Philippine COVID-19 Living Clinical Practice Guidelines
Institute of Clinical Epidemiology, National Institutes of Health, UP Manila
In cooperation with the Philippine Society for Microbiology and Infectious Diseases
Funded by the Department of Health

EVIDENCE SUMMARY

Is a facemask with face shield more effective than facemask alone in reducing SARS COV2 transmission?

Update by: Germana Emerita Gregorio, MD; Myzelle Anne Infantado, PTRP, MSc (cand.) Maria Teresa Sanchez-Tolosa, MD, D Clin Epi, FPDS

Initial review by: Cristina Z. San Jose, MD, FPNA, Valentin C. Dones, PTRP, MSPT, PhD, Germana Emerita Gregorio, MD, MSc, PhD, Maria Teresa Sanchez-Tolosa, MD, D Clin Epi, FPDS

RECOMMENDATIONS

We suggest against requiring the use of face shields in addition to face masks among the general public in non-healthcare settings. *(Very low certainty of evidence; Weak recommendation)*

We recommend the addition of face shields to face masks among the general public in areas with sustained community transmission of SARS-CoV-2. *(Very low certainty of evidence; Strong recommendation)*

We recommend the use of face shield plus medical face mask and standard personal protective equipment among health care workers not directly involved in the care of COVID-19 patients in areas with sustained community transmission of SARS-COV2. *(Very low certainty of evidence; Strong recommendation)*

Consensus Issues

For the first statement, which suggests against obligatory public use of face shields, the panel's primary consideration was the insufficient evidence from existing literature that were assessed to be of very low certainty. This assessment stemmed from the indirectness of the studies in which they enrolled healthcare workers – rather than the general public – in the community, and included laboratory experiments not directly involving humans, as well as studies that investigated different viral infections with varied routes of transmission. Other factors affecting the panel's decision were public preference and observed poor compliance, environmental pollution, safety issues particularly in workplaces, additional costs, increasing vaccination rates, declining COVID-19 incidence, and the individuals' capacity to assess their own risk in the community. Despite this suggestion to rescind the mandatory use of face shields, continued proper use of well-fitted face masks is still recommended.

Due to the perceived benefit of providing an additional mechanical barrier against viral infections, the panel maintained a strong recommendation for wearing both face masks and face shields in high-risk environments such as crowded public transit, poorly ventilated spaces, and areas with high incidence of COVID-19 cases. In support of this, the panel considered the indirect evidence taken from a high-quality meta-analysis that showed a 78% reduction of risk in contracting respiratory infections from SARS-CoV-2, SARS, or MERS when an eye protector such as face shield or goggles was used compared with none.

There was a unanimous decision on adopting the previous recommendation on the use of face shield plus medical face mask for the healthcare workers and no concerns were mentioned.

PREVIOUS RECOMMENDATION

We suggest the use of face shield plus face mask among the general public in areas with sustained community transmission of SARS-COV2. *(Very low quality of evidence; Conditional recommendation)*

We recommend the use of face shield plus medical face mask and standard personal protective equipment among health care workers not directly involved in the care of COVID-19 patients in areas with sustained community transmission of SARS-COV2. *(Very low quality of evidence; Strong recommendation)*

We suggest using a cloth mask that fits snugly on the face and made of at least two layers of cotton (e.g., t-shirt fabric) or non-woven nylon with aluminum nose bridge by the general public with low risk of exposure to COVID-19 in outdoor or indoor areas to prevent COVID-19 infections. *(Low quality of evidence; Conditional recommendation)*

Previous Consensus Issues
The very low quality of evidence was due to biases and imprecision seen in the observational studies included in the review. It was noted that none of the studies considered ventilation or testing in an enclosed space. Since the World Health Organization declared COVID-19 as airborne, there can be transmission if there is no eye covering or face shield.

What's new in this version?

This updated review includes two new case-control studies that were not included in the original evidence. Analysis of the effect estimates was performed according to setting (hospital and community), and then according to study design (case-control, and pre- and post-surveillance studies).

