



## Report of "Habits of Using Face Masks During The Epidemic In Hong Kong"

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## Press Conference Rundown

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2. Survey Methodology
  - 2.1 Online Opinion Survey
  - 2.2 Reusable Masks Survey
3. Sharing by Dr. Alvin Chan
4. Q&A



# Survey Background and Methodology

## 1. Survey Background

- The outbreak of Covid-19 epidemic early this year in Hong Kong has boosted the demand for face masks. Our survey hopes to find out HK people's habits and reasons of using face masks such as disposable masks and reusable masks during the epidemic in order to suggest eco-friendly ways to use face masks.



## 2. Methodology

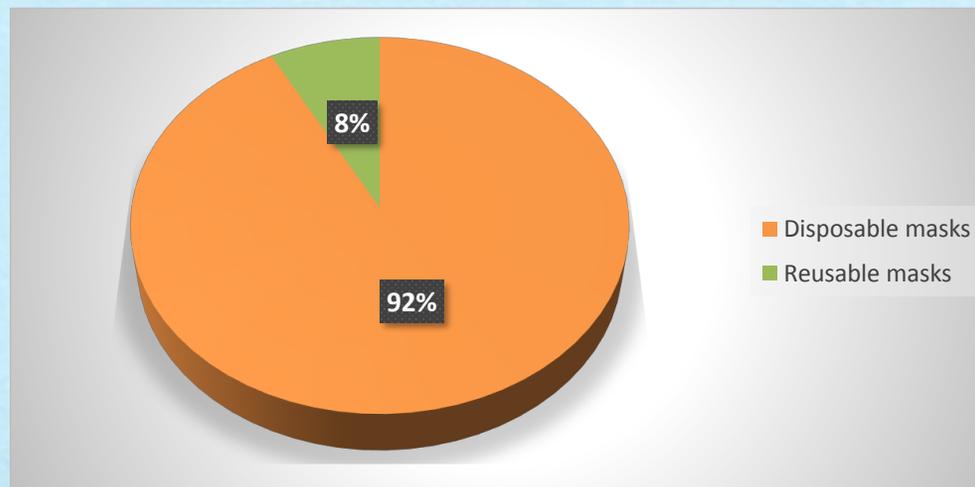
**2.1** Opinion Survey: 1,095 valid responses were collected through online survey from 13th to 31st October 2020

**2.2** Reusable Masks Survey: Researched 20 reusable masks information on the internet.

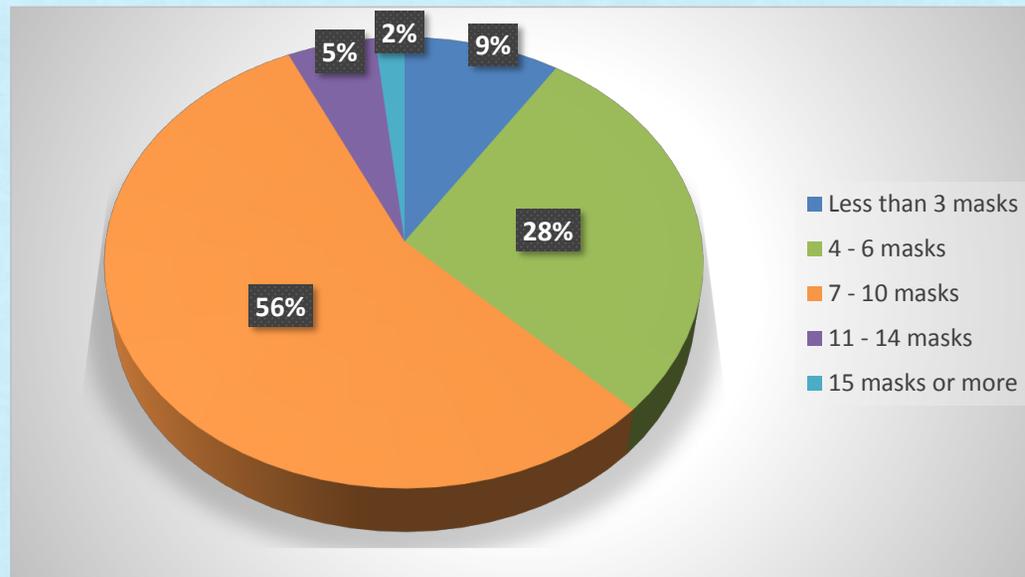
# Opinion Survey

Q.1 : What kind of face masks do you use the most recently?

Disposable Mask	Reusable Mask
	

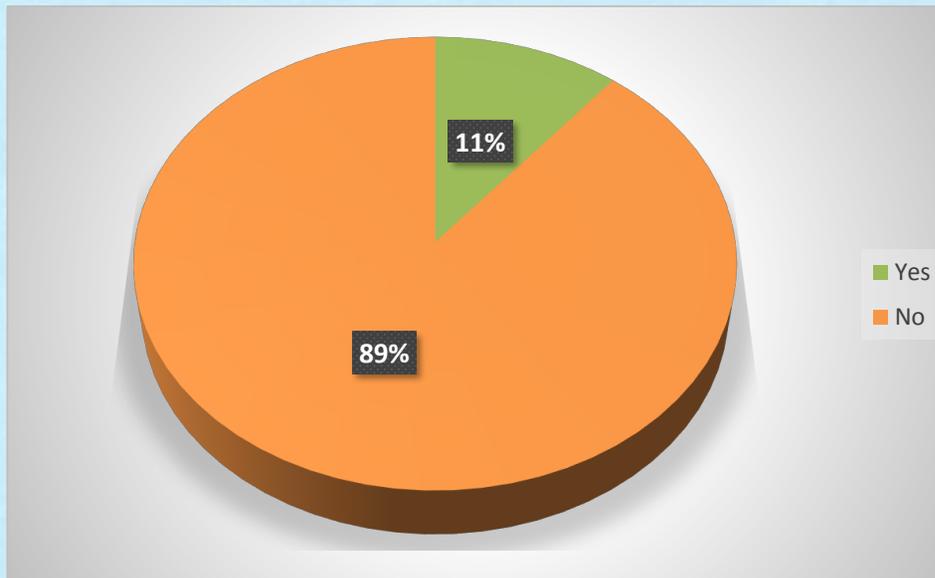


## Q.2 : How many face masks did you personally use and dispose of in the past 7 days?



- **More than 2 billion disposable masks** were used since the outbreak of the epidemic in February based on the survey result, at least **54 million** disposable masks were used every week.
- **2 billion disposable masks are equivalent to the weight of 1.1 million plastic bottle.** (Assume that each disposable mask that weigh 2 grams, and each PET bottle that weigh 19 grams.)

### Q.3 : Have you put used disposable masks in the garbage bin dedicated for used masks?



- According to the advice of World Health Organization (WHO), contaminated tissue and used face masks should be discarded in garbage bin with lid.

## Negative Impact of Disposable Masks Treatment

- Used disposable masks are regarded as general waste and transferred to landfills.
- Dedicated garbage bin can tackle the hygiene problem but not the environmental problem.



