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on
**Sustainable Solid Waste
Management**

Marine Litter, Plastics & Bioplastics

ANALYSIS OF HAZARDOUS PLASTIC WASTE GENERATED DURING THE COVID-19 PANDEMIC

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Alongside other preventive measures, wearing a face mask may help slow the spread of SARS-CoV-2, the virus that causes COVID-19.

Different types of mask are available for people to wear during the current pandemic.

A photograph of a rocky beach with several discarded face masks and gloves scattered across the stones. The masks are in various colors, including light blue, dark blue, and orange. The background shows the ocean and a clear sky. The text is overlaid in the center of the image.

Coronavirus face masks:
an environmental disaster that might
last generations!

- ❑ Discarded masks may risk spreading coronavirus to waste collectors, litter pickers or members of the public who first come across the litter.
- ❑ In certain conditions, the virus can survive on a plastic surgical mask for seven days.
- ❑ Plastic waste can smother environments and break up ecosystems.

DISPOSABLE FACE MASKS CONSIST:

- Disposable face masks are made with non-woven fabric, which has better bacteria filtration and air permeability while remaining less slippery than woven cloth.
- The material most commonly used to make them is **polypropylene**, either 20 or 25 grams per square meter (gsm) in density.
- Masks can also be made of **polystyrene, polycarbonate, polyethylene, or polyester.**



N95 face mask: What is it made from?

N95 face masks are made from unwoven Propylene (PP).



<https://ecochain.com/knowledge/footprint-face-masks-comparison/>

This is how the face mask structure looks like in Mobius

- [-] **1 piece von Face Mask N95**
 - [-] 0.5 gram von Aluminium Strip
 - [-] 0.5 g von Auminium
 - [-] 0.5 g von Production Aluminium
 - [-] 2 g von Filter
 - [-] 2 g von Polypropylene
 - [-] 2 g von Production PP
 - [-] 9 g von Mask
 - [-] 9 g von Polypropylene
 - [-] 9 g von Production PP
 - [-] 0.5 g von Rubber Strap
 - [-] 0.5 g von Rubber

Cotton face mask structure looks like in Mobius:

[-] **1 piece von Self-made Cloth Facemask**

[-] 12 g von Cloth

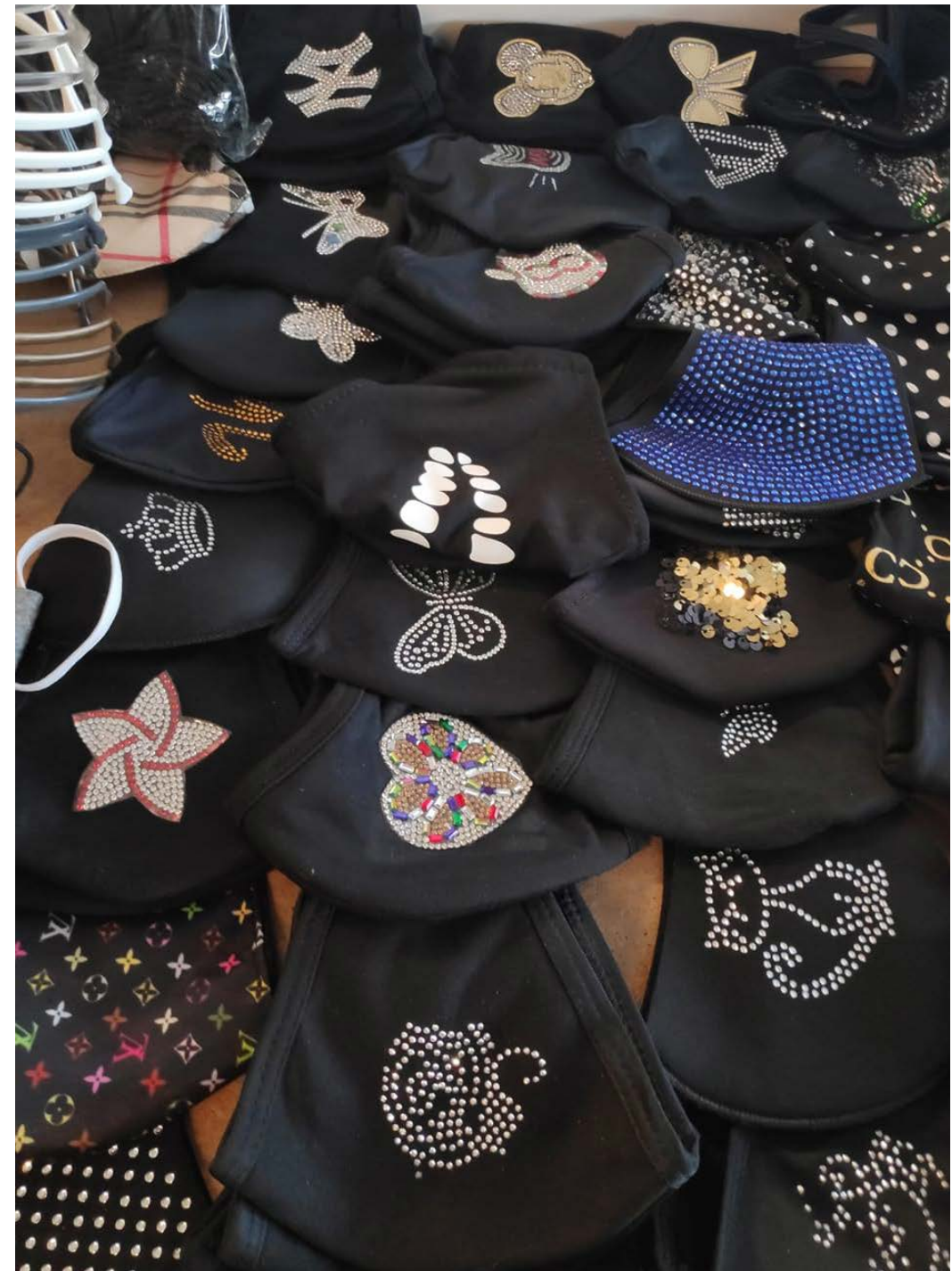
[-] 12 g von Cotton fabric

[-] 12 g von Weaving process

[-] 0.5 g von Rubber Strap

[-] 0.5 g von Rubber

[-] 0.01 kWh von Sewing



<https://ecochain.com/knowledge/footprint-face-masks-comparison/>

- ❖ According to a 2018 estimate by UN Environment - As much as 13 million tonnes of plastic goes into oceans each year;
- ❖ The Mediterranean sees 570,000 tonnes of plastic flow into it annually – an amount the WWF has described as equal to dumping 33,800 plastic bottles every minute into the sea.

- ❑ Plastics first break down into microplastics and eventually into even smaller nanoplastics.
- ❑ These tiny particles and fibres are often long-lived polymers that can accumulate in food chains.
- ❑ Just one mask can produce millions of particles, each with the potential to also carry chemicals and bacteria up the food chain.

The aim of the study was to estimate the amount of hazardous plastic waste generated by disposable face masks generated in Lithuania during the COVID19 pandemic.

- In **LITHUANIA** currently has about **2 million adults**.
- If everyone used disposable masks and replaced them every day, then 2 million masks would be discarded every day.
- **AS ONE MASK WEIGHS ABOUT 2.7274 g.- adults in Lithuania would generate 5.4548 tons of plastic waste per day.**
- Multiplied by 30 **generate 163,644 tons per month.**
- There's also a significant amount of waste generated by discarded protective sterile plastic clothing.

