

BSI Flex 5555

Version 2.1, April 2021

Community face coverings — Specification



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Foreword

The development of this BSI Flex was facilitated by BSI Standards Limited and it was released under licence from The British Standards Institution.

Acknowledgement is given to the following organizations and their representatives as well as individuals who contributed as members of the Advisory Group:

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The agile BSI Flex standard development process enables a specification to be rapidly developed, and on an iterative basis, in order to fulfil an immediate need in industry. This BSI Flex standard can be considered for further development as a PAS, British Standard, or constitute part of the UK input into the development of a European or International Standard.

Supersession

This version of BSI Flex 5555, v2.1:2021-04, supersedes BSI Flex 5555 v2.0:2021-03, which is withdrawn.

Relationship with other publications

This BSI Flex was adapted from the CEN Workshop Agreement, *Community face coverings — Guide to minimum requirements, methods of testing and use*. The CEN Workshop Agreement is now being further developed as the basis for a CEN Technical Specification. A decision on whether this BSI Flex will be withdrawn once the CEN Technical Specification is published will be made once the content of the CEN Technical Specification has been finalized.

Information about this document

This version 2.1 is an update of the BSI Flex that is focused on introducing the following two changes:

- **Filtration efficiency requirements:** these are now consistent with the testing options in 6.4 (see 5.8).
- **Material filtration efficiency test:** particle size has been added (see 6.4).

Version 2.0 of the BSI Flex introduced the following principal changes:

- **Terms and definitions:** a note has been added to the definition of “community face coverings” to cover the fact that they are often referred to as “face masks” (see 3.4).
- **Cleaning:** requirements around cleaning have changed and guidance on washing cycles has been added (see 5.5).
- **Size and fit:** requirements have been expanded (see 5.2).
- **Fastenings:** requirements regarding tensile load have been changed and there are now different requirements for single-use and reusable coverings (see 5.7).
- **Breathing resistance:** a change to the differential pressure requirement has been made and notes have been added (see 5.10).
- **Labelling and instructions for use:** new information added (see Clause 7).
- **Environmental considerations:** a new requirement has been added with additional notes (see Clause 8).
- **Face coverings for children:** an informative annex has been added (see Annex A).

Use of this document

The provisions of this BSI Flex are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Please note that the content in this release is part of an iterative process and changes from time to time with subsequent iterations.

It has been assumed in the preparation of this BSI Flex that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

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Introduction

In response to the COVID-19 pandemic, people were asked to wear face coverings to reduce the transmission of the coronavirus, which can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe heavily. There has therefore been a need to define the performance requirements for these products.

The World Health Organization (WHO) have provided guidance on the factors which are to be considered for face coverings, as well as examples of where the general public are encouraged to use medical and non-medical masks (i.e. face coverings) in areas with known or suspected community transmission [1].

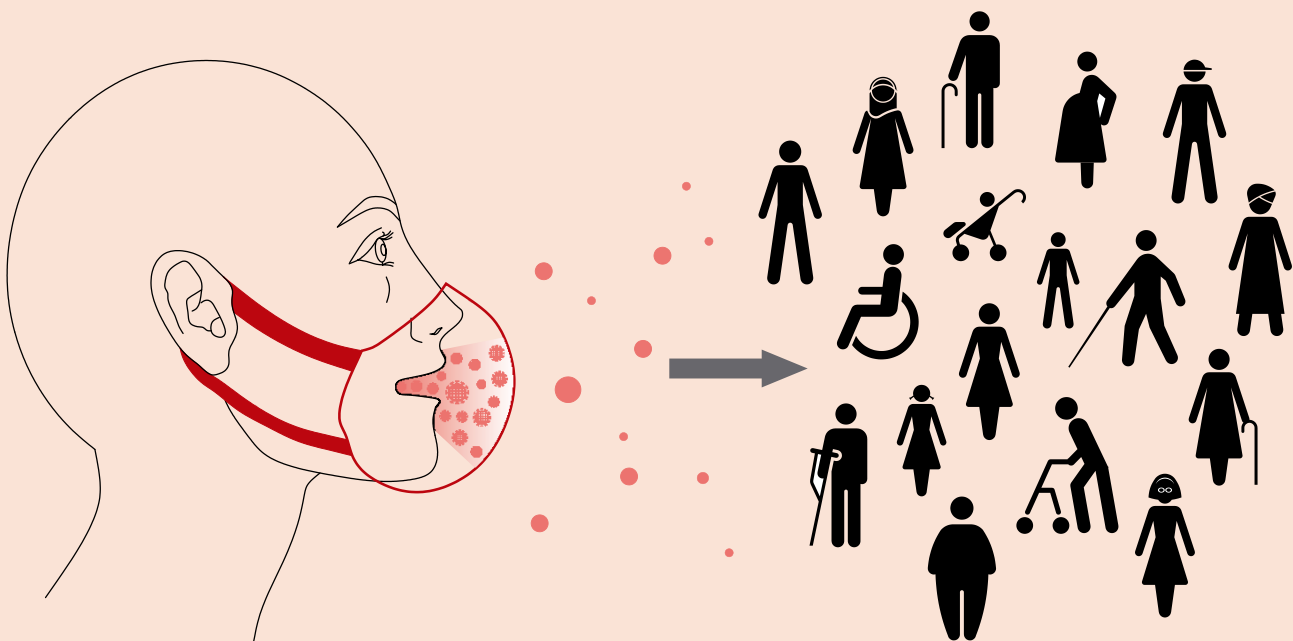
Community face coverings are intended for use by people not displaying any clinical symptoms of viral or bacterial infection and who do not come into contact with people displaying such symptoms.