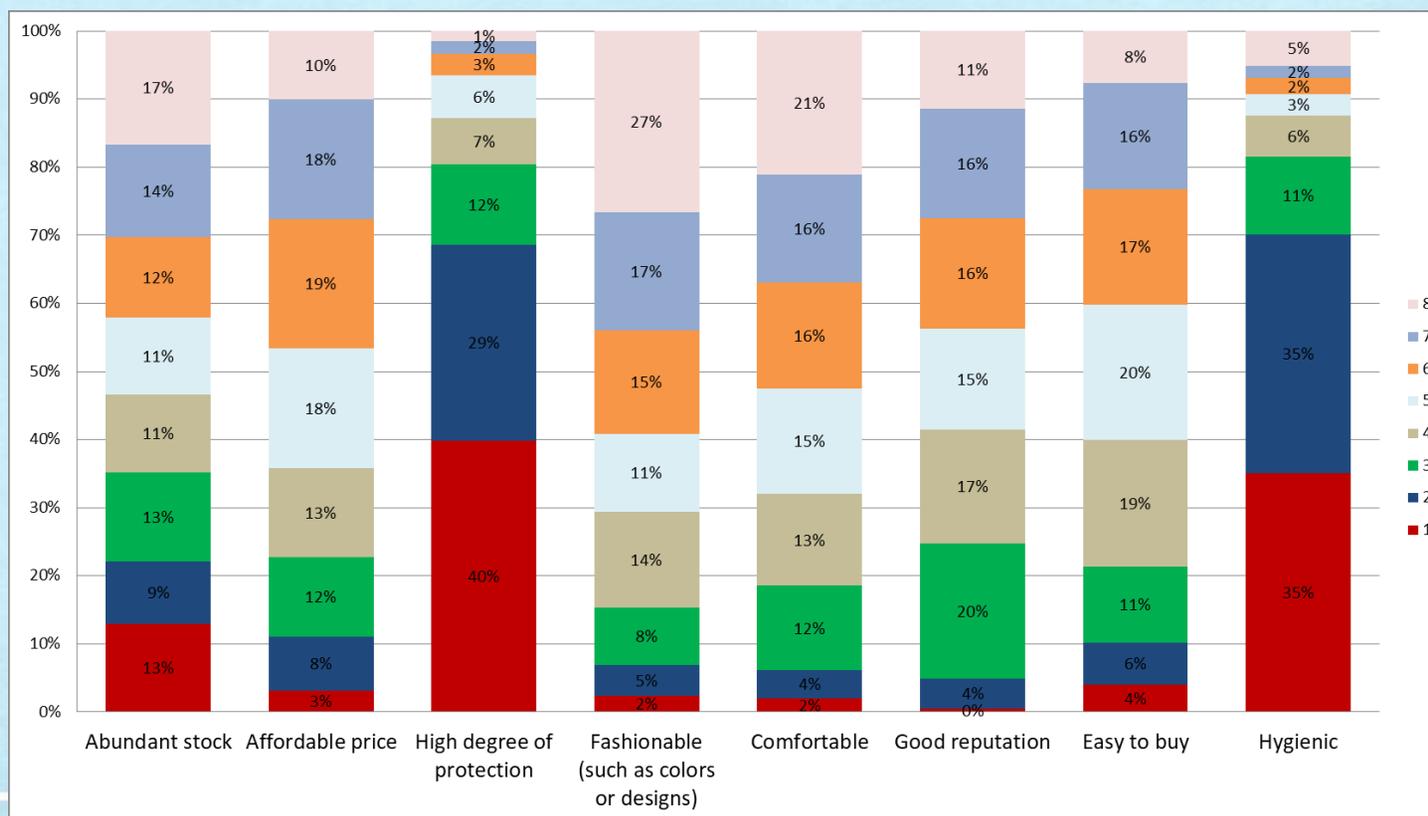
# Negative Impact of Disposable Masks Treatment

- Structure of disposable masks:

Layer	Composition	Material
First Layer	Non-woven fabric	<b>Polypropylene</b> , artificial fibre
Second Layer	Melt-blown non-woven polymer filter	<b>Polypropylene</b>
Third Layer	Non-woven cotton	Cotton/artificial fibre
Other	Plastic nose wires	<b>Polypropylene</b> , stainless steel wire
Other	Earloop	Polyester, Nylon

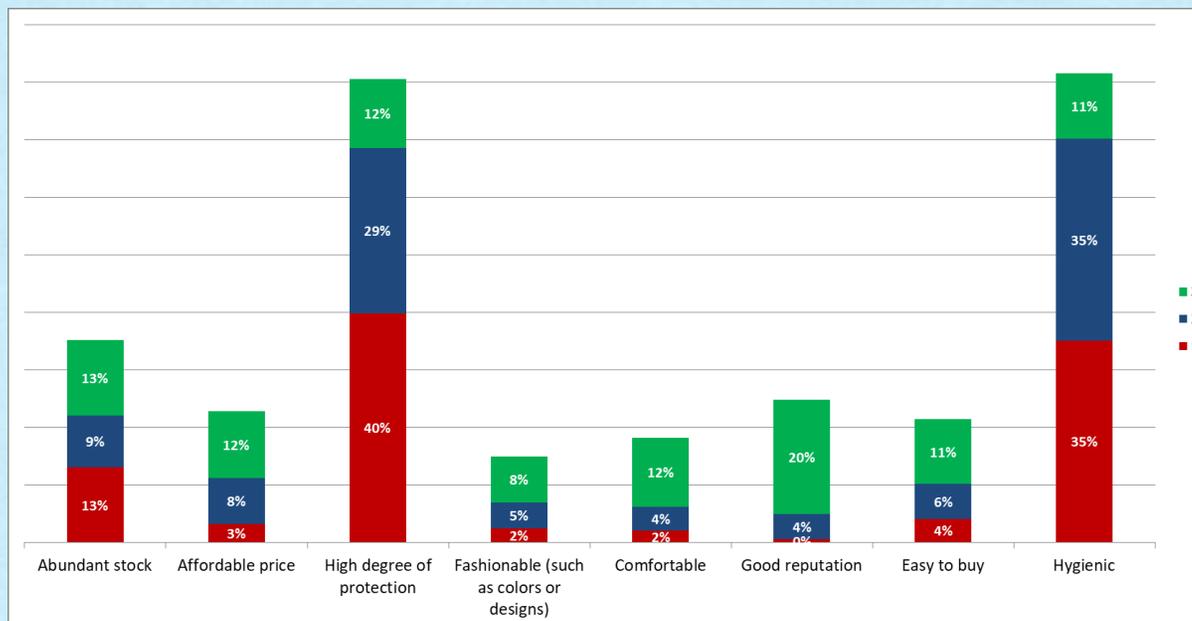
- Disposable masks are mainly composed of polypropylene which is hard to be degraded. This is destructive to the environment.
- Structure with mixed materials and hygienic concerns make result for difficult to recycle.

**Q.4 : Why did you use disposable masks instead of reusable masks?**  
 (Please rank according to importance, 1 is the most important, and 8 is the least important.  
 Please fill in all the options.)



### Q.4 : Why did you use disposable masks instead of reusable masks?

(Please rank according to importance, 1 is the most important, and 8 is the least important. Please fill in all the options.)



Reason	Top 3 Preferences
High degree of protection	<b>81%</b>
More hygienic	<b>81%</b>
Abundant stock	<b>35%</b>

- Filtration efficiency and hygiene are top concerns for most of the respondents when they choose disposable masks.
- Masks filtration ability standard usually contain BFE, PFE, VFE.

Disposable Masks = **Better Protection?**

Reusable Masks = **Unhygienic?**

# Face Masks Protection Standard

Filtration Efficiency is one of the standards adopted by ASTM International to gauge the protection ability of face masks.