Key Findings

There was no available direct evidence for face shield plus face mask versus face mask alone in the general public. In the initial review done in May 2021, there were three studies that were included; for this updated review (until September 2021) we found two additional case-control studies. All these five studies were conducted among health care workers: four were done in the health care setting and one in the community. Three case-control studies showed a trend toward benefit with the use of face shields but this was inconclusive (OR 0.85, 95% CI 0.68-1.08). Two pre- and post- face shield use surveillance studies showed significant benefit (OR 0.28, 95% CI 0.22-0.37 and OR 0.04, 95% CI 0.00-0.69), respectively. The overall certainty of evidence was very low as the studies were non-randomized, unadjusted for confounders and with high risk of bias as well as indirectness.

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is mainly transmitted through respiratory droplets and close contact, with a particular concern for airborne transmission especially during aerosol-generating procedures. In SARS-CoV-2, SARS or MERS, reduced risk of infection was observed with the use of surgical or 12-16 layer cotton masks (OR=0.15, 95% CI 0.07-0·34); the use of eye protectors showed significant protection (OR=0.22, 95% CI 0.12-0.39), translating to 78% relative risk reduction.[1] The use of face shields was found to reduce the

potential for autoinoculation by preventing one from touching the front and side of the face, and to protect viral entry into the eyes, nose and mouth.[2]

Review Methods

We comprehensively searched various electronic databases that included PUBMED, MEDLINE, Cochrane CENTRAL, ChinaXiv, MedRXIV, BioRXIV, as well as the following registries for ongoing and completed trials: USA - https://clinicaltrials.gov/; China - http://www.chictr.org.cn/searchprojen.aspx; and the WHO - https://www.who.int/clinical-trials-registry-platform. We also searched for published/ongoing studies on the COVID-19 Open Living Evidence Synthesis: https://covid-nma.com/ and the Living Evidence on COVID-19: https://zika.ispm.unibe.ch/assets/data/pub/search_beta/. The last search date was September 30, 2021 using a combination of subject headings and keywords for the following PICO: P – general public; I – face shield with face mask, face shield; C – no face shield; and O – prevalence of SARS-CoV-2 transmission. We included any type of study that investigated the effects of face shield or face mask on the incidence of SARS-COV-2 infection. We checked the reference lists of included papers and relevant systematic reviews. We also did a free search of online sources, preprint articles, and various coronavirus resource centers. We screened abstracts, reviewed full texts and extracted relevant information on study design, settings, population and outcomes. There was no language restriction. We screened studies, extracted data, assessed risk of bias and certainty of evidence using the GRADE approach.

Results

Similar to the previous evidence synthesis [3], there is no available direct evidence for face shield plus face mask versus face mask alone in the general public. For this update, we only found two additional case-control studies that dwelt on healthcare workers in the hospital and community settings. A summary of our five included studies is shown in Appendix 1.

The three case-control studies[4-6] included in this review enrolled a total of 1164 healthcare workers in a hospital/healthcare setting. Of these, 608 used or always used face shield or goggles while 556 did not use or did not always use face shield or goggles. In the former group, 295 tested positive for COVID-19; in the latter, 291 had positive results. The pooled estimate for the outcome of COVID-19 infection showed a trend toward benefit with the use of face shield or goggles, but this was inconclusive (OR 0.85, 95% CI 0.68-1.08).

The critical appraisal of these three studies is shown in Appendix 3. There were issues related to representativeness, selection of controls, and ascertainment of exposure. The overall certainty of evidence was judged to be very low (see Appendix 4A).

The pre- and post-surveillance study of Mohajer et al. [7] done in a healthcare setting reported that before the use of face shields was instituted in their hospital, 166 individuals out of the 2486 tested had positive RT-PCR results. After the hospital-wide directive on face shield use, only 80 of the 4041 persons tested were positive on RT-PCR. This study showed significant benefit with the use of face shields (OR 0.28, 95% CI 0.22-0.37); however, the certainty of evidence was very low because of serious risk of bias and indirectness (see Appendix 4B).

The pre-and post-surveillance study done in the community by Bhaskar and Arun [8] involved 62 healthcare workers serving in the community. Before the use of face shields, 12 of the healthcare workers contracted COVID-19. After the initiation of face shield use, none of the remaining 50 contracted the infection. There was significant protection with the use of face shields (OR 0.04,

95% CI 0.00-0.69). The certainty of evidence was assessed to be very low because of very serious risk of bias, imprecision and indirectness.