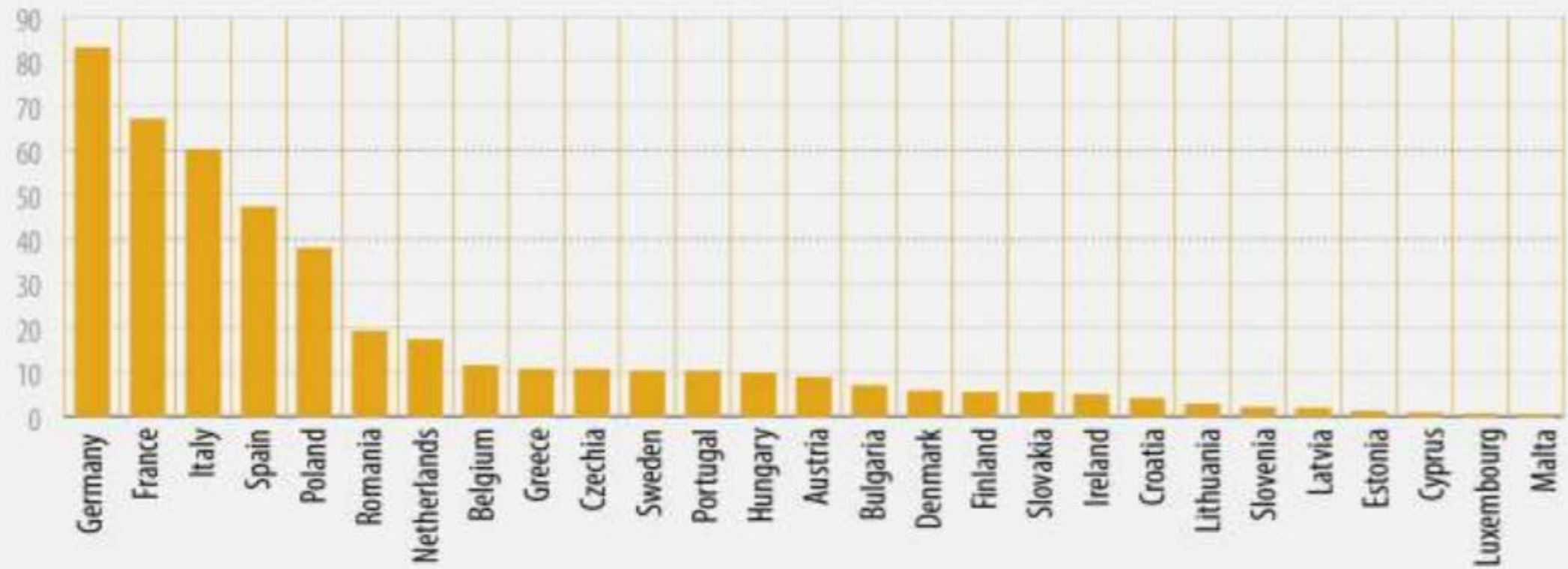
111/2020 - 10 July 2020

First population estimates

EU population in 2020: almost 448 million

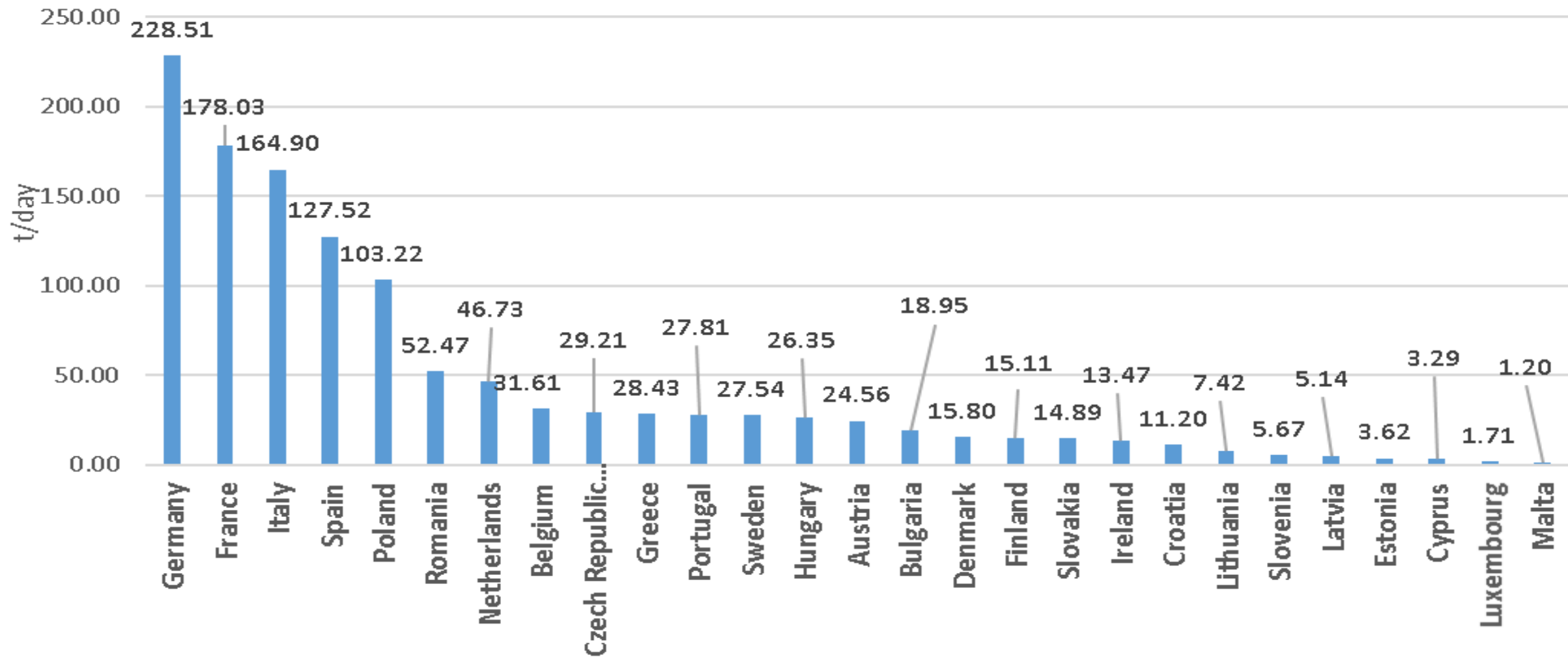
Population in the EU Member States on 1 January 2020

(in millions)