Community face coverings are not suitable for children under 3 years of age. It is recommended that children between 3 and 11 years are supervised while wearing the community face covering. See Annex A for more information.

NOTE *The minimum age criteria can be higher in accordance with national recommendations.*

Community face coverings are intended for use in community settings where other forms of face coverings are not commonly used (e.g. medical or occupational masks or respirators). Community face coverings are intended to protect others by reducing the projection of the wearer's respiratory droplets, saliva, sputum or respiratory secretions when talking, coughing or sneezing. Community face coverings are designed to offer a level of protection for those around the wearer, but they can also reduce penetration by respiratory droplets from another person into the wearer's nose and mouth. A face covering can also reduce the amount a wearer touches their nose and mouth. See Figure 1.

Figure 1 – Limitation of the projection of respiratory droplets to the environment



This document specifies the minimum performance requirements and associated test methods for community face coverings.

This document specifies a filtration level for the community face coverings corresponding to the use defined by national authorities. Examples of where the general public should be encouraged to use them are given in World Health Organization recommendations [1].

This document provides support for the potential producers of these community face coverings.

Community face coverings might be legally required to be worn in a number of settings, and attention is drawn to national regulations.

Clear face coverings are out of scope of this version of the BSI Flex, however, NHS England is currently drafting guidance on clear face coverings as it is recognized that being able to see other's mouths and facial expressions is important to aiding communication for all.

IMPORTANT Community face coverings are not subject to a mandatory conformity assessment by Approved Bodies or laboratories. Their design in accordance with accepted best practices and production quality control remain the producer's responsibility. The producer might need to call upon a laboratory to verify the required performance.

IMPORTANT A community face covering will have maximum effectiveness if it is worn in direct contact with bare skin. Facial hair can influence the effectiveness of the face covering, and those with facial hair should take extra precautions of social distancing.

IMPORTANT The community face coverings specified in this document do not fall under medical devices within the meaning of Part II of the Medical Devices Regulations 2002 (No. 618) (as amended) [2] or Directive 93/42/CEE [3] or Regulation (EU) 2017/745 [4], nor as a personal protective equipment (PPE) within the meaning of Regulation (EU) 2016/425 [5]. The General Product Safety Regulations, GPSR, [6] requires all products placed on the market are safe for consumers.

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1 Scope

This BSI Flex specifies the minimum requirements for reusable or single-use community face coverings intended for the general public. These minimum requirements include:

- a) design;
- b) performance;
- c) test methods;
- d) packaging;
- e) labelling;
- f) information and instructions for use; and
- g) environmental considerations.

This BSI Flex is not applicable to community face coverings for children under the age of 3 due to suffocation or overheating hazards, or for community face coverings that contain any valves.

