Supplementary table. Experimental design and detailed results of included studies

First author, year	Masks tested	Description of cotton mask including material, weight, weave (twill or twisted), thread count, and number of layers	Details of experiments performed	Details of what was sampled	Outward, inward both, neither	Filtration efficiency
Capps 1918[1]	Cloth Mask	Rectangular mask measuring 5 x 7 inches made of 3 or 4 layers of gauze, weight NA, weave NA, thread count NA	No experiment was set up; rather it was an observation of patients and physicians wearing the masks at the infirmary, ambulance, office and wards.	The study measured the effectiveness of the entire method of masking and cubical quarantining for prevention of the spread of respiratory infectious diseases like measles and scarlet fever	Both	No mask efficiency was reported but the system as a whole (cubical quarantining plus masking) was 95% and 100% effective for preventing scarlet fever and measles, respectively
Cooper 1983[2]	Cloth Mask (cotton/ polyester shirt material, cotton handkerchief material, toweling) Surgical mask (Johnson & Johnson	In total, 3 cloth masks were tested: 1. Shirt made with oxford cloth 65% fortel polyester and 35% cotton, weight NA, weave NA, thread count 46/inch by 46/inch, 4 layers 2. Handkerchief white broadcloth 100% cotton, weight NA, weave NA, thread count 66/inch by 58/inch, 4 layers 3. Toweling terryweave 88% cotton and 12% dacron polyester, weight NA, weave NA, thread count NA, 1 or 2 layers	Different material masks were fastened on a mannequin head and aerosol inward leakage and penetration were measured using fluorescent aerosols and a filter located inside the mannequin head's mouth. The filter was 47mm in diameter and was cleaned after every experiment. Aerosols (fluorescent dioctyl phthalate aerosol 1.8 µm in diameter) were generated using a Thermo-Systems incorporated (TSI)	The dioctylphthalate fluorescence on the filter was sampled, the fluorescence was measured and concentration determined by comparison with a standard curve and linear regression. Four tests were performed and mean of leakage plus penetration was calculated.	Inward	3M nylon hosiery: 99.42% 3M fully taped: 98.5% 3M strapped: 81% J&J fully taped: 95.8% J&J tied: 64% Shirt-oxford cloth fully taped: 69% Shirt-oxford cloth corners taped: 26% Handkerchief fully taped: 76% Handkerchief corners taped: 32% Handkerchief nylon

	Co., Model HRI 8137) Disposable face mask (3M Corp., Model #8710)		Model 3050 vibrating orifice generator. Volume of air inhaled per minute was 37 L, respiratory rate of 23 cycles per minute. Mannequin was U.S. army design used for testing military respirators, facial features are based upon average male. Masks were fastened on the head by taping using different methods: 1) completely seal all edges with plastic tape over nose, around cheeks and under chin 2) loosely hold material with four pieces of tape on corners of mask 3) using nylon hosiery to hold mask in place by placing nylon hosiery over the head entirely.	Filtration efficiency was calculated using formula FE = 1-TIL.		hosiery: 72% Toweling washcloth fully taped (1 layer): 61% Toweling washcloth (1 layer) corners taped: 40% Toweling washcloth (2 layers) corners taped: 70%
Dato 2006[3]	Cloth mask	Hanes Heavyweight 100% preshrunk cotton T-shirt (made in Honduras) was boiled for 10 minutes and air-dried to maximize shrinkage and sterilize material in manner available in developing countries. Scissor, marker and ruler were used to cut out 1 outer layer (37x72 cm; used to fasten mask to head with 3 straps) and 8 inner layers (≤18 cm^2, layered as follows: 2 cross grain, 2 straight	Three authors of this paper made their own cloth masks to fit their faces. A quantitative fit test was performed using the Portacount Plus Respirator Fit Tester with N95 Companion, which measured the concentration of aerosol outside and inside the prototype mask. Ambient	Aerosol concentration (ambient dust and other aerosols present in air) outside and inside the prototype mask were measured. A fit factor was calculated,	Inward	Cloth mask filtration efficiency, 98.5%, 92.3%, 94.1% N95 filtration efficiency, 99%

		grain, 2 cross grain, 2 straight grain), weight NA, weave NA, thread count NA	dust and other aerosols present in the air were measured. Workplace activities were simulated (series of exercises, each 1 minute in duration).			
Davies 2013[4-6]	Cloth mask and medical mask cut in circular shape and used as a filter	Different materials were used to make a "homemade" mask. Materials included 100% cotton shirt, scarf, tea towel, pillowcase, vacuum cleaner bag, cotton mix, linen, and silk. Weight NA, weave NA, thread count NA, 1 or 2 layers Medical mask (Mölnlycke Health Care Barrier face mask 4239, EN14683 class I)	This paper consisted of three experiments: 1. Measuring filtration efficiency as a measure of inward protection, done by cutting masks made of different household materials in circular pieces and then placing in airtight cases as a filter. A Henderson apparatus allows closed-circuit generation of microbial aerosols from a Collison nebulizer at a controlled relative humidity and was used to deliver aerosol across each material at 30L/min. Aerosol particle size and distribution NA. 2. Measuring fit factor of homemade mask made of 100% cotton t-shirt fabric, by comparing concentration of microscopic particles outside and inside the respirator using the TSI	For inward experiment, there was an empty filter (used as a reference point) and then the chosen filter (used as the experimental group) to determine concentration of the different microbial aerosols in and out to determine filtration efficiency. *B. atrophaeus* and *Bacteriophage MS2* were used, and can be compared in size to influenza virus. For outward protection, many variables were measured including fit,	Both	Filtration Efficiency (first experiment) given in percentage, number in parentheses is for 2 layers. First numbers using *B atrophaeus*, second numbers using *Bacteriophage MS2* 100% cotton T-shirt: 69.42% (70.66%), 50.85% Scarf: 62.30%, 48.87% Tea towel: 83.24% (96.71%), 72.46% Pillowcase: 61.28% (62.38%), 57.13% Antimicrobial pillow case: 65.62%, 68.90% Medical mask: 96.35%, 89.52% Vacuum cleaner bag: 94.35%, 85.95%

			PortaCount Plus Respirator Fit Tester and N95 Companion module model 8095. During the fit test volunteers performed following consecutive exercises, each lasting 96 seconds: normal breathing, deep breathing, head moving side to side, head moving up and down, talking aloud, bending at waist as if touching toes and normal breathing. 3. A mobile sampling chamber, or cough box, was used for the purpose of sampling aerosols and droplets from healthy volunteers outward protection. Four settling plates with Tryptose soya agar were used as the culture medium placed inside this cough box, and the number of colony forming units were counted. Volunteers coughed twice into the box, wearing homemade mask, surgical mask and no mask	median and interquartile range, and colony forming units from "droplets"		Cotton mix: 74.60%, 70.24% Linen: 60.00%, 61.67% Silk: 58.00%, 54.32% Filtration Efficiency (second experiment), given as protection factors and converted in to filtration efficiency Normal breathing Homemade mask, 50% Medical mask, 83% Heavy breathing Homemade mask, 50% Medical mask, 86% Head moving side to side Homemade mask, 50% Medical mask, 80% Head moving up and down Homemade mask, 50% Medical mask, 80% Bending over Homemade mask, 0% Medical mask 67%

						Talking Homemade mask, 50% Medical mask, 83% Normal breathing again Homemade mask, 50% Medical mask 80% All data Homemade mask, 50% Medical mask, 80% Filtration Efficiency (Third experiment), given as number of colonies and converted in to filtration efficiency, 3 different sampling methods, air, settle plates and total Air Homemade mask, 83.3% Medical mask, 83.3% Settle plates Homemade mask, 0% Medical mask, 100% Total sampling methods Homemade mask, 50% Medical mask, 100% Filtration efficiency

						(third experiment), given as number of colonies and converted in to filtration efficiency, different particle diameters >7 µm Homemade mask, 66% Medical mask, 44% 4.7-7 µm Homemade mask, 61.1% Medical mask, 61.1% 3.3-4.7 µm Homemade mask, 20% Medical mask, 20% 2.1-3.3 µm Homemade mask, 85.1% Medical mask, 89.4% 1.1-2.1 µm Homemade mask, 84% Medical mask, 94% 0.65-1.1 µm Homemade mask, 71.4% Medical mask, 85.7% All particle sizes Homemade mask,

