

Best Evidence Topic Report

Title	COVID-19: FFP2 maskers of chirurgische maskers?
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Clinical scenario	Welke respiratoire bescherming voorziet men bij contact met patiënten die mogelijks besmet zijn met het SARS-Cov2 virus?
Answerable question (PICO/PIRT/PEO)	<p>P: zorgverleners die in contact komen met patiënten die (mogelijks) besmet zijn met SARS-CoV2/Covid 19</p> <p>I: FFP2 maskers vergelijken met chirurgische maskers</p> <p>P: zorgverleners</p> <p>O: aantal besmettingen, overdracht van het virus</p> <p>H: bij contact tussen zorgverlener en patiënt: zowel eerste lijn als in hospitaal-setting.</p>
Search terms	<p>Pubmed:</p> <p>1) ("Respiratory Protective Devices"[Mesh] OR "Masks"[Mesh]) AND ("Occupational Exposure"[Mesh] OR "Disease Transmission, Infectious"[Mesh] OR "Cross Infection"[Mesh]) AND ("COVID-19" [Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2" [Supplementary Concept] OR "SARS Virus"[Mesh] OR "Respiratory Tract Infections"[Mesh] OR "Coronaviridae Infections"[Mesh])</p> <p>2) COVID-19 AND health care workers</p> <p>Embase:</p> <p>('respiratory protection'/exp OR 'respiratory protection' OR 'mask'/exp OR mask) AND ('occupational exposure'/exp OR 'occupational exposure' OR 'disease transmission'/exp OR 'disease transmission' OR 'cross infection'/exp OR 'cross infection') AND ('coronaviridae'/exp OR coronaviridae OR 'severe acute respiratory syndrome'/exp OR 'severe acute respiratory syndrome' OR 'sars coronavirus'/exp OR 'sars coronavirus')</p>
Search date	18-03-2020

Search Outcome (number of hits)	404 zoekresultaten
Relevant papers (number of final inclusions)	5 studies
Flow chart	<pre> graph TD A["Pubmed 206 + 18 resultaten"] --> B["21 resultaten"] C["Embase 180 resultaten"] --> D["17 resultaten"] E["Exclusie en inclusiecriteria - Op basis van titel/abstract (1)"] --> B E --> D B --> F["5 resultaten"] D --> F G["Exclusie en inclusiecriteria - Op basis van tekst (2)"] --> F </pre>
Inclusie en exclusie criteria	<p>(1) Op basis van titel/abstract</p> <p>Inclusie: Patiëntenpopulatie: gezondheidsmedewerkers. (n = 156) Gebruik van FFP2/N95 maskers én chirurgische maskers. (n = 101) Uitkomst: risico op besmetting met COVID-19 of SARS of andere respiratoire virussen. (n = 49)</p>

Exclusie:

Procedures die aerosolvorming bewerkstelligen, tenzij in kader van covid-19. (n = 8)

Studiedesign: letters, commentaries (n = 18)

Studies die enkel resultaten van influenza rapporteren (n = 8)

Niet beschikbaarheid van abstract/artikel (n = 29)

(2) Op basis van tekst**Inclusie:**

Patiëntenpopulatie: gezondheidsmedewerkers. (n = 3)

Gebruik van FFP2/N95 maskers én chirurgische maskers. (n = 5)

Uitkomst: risico op besmetting met COVID-19 of SARS of andere respiratoire virussen. (n = 7)

Exclusie:

Procedures die aerosolvorming bewerkstelligen, tenzij in kader van covid-19. (n = 1)

Studiedesign: letter, commentaries. (n = 0)

Studies die enkel resultaten van influenza rapporteren (n = 0)

Niet beschikbaarheid van abstract/artikel (n = 3)

Artikels vormen deel van geïncludeerde systematic reviews (n = 11)

Add evidence tables here:

	Title	Author, date and country	Study type	Main risks of bias	Patient characteristics	N95 respirator	Surgical mask (or synonyms)	Outcome	Key results:
1	COVID-19 and the Risk to Health Care Workers: A case [1]	Ng. K. 2020-03-16	Case report	- Small sample size - Selective reporting	41 Health care workers having exposure to aerosol - generating procedures for at least 10 minutes at a distance of less than 2 meters from the patient.	6 HCW	35 HCW	COVID-19 infection	Surgical masks and N95 respirators are equal in preventing covid-19 contamination The experts of this study recommend that health care workers wear an N95 mask or equivalent equipment while performing an aerosol-generating procedure.
2	Protecting health-care workers from subclinical coronavirus infection [2]	Chang D., 2020-03-01, United Kingdom	Case report	- Total population is unknown - Selective reporting	Health care workers	Not specified	Not specified	COVID-19 infection	14 HCW wearing surgical masks were infected by COVID-19.
3	N95 Respirators vs Medical masks for Preventing Influenza Among Health Care Personnel: A Randomized Clinical Trail. [3]	Randonovich LJ. Jr, 2019-09-3	Rando mised control led trial	- Lack of statistical powering - No blinding of participants - the effect of possible confounding factors could	2862 Health care workers (cluster randomization was conducted each year)	1993 HCW	2058 HCW	Laboratory confirmed influenza (LCI) Acute respiratory illness events (ARE) Laboratory-detected respiratory infections (LDCI)	N95 vs medical mask: - LCI 8.2% vs 7.2% - ARE 1556 vs 1771 - LDRI 679 vs 745 - LCRI 371 vs 417 - ILI 128 vs 166

