41%) Ear pain: 110/136 (80.88%) Eczema: 43/ 136 (31.62%)	Shortness of breath: $p = 0.01$ Upper respiratory symptoms: $p = 0.101$ Damaged skin on nose: $p = 0.552$ Damaged facial skin: $p = 0.202$ Face pain: $p = 0.503$ Nose pain: $p = 0.088$ Ear pain: $p = 0.619$ Eczema: $p = 0.012$
MacIntyre 2011	15 tertiary hospitals	China	Physical	Adverse events: Self reported headaches, rash, difficulty breathing, pressure on nose, and trouble communicating:	Medical masks Headaches: 11/281 (3.9%) Rash: 13/281 (4.6%) Difficulty breathing: 35/281 (12.5%) Pressure on nose: 31/281 (11.0%) Trouble communicating: 9/303 (3.0%)	Headaches: 94/701 (13.4%) Rash: 35/701 (5.0%) Difficulty breathing: 136/701 (19.4%) Pressure on nose: 366/701 (52.2%) Trouble communicating: 62/775 (8.0%)	Headaches: $p < 0.01$ Rash: $p = 0.81$ Difficulty breathing: $p = 0.01$ Pressure on nose: $p < 0.01$ Trouble communicating: $p < 0.01$
Manerkar 2021	Tertiary care dental clin	India	Physical	Headache: Mask-associated symptom of psychological stress collected by self-administered questionnaire Oxygen saturation (SaO_2): Measured using pulse oximeter and collected in morning Heart rate: Measured using pulse oximeter and collected in morning	Headache: 31/59 (52.5%) Oxygen saturation: Baseline: 98.29±1.36 60 min: 98.14±1.16 120 min: 98.17±1.04 Pulse rate: Baseline: 83.54±11.83 60 min: 84.97±14.25 120 min: 82.78±11.42	Headache: 52/69 (75.4%) Oxygen saturation: Baseline: 98.3±0.97 60 min: 96.13±2.84 120 min: 97.61±1.99 Pulse rate: Baseline: 85±12.8 60 min: 83.25±14.13 120 min: 84.01±14.57	Headache: OR: 6.685 (95% CI: 2.45-19.18), $p < 0.05$ Oxygen saturation: Baseline: $p = 0.582$ 60 min: $p = 0.001$ 120 min: $p = 0.012$ Pulse rate: Baseline: $p = 0.537$ 60 min: $p = 0.522$ 120 min: $p = 0.663$
Maniaci 2021	University hospital	Italy	Physical	Eye symptoms: HCP reported symptoms including itching, tearing, or redness of the eyes on Likert scale via questionnaire Nasal symptoms: HCP reported symptoms on Likert scale via questionnaire Pulmonary disorders: HCP reported lower respiratory tract symptoms on Likert scale via questionnaire			Eye symptoms: No differences emerged for the type of mask (surgical, FFP1, FFP2, or FFP3) used regarding the prevalence of eye symptoms ($p > 0.05$) Nasal symptoms: There was a higher association between type of device (FFP2 or FFP3 mask) used and nasal symptoms ($p = 0.001$). Pulmonary disorders: HCP using FFP2 or FFP3 masks reported higher percentages of pulmonary disorders ($p = 0.002$)