						78.5% Medical mask, 85%
Doust 1918[7]	Cloth masks	Coarse gauze, medium gauze, buttercloth, hemmed on the edges with 4 plaits on each lateral edge, equipped with tapes on 4 corners to tie behind the head. 6x8 inches, weight NA, weave NA, thread count NA, number of layers varying from 2 to 10 layers.	This paper performed 4 experiments with no masks, coarse gauze, medium gauze and buttercloth comparing the colony count on agar plates in different breathing conditions by volunteers sitting at a table with exposed plates arranged at distances of 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 feet. Volunteers were instructed to talk in ordinary conversational tone for five minutes, talk in a loud tone for 5 minutes, or cough as much as possible for 5 minutes with the no mask and the different mask conditions	Volunteers were contaminated with *B. prodigiosus*	Outward	Coarse gauze Speaking in a loud tone for 5 minutes 1ft, 2 layers, 68.2% 1ft, 3 layers, 92.4% 1ft, 4 layers, 90.7% 1ft, 5 layers, 99.2% 1ft, 6 layers, 97.9% 1ft, 7 layers, 98.7% 1ft, 8 layers, 99.2% 1ft, 9 layers, 100% 1ft, 10 layers, 100% 2ft, 2 layers, 50% 2ft, 3 layers, 50% 2ft, 4 layers, 50% 2ft, 5 layers, 100% 2ft, 6 layers, 100% 2ft, 7 layers, 100% 2ft, 8 layers, 100% 2ft, 9 layers, 100% 2ft, 10 layers, 100% 3ft, 4ft, for all layers 100% expect 4ft, 3 layers, which is 0% 5ft and 6ft, the control is 0, unable to calculate Coarse gauze Coughing for 5 minutes 1ft, 2 layers, 0% 1ft, 3 layers, 54.5% 1ft, 4 layers, 0% 1ft, 5 layers, 49% 1ft, 6 layers, 76.3%

						1ft, 7 layers, 75.2% 1ft, 8 layers, 97.1% 1ft, 9 layers, 97.8% 1ft, 10 layers, 96.7% 2ft, 2 layers, 0% 2ft, 3 layers, 54% 2ft, 4 layers, 0% 2ft, 5 layers, 12.3% 2ft, 6 layers, 89% 2ft, 7 layers, 65.5% 2ft, 8 layers, 99.5% 2ft, 9 layers, 97.8% 2ft, 10 layers, 98.9% 3ft, 2 layers, 0% 3ft, 3 layers, 64.1% 3ft, 4 layers, 0% 3ft, 5 layers, 0% 3ft, 6 layers, 88.4% 3ft, 7 layers, 82.6% 3ft, 8 layers, 100% 3ft, 9 layers, 97.7% 3ft, 10 layers, 100% 4ft, 2 layers, 0% 4ft, 3 layers, 93.4% 4ft, 4 layers, 54.1% 4ft, 5 layers, 44.9% 4ft, 6 layers, 94.8% 4ft, 7 layers, 100% 4ft, 8 layers, 100% 4ft, 9 layers, 100% 4ft, 10 layers, 100% 5ft, 2 layers, 0% 5ft, 3 layers, 89.2% 5ft, 4 layers, 78.4% 5ft, 5 layers, 59.5% 5ft, 6 layers, 100%

						5ft, 7 layers, 100% 5ft, 8 layers, 100% 5ft, 9 layers, 100% 5ft, 10 layers, 100% 6ft, 2 layers, 0% 6ft, 3 layers, 73.3% 6ft, 4 layers, 60% 6ft, 5 layers, 86.7% 6ft, 6 layers, 86.7% 6ft, 7 layers, 100% 6ft, 8 layers, 100% 6ft, 9 layers, 100% 6ft, 10 layers, 100% Medium gauze Speaking in a loud tone for 5 minutes 1ft, 2 layers, 6.8% 1ft, 3 layers, 99.6% 1ft, 4 layers, 100% 1ft, 5 layers, 100% 1ft, 6 layers, 99.6% 1ft, 7 layers, 99.2% 1ft, 8 layers, 100% 1ft, 9 layers, 100% 1ft, 10 layers, 100% 2ft, all layers, 100% Except 2ft, 2 layers, 0% 3ft, all layers, 100% Except 3ft, 3 layers, 42.9% 4ft, all layers, 100% Except 4ft, 4 layers, 0% 5ft and 6ft, the control is 0, unable to calculate

						Medium gauze Coughing for 5 minutes 1ft, 2 layers, 94.5% 1ft, 3 layers, 85.8% 1ft, 4 layers, 83.6% 1ft, 5 layers, 99.3% 1ft, 6 layers, 100% 1ft, 7 layers, 97.1% 1ft, 8 layers, 98.2% 1ft, 9 layers, 98.9% 1ft, 10 layers, 99.6% 2ft, 2 layers, 96.7% 2ft, 3 layers, 86.3% 2ft, 4 layers, 88.5% 2ft, 5 layers, 99.5% 2ft, 6 layers, 99.5% 2ft, 7 layers, 94.5% 2ft, 8 layers, 100% 2ft, 9 layers, 96.7% 2ft, 10 layers, 100% 3ft, 2 layers, 98.7% 3ft, 3 layers, 86.1% 3ft, 4 layers, 90.7% 3ft, 5 layers, 100% 3ft, 6 layers, 100% 3ft, 7 layers, 91.9% 3ft, 8 layers, 98.8% 3ft, 9 layers, 98.8% 3ft, 10 layers, 100% 4ft, 2 layers, 98.7% 4ft, 3 layers, 97.4% 4ft, 4 layers, 98.7% 4ft, 5 layers, 100% 4ft, 6 layers, 100% 4ft, 7 layers, 88.2% 4ft, 8 layers, 98.7%

						4ft, 9 layers, 98.7% 4ft, 10 layers, 98.7% 5ft, 2 layers, 97.3% 5ft, 3 layers, 97.3% 5ft, 4 layers, 100% 5ft, 5 layers, 100% 5ft, 6 layers, 100% 5ft, 7 layers, 81.2% 5ft, 8 layers, 97.3% 5ft, 9 layers, 89.2% 5ft, 10 layers, 100% 6ft, 2 layers, 100% 6ft, 3 layers, 100% 6ft, 4 layers, 100% 6ft, 5 layers, 100% 6ft, 6 layers, 100% 6ft, 7 layers, 20% 6ft, 8 layers, 100% 6ft, 9 layers, 86.7% 6ft, 10 layers, 100% Buttercloth Speaking in loud tone for 5 minutes 1ft, 2ft, 3ft, 4ft, all layers 100% 5ft, 6ft, the control is 0, unable to calculate Buttercloth Coughing for 5 minutes 1ft, 2ft, 3ft, 4ft, 5ft, 6ft, all layers 100% Except 2ft, 2 layers, 98.9%
Furahashi	Cloth	Cloth from 4 different cloth masks	A test apparatus (US	Total number of	Non-	FE is given as % (SD)

1978[8]	masks, surgical masks	and mask material from 2 commercial made masks were tested A. Bleach cotton fabric, weight NA, weave NA, thread count 46/inch by 50/inch B. Calico, weight NA, weave NA, thread count 80/inch by 80/inch C. Twill weave cotton, weight NA, weave NA, thread count NA D. Bleached cotton fabric, weight NA, weave NA, thread count 40/inch by 46/inch E. Fine glass fiber with non-woven fabric (commercial mask 1; Hopes) F. Fine glass fiber with non-woven fabric (commercial mask 2; Medispo)	military standard) was used to determine bacterial filtration efficiency. Bacterial agar plates were used within the apparatus where they compared the number of colony counts on control plates versus the plates with the filter interposed. Flow rate 8L/min. Aerosol size not specified.	bacterial colony counts of *Staphylococcus aureus* (used with all masks) and *Serratia marcescens* (only used with commercial mask made by Hopes).	directional	A. Bleached cotton fabric: 68.8% (SD 3.65) B. Calico: 73.2% (SD 3.55) C. Twill weave cotton: 93.6% (SD 1.16) D. Bleached cotton fabric: 43.1% (SD 8.93) E. Fine glass fiber with non-woven fabric (Hopes): 98.1% (SD 1.02) for Staph. aureus and 96.4% (SD 0.65) for Serr. marcescens F. Fine glass fiber with non-woven fabric (Medispo): 99.4% (SD 0.45)
Greene 1962[9]	Cloth mask	2 layers of thin muslin, inner lining of 4-oz outing flannel, weight NA, weave NA, thread count NA	A Sampling chamber was used made of a plywood box (5 ft by 16 inch by 16 inch) mounted vertically on an angle iron frame. This allowed the participant to insert their head only into this isolated chamber. Participants were instructed to say “sing and chew” at 10 second intervals. Thereafter, the air was sampled on blood agars using an Anderson sampler	The number of airborne microorganisms was sampled on the sedimentation plates or by the sample chamber for masked and unmasked individuals	Outward	Filtration efficiency as %, taken from sedimentation plates, talking Subject 1, 99.9% Subject 2, 99.6% Subject 3, 99.9% Subject 4, 99.3% Airborne microorganisms, taken from sampling chamber particles less than 4 µm Subject 1, 95.7%

