

Supplementary File 2. Summary of all studies included in scoping review in PICOS format (n=48)

Year	Region	Population	Intervention	Outcome Measures	ISSN (Electronic)	Category
2009 (21)	Japan	32 nurses, doctors, and co-medical personnel in 1 tertiary care hospital	Continuous use of surgical mask  Control: no mask, unless required to do	Self-reporting of upper respiratory symptoms	0196-6553	Synthesis of Results - Med grade facial protection; Inpatient setting
2009 (22)	Canada	446 nurses in emergency departments, medical units, and pediatric units in 8 tertiary care hospitals	Targeted use of fit-tested N95 respirator  Targeted use of surgical mask	Primary: laboratory-confirmed influenza	1538-3598	Synthesis of Results - Med grade facial protection; Inpatient setting
2013	China	1,669 nurses and doctors in 68 wards from 19 hospitals; cluster randomization by ward	Continual use, fit-test N95 respirator  Targeted use, fit-tested N95 respirator  Control: continual use, medical mask	Laboratory-confirmed respiratory infection  Influenza-like illness	1535-4970	Synthesis of Results - Med grade facial protection; Inpatient setting
2014	China	1,441 inpatient nurses and doctors from 15 hospitals  Control: 481 nurses and doctors in 9 hospitals	Medical masks  N95 respirators (fit and non fit tested)  Convenience control group	Laboratory-confirmed bacterial colonization	1096-0260	Synthesis of Results - Med grade facial protection; Inpatient setting

tyre 2015	Vietnam	1,607 inpatient hospital healthcare workers from 14 hospitals	Medical masks Cloth masks Control group:usual practice, which included mask wearing)	Clinical respiratory illness Influenza-like illness Laboratory-confirmed respiratory virus infection	2044-6055	Synthesis of Results - Improvised m:
tyre 2011	China	1,441 inpatient nurses and doctors from 15 hospitals Control: 481 nurses and doctors from 9 hospitals	Medical masks N95 respirators (fit- and non-fit tested) Convenience control group	Self reported clinical respiratory infection Self reported influenza like illness Laboratory confirmed viral infection and influenza by PCR	1750-2659	Synthesis of Results - Med grade facial protection; Inpatient setti
tyre 2017	China	3,591 inpatient nurses and doctors Control: 481 nurses and doctors from 9 hospitals (Pooled participants from MacIntyre 2011 and MacIntyre 2013)	Continuous N95 respirator use Targeted N95 respirator use Medical mask use Convenience control group	Laboratory-confirmed viral respiratory infection, influenza A or B Laboratory-confirmed bacterial colonization and pathogens grouped by mode of transmission	1750-2659	Synthesis of Results - Med grade facial protection; Inpatient setti
20 (28)	Singapore	41 healthcare workers with exposure to aerosol-generating procedures conducted on COVID-19 patient	Detection of SARS-CoV-2 by PCR assay	Exposures to aerosol generating procedures Type of mask worn Acquisition of SARS-CoV-2 infection	1539-3704	Synthesis of Results - Med grade facial protection; Inpatient setti

ovich 2019	United States	2371 nurses/nursing trainees, clinical support staff, physicians/advanced practitioners/physician trainees, registrations/clerical receptions, social workers/pastoral cares and environmental service workers/housekeepers from 137 outpatient study sites; cluster randomization by outpatient clinic or outpatient setting	Targeted use of fit-tested N95 respirator  Targeted use of surgical masks  Control: targeted use, medical mask	Primary: Incidence of laboratory-confirmed influenza  Secondary: Incidence of acute respiratory illness, laboratory-detected respiratory infections, laboratory-confirmed respiratory illness, and influenza-like illness	1538-3598	Synthesis of Results - Med grade facial protection; Outpatient set
Science rch	Region	Entity or device studied	Intervention	Outcome Measures	ISSN	Categorie
r 2006 (11)	United States, Poland	2 N95 respirator models and 2 surgical mask models	Exposure to viral particles during simulated inhalation	Fractional penetration of viral particles	1527-3296	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
an 2010	United States	6 N95 respiratory models	Three-cycle processing of 8 different N95 respirator decontamination methods, submersion in deionized water	Changes in physical appearance, odor, and filtration performance (aerosol penetration and airflow resistance)	1558-9250 (Print)	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
an 2012	United States	6 N95 respirator models	20 consecutive donnings of each model by 10 test	Percentage of donnings resulting in fit factor $\geq 100$	1527-3296	Synthesis of Results - Med grade facial