Study	Setting	Country	Type	Definition	Group 1 results	Group 2 results	Comparison
Nwosu 2021	Hospitals	Nigeria	Physical	Difficulty breathing: Difficulty in breathing reported during interview contributed to discomfort Skin irritation: Facial irritation/hotness reported during interview contributed to discomfort SpO2: Pulse oximeter with probe applied to the index finger was used for non-invasive determination of arterial oxygen saturation checked before donning facemask and then repeated before mask removal	Difficulty breathing: 16/48 (33.3%) Skin irritation: 19/48 (39.6%) SpO2: Pre-test mean (SD): 98.1 (0.8) Post-test mean (SD): (98.1) (0.8)	Difficulty breathing: 12/28 (42.9%) Skin irritation: 14/28 (50%) SpO2: Pre-test mean (SD): 97.9 (0.8) Post-test mean (SD): 97.8 (0.8)	Difficulty breathing: p = 0.406 Skin irritation: p = 0.377 SpO2 Pre-test: p = 0.388 Post-test: p = 0.114
Nwosu 2021	Hospitals	Nigeria	Occupational	Difficulty in communication: Communication difficulty with team members reported during interview contributed to mask discomfort	Difficulty in communication: 23/48 (47.9%)	Difficulty in communication: 13/28 (46.4%)	Difficulty in communication: p = 0.9
Park 2021	Teaching hospital	Korea	Physical	Skin lesions: Acne, rash, or scales caused by facial masks reported via self-administered online survey conducted through hospital intranet system Skin symptoms: Itching, dryness/tightness, stinging sensation, and flushing caused by facial masks reported via self-administered online survey conducted through hospital intranet system	Skin lesions: 71/131 (54.2%) Skin symptoms: 84/131 ((64.1%)	N95: Skin lesions: 13/21 (61.9%) Skin symptoms: 15/21 (71.4%) KF94: Skin lesions: 96/151 (63.6%) Skin symptoms: 108/151 (71.5%)	OR: Odds ratio N95 vs. surgical (ref): Skin lesions, OR: 1.294 (95% IC: 0.487 - 3.435) Skin symptoms, OR: 1.243 (95% CI: 0.430 - 3.695) KF94 vs. surgical (ref): Skin lesions, OR: 1.609 (95% CI: 0.974 - 2.657) Skin symptoms, OR: 1.657 (95% CI: 0.962 - 2.852)
Peres 2022	Healthcare organization	Portugal	Physical	Discomfort: PPE use associated with HCP reporting discomfort Dyspnea: PPE use associated with HCP reporting dyspnea Skin rash or itching: PPE use associated with HCP reporting skin rash or itching Headache: PPE use associated with HCP reporting headache	Discomfort: 26.8% Dyspnea: 14.4% Skin rash or itching: 19.4% Headache: 19.4%	Discomfort: 58.2% Dyspnea: 36.0% Skin rash or itching: 37.5% Headache: 37.5%	Discomfort: p < 0.001 Dyspnea: p < 0.001 Skin rash or itching: p < 0.001 Headache: p < 0.001
Peres 2022	Healthcare organization	Portugal	Occupational	Task performance: HCP reported PPE use was negatively associated with task performance Communication: HCP reported PPE use was negatively associated with communication	Task performance: 18.9% Communication: 40.9%	Task performance: 41.5% Communication: 55.0%	Task performance: p < 0.001 Communication: p < 0.001
Ramirez-Moreno 2020	Tertiary hospital	Spain	Physical	De novo headache: When a new headache occurs for trhe first time in close temporal relationship to use PPE, even when the headache has the characteristics of a primary headache (migrane, tension type of headache, cluster headache or one of the other trigeminal autonomic headaches)			aOR: Adjusted odds ratio; model adjusts for HCP type and asthma OR: Odds ratio aOR: 2.14 (95% CI: 1.07 - 4.32), p = 0.027 OR: 2.08 (95% CI: 1.07 - 4.07), p = 0.026