			at different ranges			Subject 2, 87.6% Subject 3, 99.0% Subject 4, 98.6% Average of all subjects, 96.7% All particles Subject 1, 99.5% Subject 2, 99.5% Subject 3, 99.8% Subject 4, 99.7% Average of all subjects, 99.6% Airborne particles, sampling chamber, talking >8 µm, 99.8% 4-8 µm, 99.8% <4 µm, 96.7% Total particles, 99.6% Airborne particles, unconfined space, talking >8 µm, 97.3% 4-8 µm, 96.5% <4 µm, 95.4%
Guyton 1959[10]	Cloth masks	8 different items were tested. 1. Men's cotton handkerchief, weight NA, weave NA, thread count 80/inch by 10/inch. 2. Toilet paper Waldorf Scottissue 3. Towel, bath Cotton terry weave Federal Spec, Bi, DDD-T-551 B Type 2, Class D, weight NA, weave	Four subjects were used for each material. A mouth collector was placed in the mouth of participants and the mask material was placed on top of the collector, subjects held the mask in place. Subjects	*Bacillus subtilis var. niger* was sampled as the "exposure aerosol"	Inward	Mean filtration efficiency, number of layers (95% confidence interval). - Men's cotton handkerchief 16 layers: 94.2 (92.6-95.5) - Toilet paper 3 layers:

		NA, thread count NA 4. Bed sheet muslin, Pepperell Red Label (fine muslin), weight NA, weave NA, thread count 131 per square inch 5. Shirt cotton Arrow Dart, weight NA, weave NA, thread count NA 6. Women's handkerchief, cotton lawn fabric, weight NA, weave NA, thread count 76/inch by 72/inch 7. Dress material, cotton, Rondo Percale, weight NA, weave NA, thread count NA 8. Slip, rayon, Barbizon Jaunty Fit, acetate and rayon, weight NA, weave NA, thread count NA	were put into an exposure chamber which released the "contaminants" in the air and anything that was not filtered by the mask was collected by the mouth collector. This allowed for the measurement of filtration efficiency of the different masks. Aerosols had particle size of 1-5 microns.			91.4 (89.8-92.8) - Men's cotton handkerchief 8 layers: 88.9 (85.5-91.6) - Men's cotton handkerchief, crumpled: 88.1 (85.1-90.5) - Towel bath, 2 layers: 85.1 (83.3-86.8) - Towel bath, 1 layer: 73.9 (70.7-76.8) - Bed Sheet Muslin, 1 layer: 72.0 (68.8-74.9) - Towel bath, 1 layer wet: 70.2 (68.0-72.3) - Shirt cotton, 1 layer wet: 65.9 (57.9-72.3) - Shirt cotton 2 layers: 65.5 (60.8-69.6) - Women's cotton handkerchief, 4 layers wet: 63.0 (57.3-67.9) - Men's cotton handkerchief, 1 layer wet: 62.6 (57.0-67.5) - Cotton Dress Material, 1 layer wet: 56.3 (49.6-62.0) - Women's cotton handkerchief, 4 layers: 55.5 (52.2-58.7) - Rayon Slip, 1 layer: 50.0 (46.2-53.6) - Cotton Dress Material, 1 layer: 47.6

						(41.4-53.2) - Shirt cotton, 1 layer: 34.6 (29.0-39.9) - Men's cotton handkerchief, 1 layer: 27.5 (22.0-32.5)
Haller 1918[11]	Cloth masks	Four different cloth masks were tested, gauze used was Bauer and Black's or equivalent of their specimens called 1. B and B, weight NA, weave NA, thread count 32/inch by 26/inch 2. L and L, weight NA, weave NA, thread count 28/inch by 24/inch 3. Lakeside, weight NA, weave NA, thread count 24/inch by 20/inch 4. Dearborn, weight NA, weave NA, thread count 20/inch by 14/inch Masks tested varied from 1-8 layers	Two different experiment were performed to demonstrate inward and outward protection. The first experiment had one infected subject wear masks with different layers and then cough at a constant pace and pressure toward a petri dish placed horizontally 12-14 inches away. The second experiment required the same infected subject to caught at a petri dish covered with different layers of mask to demonstrate inward protection.	Pneumococci (Type IV)	Both	First experiment, mask over face of person coughing 1 layer B and B, 59.3% L and L, 60.0% Lakeside, 56.3% Dearborn, 59.5% 2 layers B and B, 86.2% L and L, 85.3% Lakeside, 70.0% Dearborn, 61.3% 3 layers B and B, 91.5% L and L, 83.7% Lakeside, 85.0% Dearborn, 76.5% 4 layers B and B, 99.2% L and L, 90.0% Lakeside, 91.5% Dearborn, 84.5% 5 layers B and B, 100% L and L, 98.2%

						Lakeside, 93.2% Dearborn, 81.0% 6 layers B and B, NA L and L, 100% Lakeside, 96.3% Dearborn, 88.0% 7 layers B and B, NA L and L, NA Lakeside, 100% Dearborn, 96.7% 8 layers B and B, NA L and L, NA Lakeside, NA Dearborn, 100% Second experiment, mask over Petri dish Lakeside, 5 layers, 100% No other data given
Jang 2015[12]	Cloth from cloth masks, medical mask	Cloth mask A, shape: plate type, 50% nylon, 40% polypropylene, 10% polyurethane, thickness 1.22 mm, weave NA, thread count NA, 1, 2, and 4 layers Cloth mask B, shape: plate type, 84% nylon, 12% polyester, 4% spandex, thickness 0.62mm,	Polydisperse NaCl aerosols were generated by an atomizer (Atomizer 9302, TSI, USA) and introduced into an aerosol chamber and then passed through the fabric that was being tested. The concentration of particles was measured	Polydisperse NaCl aerosols of the size range 0.3~10 µm	Non-directional	Cloth mask A 0.3-0.5 µm 1 layer: 29% 2 layers: 59% 4 layers: 75% 2-5 µm 1 layer: 60% 2 layers: 70%

		weave NA, thread count NA, 1, 2, and 4 layers Cloth mask C, shape: plate type, 100% polyester (cool comfort fabrics), thickness 0.29 mm, weave NA, thread count NA, 1, 2, and 4 layers Cloth mask D, shape: plate type, 100% polyester (microfiber), thickness 0.30 mm, weave NA, thread count NA, 1, 2 and 4 layers Cloth mask E, shape: cup type, 100% polyester (microfiber), 2.77 mm, weave NA, thread count NA, 1 layer R, Class 1 disposable respirator, shape: cup type, non-woven fabrics, thickness 1.81 mm, weave, thread count and layers all not relevant (N95 type mask)	by an optical particle counter (OPC) in five channels of the size range 0.3~10 µm. The mask fabric was either tested in 1, 2, or 4 layers. Flow rates of 30 LPM, 95 LPM and 85± LPM were mentioned but due to a language barrier it is not clear which one was used for which test.			4 layers: 94% Cloth mask B 0.3-0.5 µm 1 layer: 28% 2 layers: 32% 4 layers, 67% 2-5 µm 1 layer: 63% 2 layers: 71% 4 layers: 77% Cloth mask C 0.3-0.5 µm 1 layer: 18% 2 layers: 50% 4 layers: 55% 2-5 µm 1 layer: 45% 2 layers: 78% 4 layers: 81% Cloth mask D 0.3-0.5 µm 1 layer: 9% 2 layer: 45% 4 layers: 62% 2-5 µm 1 layer: 45% 2 layers: 59% 4 layers: 99% Cloth mask E