This BSI Flex does not apply to PPE or medical grade face masks.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS EN 13274-3:2001](#), *Respiratory protective devices – Methods of test – Part 3: Determination of breathing resistance*

[BS EN 13274-7:2019](#), *Respiratory protective devices – Methods of test – Part 7: Determination of particle filter penetration*

[BS EN 14683:2019](#), *Medical face masks – Requirements and test methods*

[BS EN ISO 3758](#), *Textiles – Care labelling code using symbols*

[BS EN ISO 6330](#), *Textiles – Domestic washing and drying procedures for textile testing*

[BS EN ISO 13934-2](#), *Textiles – Tensile properties of fabrics – Part 2: Determination of maximum force using the grab method*

[BS EN ISO 15797](#), *Textiles – Industrial washing and finishing procedures for testing of workwear*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 breathing resistance

resistance of community face coverings to the flow of inhaled air (inhalation resistance) or exhaled air (exhalation resistance)

3.2 child

person from birth to 11 years of age

3.3 cleaning cycle

full processing cycle (washing and drying) consisting of the steps recommended by national authorities or the community face covering producer

3.4 community face covering

facepiece covering the mouth, nose and chin

NOTE 1 A community face covering is not PPE and is not a medical face mask.

NOTE 2 The term “community face covering” is used in this document to distinguish this type of face covering from PPE and medical face masks, however, the term “face mask” is commonly used in everyday speech and media to refer to a community face covering.

3.5 exhaled air

air that is breathed out by the wearer

3.6 inhaled air

air that is breathed in by the wearer

3.7 material

element of community face coverings forming the barrier

3.8 producer

- a) the manufacturer of the product, when they are established in the European Union, and any other person presenting themselves as the manufacturer by affixing to the product their name, trade mark or other distinctive mark, or the person who reconditions the product;
- b) the manufacturer’s representative, when the manufacturer is not established in the European Union or, if there is no representative established in the European Union, the importer of the product;
- c) other professionals in the supply chain, insofar as their activities may affect the safety properties of a product.

[SOURCE: General Product Safety Directive 2001/95/EC [7]]

3.9 product(s)

item intended for use or likely, under reasonably foreseeable conditions, to be used by wearers

3.10 tubular face covering

ring of material pulled over the head and worn round the neck and over the face

4 Designation

Where community face coverings placed on the market meet all the requirements of this document, they can be designated as follows: BSI Flex 5555.

5 Requirements

5.1 General

Community face coverings shall not contain any valves as valves can allow air to be released when the wearer exhales, thus reducing efficiency of the face covering.

Community face coverings are intended to be either reusable or for single use.

NOTE 1 For single-use community face coverings, consideration should be given to using sustainable materials to reduce the environmental impact. See Clause 8.

Community face coverings can be made of one or multiple fabric layers (woven, knitted, non-woven, etc.). They shall have a means to be held in place over the nose, mouth and chin:

- a) with fastenings around the head or with ear loops; or
- b) being a tubular face covering.

The community face covering shall be able to be worn and maintained over the nose, mouth, cheeks and chin of the wearer during normal activities, for example, when the wearer moves their head, talks, and when the wearer's skin is dry or damp.

NOTE 2 Inhaled air mostly penetrates community face coverings through the material and arrives directly in the region of the nose and mouth. Exhaled air is discharged via the same route directly into the ambient atmosphere.

The producer shall retain all necessary documentation in relation to the materials that are used in the manufacturing of community face coverings for a period appropriate to the product life cycle.

To comply with this document, products shall meet all the requirements specified in this document throughout their useful life as per the manufacturer's claims. Where no maximum cleaning cycles are stipulated, reusable community face coverings shall withstand a minimum of 5 cleansing cycles.

5.2 Dimensions/sizing

Community face coverings shall have a means by which they can be fitted over the nose, mouth and chin of the wearer and which ensures that the face covering fits closely to the face. Community face coverings shall be produced in a selection of sizes to enable a close fit for the intended user population.

If adjustments to the fit are possible either by design of the community face covering or by using additional elements such as back of head clips, adjustment instructions shall be included in the instructions for use (see Clause 7).

5.3 Packaging

Community face coverings shall be packaged in such a way as to protect them against any mechanical damage and any contamination before use.

NOTE 1 Individual or grouped packaging are at the producer's discretion.

NOTE 2 Consideration should be given to using sustainable materials for packaging to reduce the environmental impact. See Clause 8.

5.4 Materials

Materials used shall be suitable to withstand handling and wear over the period for which the community face covering is designed to be used.

The producer shall take into account the following when selecting materials:

- a) its breathability;
NOTE 1 Materials should be selected with care to ensure the fabrics do not release fibres. Fabrics which are suitable for clothing might not be appropriate for a community face covering, which covers the nose and mouth, and where fibres might be inhaled.
- b) its ability to absorb moisture or reduce the effects of condensation;
- c) whether it is known to cause irritation, or produce allergenic or other toxic effects. Materials that might cause a respiration risk shall be avoided. Biocides shall not be used; and
- d) for reusable community face coverings, its ability to withstand the cleaning cycles, soaps, detergents and methods specified by the producer.