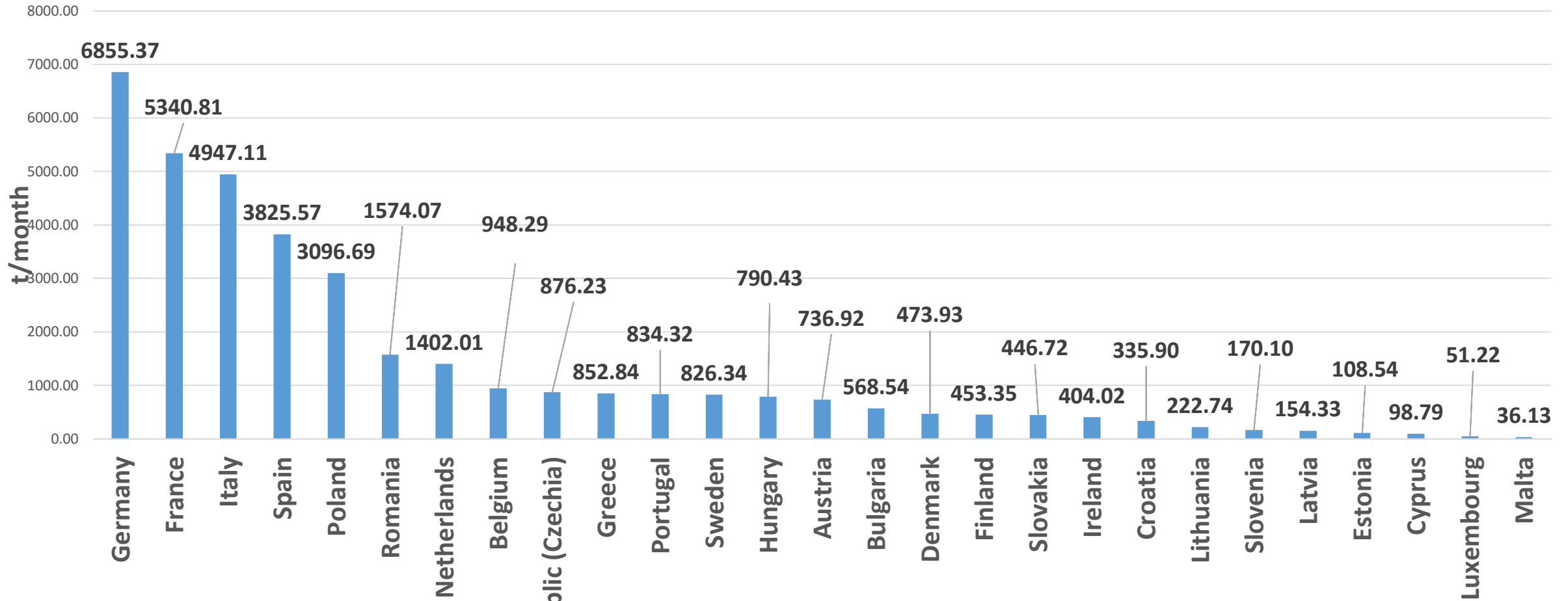


**If 448 million people in the European Union
everyone used a disposable mask per day:**

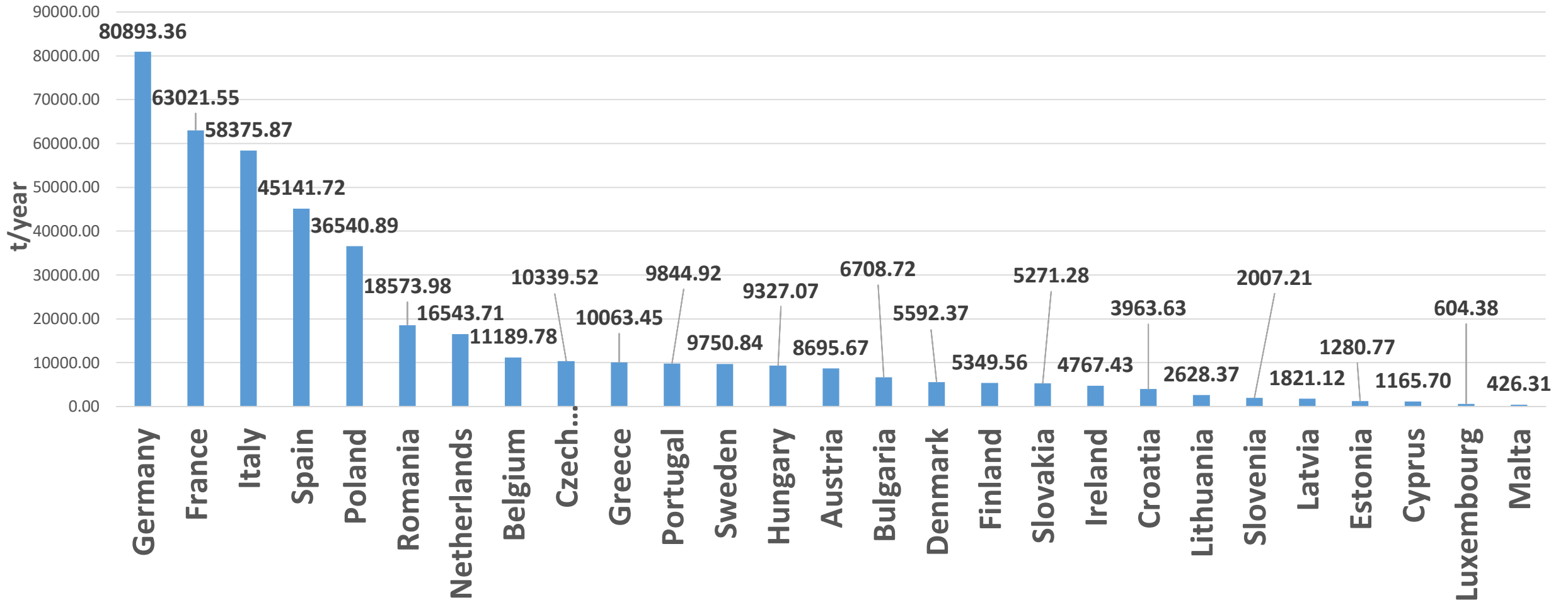
EU WOULD BE GENERATING of plastic waste :
1221.88 tons/day,
36656.2 tons/ month,
432545.52 tons/year.



Of plastic waste t/per day



Of plastic waste t/per month



Of plastic waste t/per year

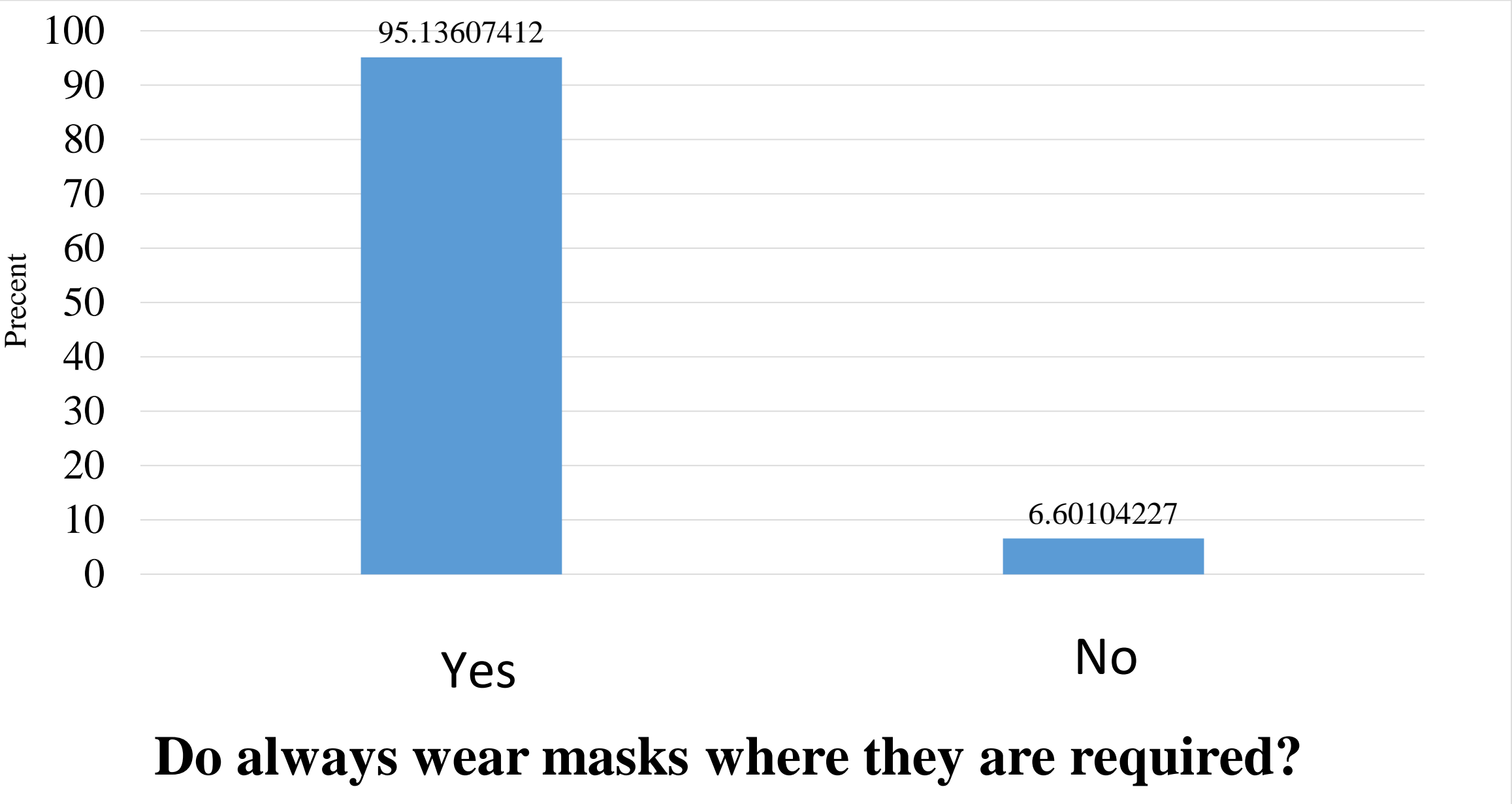
Analyzing the habits of wearing face protection mask in Lithuania, it is estimated that at the beginning of 2021, 2 million 795.7 thousand permanent residents lived in Lithuania.