- BFE (Bacterial Filtration Efficiency) : for bacterial particles size  $\geq 3 \mu\text{m}$  including dust and droplet
- PFE (Particle Filtration Efficiency) : for particle size  $\geq 0.1 \mu\text{m}$  including influenza and SARS
- VFE (Viral Filtration Efficiency) : for particle size from 0.1 to  $5 \mu\text{m}$  (average  $2.8 \mu\text{m}$ )

	The U.S. (ASTM)	South Korea (KF)	EU (FFP)
Level of Protection	BFE、PFE >95% (Level 1)	KF80 : Resist $\geq 80\%$ $0.6 \mu\text{m}$ particles	FFP1 (Filtration Efficiency of 80%)
	BFE、PFE >98% (Level 2)	KF94 : Resist $\geq 94\%$ $0.4 \mu\text{m}$ particles	FFP2 (Filtration Efficiency of 94%,comparable to N95)
	BFE、PFE >98% (Level 3)	KF99 : Resist $\geq 99\%$ $0.4 \mu\text{m}$ particles	FFP3 (Filtration Efficiency of 99%,comparable to N99)

# Reusable Masks Research

Types of Mask	Number	Product Name	Reusable Mask Cat.	Degree of Protection		Reusable Times(2)	Degree of Protection ( After multi-time usage)		Price			Materials Used	
				Filtration Efficiency	Score(1)		Antibacterial test report after multi-time usage	Score(3)	Reference Price (HKD)(4)	Reference Price of Filter (HKD/Pc)	Average Daily Price (HKD)(5)		Score(6)
Listing masks included those laboratory certification that can be viewed online or data has been provided to Greeners Action													
	1	Nanofit Reusable Fabric Mask	Non-replaceable Filter	BFE>93% PFE>78%	👍👍	125 times	BFE>93% PFE>99%	👍👍👍	288	N/A	2.3	👍👍👍	Surface: Nanotechnology processed fabric Middle layer: rewashable filter Bottom: All cotton cloth
	2	Metamask Nano Technology	Non-replaceable Filter	VFE>97% PFE>97%	👍👍👍	Approx. 2 months	No information (Varies with air quality indicators of different regions)	👍	198	N/A	3.3	👍👍	Nanofibers organic cotton
	3	Xpure Anti-Pollution Mask	Non-replaceable	VFE>99%	👍👍👍	200 times	0.26um [MMD] Filtration Efficiency 60.72%	👍👍	155	N/A	0.8	👍👍👍	Nanofibers Collagen lining
	4	Re-Mask Pro	Non-replaceable	VFE>99%	👍👍👍	3 months to 1 year	Information not available	👍	228	N/A	0.7-2.6	👍👍👍	Nanofibers organic cotton
	5	Cambridge Mask the Watson pro	Non-replaceable	PFE>98% VFE>99%	👍👍👍	3-6 months	No relevant testing (Varies with air quality indicators of different regions)	👍	258	N/A	1.4-2.9	👍👍👍	Activated carbon filter cloth
	6	Lockill FaceOff Reusable Facewear	Non-replaceable	BFE >95%	👍👍	20 times	Information not available	👍	236	N/A	11.8	👍	Polyester Elastic fiber
	7	AA99 AntiViral AntiBacterial Reusable FaceMask	Non-replaceable	Isolate 99% of bacteria and viruses	👍	50 times	Information not available	👍	99	N/A	2	👍👍👍	Polyurethane cotton Polyester
	8	Sunna Washable Anti-bacterial Copper Mask	Non-replaceable	Antibacterial protection (cloth layer) reaches 99.9% (Filter not included)	👍	100 times	After 100 times usage, cloth layer filter keeps 99.9% antibacterial protection (Filter not included)	👍	148	N/A	1.48	👍👍👍	Polyester Spandex cotton Acrylic Antibacterial copper wire
	9	Inomskin Reusable face mask	Non-replaceable	Kills 99.9% of bacteria and viruses	👍	50 times	Information not available	👍	288	N/A	5.8	👍	Mineral material fabric
	10	GH Washable & Reusable Antibacterial Face Mask	Non-replaceable	Escherichia coli Staphylococcus aureus Klebsiella pneumoniae	👍	20 times	Information not available	👍	198	N/A	9.9	👍	Polyester fabric

# Reusable Masks Research

Types of Mask	Number	Product Name	Reusable Mask Cat.	Degree of Protection			Degree of Protection ( After multi-time usage)		Price				Materials Used
				Filtration Efficiency	Score(1)	Reusable Times(2)	Antibacterial test report after multi-time usage	Score(3)	Reference Price (HKD)(4)	Reference Price of Filter (HKD/Pc)	Average Daily Price (HKD)(5)	Score(6)	
Listing masks included those laboratory certification that can be viewed online or data has been provided to Greeners Action													
	11	Hooohah KN94 Resuable Mask	Replaceable Fil	Filters out 94%0.4µm size particles	👍👍	Approx. 1 week	Depends on air quality	N/A	250	24	3.5	👍👍	Polyester Acrylic Polypropylene Harmless nylon Thermoplastic rubber (TPE)
	12	Meo Lite Reusable Mask	Replaceable Fil	PFE>99%	👍👍👍	2-3 weeks	Varies with air quality indicators of different regions	N/A	299	63	3-4.5	👍👍	Non-woven wool
	13	O2 Mask	Replaceable Fil	BFE>99% VFE>99%	👍👍	1-2 weeks	Depends on air quality	N/A	540	15	1.1-2.2	👍👍👍	Silicone
	14	Delione KN95/KN90	Replaceable Fil	PFE>98%	👍👍	Approx. 3 days	Depends on air quality	N/A	128	8.3	2.8	👍👍👍	Silicone Melt blown non-woven fabric (MBPP) nylon Elastic fiber
	15	CHITTON™ - Pro 6 Mask	Non-replaceabl	BFE>98%	👍	60 times	Information not available	👍	198*	N/A	3.3	👍👍	Outer layer: nylon spandex Inner layer: non-woven fabric
	16	COPPERLINE KOREA Anti-microbial Mask	Non-replaceabl	Cloth layer VFE>79% (Additional filter VFE>99%)	👍👍	30次	Cloth layer can kill 99%bacteria (Suggest to replace the filter after 3-4 hours of usage)	👍	268	N/A	9	👍	Polyester Antibacterial copper wire nylon Elastic fiber
	17	KNIInWEAR	Replaceable Fil	BFE 96%	👍👍	No information	Information not available	N/A	168	4	Cannot be calculated	👍	Copper ion fiber polyester Polyester Nylon spandex
Masks that claim to have laboratory certificates of protection													
	18	The MASKSAVER Resuable Mask	Replaceable Fil	EU standards EN-149 FFP2	👍👍	Daily replacement	N/A	N/A	156	1.5	1.5	👍👍👍	Food grade plastic
	19	Banale MASK	Replaceable Fil	FFP2	👍👍	6-8 weeks	Depends on usage	N/A	199	74	1.4-1.8	👍👍👍	Polyester
	20	SIU Antibacterial Silk Herba	Non-replaceabl	PFE>95%	👍👍	50 times	Information not available	👍	200	N/A	4	👍	Silk fabric