						0.3-0.5 µm: 27% 2-5 µm: 80% Class 1 disposable respirator, R 0.3-0.5 µm: 91% 2-5 µm: 100%
Jung 2014[13]	Cloth masks, medical masks	5 types of cotton mask, all flat, weights NA, weaves NA, thread counts NA, layers NA 3 types of handkerchief 1 cotton, 1 gauze and 1 towel Shape NA, weights NA, weaves NA, thread counts NA, 1-4 layers 7 types of medical mask 4 surgical masks: 1 cotton and flat, 1 nonwoven and flat and 2 nonwoven and cup shaped. All weights, weaves, thread counts and layers NA 3 dental masks: all 3 nonwoven and flat. All weights, weaves, thread counts and layers NA	NaCl particles were tested by two TSI 8130 Automatic Filter Testers (AFTs). The AFT was designed in compliance with the KFDA protocol and the NIOSH regulation 42 CFR part 84 protocols. Before testing the fabric the tested aerosols were examined to meet size criteria of the NIOSH and KFDA with a scanning mobility particle sizer (SMPS, TSI-3910; TSI Inc., Shoreview, MN, USA). The fabric samples were attached to plates with hot-metal adhesive. Using the TSI 8130 automated filter tester the plate was placed into the lower chuck of tester with a space ring (20 cm in diameter and 10 cm in height) fitted with a gasket placed on top. Then a second plate was placed on top of the spacer ring, the pressure, when the	1% NaCl concentration and 2% NaCl solution	Medical masks were tested in both directions. Non-directional for cloth masks.	NIOSH protocol Medical masks Surgical inward: 40.9% SD 36.7 Surgical outward: 42.3% SD 33.7 Dental inward: 70.9% SD 12 Dental outward: 68.8% SD 14.3 General masks Non-woven: 54.75 SD 9.414 Cotton: 22.6% SD 26.8 Handkerchief Cotton 1 layer: 1.1% SD 0.666 2 layers: 2% SD 0.702 3 layers: 3.1% SD 0.379 4 layers: 3.8% SD 0.346 Gauze 1 layer: 0.7% SD 0.300 2 layers: 1.4% SD 0.493 3 layers: 2% SD 0.400 4 layers: 3.6% SD 0.351

			AFT was closed, of the top chuck on the upper plate compressed the plates and spacer ring together, forming an airtight seal. The TSI uses two aerosol photometers to measure particle penetration, with one placed before and one placed after the filter. (NIOSH, 1996; TSI, 2006) The penetration was recorded at 1-min intervals. Six samples of each model were tested: three for the KFDA method and three for the NIOSH method. For the KFDA method all penetration tests were done at the flow rate of 95 L/min and a NaCl concentration of 1%. For the NIOSH method the tests were done at the flow rate of 85 L/min and a 2% NaCl solution was used.			
Kellogg 1920[14] Experiment No. I.	Cloth	Gauze, weight NA, weave NA, thread count 40 by 17, 6 layers	An unknown number of replicates coughing on petri dishes located 4ft in front of them.	*Bacillus prodigiosus* sprayed into the mouths of volunteers	Outward	82.20%
Kellogg 1920[14] Experiment No. II.	Cloth	Gauze, weight NA, weave NA, thread count 20 by 17, 6 layers	An atomizer was placed 1, 2, and 3 ft away from petri dishes in jars.	*Bacillus prodigiosus*, saline	Inward	At 1ft 73.9%, At 2ft 35.5%
Kellogg	Cloth	Gauze, weight NA, Weave NA,	An atomizer was placed 3,	*Bacillus*	Inward	3 ft, 3 layers 12%

1920 Experiment No. III.		thread count 20 by 17, 6, 5, 4, and 3 layers	4, 5, 6, 7, and 8 ft away from petri dishes	*prodigiosus*, paraffin oil		3 ft, 4 layers 53.4% 3ft, 5 layers 89.1% 3ft, 6 layers 87% 4ft, 3 layers 26.4% 4ft, 4 layers 70.2% 4ft, 5 layers 87.5% 4ft, 6 layers 90% 5ft, 3 layers 37.1% 5ft, 4 layers 75% 5ft, 5 layers 90.8% 5ft, 6 layers 88% 6ft, 3 layers 23% 6ft, 4 layers 71.6% 6ft, 5 layers 95.1% 6ft, 6 layers 87.6% 7ft, 3 layers 26.7% 7ft, 4 layers 74.9% 7ft, 5 layers 91.6% 7ft, 6 layers 87.4% 8ft, 3 layers 55.8% 8ft, 4 layers 81.5% 8ft, 5 layers 94.4% 8ft, 6 layers 87.7%
Kellogg 1920[14] Experiment No. V.	Cloth	Gauze, weight NA, weave NA, thread count reported as 24 by 18 but also as 24 by 28, possible error. 2, 3, 4, 5, 6, 7, 8, and 9 layers	An atomizer was placed 5ft away from petri dishes. Petri dishes were in jars with a whole in the lid and suction applied to the bottom of the jar to create air flow. The jars were covered in no layers or 2, 3, 4, 5, 6, 7, 8, or 9 layers of gauze. Atomizer was turned on and off and then was left to settle for 5min.	*Bacillus prodigiosus*	Inward	2 layers 25.9%, 3 layers 48.1%, 4 layers 78%, 5 layers 72.7%, 6 layers 85%, 7 layers 81.6%, 8 layers 97.4% 9 layers 98.3%

Kellogg 1920[14] Experiment No. VI.	Cloth	Gauze, weight NA, weave NA, thread count reported as 24 by 18 but also as 24 by 28, possible error. 2, 3, 4, 5, 6, 7, and 8 layers	An atomizer was placed 5ft away from petri dishes. Petri dishes were in jars with a whole in the lid and suction applied to the bottom of the jar to create air flow. The jars were covered in no layers or 2, 3, 4, 5, 6, 7, 8 or 9 layers of gauze. Atomizer was turned on and off and then was left to settle for 3min. Identical to experiemnt No. V. expect for exposure time.	*Bacillus prodigiosus*	Inward	2 layers 12.5% 3 layers 0% 4 layers 15.9% 5 layers 17.4% 6 layers 28.1% 7 layers 55% 8 layers 59.2%
Kellogg 1920[14] Experiment No. VII.	Cloth	Fine and extra fine gauze also called butter cloth by the author, weight NA, weave NA, thread count 42 by 44 threads, 2, 3, 3, 4, 5, 6, 7, 8, and 9 layers	An atomizer was placed 4 and 5.5 ft away from petri dishes in jars. Suction was applied to the jars to create air flow. The jars were either covered with no gauze or 2, 3, 4, 5, 6, 7, 8 or 9 layers. The DeVilbiss No. 15. Atomizer was used. The atomizer was turned on and off and then left to settle for 5min.	*Bacillus prodigiosus*	Inward	4 ft, 2 layers 10.1% 4 ft, 3 layers 0% 4 ft, 4 layers 31.4% 4 ft, 5 layers 68.9% 4 ft, 6 layers 96.7% 4 ft, 7 layers 98.9% 4 ft, 8 layers 98.6% 4 ft, 9 layers 97.5% 5.5 ft, 2 layers 0% 5.5 ft, 3 layers 0% 5.5 ft, 4 layers 11.6% 5.5 ft, 5 layers 37.3% 5.5 ft, 6 layers 94.8% 5.5 ft, 7 layers 98.3% 5.5 ft, 8 layers 99% 5.5 ft, 9 layers 97.1%
Kellogg 1920[14] Experiment No. VIII.	Cloth	Fine and extra fine gauze also called butter cloth by the author, weight NA, weave NA, thread count 42 by 44 threads, 2, 3, 3, 4, 5, 6, 7, 8, and 9 layers	An atomizer was placed 4 and 5.5 ft away from petri dishes in jars. Suction was applied to the jars to create air flow. The jars	*B. prodigiosus*	Inward	4 ft, 2 layers 76.3% 4 ft, 3 layers 86.3% 4 ft, 4 layers 90.5 4 ft, 5 layers 88.2% 4 ft, 6 layers 100%