A questionnaire survey was conducted.

In order for the survey to be representative and reliable with an error of 5%, 400 Lithuanian residents ($n = 1 / (0.0025 + 1/2795700)$) must be surveyed in the survey.

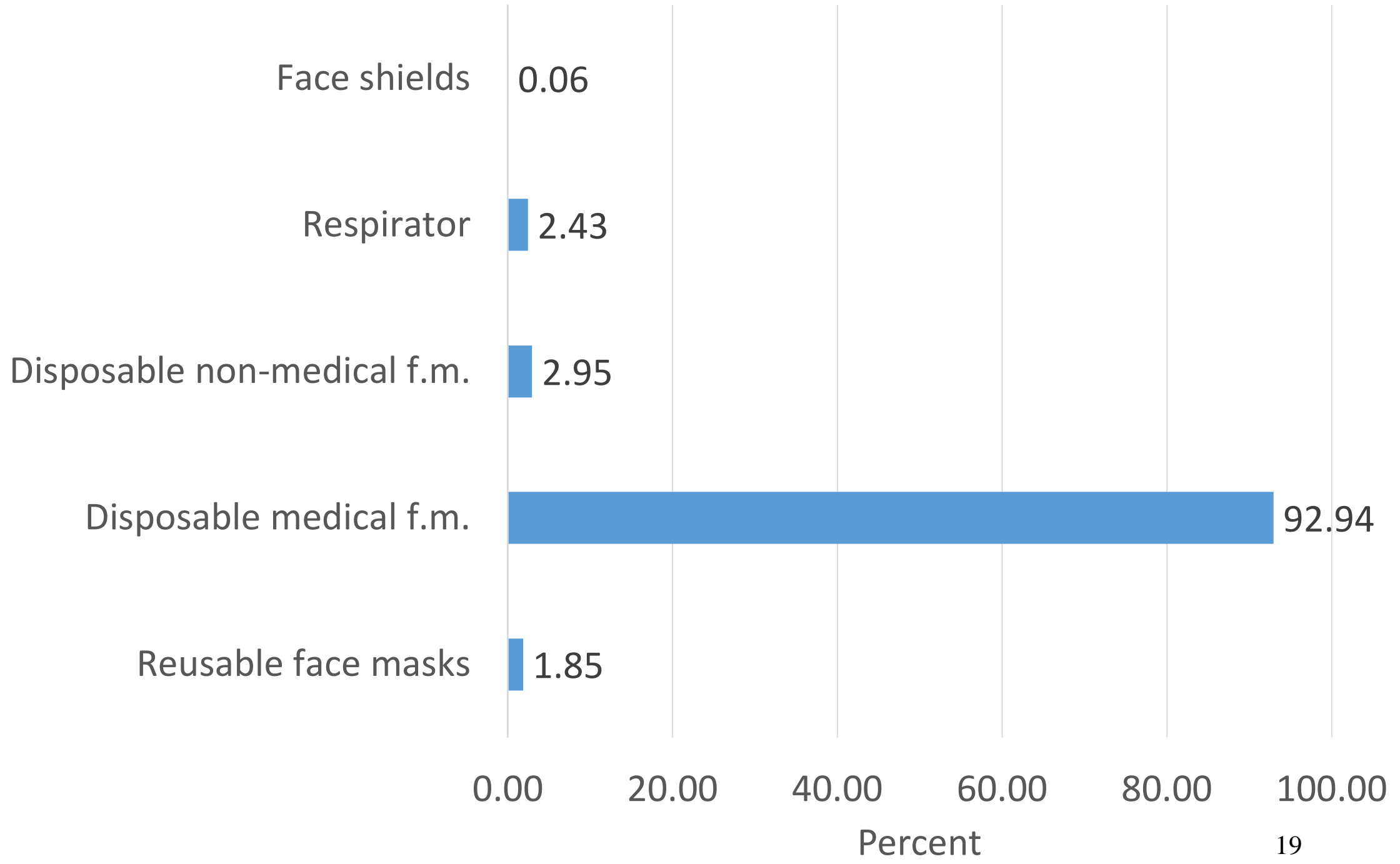
In our case 1753 respondents were surveyed.