# Degree of Protection

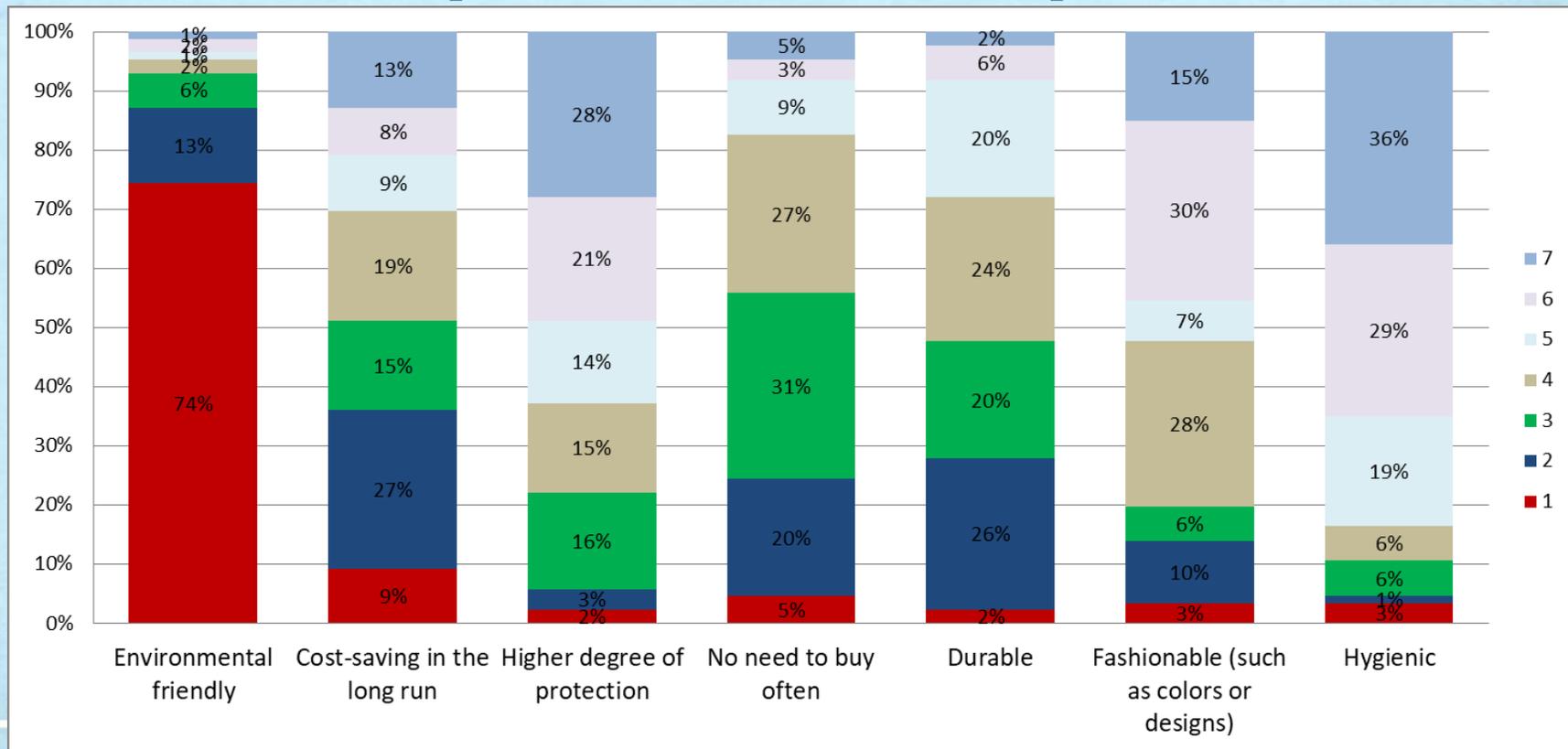
Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency
	Metamask Nano Technology	Non-replaceable Filter	VFE>97% PFE>97%
	Xpure Anti-Pollution Mask	Non-replaceable Filter	VFE>99%
	Re-Mask Pro	Non-replaceable Filter	VFE>99%
	Lockill FaceOff Reusable Facewear	Non-replaceable Filter	BFE >95%

# Degree of Protection

Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency
	COPPERLINE KOREA Anti-microbial Mask	Non-replaceable Filter	VFE>79% (VFE>99% with filter)
	Meo Lite Reusable Mask	Replaceable Filter	PFE>99%
	O2 Mask	Replaceable Filter	BFE>99% VFE>99%
	Delione KN95/KN90	Replaceable Filter	PFE>98%

### Q.5 : Why did you use reusable masks?

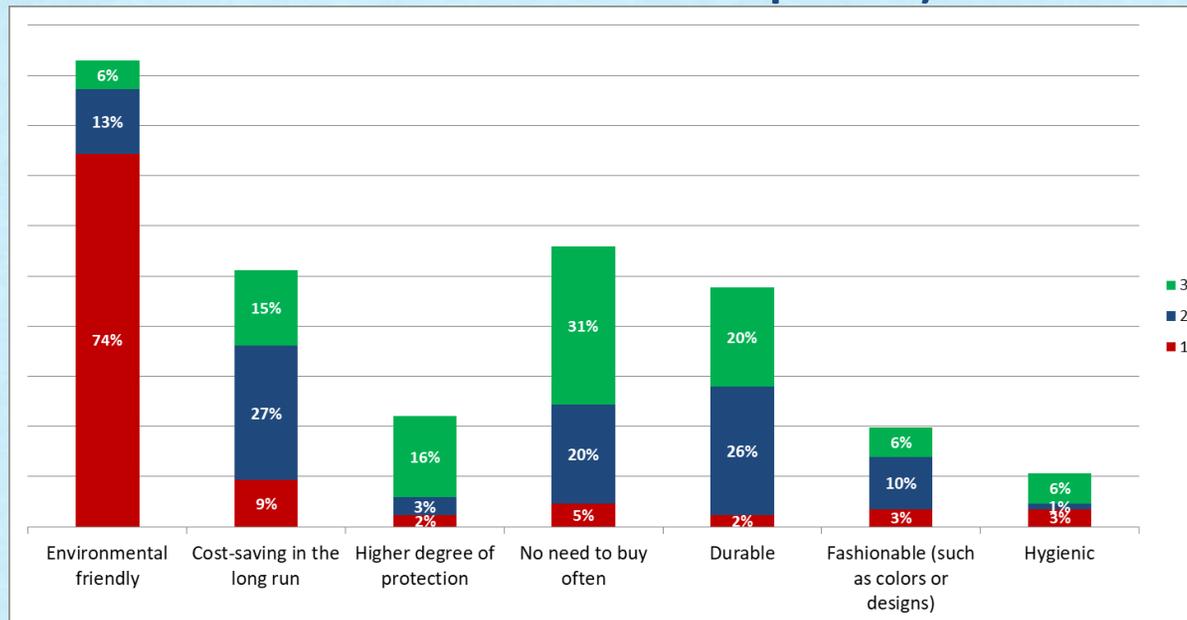
(Please rank according to importance, 1 is the most important, and 7 is the least important. Please fill in all the options.)



## Q.5 : Why did you choose to use reusable masks?

(Please rank according to importance, 1 is the most important, and 7 is the least important.

Please fill in all the options.)



Reason	Top 3 Preferences
Environmental friendly	<b>93%</b>
No need to buy often	<b>56%</b>
Cost saving in the long run	<b>51%</b>

- Compared with disposable masks, only **2% and 3%** reusable masks users choose protection level and hygiene as their preference respectively.
- This shows reusable masks users disagree reusable masks possess high degree of protection level and hygienic.

# Degree of Protection

Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency
	Metamask Nano Technology	Non-replaceable Filter	<b>VFE&gt;97%</b> <b>PFE&gt;97%</b>
	Xpure Anti-Pollution Mask	Non-replaceable Filter	<b>VFE&gt;99%</b>
	Re-Mask Pro	Non-replaceable Filter	<b>VFE&gt;99%</b>
	Lockill FaceOff Reusable Facewear	Non-replaceable Filter	<b>BFE &gt;95%</b>

# Degree of Protection

Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency
	COPPERLINE KOREA Anti-microbial Mask	Non-replaceable Filter	<b>VFE&gt;79%</b> <b>(VFE&gt;99% with filter)</b>
	Meo Lite Reusable Mask	Replaceable Filter	<b>PFE&gt;99%</b>
	O2 Mask	Replaceable Filter	<b>BFE&gt;99%</b> <b>VFE&gt;99%</b>
	Delione KN95/KN90	Replaceable Filter	<b>PFE&gt;98%</b>