			were either covered with no gauze or 2, 3, 4, 5, 6, 7, 8 or 9 layers. The DeVilbiss No. 15. Atomizer was used. The atomizer was turned on and off and then left to settle for 3min. Identical to experiment No. VII. except for exposure time.			4 ft, 7 layers 100% 4 ft, 8 layers 100% 4 ft, 9 layers 99.5% 5.5 ft, 2 layers 84.3% 5.5 ft, 3 layers 93.7% 5.5 ft, 4 layers 85.8% 5.5 ft, 5 layers 89.8% 5.5 ft, 6 layers 100% 5.5 ft, 7 layers 99.2% 5.5 ft, 8 layers 100% 5.5 ft, 9 layers 100%
Kellogg 1920[14] Experiment No. IX.	Cloth	Gauze, weight NA, weave NA, thread count 60 by 72, 1, 2, 3, 4, 5, 6, 7, 8, and 9 layers.	An atomizer was placed 4 and 5.5 ft away from petri dishes in jars. Suction was applied to the jars to create air flow. The jars were either covered with no gauze or 1, 2, 3, 4, 5, 6, 7, 8 or 9 layers. The DeVilbiss No. 15. Atomizer was used. The atomizer was turned on and off and then left to settle for 5 min.	*B. prodigiosus*	Inward	4 ft, 1 layer 0% 4 ft, 2 layers 0% 4 ft, 3 layers 84.7% 4 ft, 4 layers 97% 4 ft, 5 layers 97.9% 4 ft, 6 layers 96% 4 ft, 7 layers 97.6% 4 ft, 8 layers 97.1% 4 ft, 9 layers 98% 5.5 ft, 1 layer 0% 5.5 ft, 2 layers 0% 5.5 ft, 3 layers 26.2% 5.5 ft, 4 layers 93% 5.5 ft, 5 layers 91.9% 5.5 ft, 6 layers 95.9% 5.5 ft, 7 layers 96.5% 5.5 ft, 8 layers 95.3% 5.5 ft, 9 layers 97.7%
Kellogg 1920[14] Experiment No. X.	Cloth	Gauze, weight NA, weave NA, thread count 60 by 73, 5, 6, 7, 8, 9, and 10 layers	An atomizer was placed 5 ft away from a large jar. The jar had the petri dishes inside and two holes in it, the first covered by a wax nose with nostrils and the other one was open with a	*B. prodigiosus*	Inward	Nose without nostrils, 5 layers 92.9% Nose without nostrils, 6 layers 89.4% Nose without nostrils, 7 layers 95.4% Nose without nostrils, 8

			wax nose without nostrils just above the hole. The jar was standing vertically. The atomizer was turned on and off and then left to settle for 3 min. The noses were covered with no gauze or 5, 6, 7, 8, 9 or 10 layers of gauze. The DeVillbiss No. 15. atomizer was used.			layers 97.6% Nose without nostrils, 9 layers 98.4% Nose without nostrils, 10 layers 99.6% Nose with nostrils, 5 layers 90% Nose with nostrils, 6 layers 86.7% Nose with nostrils, 7 layers 91.3% Nose with nostrils, 8 layers 90% Nose with nostrils, 9 layers 94% Nose with nostrils, 10 layers 94.7%
Kellogg 1920[14] Experiment No. XI.	Cloth	Gauze, weight NA, weave NA, thread count 60 by 72, in 5, 6, 7, 8, and 9 layers and 24 by 28 in 6, 7, 8, 9, and 10 layers.	Atomizer placed 5 ft away from petri dishes that are placed in 2 vertical jars with holes on the top. There is suction on both jars to create air flow. The hole on the top of one jar is covered by a wax nose with nostrils and a gauze mask. The mask is piece of cloth over the nose. The second jar's hole is covered with a nose with nostrils but no mask. The atomizer was turned on and off and there was 3 min of settling. This experiment was performed twice once with	*B. prodigiosus*	Inward	Set 1 (gauze with thread count 60 by 72) 5 layers 57.7% 6 layers 77.3% 7 layers 77% 8 layers 98.2% 9 layers 100% Set 2 (gauze with thread count 24 by 28) 6 layers 38.8% 7 layers 77.3% 8 layers 56.5% 9 layers 94.7% 10 layers 94%

			gauze with a thread count of 60 by 72 and another time with gauze with a thread count of 24 by 28. Both times with varying layers of cloth.			
Konda 2020[15, 16]	Cloth, surgical mask material, N95 mask material	15 different types of fabric were tested. Cotton quilt, filling: ~0.5cm, 90% cotton, 5% polyester, 5% other fibers, purchased from NA, weight NA, weave woven, thread count 120 TPI, 2 layers Quilters cotton, 100% cotton, purchased from NA, weight NA, weave woven, thread count 80 TPI, number of layers varies Cotton, 100% cotton, purchased from Wamsutta, weight NA, weave woven, thread count 600 TPI, number of layers varies Flannel, 65% cotton, 35% polyester, purchased from Walmart Fabric Center, weight NA, weave woven, thread count 90 TPI, 1 layer Chiffon, 90% polyester, 10% spandex, purchased from Jo-Ann Stores (1636949), weight NA, weave woven, thread count 195 TPI, number of layers varies Natural silk, 100% silk, purchased from NA, weight 9 momme or 39 g/m^2 (personal communication Supratik Guha), weave woven,	A polydisperse, nontoxic NaCl aerosol was generated by a particle generator (TSI Particle Generator, model #8026) and introduced into a mixing chamber. Particle sizes were in the range of 10 nm to 10 µm. Here it was mixed with the help of a portable fan and passed through the material (area: ~59 cm^2) that was being tested, which was held in place using a clamp for a better seal. The aerosol was sampled before and after passing through the material by two different particle analyzers, a TSI Nanoscan SMPS nanoparticle sizer (Nanoscan, model #3910) and a TSI optical particle sizer (OPS, model #3330) for measurements in the range of 10 to 300 nm and 300 nm to 6 µm, respectively. Cloth was measured using a system	Polydisperse, nontoxic NaCl aerosol	Non-directional	Note: standard deviations are available in the original manuscript. Not extracted here because of the large number of data points. Flow rate: 35 L/min ('decreased by an order of magnitude,' once cloth inserted, personal communication, Supratik Guha) ~3.5 L/min 75-100 nm: - N95 (no gap): 90% - N95 (with gap): 32.5% - Surgical mask (no gap): 79% - Surgical mask (with gap): 49% - Cotton quilt: 98% - Quilter's cotton (80 TPI), 1 layer: 4% - Quilter's cotton (80 TPI), 2 layers: 32% - Flannel: 55% - Cotton (600 TPI), 1 layer: 75.5% - Cotton (600 TPI), 2

		thread count 145 TPI, number of layers varies Synthetic silk, 100% polyester, purchased from Jo-Ann Stores (1446277), weight NA, weave woven, thread count 102 TPI, number of layers varies Satin, 97% polyester, 3% spandex, purchased from Jo-Ann Stores (4488359), weight NA, weave NA, thread count 203 TPI, 1 layer Spandex, 52% nylon, 39% polyester, 9% spandex, purchased from Jo-Ann Stores (17026402), weight NA, weave woven, thread count 180 TPI, 1 layer Polyester, 100% woven polyester, purchased from Walmart Fabric Center, weight NA, weave woven, thread count 135, 1 layer Cotton/silk, cotton identical to 600 TPI cotton described above, silk not otherwise specified, order not specified, 1 layer of cotton, 2 layers of silk Cotton/chiffon, cotton identical to 600 TPI cotton described above, chiffon identical to chiffon described above, order not specified, 1 layer of cotton, 2 layers of chiffon Cotton/flannel, cotton identical to 600 TPI cotton described above, flannel identical to flannel described above, order not specified, 1 layer of cotton, 1 layer	that produced initial flow rates of 35 L/min and 90 L/min respectively during unrestricted flow; however, when cloth was inserted, increasing the resistance, the flow rate fell, by an amount that could be an order of magnitude or more than the original flow rate (personal communication, Supratik Guha). Some tests were carried out with two circular holes with a diameter of 0.635 cm in the material, to simulate the effect of gaps on the filtration efficiency. Each sample was tested 7 times.			layers: 85% - Chiffon, 1 layer: 57.5% - Chiffon, 2 layers: 86% - Natural silk, 1 layer: 54% - Natural silk, 2 layers: 65% - Natural silk, 4 layers: 84% - Silk, 1 layer: 53.5% - Silk, 2 layers: 64% - Silk, 4 layers: 83.5% - Hybrid 1 cotton/chiffon: 97% Cotton/chiffon, 2 layers: 98% - Hybrid 2 cotton/silk (no gap): 96% - Hybrid 2 cotton/silk (with gap): 34% - Hybrid 2 cotton/silk, 2 layers (no gap): 96% - Hybrid 2 cotton/silk, 2 layers (with gap): 33% - Hybrid 3 cotton/flannel: 95% 2-3 μm: - N95 (no gap): 100% - N95 (with gap): 7% - Surgical mask (no gap): 100% - Surgical mask (with gap): 45% - Cotton quilt: 95%