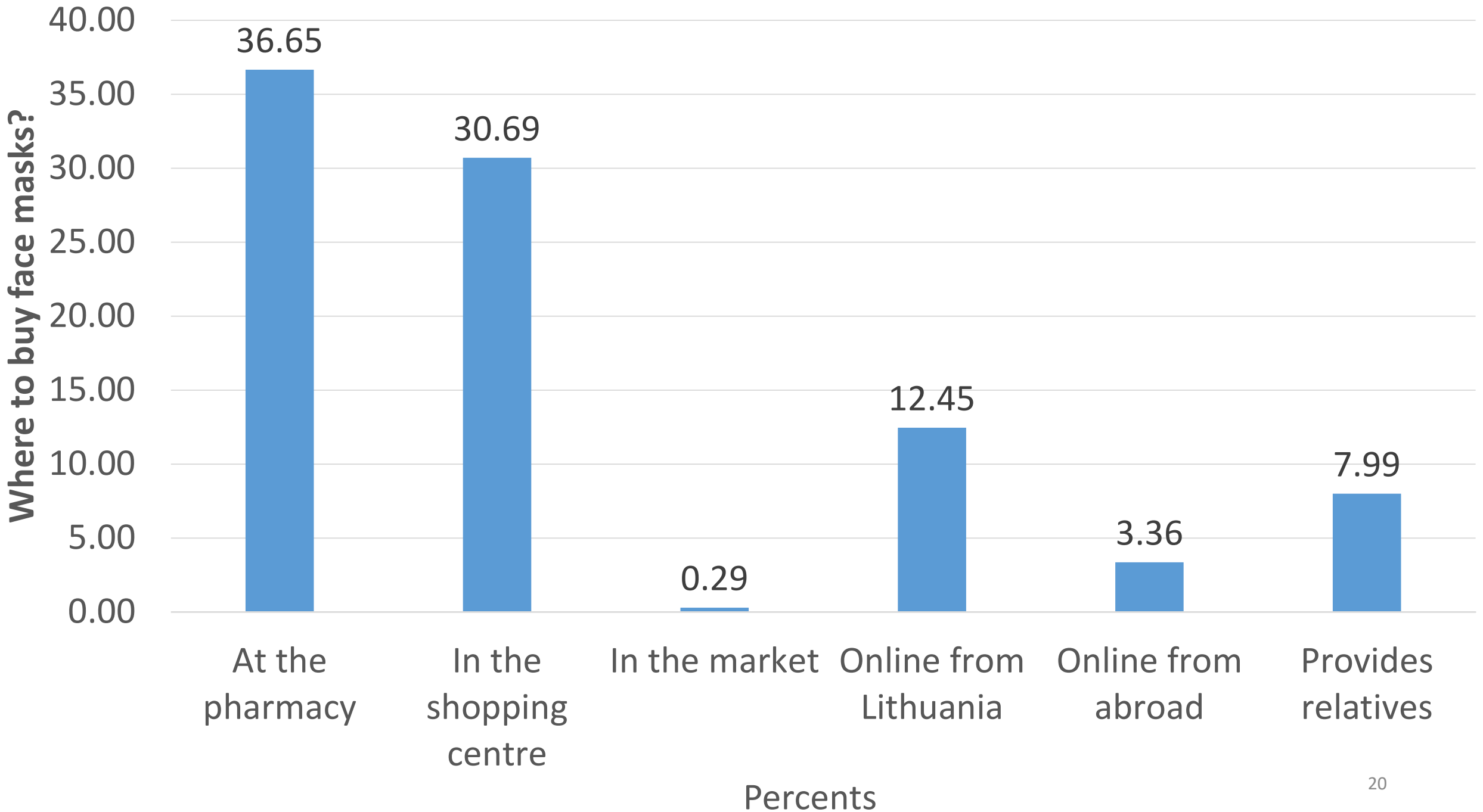
Survey Results



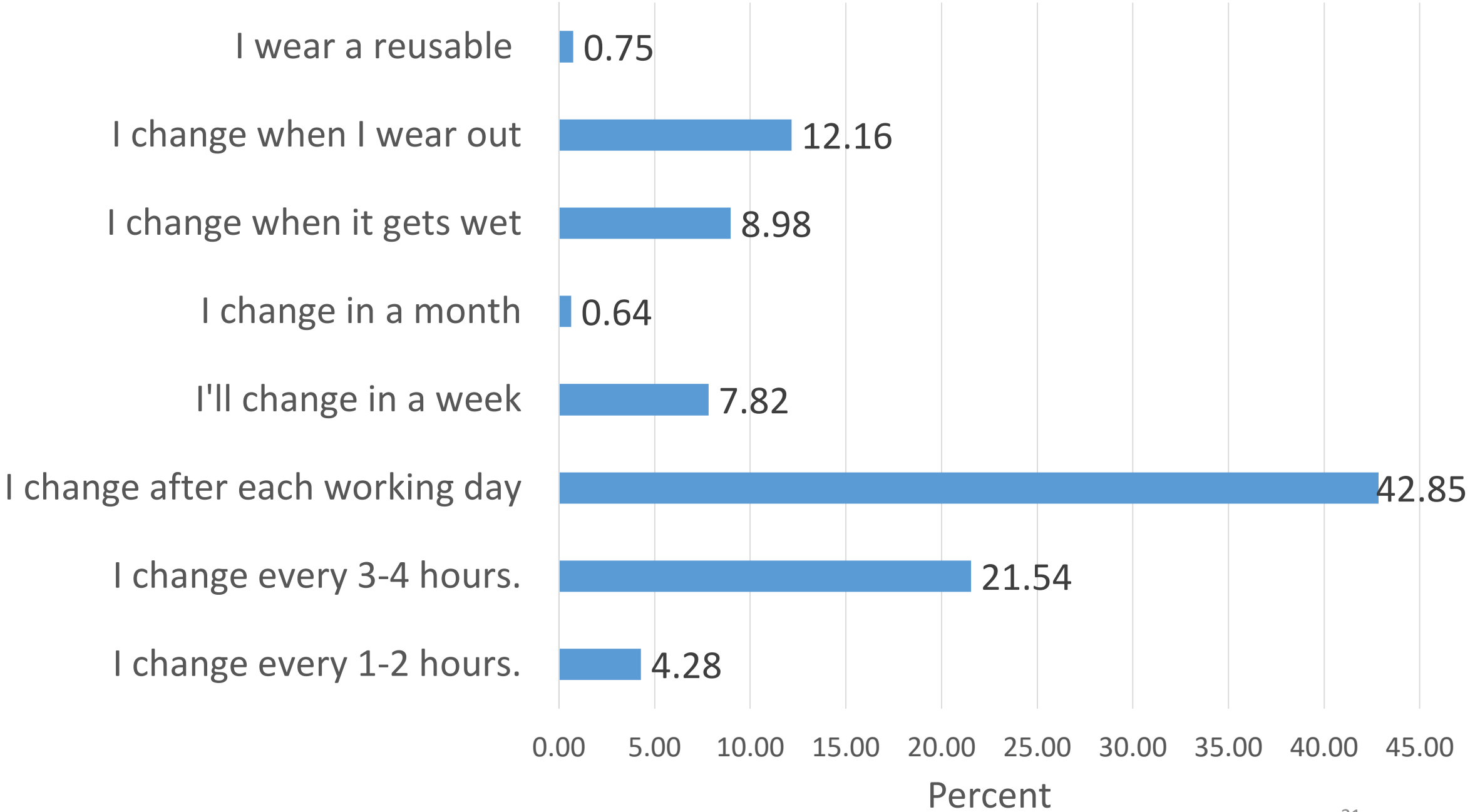
Do always wear masks where they are required?

What kind of masks do you wear most often?

