SEWING STRONG

A step-by-step guide to community mask making
ACKNOWLEDGMENT

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‘Sewing Strong’ is an initiative aiming to mitigate the spread of the coronavirus and the impact of the COVID-19 pandemic on the most vulnerable populations. It supports the scale-up of locally produced quality community masks through capacity building and strengthening the work of community-based women’s organizations and social enterprises across South Asia. Sewing Strong recognizes an urgent need to support the vulnerable families to generate an income while ensuring communities receive clear messaging about source control, guidance and lifesaving information, along with other essential interventions. It recognizes women’s initiative and leadership in their communities, particularly during an emergency.
A STEP-BY-STEP GUIDE TO COMMUNITY MASK MAKING

This guide complements UNICEF’s Sewing Strong initiative and follows recommendations from the World Health Organization. It contains instructions for making non-medical masks made of fabric and includes a size guide for adults’ masks and for children’s masks (aged 6 and above).

WHAT IS THE MASK:

1. **Intended use:** Community masks are intended to control the spread of disease at the source, and should be suitable for the ages of mid-adolescent, older adolescent and adult. Because the environment can be dusty, hot and, at times, humid, the masks should be size-appropriate, easy to breathe through (‘breathable’) and minimize dust intake. To avoid irritating the skin with sweat, the fabric and construction should limit condensation build-up inside the mask.

2. **Special design:** To ensure best comfort and effectiveness, the masks should be made in three sizes: Adult, Older Adolescence, and Mid Childhood to Younger Adolescence.

3. **Sizes:** Creating desirable masks will be important to ensure the communities will feel comfortable wearing them. This is especially important for children so they keep the masks on when and if required. This can be done using colourful printed fabrics. Comfort and desirability will be key in getting the wearer to keep the mask on when in high-density areas.

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I. SELECT THE MATERIALS FOR THREE LAYERS

It is important that the combination of the three layers combined provide a comfortable and good fit. Therefore, selecting the fabrics for comfort and effectiveness is key.

**Outermost layer** – or top layer – made of hydrophobic material, e.g., polyester or their blends, which can limit external contamination from reaching through a mask to penetrate the wearer’s nose and mouth. Alternative fabrics for the outermost layer sourced locally in the region could include a high-thread-count woven cotton. Do not use an open weave as that can allow the droplets to penetrate quickly through the outer layer. Currently access to high thread count cotton between 200TD and 300DT is not available in the local market but gaining access to producers of higher thread counts through the Sewing Strong initiative will make it easier.

**Middle layer** – or filtration layer – made of hydrophobic material (resists water penetration), e.g., a synthetic non-woven fabric such as polypropylene or a cotton that can enhance filtration or retain droplets so they are not spread by the person wearing the mask. One example of this could be a lightweight interfacing fabric, which is also used for fusing or sew-in inside the collar or stand of a shirt. Don’t use heavy interfacing as a filter because it may make it difficult to breathe when combined with the outermost layer and innermost layer fabrics.
The World Health Organization ideally recommends a three layered fabric mask for ages 12 years and above. For children ages 6 up to 12 years two layers or three layers are optional and may be more suitable due to the local climate and materials. Breathability and well fitted masks are important for effective source control. Producing masks appropriate to ages is important, and the use of suitable materials plays a key role. Section II outlines the recommendations and suggestions for fabrics that can be sourced in the region.

WHO mentions that if it is not possible to source the middle layer at the time of the masks being made, a pocket can be made in the mask making it possible to later insert a filter. However, there is a risk with using a pocket version because it may mean a filter in some cases will not be inserted into the mask.

II. HOW TO SELECT BEST FABRICS

- No matter which combination of materials is used, it is very important to test the fabrics’ breathability before using the combination for mask-making. In a humid climate, this is crucial because the mask needs to be worn comfortably so that it is not partly removed (e.g., not covering the wearer’s nose or chin).
- Ensure that the fabrics are suitable. All masks should be made using only azo-free dyed woven fabrics. (The majority of azo dyes are water-soluble and are therefore easy for the body to absorb, and this takes place through inhalation and swallowing of dust as well as through skin contact. Azo dyes may also be toxic to aquatic organisms and cause long-term adverse effects in the aquatic environment.) This is important, because some cheaper dyes may contain harmful chemicals. If the fabric has an all-over print or placement print, please double-check to make sure that azo-free dyes were used in the making. It is also an option to use vegetable dyed fabrics as long as the density of the fabric is high.
The polypropylene middle layer should be of the thickness which that is normally used for light weight shirts so that it does not restrict breathing. Avoid making the mask too stiff so the fit will be less comfortable. When making the masks, please wash the outer layer and inner layer fabrics before cutting to avoid shrinkage and ensure you work with clean materials.

- Avoid using any fabrics with embroidery as the penetration of the needlework will reduce the effectiveness of the mask against a virus. Local printed fabrics where dyes have not been tested for harmful chemicals should be avoided.

III. OVERALL DESIGN, CREATING A COMFORTABLE FIT AND MEASUREMENTS

Design and fit:
The design shown in this guide is a flat-fold fabric mask with three pleats. For this design, the three pleats must be of equal size. However, producers may already be working on a model with a good fit; if so the fabric requirements are the most essential in this guide to those who have developed an excellent fit.

It is always important to ensure a good fit. We chose to illustrate this design because it is effective and fits well to cover a person’s face from the bridge of a nose to the bottom of a chin. A two-pleat mask will not achieve the same fit around the cheeks and chin and over the nose and will be less effective.