				not always be considered				Laboratory confirmed respiratory illness (LCRI) Influenza-like illness (ILI)	→ All results were non-significant
4	Effectiveness of Masks and Respirators Against Respiratory Infections in Healthcare Workers: A Systematic Review and Meta-Analysis. [4]	Offedu et al. 2017-11-13	Systematic review and meta-analysis	- Lack of statistical powering - No blinding of participants - The effect of possible confounding factors could not always be considered - Relative risk was calculated based on odds ratio and an assumed risk of infection	3466 Health care workers	- 1740 HCW (CRI, BRI, ILI and VRI) - 49 HCW (SARS)	- 1276 HCW (CRI, BRI, ILI and VRI) - 401 HCW (SARS)	Self-reported clinical respiratory illness (CRI) Laboratory confirmed upper respiratory tract bacterial colonization (BRI) Laboratory confirmed influenza (ILI) Laboratory confirmed viral infection (VRI) SARS infection	CRI: RR=0.47, ILI: RR=0.84, NS VRI: RR=0.78, NS SARS exposure: risk reduction of 80% in both groups
5	Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infections: a systematic review and meta-analysis [5]	Smith J. D. 2015-12-02	Systematic review and meta-analysis	- Lack of statistical powering - Lack of data concerning absolute number of participants in N95/surgical mask group - No blinding of participants	4109 Health care workers	Not specified	Not specified	Laboratory-confirmed respiratory infection (LCI) Influenza like illness (ILI) Workplace absenteeism (WA)	LCI: -OR 0,89 (0,64-1,24) in RCTs -OR 0,43 (0,03-6,41) in cohort study, -OR 0,91 (0,25-3,36) in the case control studies ILI: OR 0,51 (0,19-1,41) in the RCTs

				- The effect of possible confounding factors could not always be considered					WA: OR 0,92 (0,57-1,5) in one RCT. → All results were non-significant
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Add conclusions of overall body of evidence here:

1. Main results:

Er is geen significant verschil tussen FFP2/N95 maskers en chirurgische maskers in het aantal besmettingen met respiratoire virussen bij gezondheidswerkers in normale klinische omstandigheden.

2. Risk of bias

De evidence bestaat uit studies met data van andere gelijkaardige virale respiratoire infecties die zich verspreiden via droplets.

De meeste RCT's en observationele studies zijn van lage kwaliteit en hebben onvoldoende power om een eventuele superioriteit van FFP2 maskers aan te tonen.

Er is een grote variatie in de verscheidene types maskers, o.a. afhankelijk van de producent. In onze best bet hebben we N95 maskers als equivalent beschouwd als FFP2 maskers en werden synoniemen van het 'chirurgisch masker' (o.a. medical mask) meegenomen.

3. Heterogeneity: statistical and/or clinical

Twee systematic reviews en één RCT over gelijkaardige respiratoire virale infecties vormen de basis. Aanvullend werden twee case reports van COVID-19 toegevoegd. Alle resultaten liggen in dezelfde lijn: geen significant verschil met wel een lichte trend ten voordele van de FFP2 maskers.

In de meta-analyses zag men geen duidelijke heterogeniteit tussen de verschillende geïnccludeerde studies. De twee systematic reviews baseren zich grotendeels op dezelfde studies in hun meta-analyse. Beide statistische analyses bereikten hiermee gelijkaardige resultaten.

Add clinical bottom line here:

De huidige medische literatuur zou geen superioriteit van de FFP2/N95 maskers t.o.v. de chirurgische maskers aantonen ter preventie van besmetting door influenza-like virussen. Studies naar COVID-19 wijzen in dezelfde richting maar hebben onvoldoende power om zeker te zijn.

NB:

- *Er dient aandacht te zijn voor de 'fit' en correct gebruik van de maskers. In de studies wordt gezien dat er vaak incorrect gebruik van maskers (voornamelijk N95 maskers) voorkomt. Daarnaast zijn ook andere preventieve maatregelen van primordiaal belang. Enkel maskers zonder andere preventieve maatregelen geeft onvoldoende bescherming.*
- *Bij omstandigheden met risico op aerosolvorming worden in de studies N95/FFP2 maskers aangeraden.*

References:

1. Ng K, Poon BH, Kiat Puar TH. COVID-19 and the Risk to Health Care Workers: A case. Ann Intern Med. 2020.
2. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health care workers from subclinical coronavirus infection. The Lancet Respiratory Medicine 2020.
3. Offeddu V, Yung CF, Low MSF, Tam CC. Effectiveness of Masks and Respirators Against Respiratory infections in Healthcare Workers: A systematic Review and Meta-Analysis. Clin Infect. Dis. 2017.
4. Radonovich LJ, Simberkoff MS, Bessesen MT, et al. N95 respirators vs medical masks for preventing influenza among health care personnel: A randomized clinical trial. JAMA - J Am Med Assoc. 2019
5. Smith JD, MacDougall CC, Johnstone J, Copes RA, Schwartz B, Garber GE. Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: A systematic review and meta-analysis. CMAJ. 2016.