Supplemental Information

Quantitative Method for Comparative Assessment

of Particle Removal Efficiency of Fabric Masks

as Alternatives to Standard Surgical Masks for PPE

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Table SI1. Mask details, mean filtration efficiency ($\overline{x}$), standard deviation of mean filtration efficiency between replicates* (s_r), and standard deviation of filtration efficiency over one minute runs (s_t).

| Sample	Description	worn as designed			worn with overlayer		
		$\overline{x}$	s_r	s_t	$\overline{x}$	s_r	s_t
N95-1		99.2%	0.4%	0.8%	-	-	-
N95-2	Makrite model 9500-N95	90.6%	5.9%	4.6%	95.2%	0.9%	4.7%
S-1	3M surgical mask model 1826	74.6%	4.1%	9.5%	90.3%	1.5%	3.9%
S-2	Keystone surgical mask model FM-EL-BLUE	59.3%	3.3%	13.0%	86.0%	3.2%	2.7%
S-3	Hong Da Wei Cai surgical mask labeled for medical use	53.4%	4.4%	12.6%	90.0%	6.0%	5.6%
O-1	surgical style 4 layer mask with black "charcoal" layer (no brand information available)	73.4%	4.1%	9.7%	86.8%	0.4%	5.2%
CS-1	cloth surgical-style mask with earloops and wired nose bridge, layers (3): two cotton quilting fabric and one Pellon interfacing fabric	58.6%	5.0%	11.6%	77.5%	6.2%	0.8%
CS-2	fabric surgical style mask with earloops, no wire at bridge of nose, layers: two cotton plain weave	28.2%	5.9%	24.3%	73.2%	1.4%	1.2%
CS-3	fabric surgical style mask with ties, wired nose bridge, layers (6): two Smartfab nonwoven fabric, two disposable baby wipe (dry), one massage table non-woven fabric cover, one meltblown filter (BFE85)	85.0%	1.3%	5.4%	81.3%	3.4%	7.9%
CS-4	fabric surgical style mask with ties, wired nose bridge, layers (2): two cotton duck	72.9%	8.8%	7.1%	78.5%	12.3%	6.7%
CS-5	fabric surgical style mask with ties, no wire at bridge of nose, layers (2): two layers of cotton twill (sold by Reformation clothing company at thereformation.com)	56.0%	3.9%	13.1%	66.9%	1.7%	10.2%

Table SI1 (cont.). Mask details, mean filtration efficiency ($\overline{x}$), standard deviation of mean filtration efficiency between replicates* (s_r), and standard deviation of filtration efficiency over one minute runs (s_t).

Sample	Description	worn as designed			worn with overlayer		
		$\overline{x}$	s_r	s_t	$\overline{x}$	s_r	s_t
CS-6	fabric surgical style mask with earloops, no wire at bridge of nose, layers (2): woven nylon	47.1%	2.3%	12.2%	56.8%	5.9%	8.7%
CC-1	commercially produced nuisance dust mask modified with cloth liner, layers (4): two Smartfab nonwoven fabric , one disposable baby wipe (dry), one meltblown filter (BFE84)	85.9%	6.3%	4.7%	89.3%	1.5%	3.8%
CC-2	commercially produced nuisance dust mask	60.3%	3.2%	10.4%	61.1%	2.8%	9.4%
CC-3	fabric cone-shaped mask with elastic head band and wired nose bridge, layers (6): two cotton muslin fabric, two disposable baby wipe (dry), one massage table cover non-woven fabric, one meltblown filter (BFE85)	86.2%	1.0%	5.5%	88.5%	0.9%	3.8%
CC-4	fabric cone-shaped mask with elastic head band, layers (6): two Smartfab nonwoven fabric, two disposable baby wipe (dry), one massage table non-woven fabric cover, one meltblown filter (BFE85)	89.1%	1.7%	3.4%	91.7%	2.8%	4.3%
CC-5	fabric cone-shaped mask with elastic head band, wired nose bridge, PM2.5 filter insert, layers (4, including pocket): three cotton muslin, one massage table non-woven fabric cover	80.2%	2.5%	7.1%	84.3%	2.5%	5.9%

Table SI1 (cont.). Mask details, mean filtration efficiency ($\overline{x}$), standard deviation of mean filtration efficiency between replicates* (s_r), and standard deviation of filtration efficiency over one minute runs (s_t).