Study	Setting	Country	Domain	Outcome measures			
Rapisarda 2021	Hospitals and clinics	Italy	Physical	Headache: Headache outcome measures included headache days, migraine days, migraine-like days, average headache severity, headace-related disability collected using headache impact test, and allodynia socred using the aollodynia symptom checklist			Type of facemask was not associated with change in headache outcome measures from baseline among HCP with predisposed headaches and HCP with no history of headaches (p > 0.05).
Su 2021	Tertiary center	Taiwan	Physical	Vital signs: Change in SpO_2, PaO_2, PCO_2, systolic and diastolic blood pressure, and heart rate from baseline to after 8 hours of wearing facemasks, measured using a fingertip detector Shortness of breath: Shortness of breath after wearing facemasks was evaluated after questionnaire Headache: Headache after wearing facemasks was evaluated via questionnaire Dizziness: Dizziness after wearing facemasks was evaluated via questionnaire	Vital signs, change from baseline: SpO_2: -0.02 (SE 0.03) PaO_2: -0.29 (SE 0.28) PCO_2: 0.03 (SE 0.06) Systolic BP: -0.43 (SE 0.39) Diastolic BP: -0.41 (SE 0.26) Heart rate: 0.63 (SE 0.58) Shortness of breath: 1/34 (3%) Headache: 0/34 (0%) Dizziness: 0/34 (0%)	Vital signs, change from baseline: SpO_2: 0.03 (SE 0.04) PaO_2: 0.42 (SE 0.34) PCO_2: -0.06 (SE 0.07) Systolic BP: -0.78 (SE 0.34) Diastolic BP: -0.49 (SE 0.29) Heart rate:-1.39 (SE 0.53) Shortness of breath: 15/34 (44%) Headache: 6/34 (18%) Dizziness: 5/34 (15%)	Adjusted difference of least square means: SpO_2: 0.06 (95% CI: -0.04 - 0.15), p = 0.2454 PaO_2: 0.71 (95% CI: -0.16 - 1.58), p = 0.1090 PCO_2: -0.10 (95% CI: -0.27 - 0.07), p = 0.2674 Systolic BP: -0.35 (95% CI: -1.36 - 0.67), p = 0.5034 Diastolic BP: -0.09 (95% CI: -0.84 - 0.67), p = 0.8249 Heart rate: -2.01 (95% CI: -3.56 - -0.47), p = 0.0105 Shortness of breath: p < 0.001 Headache: p = 0.012 Dizziness: p = 0.027
Su 2021	Tertiary center	Taiwan	Psychological	Fatigue: Reported after wearing facemasks and evaluated via questionnaire	Fagitue: 0/34 (0%)	Fatigue: 9/34 (27%)	Fatigue: p = 0.001
Su 2021	Tertiary center	Taiwan	Occupational	Difficulty talking: Symptom after wearing facemasks was evaluated via questionnaire	0/34 (0%)	18/34 (53%)	p < 0.001
Tatti 2022	Academic hospital	Italy	Physical	Best-corrected visual acuity (BCVA): Measured by using a 3-m Snellen chart and then converted to LogMAR Corneal fluorescein staining (FS): Evaluated according to the Oxford Grading Scale on the basis of the fluorescein dye staining pattern on an ocular surface Tear film break-up time (BUT): Timespan, after fluorescein dye application, between a complete blink and the appearance of the first dry spot on the corneal surface; considered pathological when <10 s Schirmer test I: Length of wetting from notch of paper strip after 5 min with eyes gently closed; considered pathological when < 10mm / 5 min	BCVA, pre shift: 0.06 (SE 0.01) BCVA, post shift: 0.07 (SE 0.01) FS, pre shfit: 0.01 (SE 0.04) FS, post shift: 0.43 (SE 0.07) BUT, pre shift: 8.86 (SE 0.28) BUT, post shift: 7.06 (SE 0.25) Schirmer, pre shift: 16.14 (SE 0.94) Schirmer, post shift: 13.05 (SE 1.02)	BCVA, pre shift: 0.04 (SE 0.01) BCVA, post shift: 0.06 (SE 0.01) FS, pre shfit: 0.01 (SE 0.03) FS, post shift: 0.55 (SE 0.06) BUT, pre shift: 9.34 (SE 0.26) BUT, post shift: 7.78 (SE 0.24) Schirmer, pre shift: 16.18 (SE 0.85) Schirmer, post shift: 14.70 (SE 0.92)	No significant difference between surgical masks and N95s were observed (p > 0.05). BCVA: p = 0.41 FS: p = 0.96 BUT: p = 0.111 Schirmer: p = 0.49