			subjects			protection; Extended use reuse of N95 respirators
off 2011	United States	Masks worn by 28 healthy participants	Ocular exposure to monodispersed live attenuated influenza vaccine (LAIV) particles while wearing 5 different forms of facial protection versus no protection	Quantitative measurement of LAIV in post exposure nasal wash by RT-PCR and culture.	1537-6613	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
ot 2012	France	2 models of N95 half-mask respirators	Test-chamber exposure to aerosolized nanoparticles a manikin head with simulated human respiration with sealed and unsealed fit	Global protection factor assessed by nanoparticle filtration efficiency	1537-6613	Synthesis of Results - Improvised m:
au 2010	United States	35 subjects with no prior training or experience with N95 respirators	Subjects donned each of 2 respirator models under observation and underwent fit testing	Criteria for proper donning procedures, quantitative fit factors	1545-9632	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
2015 (29)	United States	N95 respirators	Spreadsheet model estimating respirator use in epidemic and pandemic influenza scenarios	Respirator use	1537-6591	Synthesis of Results - Med grade facial protection; Inpatient settin

ova 2010	United States	Survival of coronaviruses on PPE using a surrogate, transmissible gastroenteritis virus	Virus inoculated on material samples from N95 respirators, latex and nitrile gloves, contact isolation gowns, hospital scrubs	Virus survival and inactivation at 2, 4, and 24 hours after inoculation	1559-6834	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
ova 2013	United States	Inactivation of respiratory virus surrogate, bacteriophage phi6, on N95 respirators	Virus placed on material samples from N95 respirators	Virus survival and inactivation at every 2 hour time point after inoculation for 24 hours at 22C and 40% or 60% relative humidity	1559-6834	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
il 2004	United States	SARS-CoV inactivation methods	UV light, gamma irradiation, heat, formaldehyde and glutaraldehyde, pH analysis	Infectivity of viral RNA and virions	1879-0984	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
006 (52)	United States	Handmade, reusable, cotton mask  Control: N96	Standard quantitative fit test, the Portacount Plus Respirator Fit Tester with N95-Companion	Fit factor	1080-6059	Synthesis of Results - Improvised m:
; 2013 (51)	United Kingdom	Masks worn by 21 healthy volunteers	Homemade mask  Surgical mask  No mask	Facial fit factor  Number of microorganisms isolated from healthy volunteer coughs while wearing a homemade mask, surgical mask, or no mask	1938-744X	Synthesis of Results - Improvised m:

ok 2005	Hong Kong	Masks worn by 6 healthy volunteers	Surgical mask worn in layers of 1, 2, 3, or 5	Particle counts inside and outside the mask	1532-2939	Synthesis of Results - Med grade facial protection; Laboratory/controlled settings
2003 (44)	China	10 TCID (tissue culture infective dose) SARS-CoV-1 viruses in test environments (serum, feces, household surfaces)	UV irradiation and heat application to SARS-CoV-1	Stability of SARS coronavirus in human specimens and in environments Resistance to temperature and UV irradiation	2214-0190	Synthesis of Results - Med grade facial protection; N95 respirator decontamination procedures
hae 2017	United States	Surgical masks and N95 worn by 3 home health workers	Surgical masks compared to N95 FFR respirators	Aerosol concentrations inside and outside the masks and respirators	1545-9632	Synthesis of Results - Med grade facial protection; Laboratory/controlled settings
2011 (41)	United States	6 N95 respirator models	Microwave steam bag decontamination (performed in 3 phases)	Limited filtration performance degradation; Low water retention; Filtration efficacy; decontamination efficacy	1932-6203	Synthesis of Results - Med grade facial protection; N95 respirator decontamination procedures
h 2013 (9)	United States	5 N95 FFR models	Masks were challenged with aerosolized viable H1N1 influenza and inert polystyrene latex particles at continuous flow rates of 85 and 170 liters per minute	Filtration efficiency	1559-6834	Synthesis of Results - Med grade facial protection; Laboratory/controlled settings