Recommendations from Other Groups

The Center for Disease Control [9], as of 19 April 2021, recommends the use of masks in addition to staying at least 6 feet apart in the following situations: (1) when indoors around people who don't live in the same household; (2) traveling on a plane, bus, train, or other form of public transportation traveling into, within, or out of the United States and in U.S. transportation hubs such as airports and stations; (3) in public settings and when around people who don't live in the same household; and (4) inside the house if a household member is sick with symptoms of COVID-19 or has tested positive for COVID-19. Goggles or other eye protection may be used in addition to a mask.

The World Health Organization [10], as of 01 December 2020, recommends the use of mask in areas where the virus is circulating, when at least 1 meter distance from others is not possible, poor or unknown ventilation which depends on the rate of air change, recirculation and outdoor fresh air. There was no recommendation made on the use of face shield

The Interagency Task Force For the Management of Emerging Infectious Disease, as of 14 December 2020 [11], recommends that all persons are mandated to wear full-coverage face shields together with face masks, ear-loop masks, indigenous, reusable, or do-it-yourself masks, or other facial protective equipment which can effectively lessen the transmission of COVID-19, whenever they go out of their residences. In 23 September 2021, this was amended to limit the use of face shields, on top of face mask, in high-risk activities in closed, crowded areas and if with close contact.

Research Gaps

We do not have data on the use of face shield in addition to face mask as protection against COVID 19 infection for the general public in the community during the pandemic.

References

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[8] Bhaskar M, Arun S. SARS-CoV-2 infection among community health workers in India before and after use of face shields. JAMA. 2020;324(13):1348.

[9] CDC. Guidance on Wearing Mask 2021 [updated 19 April 2021]. Available from: https://www.google.com/search?q=cdc+guidelines+on+face+shield+use&oq=&aqs=chrome.0.35i39i362l8...8.61857611j0j15&sourceid=chrome&ie=UTF-8.

[10] WHO. Masks: World Health Organization; [updated 1 Dec 2020]. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/coronavirus-disease-covid-19-masks

[11] IATF. Management of Emerging Diseases 2021 [Available from: https://www.pna.gov.ph/articles/1154380.

Appendix 1. Evidence to Decision

Summary of initial judgements prior to the actual panel meeting (N = 8)

FACTORS	JUDGEMENT						RESEARCH EVIDENCE/ADDITIONAL CONSIDERATIONS FROM PANEL MEMBERS
Problem	No	Yes (8)					
Benefits	Large (3)	Moderate (3)	Small (1)	Uncertain (1)			• NO EVIDENCE for the reduction of risk in the general public • BENEFIT among healthcare workers in both hospital (OR 0.28, 95% CI 0.23-0.37) and community settings; INCONCLUSIVE BENEFIT from 3 cohort studies among HCW in hospital • These PPE can prevent transmission of other respiratory infectious organisms
Harm	Large (2)	Small (6)	Uncertain	Varies			• OR 0.85, 95% CI 0.68 – 1.08: Tendency to have minimal risk of COVID-19 infection among HCW in the hospital setting
Certainty of Evidence	High	Moderate (2)	Low (4)	Very low (2)			• The overall certainty of evidence: VERY LOW
Balance of effects	Favors drug (4)	Does not favor drug	Uncertain (4)	Varies			
Values	Important uncertainty or variability (3)	Possibly important uncertainty or variability (3)	Possibly NO important uncertainty or variability (2)	No important uncertainty or variability			

Resources Required	Uncertain	Large cost (1)	Moderate Cost (6)	Negligible cost (1)	Moderate savings	Large savings	• No cost-effectiveness studies available.
							• Costing(1):
							  ○ Facemask + Face shield: Php 50 - 250
							  ○ Facemask: Php 25-200

Certainty of evidence of required resources	No included studies (5)	Very low (2)	Low (1)	Moderate	High		• No cost-effectiveness studies available.