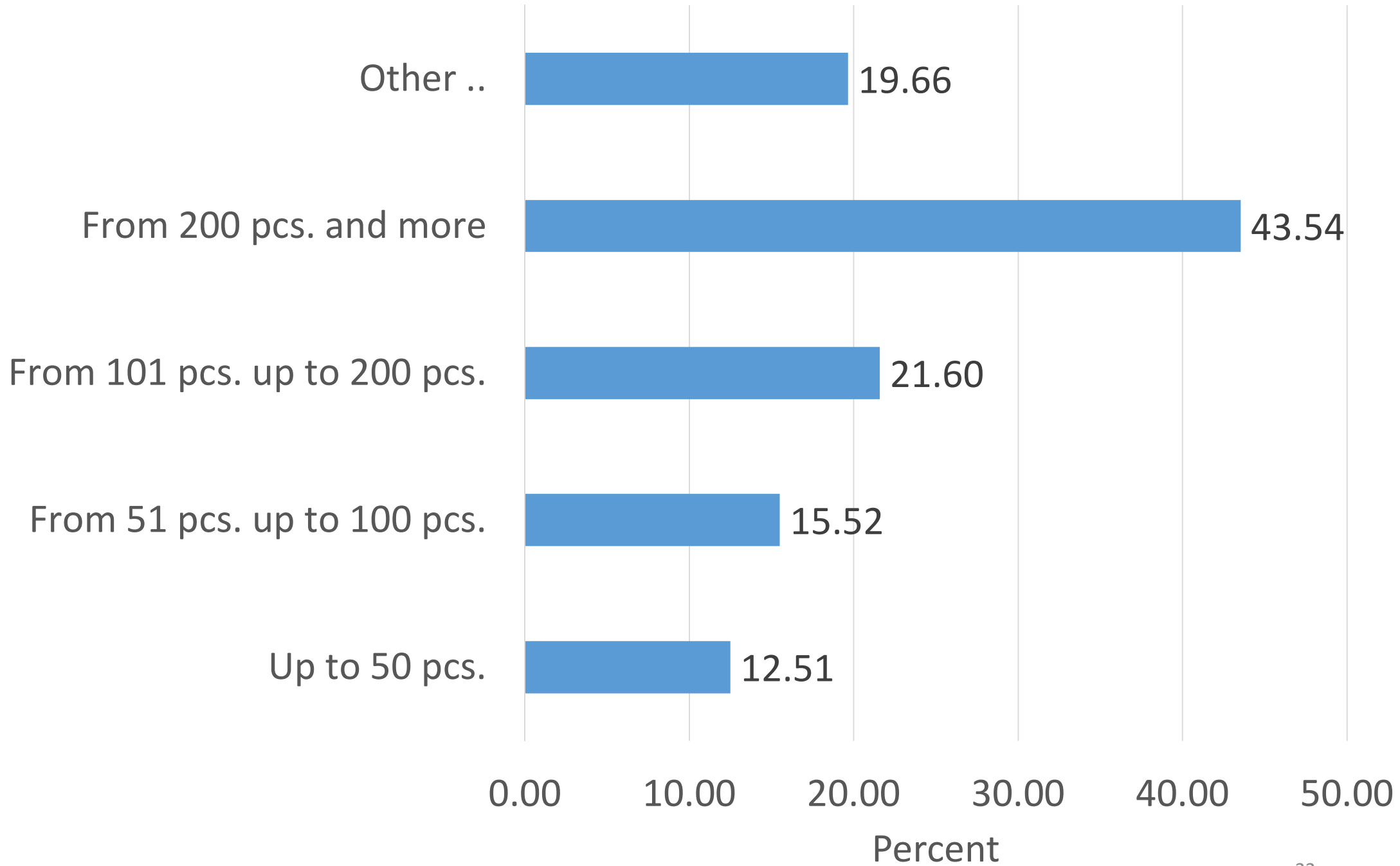




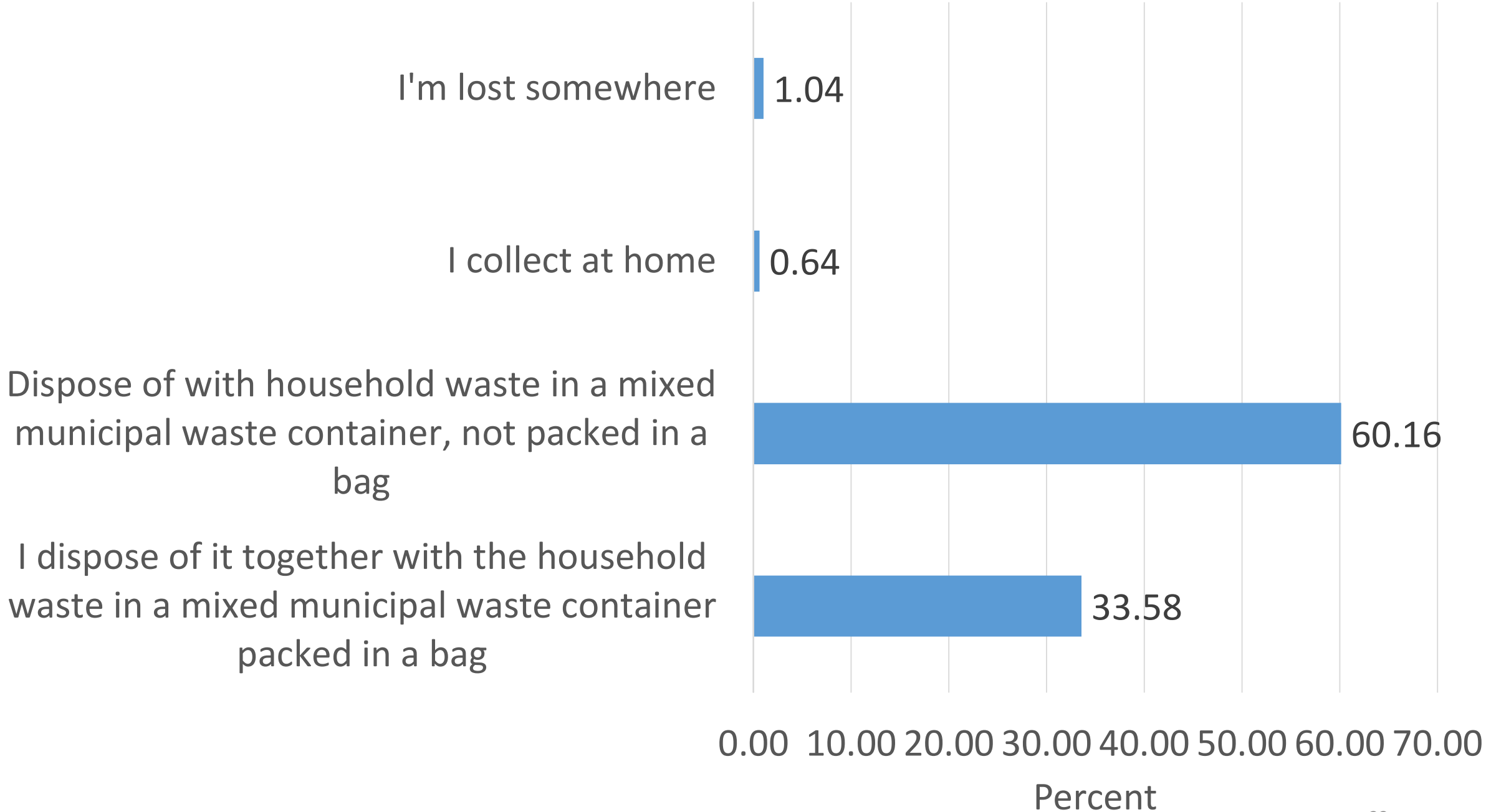
**If you use a disposable medical mask,
how often do you change it?**