2019 (7)	Korea	Efficacy of commercial face piece respirators against bacterial bioaerosols	N95, KF94 (airwasher), KF94 (Fintech), KF80 (3M9011), KF80 (3M9510), KF80/FFP1, KF80 (airwasher daily care), KMOL 2nd level, Kleenguard mask under various airflow velocity and relative humidity conditions	Filtration efficacy against <i>Staphylococcus epidermidis</i> and <i>Escherichia coli</i> bioaerosols, pressure drop of the filter, and the relative recovery rates for the bacteria	1879-1026	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
08 (10)	United States	4 models of N95 respirators and 3 models surgical masks worn by 12 healthy subjects	N95, surgical mask treated with NaCl aerosols	Protection factor	1475-3162	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
ey 2012	United States	Quantifying the spread of bioaerosols and the efficacy of different types of respiratory personal protective equipment (PPE)	No PPE, surgical masks, N95 FFRs	Aerosol exposure, influence of breathing rate, room ventilation, and location of coughing and breathing simulators	1545-9632	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
ey 2014	United States	Efficacy of face shields in reducing health care worker exposure to aerosol droplets	No face shield- 46 cm distance Face shield- 46 cm distance No face shield- 183 cm distance Face shield- 183cm distance	Inhalational exposure of influenza laden aerosol particles sized 8.5 and 4.3 microns	1545-9632	Synthesis of Results - Med grade facial protection; Laboratory/co led settings
ey 2015	United States	Effects of disinfecting disposable N95 FFRs with UVGI	Four N95 FFRs exposed to UVGI doses 120-950 J/cm <sup>2</sup>	Particle penetration, flow resistance, and bursting strengths of individual respirator	1545-9632	Synthesis of Results - Med grade facial protection; N9

				coupon layers, and breaking strength of respirator straps		respirator decontamination procedures
012 (40)	United States	Effectiveness of energetic decontamination methods on N95 FFRs	UVGI, microwave generated steam, or moist heat decontamination on two N95 FFR models	Viral load reduction Filter performance before and after decontamination	1475-3162	Synthesis of Results - Med grade facial protection; N9 respirator decontamination procedures
on 2013	United Kingdom	8 UK surgical masks designs	Inert particles and live aerosolized influenza virus	Measured levels of inert particles and live aerosolized influenza taken from the air in front of and behind each mask type	1532-2939	Synthesis of Results - Med grade facial protection; Laboratory/controlled settings
2008 (55)	United States	20 test subjects  Filter performance and facial fit of sample surgical masks	Nine varieties of surgical masks used in dental and hospital settings	Filter penetration Qualitative and quantitative fit testing	1527-3296	Synthesis of Results - Improvised m:
016 (17)	United States	Assessing source protection versus receiver protection of surgical masks	Natural fit and SecureFit surgical masks, and N95 respirator with and without Vaseline seal on source versus control	Aerosol exposure and mask filtration	1545-9632	Synthesis of Results - Med grade facial protection; Laboratory/controlled settings
samy 2010	United States	5 models of fabric masks	Monodisperse NaCl aerosols Polydisperse NaCl aerosols measured at 2 different face velocities (5.5 cm/s and 16.5 cm/s)	Monodisperse aerosol penetration of NaCl particles Polydisperse aerosol penetration of NaCl Penetration of large NaCl particles (50-100	1475-3162	Synthesis of Results - Improvised m:



				nm)		
samy 2011	United States	NIOSH-approved N95 and P100 and FFP2 and FFP3 filtering facepiece respirator models sealed to a breathing manikin kept inside closed chamber	Monodisperse sucrose aerosols generated by electrospray or polydisperse NaCl aerosols produced by atomization	Filter penetration Total inward leakage	1475-3162	Synthesis of Results - Medical-grade facial protection Inpatient setting
en 2011	United States	Subject-respirator combinations that passed fit testing with four N95FFR models	Intervention: Fit testing Control: N95FFRs which passed and failed fit testing	Particle-size-selection protection factors of particles with aerodynamic diameter = 5 0.04–1.3 mm	1475-3162	Synthesis of Results - Improvised masks
a 2017	United States	Three types of cloth masks  One type of surgical mask  Control: N95 mask	Five monodispersed aerosol sphere size (30, 100, and 500 nm, and 1 and 2.5 µm) and diluted whole diesel exhaust	Facemask performance as assessed by filtration efficiency	1559-064X	Synthesis of Results - Improvised masks
r Sande 50)	Netherlands	28 healthy adult volunteers,  11 children aged 5-11 years	FFP2 mask (N95 equivalent)  Surgical mask  Tea cloth mask	Protection factor calculated from measurements of particle concentration, reported as the ratio of particle concentrations outside and inside the mask	1932-6203	Synthesis of Results - Improvised masks
i 2009	United States	Nine models of NIOSH-certified respirators (three models each of N95 FFRs, surgical N95 respirators, P100 FFRs)	Ultraviolet germicidal irradiation, ethylene oxide, vaporized hydrogen peroxide, microwave oven irradiation, bleach	Changes in physical appearance, odor, and laboratory performance (filter aerosol penetration and filter airflow resistance)	1475-3162	Synthesis of Results - Medical grade facial protection; N95 respirator decontamination

				Dry heat laboratory oven exposures, off-gassing, and FFR hydrophobicity		procedures
i 2011	United States	N95 respirators worn by 10 human subjects who passed a standard OSHA quantitative fit test of N95	Ultraviolet germicidal irradiation, heat incubation, microwave-generated steam	N95 fitting characteristics, odor, comfort, or donning ease after interventions	1545-9632	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
i 2007	United States	Effects of decontamination methods to filtering facepiece respirators (N95 or P100)	Ten commonly available decontamination methods (chemical and non-chemical) at two different conditions  Controls: No decontamination, water	Initial instantaneous filtration performance of FFR measured by particle penetration	0892-6298 (Print)	Synthesis of Results - Med grade facial protection; N9 respirator decontaminati procedures
013 (14)	China	Filtration of aerosolized bacteriophage SM702 viral samples	Surgical mask (5 models)  N95 respirator (1 model)  N99 respirator (2 models)	Measurement of viral aerosol concentration before and after filtration	0393-5965 (Print)	Synthesis of Results - Medical-grade facial protectio Laboratory/co led settings
<b>Primary</b> <b>Search</b>	<b>Region</b>	<b>Population</b>	<b>Intervention</b>	<b>Topics reviewed</b>	<b>ISSN</b> (Electronic)	<b>Categorie</b>
n 2013	United Kingdom	Healthcare workers	Respiratory and facial protective equipment	Efficacy of surgical masks and respirators	1532-2939	Synthesis of Results - Med

				for prevention of respiratory infection		grade facial protection; Laboratory/co led settings
2014 (31)	United States	Healthcare workers	N95 FFR extended use and reuse	Risks of extended use and reuse of N95 FFR	1545-9632	Synthesis of Results - Med grade facial protection; Inpatient settin
ge 2016	United States	Healthcare workers	Face shields as adjunctive PPE	Design and structure; research; regulatory standards; guidelines; selection of face shields; proper use of face shields	1545-9632	Synthesis of Results - Medical-grade facial protectio Laboratory/co led settings
ge 2008	United States	Healthcare workers	Surgical masks worn concurrently over N95 filtering facepiece respirators	Respiratory resistance; hypercapnia and hypoxemia; heat; infection risk; communications; regulatory issues	1550-5022	Synthesis of Results - Med grade facial protection; Inpatient settin

Following classification system was used for study design: a) Clinical research: Randomized control trials (RCTs), case reports, b) Basic research: surveillance studies, device or material performance studies, virology studies, and theoretical model studies, c) Secondary research: narrative reviews. Grey area is not included in this table and can be found in the reference list.