Cost effectiveness	No included studies (6)	Favors the comparison (1)	Does not favor either the intervention or the comparison (1)	Favors the intervention		• No cost-effectiveness studies available.
Equity	Uncertain (3)	Reduced (2)	Probably no impact (1)	Increased (2)		• No local studies available.
Acceptability	Uncertain (1)	No (5)	Yes (2)	Varies		• In the survey of 400 adults, 90.75% perceived that face mask is the most effective PPE. 35/400 among adults in Metro Manila believed that face shield is most effective personal protective equipment(2) • Ease of use • Vaccination status should be considered
Feasibility	Uncertain	No (1)	Yes (7)	Varies		• No local studies available.

References

1. DOH. Updated suggested retail price (SRPs) for emergency essential medicines and medical devices due to the coronavirus disease 2019 (COVID-19) health event. In: Health Do, editor. 2021.
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Appendix 2. Search Yield and Results

14	#6 AND #1	Most Recent	("covid 19"	68
13	#8 AND #1	Most Recent	("covid 19"	30
12	#10 AND #	Most Recent	("covid 19"	22
11	transmissic	Most Recent	"transmissa	587,541
10	#1 AND #9	Most Recent	("covid 19"	30
9	N95 mask	Most Recent	"n95 respir	1,133
8	#1 AND #2	Most Recent	("covid 19"	46
7	eye goggle	Most Recent	("eye"[Me	2,805
6	#1 AND #2	Most Recent	("covid 19"	114
5	face shield	Most Recent	("face"[Me	1,415
4	#1 AND #2	Most Recent	("covid 19"	2,939
3	surgical ma	Most Recent	("surgical p	8,303
2	Mask	Most Recent	"masks"[M	45,852
1	(COVID 19)	Most Recent	("covid 19"	111,590

Appendix 3. Characteristics of Included Studies

Appendix 2. Included Studies on the Use of Face Shield Among Health Care Workers

	Setting	Population	COVID (+)	COVID (-)	Intervention	Comparator	Outcome
Khalil SN	Dhaka Bangladesh	190 Medical staff in 19 health facilities	98	92	Face shield	No Face Shield	Number of HCW with face shield infected with COVID 19
Mojajer A	Houston Texas	6527 Health Care Personnel (HCP) of a quartemary health hospital	246	6281	Face shield[1] with standard PPE	Standard PPE	Number of HCP infected before and after implementation of use of face shield with standard PPE Number of HCP with HAI before and after implementation of use of face shield with standard PPE
Bhaskar	India	112 HCW	12	100	Face shield and PPE	PPE alone	Number of HCW with COVID 19 before and after implementation of use of face shield with PPE
Chatterjee	India	751 HCW	378	373	Use of Face shield or goggles (either or both)	No face shield/goggles	Number of HCW with face shield infected with COVID 19
Rodriguez Lopez	Cali Colombia	223 HCW	120	103	Use of Face shield/goggles always	Use of Face shield/goggles not always	Number of HCW with face shield infected with COVID 19

[1] Face shield used was a Lazarus 3D (Corvallis, OR, USA)
[2] Personal protective equipment included alcohol hand rub, 3-layered surgical masks, gloves, and shoe covers and physical distancing.
Abbreviation: HCW – health care workers; HAI – hospital acquired infection; PPE – personal protective equipment

Appendix 4. Appraisal of Included Studies

Appendix 3. Detailed Appraisal of Included studies, using Newcastle Ottawa Scale

Case control studies	Khalil 2020	Chatterjee 2020	Rodriguez-Lopez 2021
Selection			
Is case definition adequate	Yes (RT PCR +)	Yes (RT PCR+)	Yes (RT PCR+)
Representatives of the cases	Not stated how they were selected from the list	Not stated how they were selected from the data portal	Selected by random sample from those identified as HCW with or without symptoms
Selection of control	Not stated how they were selected from the list	Not stated how they were selected from the data portal	Selected by random sample from those identified as HCW with or without symptoms
Definition of control **Comparability of cases and controls on the basis of the design and analysis**	Yes (RT PCR -) Yes (Cases and controls were selected on the basis of their RT PCR tests). No difference in the baseline characteristics of cases and controls	Yes (RT PCR -) Yes (Cases and controls were selected on the basis of their RT PCR tests). In those who were positive, there were more males and with duration of work in the workplace >1 year)	Yes (RT PCR -) Yes (Cases and controls were selected on the basis of their RT PCR tests); There were more COVID positive who were males, worked in high risk areas and night shift
Exposure Ascertainment of Exposure	Information was obtained online thru a Google form using a predesigned structured questionnaire	No statement that the telephone interviewer was blinded to COVID status of the interviewee (no interviewer variability was reported)	Data collected by two trained researchers by telephone interview using structured questionnaire who were blinded to the COVID status of the