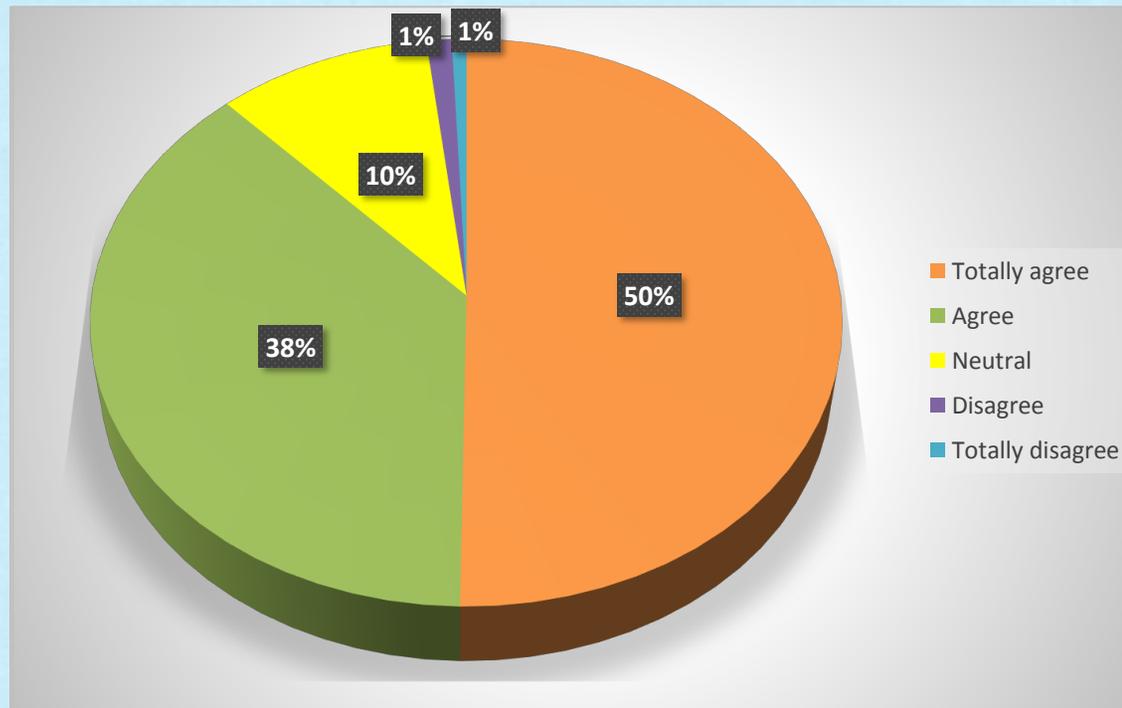
# Price

Types of Mask	Product Name	Reusable Times	Reference Price (HKD)	Average Daily Price (HKD)
	Nanofit Reusable Fabric Mask	125 times	288	<b>2.3</b>
	Xpure Anti-Pollution Mask	200 times	155	<b>0.8</b>
	Re-Mask Pro	3 months to 1 year	228	<b>0.7-2.6</b>
	AA99 <sup>®</sup> AntiViral AntiBacterial Reusable FaceMask	50 times	99	<b>2</b>

# Price

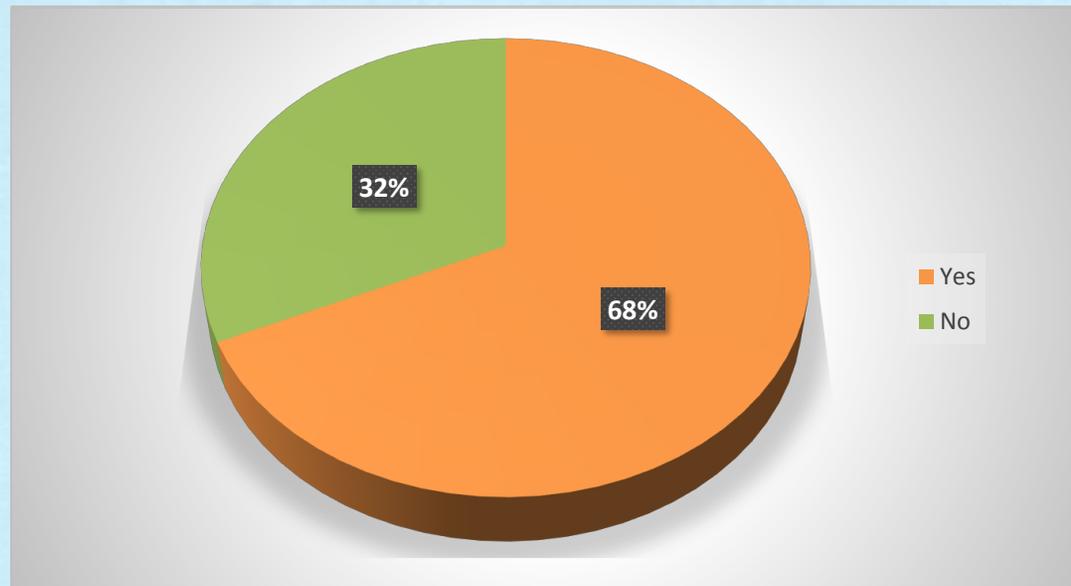
Types of Mask	Product Name	Reusable Times	Reference Price (HKD)	Average Daily Price (HKD)
	Sunna Washable Anti-bacterial Copper Mask	100 times	148	<b>1.48</b>
	The MASKSAVER Resuable Mask	Daily replacement	156 (1.5 HKD for each filter)	<b>1.5</b>
	O2 Mask	1-2 weeks	540 (15 HKD for each filter)	<b>1.1-2.2</b>
	Delione KN95/KN90	Approx. 3 days	128 (8.3 HKD for each filter)	<b>2.8</b>

Q.6 : How much do you agree that using disposable masks will damage the environment?



- **88%** disposable mask users strongly agree or agree disposable masks will damage the environment.

Q.7 : Will you use reusable masks if the epidemic continues?

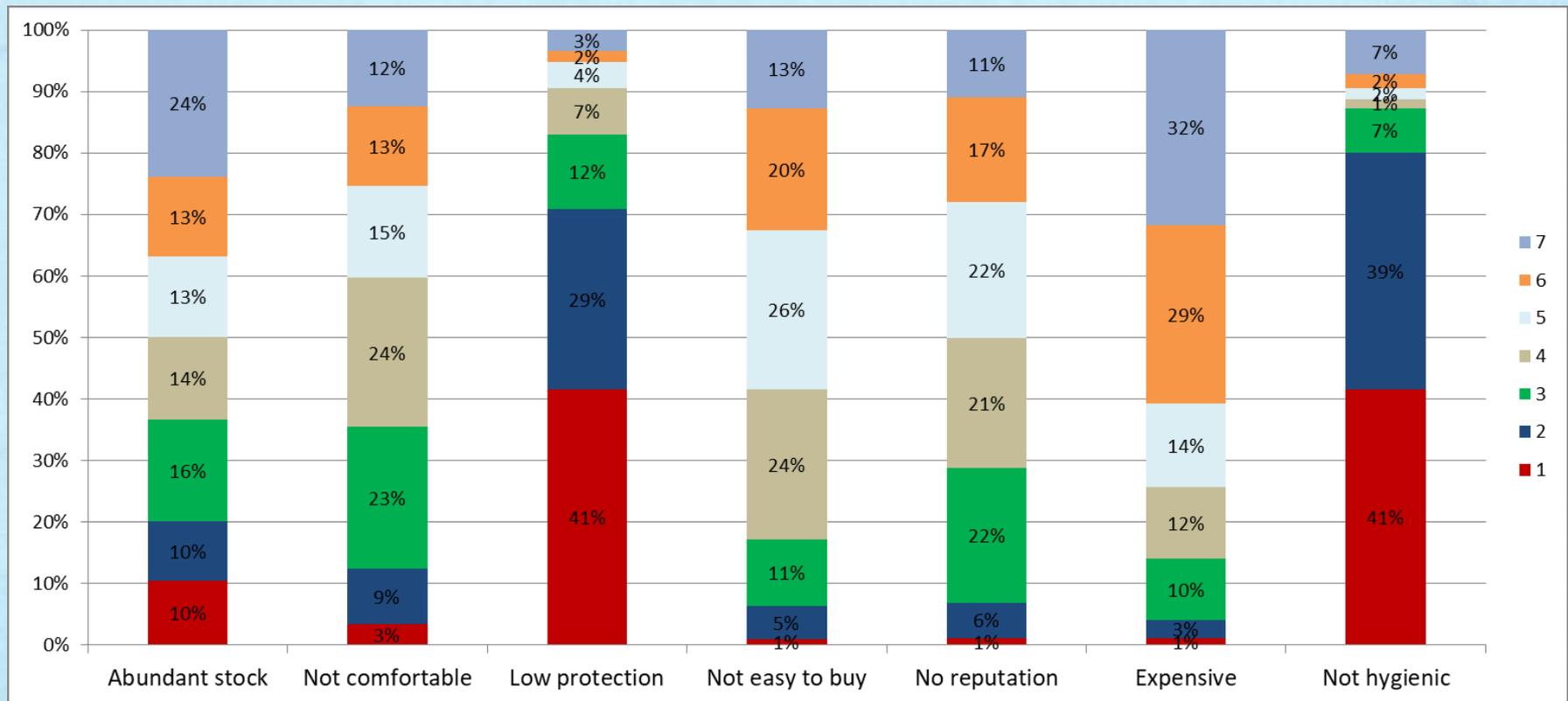


- Nearly **70%** disposable mask users agree they will use reusable masks if the epidemic continues. Nearly **30 %** respondents disagree.