Before producing multiple masks, do a ‘fit test’ of a sample mask for an adult and for a child and a teenager to ensure there is space to breathe without constraints around the mouth. Be sure the elastic ties hold the mask securely, but are long enough so they do not irritate behind the wearer’s ears. In case you can’t source soft elastic for the ties then cotton jersey ties can be a good alternative for the same mask just replacing the elastic.

Below are the size specifications for the folded 3 pleated mask in a size for children and adults.

1. Measurements for adults:
Cut 3 fabric squares, one for each layer in the mask, 20.5 x 20.5 cm (see Section I on how to choose the right fabric for each layer); elastic 2 x 21 cm for men, 2 x 19 cm for
women. An alternative to elastic can be to use jersey ties made from a T-shirt fabric and the measurements should be 45cm x 4 ties so that each corner of the mask can have a tie added. Then it can be tied around the back of the head and at the back of the neck.

When stitched together and turned around like a pocket, the mask should measure 18.5 x 18.5 cm. When the elastic is attached, the elastic ear loop should measure 20cm for men and 18.5cm for women by each ear (a little bit of the elastic ties is folded at each end to avoid fraying).

2. Measurements for older adolescence:

3 fabric squares, 18.5 x 18.5 cm (when stitched and cut it becomes 16.5 x 16.5 cm); elastic 2 x 19 cm. You can also use a jersey tie approximately 45 cm x 4 so that each corner of the mask can have a tie added. Then it can be tied around the back of the head and at the back of the neck.

3. Measurements for children, mid childhood and younger adolescence:

Choose two layers or three layers of fabric squares, ensuring using the most suitable for the wearer. If choosing to use two layers then ensure the outermost layer is of a high density weave and the inner most layers is a thin soft fabric. For the three layered option follow advise given above including the filtration layer.

3 fabric squares, 16.5 x 16.5 cm (when stitched and cut it becomes 14.5 x 14.5 cm); elastic 2 x 18.5 cm. You can also use a jersey tie approximately 40 cm x 4 so that each corner of the mask can have a tie added. Then it can be tied around the back of the head and at the back of the neck.
IV. STEP-BY-STEP INSTRUCTIONS TO MAKE A FLAT-FOLD THREE-LAYER MASK

1. From pre-washed fabric, cut three squares, one each for the innermost layer, middle (filtration) layer and outermost (top) layer.

2. Fold one side of each layer down by 1 centimetre (cm).

3. Place the middle (filtration) layer between the outer layer and inner layer. Make sure the folded fabric of the filtration layer goes over the outer layer fold. Both the inner layer front and outer layer front side should be facing the filtration layer. Then stitch the three sides that have not been folded so it makes a pocket shape.

If the filtration layer is not a fusing fabric, the three layers will look like the picture below.

If you use an iron-on interfacing as a filtration layer, iron it on to the back side of the outer layer and face the front side of the outer layer and the inner layer against each other before stitching the thread sides.
Cut the corners off so it is easy to turn the fabric and press.

Iron pleat 1, then 2 and 3. The pleats should be equal sizes for best fit.

This is how the mask should look with pleating and pressed.

Stitch across the pleats on each side of the mask 1 cm from the edge.

It is best to stitch two times over the pleats to make the mask stronger.

Cut 2 pieces elastic. Attach the elastic to each of the four corners for the best fit.

This is how it should look when the elastic is attached.
V. FINAL STEPS: PREPARING MASKS BEFORE THEY ARE DISTRIBUTED

After the mask is completed please wash the mask before distributing it to the community because germs and dust from workplace or home environment can have an impact. But by washing before delivery the mask will be clean and can be used as soon as it is received by user.

- Wash all fabric masks before providing them to the public. Wash the masks thoroughly but delicately.
- Where possible hand wash using warm or hot water (60°C) with soap or laundry detergent. Rinse thoroughly but with minimal wringing.
- Alternatively where possible wash in machine (60°C)
- Air dry the masks, ideally in the sun.
- Pack the masks in clean bags to avoid getting soiled during transit.

HOW TO WEAR A MASK

When putting on a facemask, clean your hands and put on your facemask so it fully covers your mouth and nose.

**DO** wash your hand with soap and water.

**DO** ensure you have a good fit on your cheeks leaving minimal gaps.

**DO** ensure the mask covers your mouth, nose and chin.

**DO** remove your facemask touching ONLY the straps, place it in a bag and take it home and wash it in hot water with soap and air dry.
When wearing a facemask, don’t do the following:

- **DON’T** wear your facemask under your chin.
- **DON’T** touch or adjust your facemask without cleaning your hands.
- **DON’T** wear your facemask around your ear.
- **DON’T** wear your facemask under your nose.
- **DON’T** wear your facemask on your head.
- **DON’T** hang it on your arm when doing exercise. Keep it in a clean bag when taking it off your face.

Community masks have less environmental impact because they can be washed and reused. Disposable medical masks are not biodegradable - filling up landfill sites and ending up in rivers and oceans.

Medical masks should be used by healthcare workers. Locally made community mask should be for the general public from 6 years, where social distancing is not possible.

All photos in this document were taken in 2020, by Theresa Bastrup Hasman (tbastrup@hotmail.com), who kindly gave UNICEF express permission to use them for this purpose. All illustrations are created by Sattya Media Arts Collective.