Appendix 5. GRADE Evidence Profile

A. Case control studies

Face Shield compared to No Face Shield for health care workers

Certainty assessment							Summary of findings			
Participants (studies) Follow-up	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication bias	Overall certainty of evidence	Study event rates (%)		Relative effect (95% CI)	Anticipated absolute effects	
							With No Face Shield	With Face Shield		Risk with No Face Shield	Risk difference with Face Shield
COVID 19 Infection (assessed with: RT PCR)											
586 COVID positive; 578 COVID negative; 295/608 with face shield; 291/556 without face shield (3 observational studies)	very serious[a]	serious[b]	serious[c]	not serious	strong association all plausible residual confounding would reduce the demonstrated effect	⨁◯◯◯ Very low	586 COVID positive; 578 COVID negative; 295/608 with face shield; 291/556 without face shield		**OR 0.85** (0.68 to 1.08)	**High**	
										0 per 1,000	**0 fewer per 1,000** (from 0 fewer to 0 fewer)

CI: confidence interval; **OR:** odds ratio

Explanations

a. Compliance with face shield use and other health protocols was not assessed; some studies were based on interview or structured questionnaire and may have caused recall bias
b. Considerable heterogeneity (I2=92%) with overlap on the confidence intervals of the studies
c. Research question should answer Use of Face shield and face mask vs Face mask alone

B. Pre- and post-surveillance study among health care workers

Author(s): Germana Emerita Gregorio, MD; Myzelle Anne Infantado, PTRP, MSc (cand.) Maria Teresa Sanchez-Tolosa, MD, D Clin Epi, FPDS

Question: Is Facemask with Face Shield more effective than Facemask alone in reducing SARS COV2 transmission?

Setting: Community setting

Bibliography: Mojajer M, Panthagani KM, Lasco T, Lembcke B, Hemmige V. Association between universal face shield in a quaternary care center and reduction of SARS-COV-2 infections among healthcare personnel and hospitalized patients. International JJournal of Infectious Diseases. 2021 Apr;105:252–5.

Bhaskar ME, Arun S. SARS-CoV-2 Infection Among Community Health Workers in India Before and After Use of Face Shields. JAMA. 2020 Oct 6;324(13):1348.

ertainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	With Face Shield	With No Face Shield	Relative (95% CI)	Absolute (95% CI)		
In the Hospital												
COVID-19 Infection (assessed with COVID-19 RT-PCR)												
1 6527 participants	observational studies	serious[a]	not serious	very serious[b]	not serious	strong association	80/4041 (2.0%)	166/2486 (6.7%)	**OR 0.28** (0.22 to 0.37)	**48 fewer per 1,000** (from 52 fewer to 42 fewer)	⨁◯◯◯ Very low	
In the Community Setting												
COVID-19 Infection (assessed with COVID-19 RT-PCR)												
1 112 participants	observational studies	very serious[a]	not serious	very serious[b]	very serious[c]	none	0/50 (0.0%)	12/62 (19.4%)	**OR 0.04** (0.00 to 0.69)	**186 fewer per 1,000** (from 60 fewer to --)	⨁◯◯◯ Very low	