Score	Color	Definition
1		Element is present in this study
NA		Element is not applicable to this study design
0		Unclear if this element is present in this study
-1		Element is not present in this study

OUTCOME MEASURE		Ang 2010	Anshory 2022	Belan 2022	Carazo 2023	Chokephaibulkit 2013	Cummings 2021	Dorr 2022	Haas 2021	Haller 2022	Khurana 2021	Li 2021	Loeb 2004	Loeb 2009	Loeb 2022	MacIntyre 2011	MacIntyre 2013	MacIntyre 2014	Manangan 200?	Mouliou 202?	Piapan 2020	adonovich 20?	Welbel 2009	Wislon 2022	Xie 2020
Domain	**Signaling question**																								
Study Elements	Design appropriate to research question																								
	Well described population																								
	Well described setting																								
	Well described intervention/ exposure																								
	Well described control/ comparator																								
	Well described outcome																								
	Clear timeline of exposures/ interventions and outcomes																								
Selection Bias: Sampling	Randomization appropriately performed																								
	Allocation adequately concealed																								
	Population sampling appropriate to study design																								
Selection Bias: Attrition	Attrition not significantly different between groups																								
	Attrition <10-15% of population																								
	Attrition appropriately analyzed																								
Information Bias: Measurement and Misclassification	Measure of intervention/ exposure is valid																								
	Measure of outcome is valid																								
	Fidelity to intervention is measured																								
	Fidelity to intervention is valid																								
	Prospective study																								
	Adequately powered to detect result																								
Information Bias: Performance & Detection	Outcome assessor blinded																								
	Study participant blinded																								
	Investigator/ data analyst blinded																								
	Data collection methods described in sufficient detail																								
	Data collection methods appropriate																								
	Sufficient follow up to detect outcome																								
Information Bias: Analytic	Appropriate statistical analyses for collected data																								
	Appropriate statistical analyses are conducted correctly																								
	Confidence interval is narrow																								
Confounding	Potential confounders identified																								
	Adjustment for confounders in study design phase																								
	Adjustment for confounders in data analysis phase																								
Reporting Bias	All pre-specified outcomes are adequately reported																								
Other Bias	No other sources of bias																								
COI	Funding sources disclosed and no obvious conflict of interest																								

	OUTCOME MEASURE	Author Year	Abdi 2022	Aliabadi 2022	Alizadeh 2022	Alroudhan 202	Altun 2022	Ansari 2022	Bharatha 2	Cigiloglu 2021	Gelardi 2020	Hajjij 2020	Ipek 2021	Liu 2022	MacIntyre 2011	Manerkar 2021	Maniaci 2021	Nwosu 2021	Park 2021	Peres 2022	Ramirez-Moreno 2020	Rapisarda 2021	Su 2021	Tatti 2022
Study Elements	Design appropriate to research question																							
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Selection Bias: Sampling	Randomization appropriately performed																							
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	Population sampling appropriate to study design																							
Selection Bias: Attrition	Attrition not significantly different between groups																							
	Attrition <10-15% of population																							
	Attrition appropriately analyzed																							
Information Bias: Measurement and Misclassification	Measure of intervention/ exposure is valid																							
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	Fidelity to intervention is measured																							
	Fidelity to intervention is valid																							
	Prospective study																							
	Adequately powered to detect result																							
Information Bias: Performance & Detection	Outcome assessor blinded																							
	Study participant blinded																							
	Investigator/ data analyst blinded																							
	Data collection methods described in sufficient detail																							
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	Adjustment for confounders in study design phase																							
	Adjustment for confounders in data analysis phase																							
Reporting Bias	All pre-specified outcomes are adequately reported																							
Other Bias	No other sources of bias																							
COI	Funding sources disclosed and no obvious conflict of interest																							