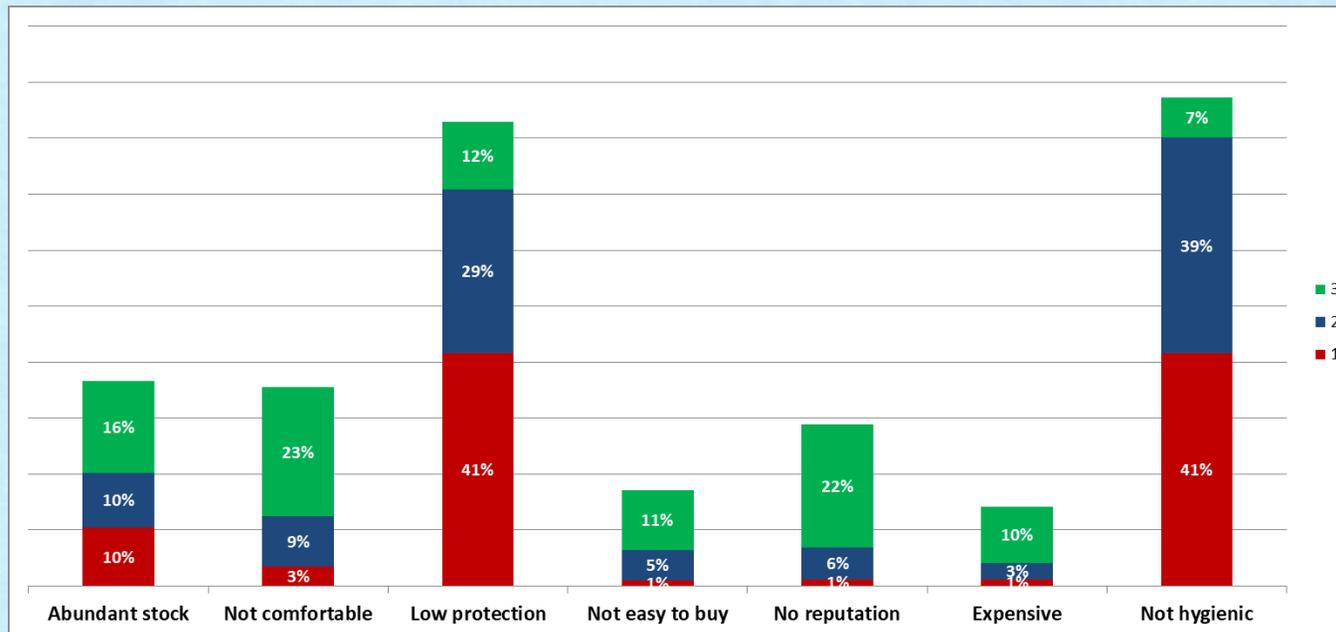
### Q.8 : What are the reasons of not using reusable masks?

(Please rank according to importance, 1 is the most important, and 7 is the least important.)

Please fill in all the options.)



**Q.8 : What are the reasons of not using reusable masks?**  
 (Please rank according to importance, 1 is the most important, and 7 is the least important.  
 Please fill in all the options.)



Reason	Top 3 Preferences
Not hygienic	<b>87%</b>
Low protection	<b>82%</b>
Abundant stock	<b>36%</b>

- Even nearly **90%** disposable mask users know disposable masks are damaging to environment, protection degree and hygiene are still the dominant considerations for them.

## Degree of Protection ( After multi-time usage)

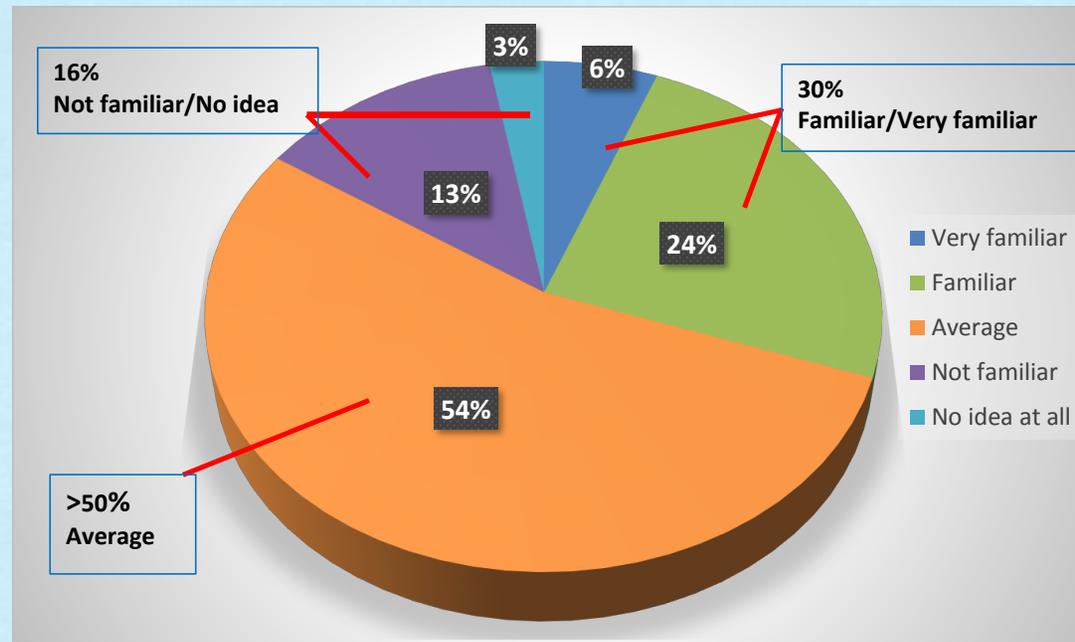


Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency	Reusable Times	Antibacterial test report after multi-time usage
	Nanofit Reusable Fabric Mask	Non-replaceable Filter	BFE>93% PFE>78%	125 times	<b>BFE&gt;93%</b> <b>PFE&gt;97%</b>
	Xpure Anti-Pollution Mask	Non-replaceable Filter	VFE>99%	200 times	<b>0.26um [MMD]</b> <b>Filtration Efficiency 60.72%</b>
	Sunna Washable Anti-bacterial Copper Mask	Non-replaceable Filter	Antibacterial protection (cloth layer) reaches 99.9% (Filter not included)	100 times	<b>After 100 times usage, cloth layer filter keeps 99.9% antibacterial protection (Filter not included)</b>
	COPPERLINE KOREA Anti-microbial Mask	Non-replaceable Filter	Cloth layer VFE>79% (Additional filter VFE>99%)	30 times	<b>Cloth layer can kill 99% bacteria (Suggest to replace the filter after 3-4 hours of usage)</b>

## Degree of Protection ( After multi-time usage)

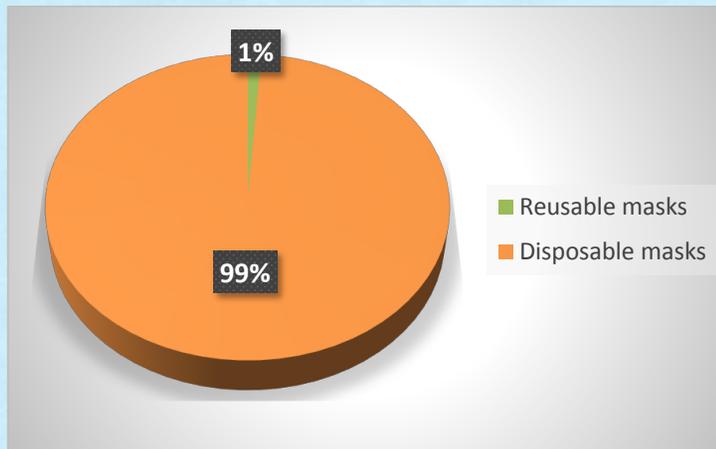
Types of Mask	Product Name	Reusable Mask Cat.	Filtration Efficiency	Reusable Times	Antibacterial test report after multi-time usage
	Hooohah KF94 Reusable Mask	Replaceable Filter	Filters out 94% 0.4 $\mu\text{m}$ size particles	Approx. 1 week	<b>Depends on air quality</b>
	Meo Lite Reusable Mask	Replaceable Filter	BFE>99%	2-3 weeks	<b>Varies with air quality indicators of different regions</b>
	O2 Mask	Replaceable Filter	BFE>99% VFE>99%	1-2 weeks	<b>Depends on air quality</b>
	Delione KN95/KN90	Replaceable Filter	PFE>98%	Approx. 3 days	<b>Depends on air quality</b>