CI: confidence interval; **RR:** risk ratio

Explanations

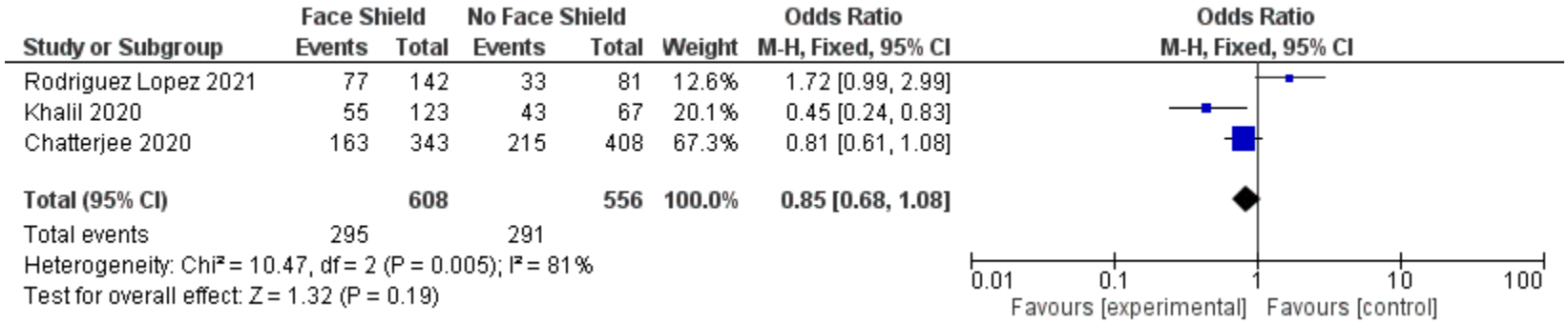
a. Compliance with face shield use and other health protocols was not assessed

b. Study was not done in the general population but among healthcare workers. Research question should answer Use of Face shield and face mask vs Face mask alone

c. Very wide confidence interval

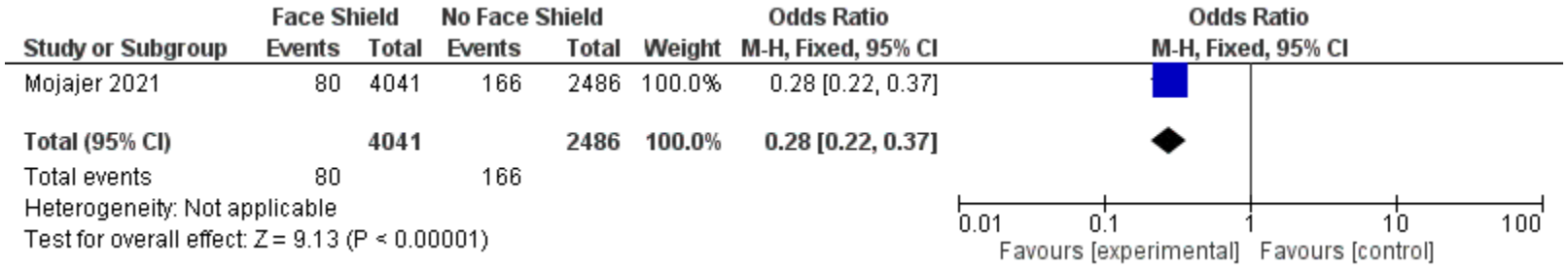
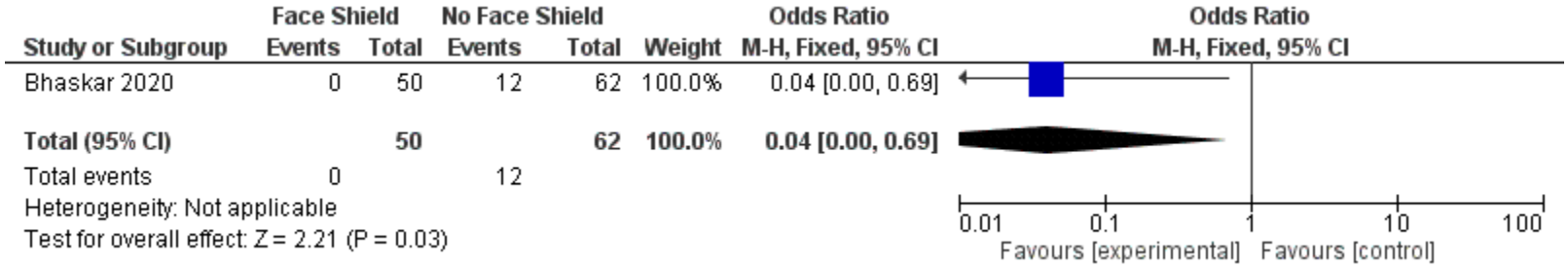
Appendix 6. Forest plots

A. Case control studies



B. Pre- and post-surveillance study among health care workers

1. In the hospital/health setting



2. In the community