Figure S1: Funnel Plot for the studies included in the primary analysis for Seasonal Pathogens
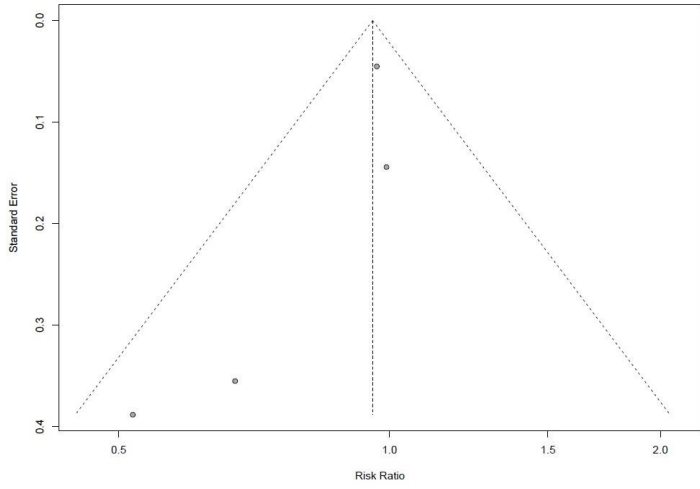

Figure S2: Funnel Plot for the studies included in the primary analysis for Novel Pathogens
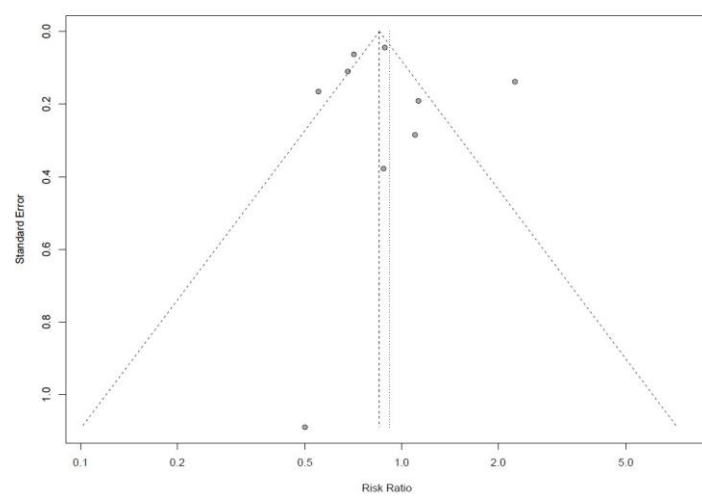

Figure S3: Funnel Plot for the studies included in Sensitivity Analysis A for Novel Pathogens
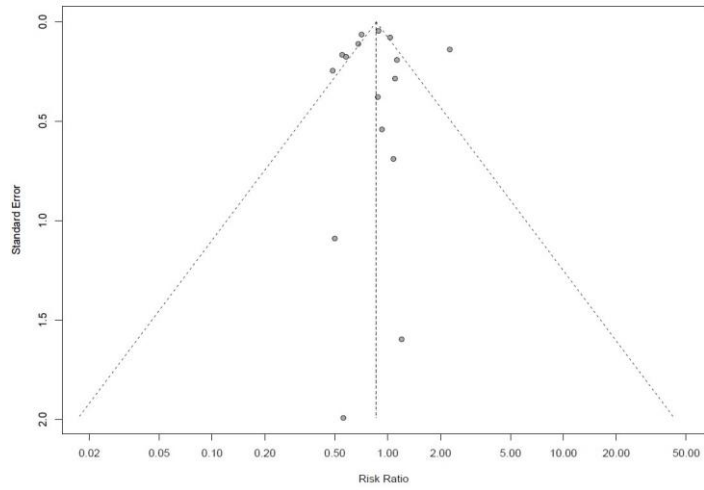

Figure S4: Funnel Plot for the studies included in Sensitivity Analysis B for Novel Pathogens