## Q.9 : How much do you know about reusable masks?

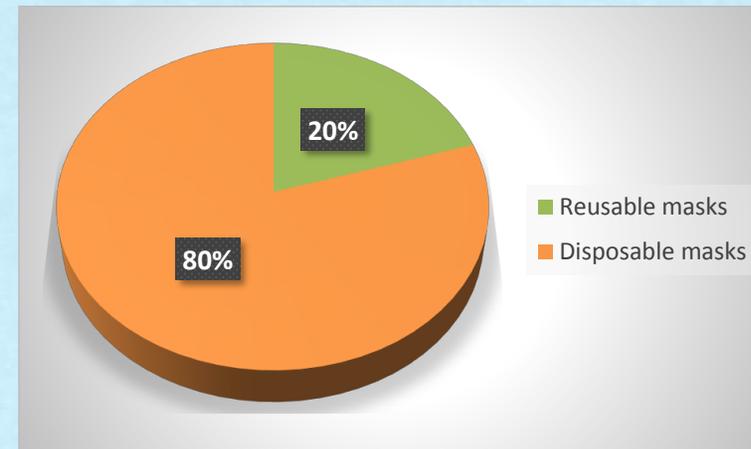


- Only **30%** respondents claim they are familiar or very familiar with reusable masks.
- **16%** respondents claim they are not familiar with or have no idea at all about reusable masks. More than **50%** respondents claim they have average knowledge only.

## No idea/Not familiar

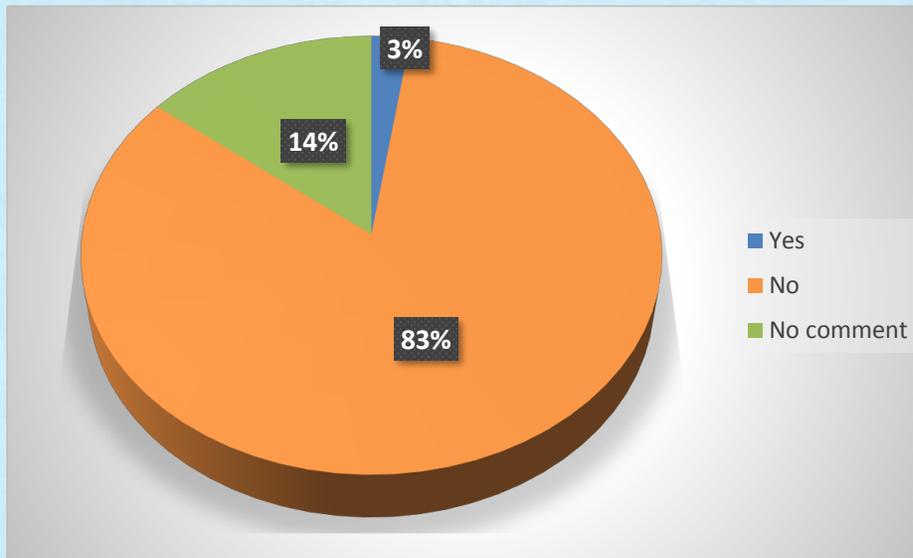


## Very familiar/familiar



- Among 16% respondents (have no idea or not familiar with reusable masks), 99% of them usually use disposable masks.
- Among 30% respondents (familiar with or very familiar with reusable masks), 80% of them usually use disposable masks.
- People will tend to use more reusable masks if they have better knowledge about reusable masks.

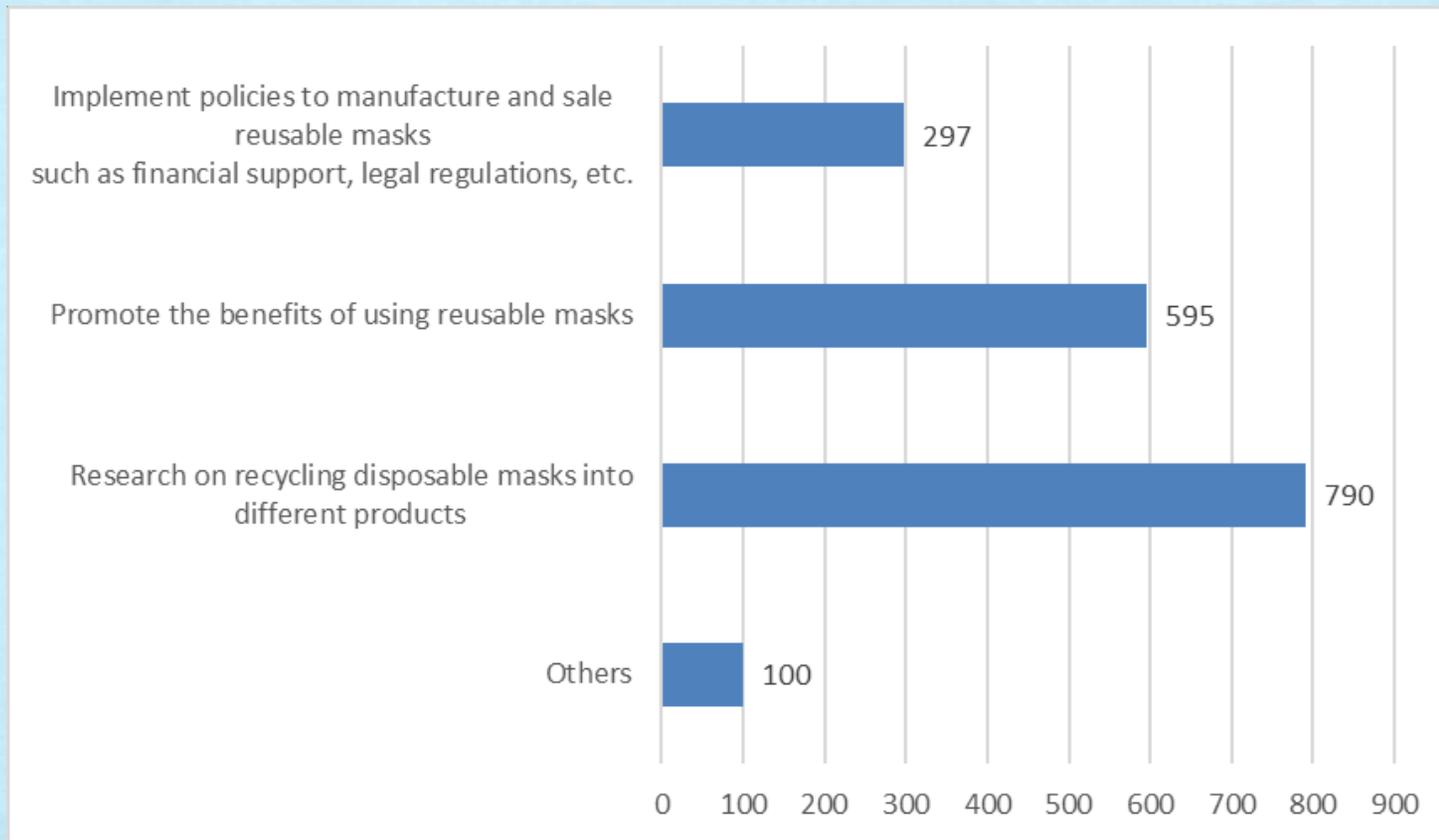
## Q.10 : Do you think the government has properly dealt with the environmental problems caused by disposable masks recently?