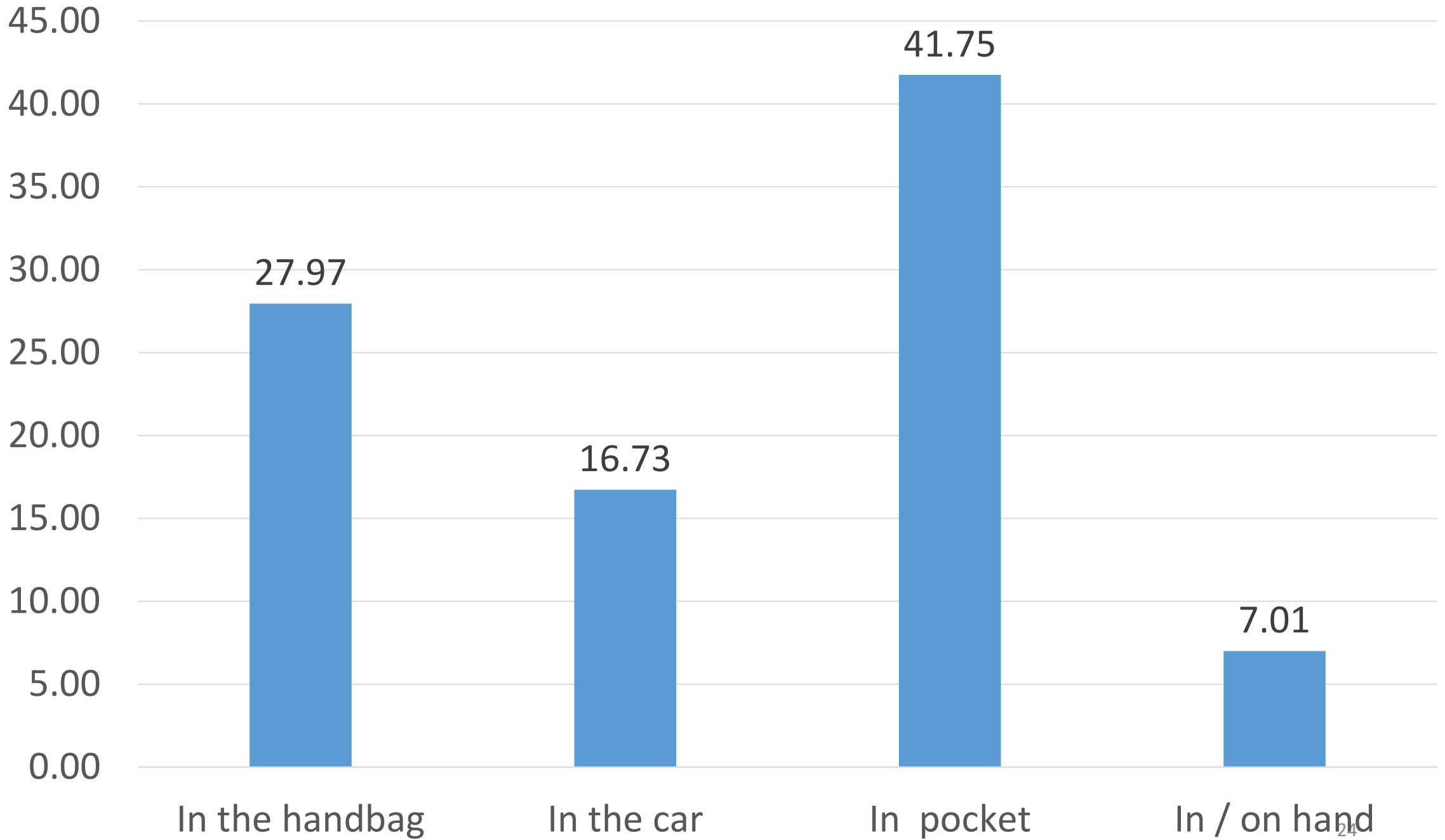
How many disposable face masks did you purchase during the entire pandemic period?