		of flannel Surgical mask, not otherwise specified, weight, weave, thread count and layers all not relevant N95, not otherwise specified, weight, weave, thread count and layers all not relevant Natural silk and synthetic silk (polyester) are both described as materials. We have extracted data exactly as reported; where we have written 'silk' it was not otherwise specified in the original report.				- Quilter's cotton (80 TPI), 1 layer: 6% - Quilter's cotton (80 TPI), 2 layers: 50% - Flannel: 44% - Cotton (600 TPI), 1 layer: 98% - Cotton (600 TPI), 2 layers: 99.5% - Chiffon, 1 layer: 73% - Chiffon, 2 layers: 90% - Natural silk, 1 layer: 55% - Natural silk, 2 layers: 66% - Natural silk, 4 layers: 88.5% - Silk, 1 layer: 55% - Silk, 2 layers: 65% - Silk, 4 layers: 87% - Hybrid 1 cotton/chiffon: 98% - Hybrid 1 cotton/chiffon, 2 layers: 99.5% - Hybrid 2 cotton/silk (no gap): 97% - Hybrid 2 cotton/silk (with gap): 35% - Hybrid 2 cotton/silk, 2 layers (no gap): 98% - Hybrid 2 cotton/silk, 2 layers (with gap): 49% - Hybrid 3 cotton/flannel: 96%

						Flow rate: 90 L/min ('decreased by an order of magnitude,' once cloth inserted, personal communication, Supratik Guha) ~9 L/min 75-100 nm: -N95 (no gap): 94% -N95 (with gap): 58% -Surgical mask (no gap): 59.5% -Surgical mask (with gap): 7.5% -Quilt cotton (80 TPI): 3% -Cotton quilt: 64.5% -Flannel: 13% -Chiffon: 24% -Synthetic silk: 10% -Satin: 13% 2-3 µm: -N95 (no gap): 100% -N95 (with gap): 66% -Surgical mask (no gap): 80% -Surgical mask (with gap): 9.5% -Quilt cotton (80 TPI): 33.5% -Cotton quilt: 80% -Flannel: 45.5% -Chiffon: 53% -Synthetic silk: 23.5% -Satin: 42%

Leete 1919[17]	Cloth	Gauze, weight NA, weave NA, thread count NA but described as very open weave, 2, 4, 8 and 12 layers Muslin, weight NA, weave NA, thread count 24 per cm, 2, 4, 6, 8, and 10 layers Damp muslin (soaked in water and then wrung out well), weight NA, weave NA, thread count NA, layers NA	Atomizer placed 9 inches away from a vertical Petri dish. Petri dish covered with nothing, gauze or muslin in varying layers. Cloth was fastened over top of petri dish and at a distance of 1.5 cm from the dish. For one of the experiments they set the atomizer to produce a coarser spray, still placed 9 inches away.	Staphylococcus pyogenes aureus	Inward	Controls: confluent colonies, too many to count. Filtration efficiency can therefore not be calculated. Number of colonies reported below Gauze, dry 2 layers: 17,500 4 layers: 4,200 8 layers: 2,000 12 layers: 700 Muslin, dry 2 layers: 4,300 4 layers: 1,400 6 layers: 100 8 layers: 40 10 layers: 0 Muslin, dry, 4 layers 12": 88 colonies 18": 14 colonies 24": 7 colonies Muslin, damp, 4 layers 9": 2000 colonies 12": 268 colonies 18": 127 colonies Muslin, dry, coarse spray 4 layers: 356 colonies 6 layers: 230 colonies 8 layers: 50 colonies

Lurie 1949[18]	Cloth masks	Gauze, weight NA, weave NA, thread count 40/inch by 44/inch, 3 or 6 layers. Masks were sewn to fit the contour of a rabbit's head, neck and ears. The mask slipped over the rabbit's head like a hood. There were no seams in front of the rabbit's nose or mouth.	Rabbits were placed in an iris diaphragm collar which fitted closely around their necks. Their heads protruded into an exposure chamber in which a nebulizer generated droplet nuclei of tubercle bacilli. In total ten experiments were performed with 6 rabbits in each experiment.	Rabbits were sacrificed and the number of macroscopic tubercles in the lungs were counted	Inward	88% (authors calculation) 95% (our calculation from data provided)
MacIntyre 2015[19]	Cloth masks, medical masks	Medical masks of non-woven material, weight NA, weave NA, thread count NA, 3 layers Cloth masks of cotton, weight NA, weave NA, thread count NA, 2 layers	A TSI 8110 Filter tester was used to test the filtration performance of both of the masks. To test the filtration performance, the filter is challenged by a known concentration of sodium chloride particles of a specified size range and at a defined flow rate. The particle concentration is measured before and after adding the filter material and the relative filtration efficiency is calculated.	Known concentration of sodium chloride particles, particle size not specified. TSI filter tester generates NaCl aerosol with count mean diameter 75 nm and geometric standard deviation 1.75.	Inward	Cloth masks 3% Medical masks 56%
Paine 1935[20]	Cloth masks	Silk, surgical gauze, fine dental gauze, all oblong shaped, all 6.5 inches by 4.5 inches. 1, 2, 3, 4, 5, 6, 7, and 8 layers of each material were used. There are tapes at each corner to tie the masks to the face.	An atomizer was attached to a tube which led to 3 holes in a “cast face” representing the mouth and 2 nostrils of a human face. Horizontal agar plates were placed at varying distances below the	*M. lysodeiklicus*	Outward	Distance in inches from mouthpiece, number of layers and filtration efficiency are reported, respectively Surgical Gauze 1", 2 layers 0% 1", 4 layers 0%

			plaster face, which sprayed "droplets" at two different momentums. The different types of mask were tied to the plaster face in the same way as they are worn in practice and tied securely under the chin.			5", 2 layers 42.3% 5", 4 layers 65.4% 9", 2 layers 0% 9", 4 layers 12.5% 14", 2 layers 67.2% 14", 4 layers 91.4% 18", 2 layers 88.8% 18", 4 layers 96.9% 22", 2 layers 64% 22", 4 layers 100% (presumed) 26", 2 layers 22.2% 26", 4 layers 100% (presumed) 30", 2 layers 42.9% 30", 4 layers 100% (presumed) 8 layers 100% at all distances (presumed) Silk, 2 layers, 100% at all distances (presumed) Fine dental gauze, 100% at all distances (presumed)
Quesnel 1975[21]	Cloth mask, medical masks	In total, five masks were tested. 1. Aseptex mask No. 1800 (3M Company, Medical Products Division), a rigid cup shaped mask of bonded polyester and rayon fibers held in place by an elastic band. 2. Cestra mask (Robinsons of	Volunteers wearing one of the masks put their heads inside a vertical chamber. Sliding panels around their heads formed a snug fit around their necks. Subjects then began to say the word chew at 1-second intervals for 5 seconds	Normal human mouth flora, number of colonies were counted with and without masks	Outward	>3.3 µm Aseptex 98.9% Cestra 99.3% Surgine 99.7% Filtermask 99.3% Filtron 99.8% 0-3.3 µm Aseptex 80%