Source: Gary Stokes Facebook

- Over **80%** respondents believe the government did not deal with the environmental problems caused by disposable masks.
- Gary Stokes from Oceans Asia has found a large quantity of improperly discarded disposable masks, including surgical and N95 masks, and on a beach at Soko Islands, Hong Kong.

**Q.10 : Do you think the government has properly dealt with the environmental problems caused by disposable masks recently?**



# Global Experience (France) : Face Masks Recycling and Reuse

- Plaxtil , a French start-up company.
- 50 disposable masks collection boxes were set up at Châtelleraut.
- Upon collection, masks will be quarantined for 4 days before they are integrated into the PLAXTIL manufacturing process. The stainless steel wires will be removed manually.
- Crushed masks will pass through an ultraviolet tunnel which removes any virus or any germ in less than 5 seconds.
- The masks will be used for the raw materials of face shield and storage boxes.
- 70,000 disposable masks were recycled until August 2020.
- <https://www.youtube.com/watch?v=gDaj1gBLhf8>





Covid-19 Plaxtil recycle les masques

19/20

Poitou  
Charentes

# Global Experience(U.S.): Face Masks Recycling and Reuse

- TerraCycle, established in 2001, continuously turns recycled materials into innovative daily necessities.
- Recycling of medical supplies, such as surgical masks, gloves and single use gear etc., by providing “Safety Equipment and Protective Gear - Zero Waste Box”.
- Recycled materials can be used for making outdoor furniture, decking and storage containers.



Safety Equipment and Protective  
Gear - Zero Waste Box™

# Guidelines on Using Non-Medical Face Masks

## Definition of non-medical face masks by WHO

- A minimum of three layers is required for non-medical masks, depending on the fabric used.

<p><b>WHO</b>  <a href="https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak">https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak</a></p>	<ol style="list-style-type: none"> <li>1. General population in public settings, such as social gatherings, schools, at work, grocery stores and churches etc.</li> <li>2. People living in cramped conditions such as refugee camps etc.</li> <li>3. General public on transportation.</li> </ol>
<p><b>Pan-Canadian Public Health Network</b>  <a href="http://www.phn-rsp.ca/sac-covid-ccs/wearing-masks-community-eng.php">http://www.phn-rsp.ca/sac-covid-ccs/wearing-masks-community-eng.php</a></p>	<ol style="list-style-type: none"> <li>1. Public transportation, shopping areas, group homes and correctional facilities etc.</li> <li>2. Within a 2m physical distance - to a client who cannot wear a non-medical mask or face covering</li> </ol>
<p><b>Australia</b>  <a href="https://www.health.gov.au/sites/default/files/documents/2020/11/coronavirus-covid-19-face-masks-how-they-protect-you-and-when-to-use-them_0.pdf">https://www.health.gov.au/sites/default/files/documents/2020/11/coronavirus-covid-19-face-masks-how-they-protect-you-and-when-to-use-them_0.pdf</a></p>	<ol style="list-style-type: none"> <li>1. Public use in community transmission where physical distancing cannot be achieved.</li> </ol>

# Degradable Face Mask

## Canada

- The Canadian government has invested 1.3 million Canadian dollars to research on using sustainable wood fibres to produce the middle filter layer which is biodegradable.
- The average filtration efficiency of the cellulosic filter media is currently at 60%. Phase 2 research will continue and target to meet requirements for surgical masks



Source: FAInnovations

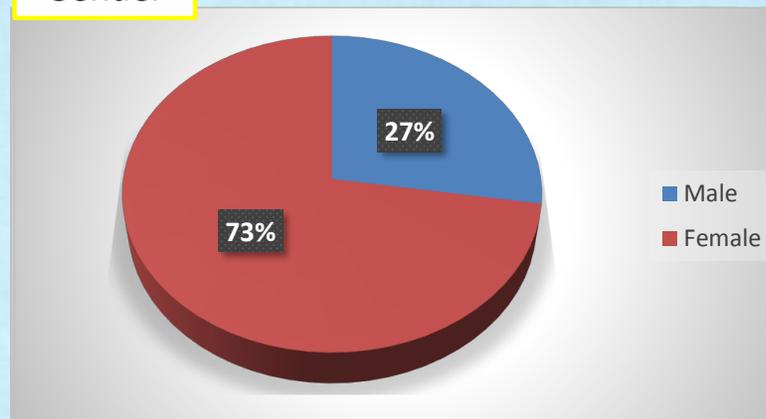
## Switzerland

- HMCARE, a start-up is developing masks of polymer composition which is 99% organic and biomass derivative.
- The masks are expected to be available in early 2021 mainly for medical use.

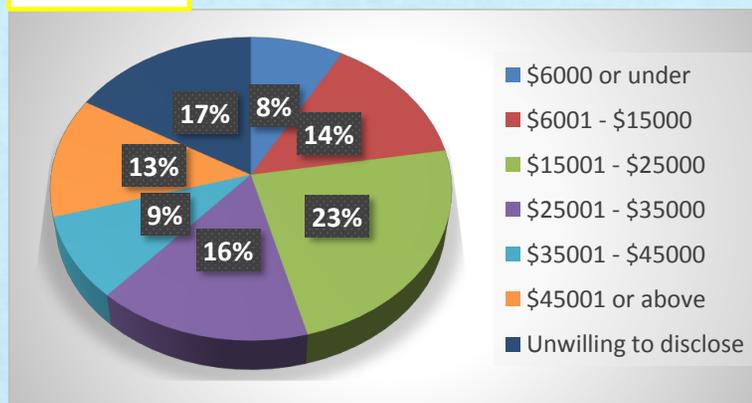


Source: HMCARE

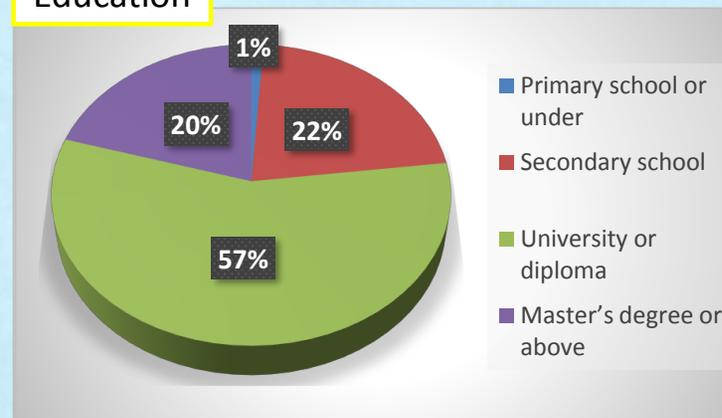
Gender



Income



Education



# Recommendations from Greeners Action

## 1. A Guideline for Using Reusable Masks

- According to the guidelines designed by Centre for Health Protection, surgical masks or masks should be used under different circumstances.
- The government should review the protection standards of reusable masks available in the market. A guideline should be set forth by taking into consideration of the need for virus prevention and environmental protection.

## Recommendations from Greeners Action

### 2. Reusable Masks as Substitute of Disposable Masks for Giveaway

- 35% respondents regard “Abundant stock” as top three preferences for using disposable masks, second only to protection level and hygiene.
- It is a common practice of charity foundations and organizations to fund the community organizations and social welfare organizations to distribute disposable masks. Private companies also follow suit for business or philanthropic purpose.
- They could substitute reusable masks with disposable masks to encourage frequent use of reusable masks and reduce environmental pollution from the source.

## Recommendations from Greeners Action

### 3. Study on Masks Recycling and Reuse of international experiences

- Reusable masks could not replace all disposable masks.
- The government should study and introduce successful experiences of disposable masks recycling and reuse from other countries and enterprises, helping face masks recycling and reuse innovation and industry development. As a result, less masks will be transported to landfills.



Q&A



綠領行動 - 全新專頁



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