Sample	Description	worn as designed			worn with overlayer		
		$\overline{x}$	s_r	s_t	$\overline{x}$	s_r	s_t
CC-6	fabric cone-shaped mask with elastic head band, layers (5): two Smartfab nonwoven fabric, one massage table non-woven fabric cover, two meltblown filter (BFE85)	90.7%	0.8%	3.1%	91.5%	1.1%	3.1%
CC-7	fabric cone-shaped mask with elastic head band, wired nose bridge, layers (4): two Smartfab nonwoven, one massage table non-woven fabric cover, two meltblown filter (BFE85)	85.3%	2.2%	4.6%	87.2%	0.9%	4.4%
CC-8	fabric cone-shaped mask with two sets of ties, wired nose bridge, layers (3): two cotton fabric, one non-woven polypropylene (recycled grocery bag)	82.6%	1.2%	5.7%	81.3%	2.4%	8.5%
CD-1	duck-bill shaped mask with elastic head band, wired nose bridge, layers (6): 4 cotton fabric, 2 Pellon interfacing	64.2%	11.0%	9.5%	80.2%	1.8%	6.3%
N only	woven nylon stocking	7.0%	2.5%	18.0%	-	-	-

* n=4 replicates for mask CS-1, all other masks n=3 replicates
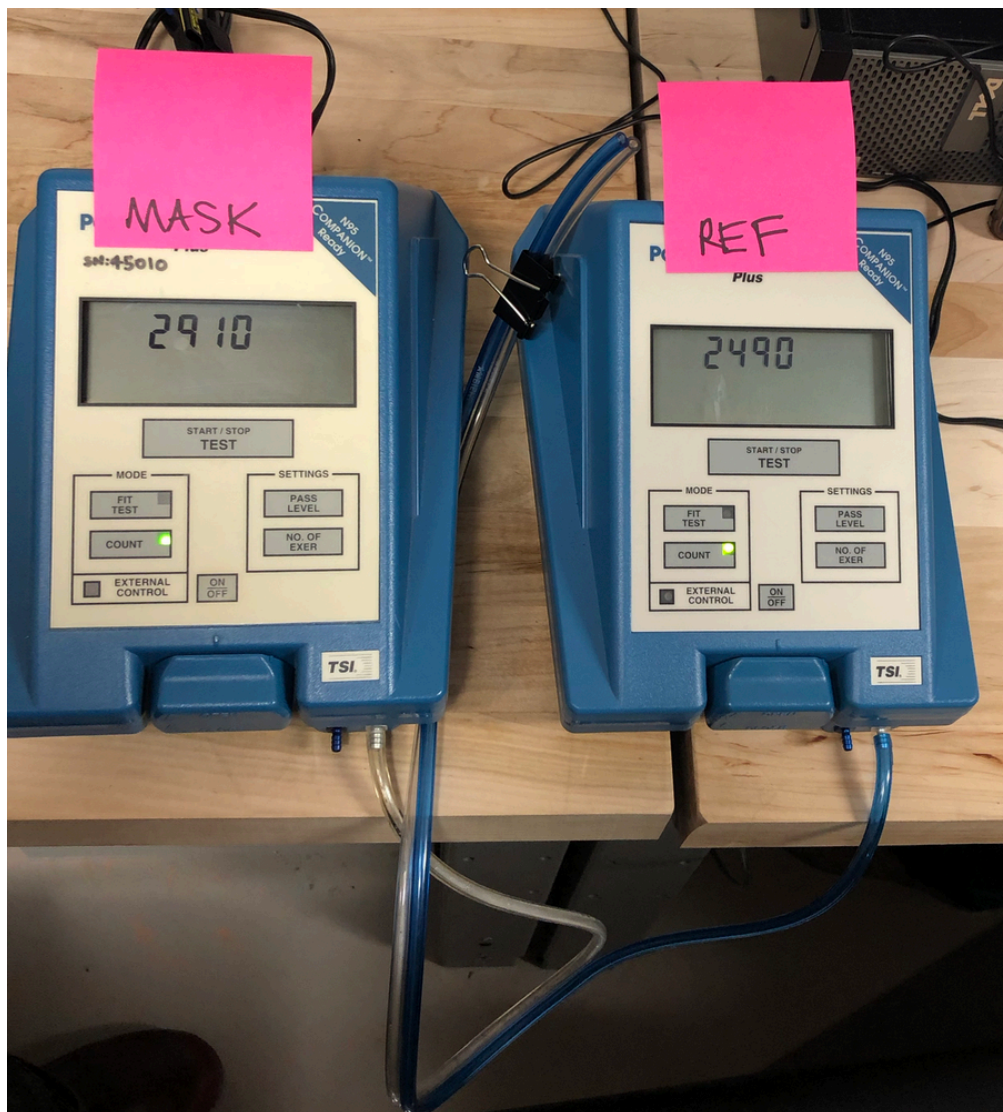
Figure S1. Two TSI PortaCount model 8028 used in this work. Sample tubes are of equal length and are connected to right-hand ports labeled "sample". Instruments were operated in count mode with "Mask"-labeled instrument sampling air from inside the mask and "Ref"-labeled instrument sampling ambient air just outside of the mask.

N95-1 **N95-2** **S-1** **S-2**

O-1 **CS-1** **CS-2** **CS-3**

CS-4 **CS-5** **CS-6** **CC-1**

CC-2 **CC-3** **CC-4** **CC-5**

CC-6 **CC-7** **CC-8** **CD-1**

Figure S2. Gallery of mask images. Masks ordered by sample ID. Descriptions included in Table S1.

Additional and updated results are available through a web portal at masktestingatNU.com.