		Chesterfield), four-ply cotton muslin, weave NA, weight NA, thread count NA, 4 layers 3. Surgine mask (Johnson & Johnson Ltd), outer layers made of bonded rayon, inner layers made of glass fibre, 3 pleats, weave not relevant, weight NA, thread count not relevant, 3 layers 4. Filtermask E-Z breathe (Deseret Pharmaceutical Co. Inc.), outer layers made of cellulose, inner layers made of glass fibre, simple folded design, 3 layers 5. Filtron mask (3M Company, Medical Products Division), outer layers made of cellulose, inner layers made of polypropylene fibre, single box-pleat design, 3 layers All masks except for the Aseptex were held in place by pairs of fabric ties. All masks except for the Cestra had metal contour strips across the nose and checks	followed by a 5-second rest, alternating for 4 minutes and saying the word a total of 120 times. After the subject finished saying the words they remained mute for 5 more minutes. Then they removed their heads from the chamber and took off their mask. This whole procedure was then repeated without masks. Samples were collected with blood-agar plates and the Andersen sampler, which was linked to the chamber by rubber tubing.			Cestra 89% Surgine 89.6% Filtermask 72.2% Filtron 88.3% All sizes Aseptex 96.5% Cestra 98.8% Surgine 98.8% Filtermask 95.8% Filtron 98.8%
Rengasamy 2010[22]	Cloth mask, N95 mask	In total, 5 materials (cloth mask, sweatshirt, T-shirt, towel, scarf) were tested, each with 3 models. 1. Cloth mask fabric (presumed multi layered as manufactured)	All 15 fabric materials were tested using a TSI 8130 Automated Filter Tester. The material was cut into 100 cm2 samples and measured at two	Monodisperse NaCl particles. 500 to 1000 nm. We decided a priori to extract data for 1000 nm.	Non-directional	1000 nm particles, results are given for 5.5 and 16.5 cm/s, respectively 1. Cloth mask fabric

		- Respro bandit mask, no details given - Breathe Health cloth mask, no details given - Breathe Health fleece mask, no details given 2. Sweatshirt fabric (presumed 1 layer) - Norma Kamali Tunic, 85% cotton, 15% polyester - Hanes, 70% cotton, 30% polyester - Faded Glory, 60% cotton, 40% polyester 3. T-shirt fabric (presumed 1 layer) - Dickies, 99% cotton, 1% polyester - Hanes, 100% cotton - Faded Glory, 60% cotton, 40% polyester 4. Towel fabric (presumed 1 layer) Pem America, 100% cotton, Pinzon, 100% cotton Aquis, 100% cotton 5. Scarf fabric (presumed 1 layer) - - Today's Gentleman Pocket Square, 100% cotton, - Walmart, fleece, 100% polyester, - Seed Supply, 100% cotton,	different face velocities, 5.5 and 16.5 cm/s, corresponding to 33 and 99 L/min. The fabric was tested against polydisperse NaCl particles.			- Respro Bandit mask, 22%, 34% - Breath Health Cloth mask, 13%, 44% - Breath Health Fleece mask, 22%, 13% 2. Sweatshirt fabric - Norma Kamali, 8%, 26% - Hanes, 19%, 15% - Faded Glory, 6%, 12% 3. T-shirt fabric - Dickies, 8%, 20% - Hanes, 9%, 12% - Faded Glory, 0%, 15% 4. Towel fabric - Pem America, 23%, 49% - Pinzon, 30%, 58% - Aquis, 33%, 0% 5. Scarf fabric - Today's Gentleman, 0%, 0% - Walmart, 25%, 14% - Seed Supply, 1%, 7% N95, 100%, 100%
Shakya 2017[23]	Cloth masks, medical	Cloth mask 1, purchased from street vendors in Kathmandu, Nepal, has a plastic and latex	Experiment 1 A constant output atomizer (model 3076)	Generated polystyrene latex microsphere	Inward	FE given for 8 L/min and 19 L/min, respectively

	masks, N95 masks	exhalation valve, weave NA, weight NA, thread count NA, layers NA Cloth mask 2, purchased from street vendors in Kathmandu, Nepal, weave NA, weight NA, thread count NA, layers NA Cloth mask 3, purchased from street vendors in Kathmandu, Nepal, weave NA, weight NA, thread count NA, layers NA Surgical mask, purchased from street vendors in Kathmandu, Nepal, has pleats, weave NA, weight NA, thread count NA, layers NA N95 mask 1, 3M model (8200) N95 mask 2, Moldex model (2701), has a plastic and latex exhalation valve	generated Polystyrene latex (PSL) microspheres in different sizes. PSL drops were then added to deionized water (~300 mL) and pure nitrogen was used as the motive gas. The aerosol was passed through a silica-based water vapor denuder to dry the particles, and then into a controlled exposure chamber. In the chamber was a polystyrene mannequin head, fitted with one of the masks, a layer of parafilm was used around the edge of all the masks to minimize leaks. Tubes connected to the mannequins mouth also connected to 2 particle sizing classifiers, an aerodynamic particle sizer (APS; Model: TSI 3321) and a SMPS (SMPS; Model 3080 Electrostatic Classifier and TSI 3775 Condensation Particle Counter). This experiment was performed at 2 different flow rates, 19 L/min, and 8 L/min. For each mask type, 8 consecutive runs were made, the first run was	particles with sizes of 30nm, 100nm, 500nm, 1µm, 2µm		30 nm N95 mask 1, 86%, 81% N95 mask 2, 64%, 77% Cloth mask 1, 87%, 78.5% Cloth mask 2, 88.5%, 15% Cloth mask 3, 54%, 26% Surgical mask, 91%, 62% 100 nm N95 mask 1, 95%, 87.5% N95 mask 2, 86.5%, 84% Cloth mask 1, 94%, 86% Cloth mask 2, 56.5%, 32% Cloth mask 3, 56.5%, 27% Surgical mask, 94%, 69.5% 500 nm N95 mask 1, 93%, 85% N95 mask 2, 85%, 79% Cloth mask 1, 90%, 82% Cloth mask 2, 47%, 56.5% Cloth mask 3, 45%, 31% Surgical mask, 92%, 64.5% 1 µm N95 mask 1, 96%, 92% N95 mask 2, 96%, 68% Cloth mask 1, 94%,

			discarded, and the remaining seven runs from each experiment were used for the analysis.			88.5% Cloth mask 2, 69%, 54% Cloth mask 3, 85%, 49% Surgical mask, 98.5%, 96% 2 µm N95 mask 1, 97%, 94% N95 mask 2, 95%, 76% Cloth mask 1, 90%, 80% Cloth mask 2, 75%, 74% Cloth mask 3, 82%, 65% Surgical mask, 99%, 97%
Shakya 2017[23]	Same as above	Same as above	Experiment 2 Primary diesel particles were generated in the laboratory to simulate urban conditions. Whole exhaust from a single-cylinder diesel generator (Yanmar L100) was injected into a 13m^2 laboratory smog chamber made of fluorinated ethylene propylene. Then it was diluted with zero air to bring the concentration level down and passed into a small sealed chamber constructed of stainless steel and aluminum, which contained the mannequin head and mask. The experiment lasted several hours. Commercially	Laboratory generated diesel particles, ranging from 14.6–710.5 nm. Results are only given for particles of 30, 100 and 500 nm size range.	Same as above	30 nm N95 mask 1, 54% N95 mask 2, 51% Cloth mask 1, 87.5% Cloth mask 2, 81.5% Cloth mask 3, 10% Surgical mask, 90% 100 nm N95 mask 1, 71% N95 mask 2, 45% Cloth mask 1, 55% Cloth mask 2, 8% Cloth mask 3, 8.5% Surgical mask, 58% 500 nm N95 mask 1, 82% N95 mask 2, 29% Cloth mask 1, 30% Cloth mask 2, 62% Cloth mask 3, 26.5%

			available, ultralow sulfur diesel was used for the combustion. A flow rate of 19 L/min was used.			Surgical mask, 92.5% In addition, overall efficiency for all particle sizes were given for cloth masks: Cloth mask 1 34% Cloth mask 2 40% Cloth mask 3 14%
Shooter 1959[24]	Cloth masks	Three types of masks were tested 1. Filtration mask, bucket-shaped, fits fairly snugly over nose and chin, made of gauze, weight NA, weave NA thread count per layer is 46, 4 layers 2. Tail mask, deflexion mask, made of closely woven cambric, 7 1/2 in. by 8 1/2 in, attached to a tail of the same size that hangs down over neck and chest, fit was loose over the cheeks, weight NA, weave NA, thread count NA, 2 layers 3. Paper mask, deflexion mask, single use only, 6 1/2 in. by 5 3/4 in, outer and inner layer surrounding a pad of cellulose wadding, covers nose, mouth and chin, fit was loose over the cheeks, weight NA, weave NA, thread count NA, 3 layers	129 healthy volunteers sat for 15 minutes with their head from the neck up enclosed in a large box. The gap around the neck was sealed by allowing a rubber diaphragm to spring back into place. A plastic canopy, held up by poles and fastened to the edge of the table by battens was put over the table. 20 petri dishes were placed, horizontally, on the floor of the box. Filtered air entered from a pipe and was sucked out at a rate of 1 cu. ft. Volunteers were then asked either to remain silent or to talk and to make an attempt at quiet but continuous conversation. The interior of the canopy and the top of the table were disinfected 30 min before each test.	Human mouth flora	Outward	Bacteria from plates Silent Area 1 (immediately in front of volunteer) Filtration mask, 0% Tail mask, 31.3% Paper mask, 37.5% Area 2 (further away but still in front of volunteer) Filtration mask, 0% Tail mask, 14.3% Paper mask, 0% Area 3 (directly behind volunteer) Filtration mask, 0% Tail mask, 6.3% Paper mask, 40% Area 4 (on both sides of volunteer) Control data not given Talking Area 1 Filtration mask, 64% Tail mask, 64% Paper mask, 66%