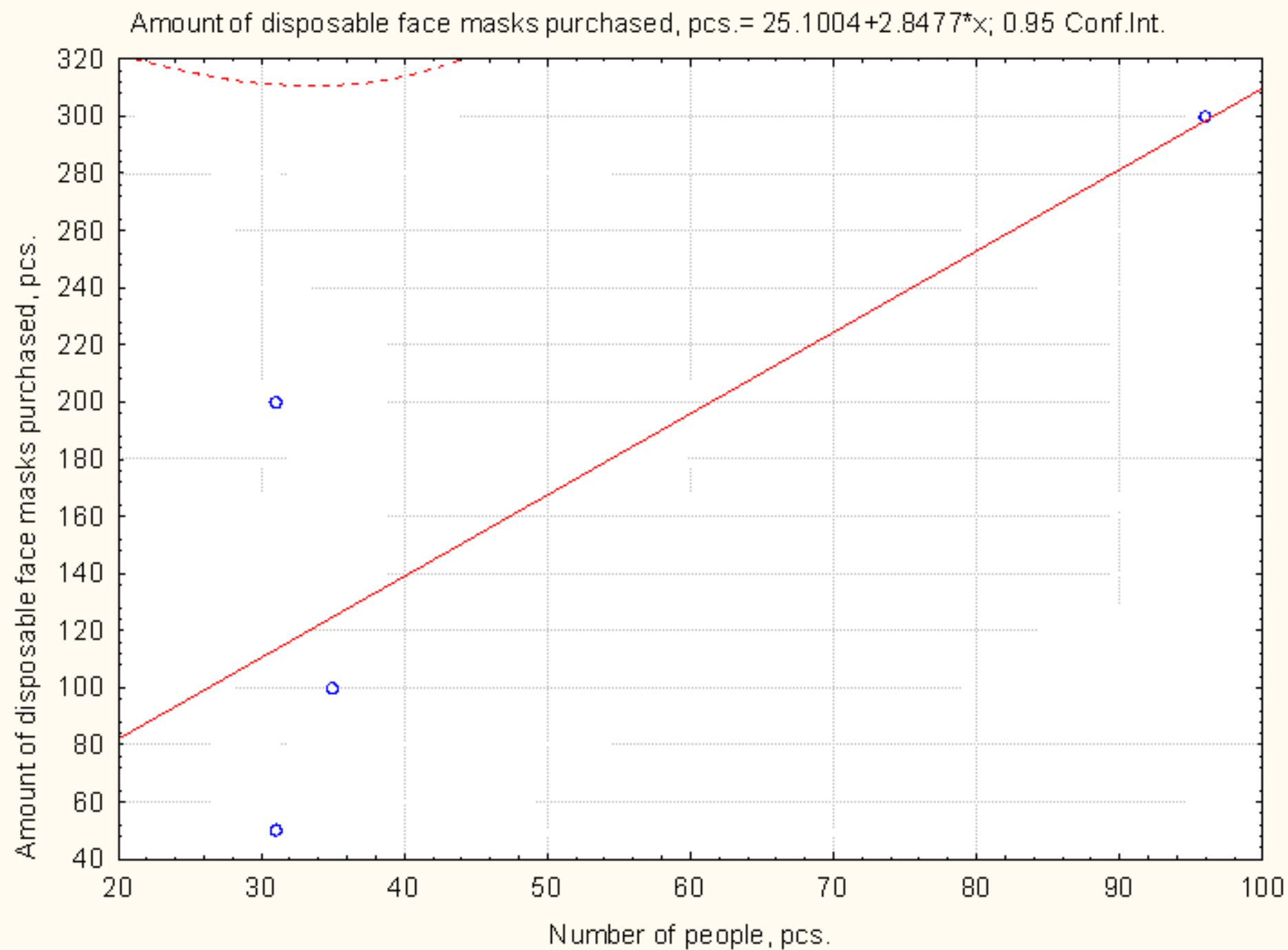


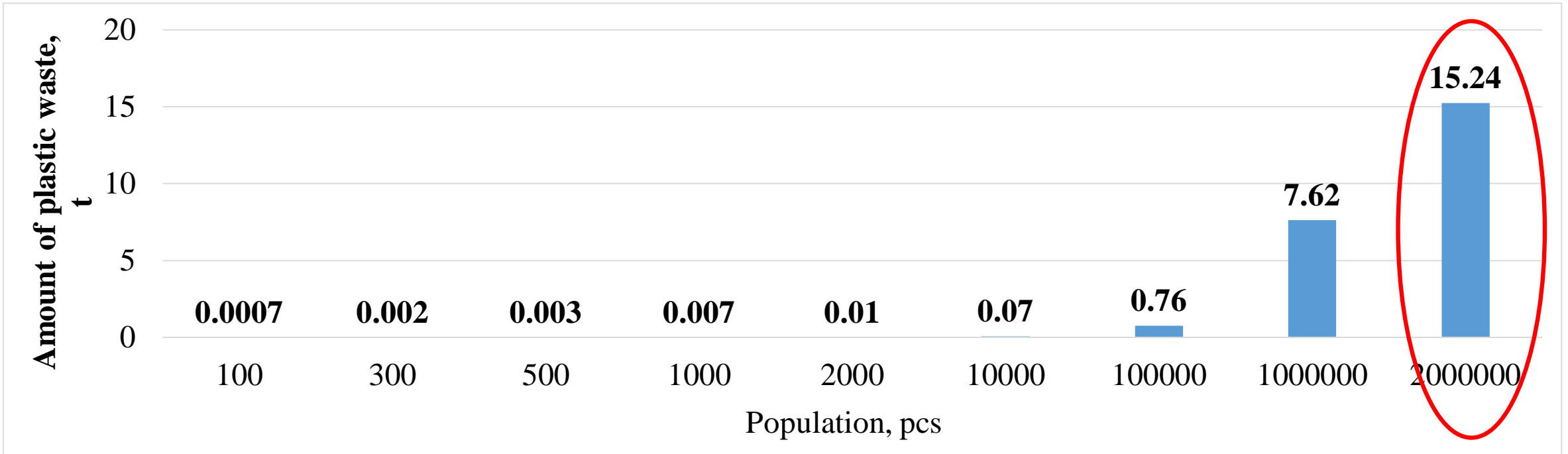
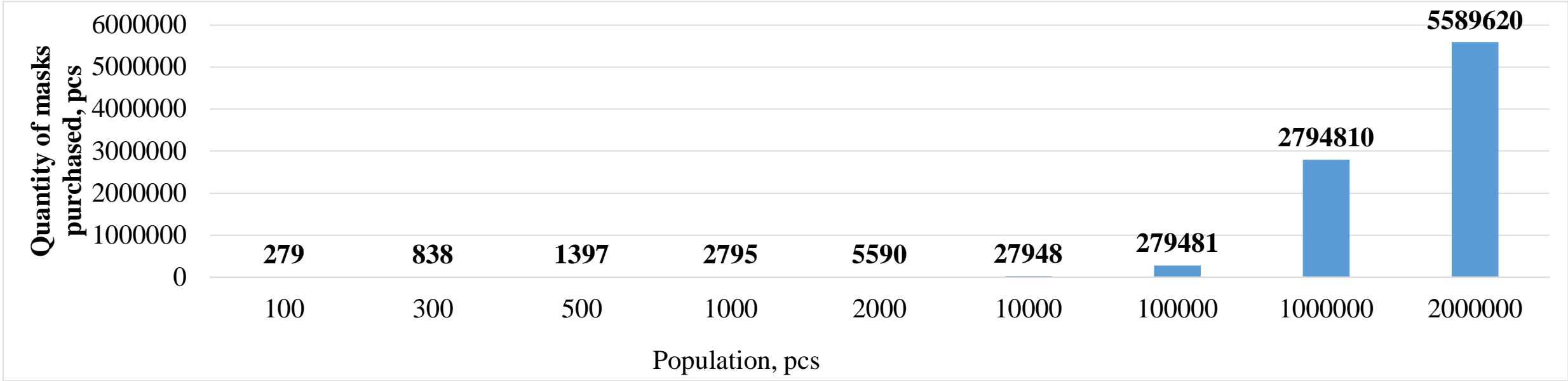
Where do you put used masks?



Where do you usually wear the mask
when you wear it several times?







This is seriously problematic because non-reusable masks are made out of plastics like polypropylene which takes around **450 years to biodegrade.**

DISPOSABLE FACE MASK

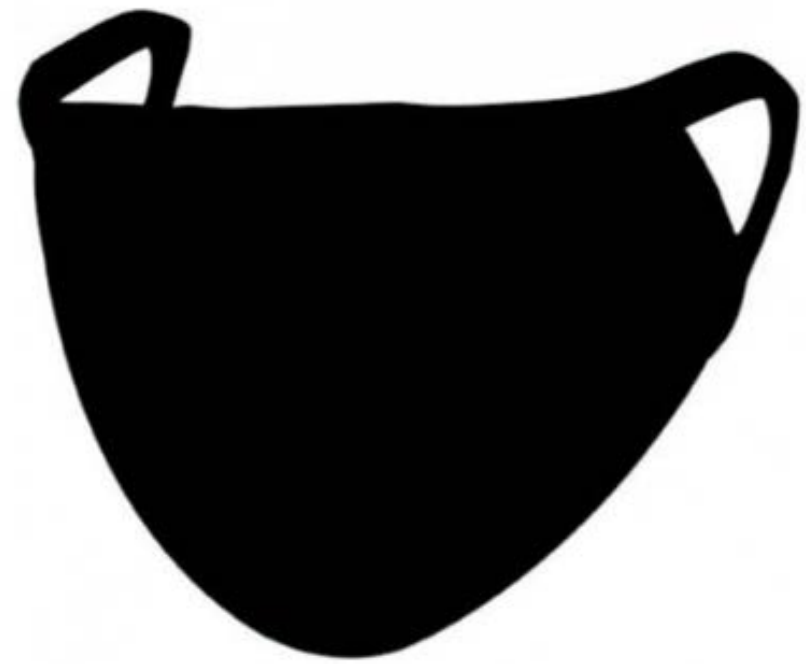
TWO HOURS OF USE - 450 YEARS OF TROUBLE!!!

DISPOSABLE FACE MASKS



Up to 99.9%

COTTON FACE MASK



Up to 86.4%

Filtration efficiency

Summary of scenarios compared in the comparative study.

*The environmental dangers of employing single-use face masks as part of a COVID-19 exit strategy/
UCL Plastic Waste Innovation Hub, Level 2, 90 Tottenham Court Road, London. W1T 4TJ
hello@plasticwastehub.org.uk;*

Scenario Number	Mask Type	Mask Use per Day	Number of Masks per Person per Year	Addition Filters	Number of Filters per Person per Year	Mask Treatment	Filter Treatment
1	Single-use	1	365	No	0	Disposed at the end of day.	N/A
2	Reusable	1	2	No	0	Manual washing	N/A
3	Reusable	1	2	Yes	365	Manual washing	Disposed at the end of day.
4	Reusable	1	4	No	0	Machine washing	N/A
5	Reusable	1	4	Yes	365	Machine washing	Disposed at the end of day.

Waste arising due to facemask use in the UK for 1 year.

	S1 - Single-Use Masks	S2 - Reusable Masks, Manually Washed, w/o Filter	S3 - Reusable Masks, Manually Washed, w/ Filters	S4 - Reusable Masks, Machine Washed, w/o Filter	S5 - Reusable Masks, Machine Washed, w/ Filters
Waste Arising per FU (kt)					
Masks	66.2	1.95	1.95	3.90	3.90
Filters			29.5		29.5
Packaging	57.4	0.680	15.6	1.36	16.3
Total	124	2.63	47.0	5.26	49.6

With all of this in mind, we should take these steps to reduce the impact of wearing a face mask:

Use reusable masks without disposable filters. Machine wash them regularly following the instructions for the fabric.

Try to carry a spare so if something goes wrong with the one you're wearing you don't need to use or buy a disposable mask.

If you do need to use a disposable mask, take it home (maybe in a bag if you have to take it off) and then put it straight into a bin with a lid. If this isn't possible, place it in a proper public bin.







Thank You for attention!