						Area 2 Filtration mask, 0% Tail mask, 15.4% Paper mask, 0% Area 3 Filtration mask, 0% Tail mask, 0% Paper mask, 0% Area 4 Filtration mask, 50% Tail mask, 25% Paper mask, 40% Bacteria isolated from air Silent Filtration mask, 0% Tail mask, 0% Paper mask, 0% Talking Filtration mask, 4.2% Tail mask, 0% Paper mask, 16.7%
Van der Sande 2008[25]	Cloth mask, surgical mask, FFP2 mask	Cloth mask, homemade, made of TD Cerise Multi teacloths, Blokker, weave NA, weight NA, thread count NA, layers NA Filtering Facepiece against Particles (FFP)-2 mask 18727V (3M), European equivalent to N95 Surgical mask, 1818 Tie-On, 3M	Healthy volunteers, 3 different experiments to assess 1) short term protection for different types of masks worn during 10-15 minutes by the same volunteer following a standardized protocol. 2) long-term protection of a specific mask worn continuously by a volunteer for 3 hours	For all experiments, candles were used in the room to increase the ambient particle count. Particles had a size of 0.02–1µm	Inward (experiment 1 and 2) Outward (experiment 3)	Experiment 1 - Tea cloth: no activity 60.0%, nodding 54.5%, shaking 54.5%, reading 68.8%, walking 58.3% - Medical mask: no activity 75.6%, nodding 78.7%, shaking 80.4%, reading 81.1%, walking 76.2% - FFP2: no activity 99.1%, nodding 98.7%, shaking 98.9%, reading

			during regular activities 3) effectiveness of different types of masks in preventing outgoing transmission by a simulated infectious subject Experiment 1: 28 adult and 11 children (5-11 years) volunteers each wearing one of the types of mask were asked to perform 5 tasks in a fixed sequence, 1.5 minute of duration each: sit still and not do anything, nod head ("yes"), shake head ("no"), read aloud from a standard text and stationary walk. The concentration of particles on both sides of the mask were measured with a receptor fixed on both sides of the mask. The receptor was connected to a portable counter of all free floating particles via an electrostatic particle classifier and counter, the Portacount. Experiment 2: Adult volunteers were divided into 3 groups. Each group wore a single type of mask			98.5%, walking 99.0% Experiment 2 - Tea cloth: no activity 68.8%, nodding 63.0%, shaking 65.5%, reading 76.7%, walking 65.5% - Medical mask: no activity 77.3%, nodding 77.8%, shaking 75.6%, reading 83.1%, walking 74.4% - FFP2: no activity 98.1%, nodding 97.9%, shaking 97.6%, reading 98.9%, walking 97.7% Experiment 3 (outward protection), two measurements for each mask type - 30 L/min Tea cloth, 17%, 17% Surgical mask, 47.4%, 65.5% FFP2, 50%, 64.3% - 50 L/min Tea cloth, 17%, 17% Surgical mask, 64.3%, 47.4% FFP2, 50%, 68.3% - 80 L/min Tea cloth, 20%, 20% Surgical mask, 52.4%, 44.4% FFP2, 68.3%, 52.4%

			for 3 hours. Participants were asked to carry on with their normal activities and after 3 hours they repeated the first experiment, performing the 5 tasks, no activity, nodding, shaking, reading aloud and walking. They did each of these for 1.5 minutes. Concentration of particles was measured similar to experiment 1. Experiment 3: The 3 different type of masks were fitted to an artificial test head, which was connected to PC-driven respirator (Bacou LAMA AMP, Modelref 1520307). Breathing frequency was varied to mimic different respiratory rates, this resulted in a breathing flow of 30, 50 and 80 liters per minute. Concentrations of particles were measured by a TSI Portacount Respirator Fit tester, model 8020.			
Weaver 1918[26]	Cloth mask	Gauze mask, weight NA, weave NA thread count NA, layers 2. Shaped to fit closely over the face from chin up to well over the nose, held in place by two tapes	Before-after study. Over the course of 2 years and 7 months the number of nurses carrying diphtheria bacilli were counted. After	Diphtheria bacilli by throat culture, cases of scarlet fever	Inward	Filtration efficiency was calculated from percentage of nurses who carried Diphtheria, and the percentage

		tied behind the head	introduction of masks for nurses that covered nose and mouth, the number of carriers were counted again. The number of nurses with scarlet fever was also counted before (3 years 3 months) and after (1 year and 6 months) introduction of face masks.			who acquired clinical scarlet fever in the no mask and with mask periods. Diphtheria no mask: 10/43 (23.25%) Diphtheria with mask: 6/73 (8.2%) Filtration efficiency 64.7% Scarlet fever no mask: 9/112 (8.0%) Diphtheria with mask: 0/73 (0%) Filtration efficiency 100%
Weaver 1919[27]		See supplementary material figures 2-4				
Zhao 2020[28]	Cloth, medical mask material	Polypropylene 1, particulate FFR, meltblown, nonwoven, weight: 25 g/m^2, thread count and layers not relevant Polypropylene 2, medical face mask, meltblown, nonwoven, weight: 26 g/m^2, thread count and layers not relevant Polypropylene 3, medical face mask, meltblown, nonwoven, weight: 20 g/m^2, thread count and layers not relevant All meltblown fabric came from	Tests were conducted with an Automated Filter Tester 8130A (TSI, Inc.) using a 0.26 µm, mass mean diameter (0.075 ± 0.02 µm count median diameter) of sodium chloride (NaCl). The test size of the filter tester was 100 cm^2, with a circular gasket outer diameter of approximately 13 cm. All samples were cut to a size greater than a 13 cm × 13 cm square. A flow rate of 32 L/min was chosen because it is similar	NaCl particles	Non-directional	Polypropylene 1: 95.9% ± 2.0 Polypropylene 2: 33.1% ± 1.0 Polypropylene 3: 18.8% ± 0.5 Polypropylene 4: 6.2% ± 2.2 Cotton 1: 5.0% ± 0.6 Cotton 2: 21.6% ± 1.8

		Guangdong Meltblown Technology Co., Ltd. Polypropylene 4, interfacing material, spunbond (Hongxiang New Geo-Material Co., Ltd.), nonwoven, weight: 30 g/m^2, thread count NA, layers NA Cotton 1, pillow cover, woven, weight: 116 g/m^2, thread count NA, layers NA Cotton 2, t-shirt, knit, weight: 157 g/m^2, thread count NA, layers NA Cotton 3, sweater, knit, weight: 360 g/m^2, thread count NA, layers NA Polyester, toddler wrap, knit, weight: 200 g/m^2, thread count NA, layers NA Silk, napkin, woven, weight: 84 g/m^2, thread count NA, layers NA Nylon, exercise pants, woven, weight: 164 g/m^2, thread count NA, layers NA Cellulose 1, paper towel, bonded, weight: 42.9 g/m^2, thread count NA, layers NA Cellulose 2, tissue paper, bonded,	to that in typical human breathing. This flow rate was used to test all samples.			Cotton 3: 25.9% ± 1.4 Polyester: 17.5% ± 5.1 Silk: 4.8% ± 1.5 Nylon: 23.3% ± 1.2 Cellulose 1: 10.4% ± 0.28 Cellulose 2: 20.2% ± 0.32 Cellulose 3: 99.9% ± 0.02

		weight: 32.8 g/m^2, thread count NA, layers NA Cellulose 3, copy paper, boded, weight: 72.8 g/m^2, thread count NA, layers NA				

SD standard deviation

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