Community face coverings shall be designed and manufactured such as to preclude risks and other nuisance factors under foreseeable conditions of use.

Community face covering materials and parts, including any of their decomposition products, shall not adversely affect user hygiene or health.

NOTE 2 Consideration should be given to using sustainable materials to reduce the environmental impact. See Clause 8.

5.5 Cleaning

Reusable community face coverings shall withstand the number of cleaning cycles claimed by the producer (at least 5 washing and drying cycles).

For community face coverings which are:

- a) intended for individual consumers to clean (at home), these shall be washed at a minimum washing temperature of 40 °C using a "normal" wash procedure, as defined in [BS EN ISO 6330](#) and supported by consumer care instructions according to [BS EN ISO 3758](#); and

NOTE 1 The following are suitable in accordance with [BS EN ISO 6330](#).

Wash cycle 9N with care symbol



Wash cycle 7N with care symbol



Wash cycle 6N with care symbol



Wash cycle 5N with care symbol



Wash cycle 4N with care symbol



- b) for community face coverings which are intended to be cleaned through communal laundry facilities, these shall be washed at a minimum washing temperature of 70 °C, as defined by [BS EN ISO 15797](#).

NOTE 2 Community face coverings which are, for example, collected in the workplace and laundered centrally might result in cross-contamination, and wearers might wear face coverings previously worn by someone else, e.g. where community face coverings are worn as part of a uniform, for example in catering or where the uniform is required to be laundered under particular conditions.

If any damage to the community face coverings is detected (e.g. tears, detachment of the fastenings, deformation, wear) after a cleaning cycle, the community face coverings shall be deemed non-compliant.

Community face coverings shall not be cleaned by professional wet or dry cleaning as these processes do not remove viruses.

5.6 Surface condition of the parts

All parts of the community face covering shall be free of sharp edges, points or burrs. Staples for connecting parts shall not be used as they pose a safety hazard to the wearer. Embellishments which could produce sharp edges or sharp points shall also not be used. Glitter or glitter prints shall not be used on community face coverings due to the potential inhalation hazard.

Testing shall be carried out in accordance with 6.2.

5.7 Fastenings

Fastenings shall be designed such that the community face coverings can be easily put on and removed.

Fastenings shall be sufficiently robust to hold the community face coverings in place in such a way as to avoid excessive tightness and discomfort when worn. Fastenings, where provided, can go around the wearer's head or ears and each attachment point shall withstand a tensile load as follows:

- a) for single-use face coverings, 10 N; and
- b) for reusable face coverings, 50 N.

Face coverings with fastenings around the head shall not be used for children; ear loops are acceptable.

Community face coverings shall be available in a selection of sizes or be self-adjusting.

NOTE 1 Fastenings can be laces, or can be made using an elastic strip or a fabric tie, such as bias tape or other fabric, attached to the material. It can be sewn or welded. Other attachment methods are permitted.

NOTE 2 A self-adjusting fastening that does not hold the community face covering correctly in place is deemed non-compliant.

Testing shall be carried out in accordance with 6.2 and 6.3. If there is any failure (e.g. breakage, tearing, separation from the point of fixation, permanent deformation or other obvious loss of function, the community face covering shall be deemed non-compliant.

5.8 Filtration efficiency of the material

Community face coverings shall have filtration efficiency of greater than or equal to 70% when tested in accordance with 6.4 or meet the bacterial filtration efficiency (BFE) requirements for Type 1 masks in BS EN 14683:2019, Table 1 when tested in accordance with 6.4b).

5.9 Tubular community face coverings

Tubular community face coverings shall stay in place, covering the nose, mouth and chin by means of their own elasticity, before and after washing.

5.10 Breathing resistance

NOTE 1 Breathability is the difference in pressure across the community face covering and is typically reported in millibars (mbar) or Pascals (Pa) or, normalized to the cm^2 in mbar/cm^2 or Pa/cm^2 .

NOTE 2 The WHO minimum specification for community face coverings states that the minimum breathability resistance performance requirement is $\leq 60 \text{ Pa}/\text{cm}^2$. However, manufacturers should note that the WHO state that the preferred threshold for adults is $\leq 40 \text{ Pa}/\text{cm}^2$, and for children is $\leq 20 \text{ Pa}/\text{cm}^2$.

The material used for community face coverings shall not exceed the limits of one of the following requirements:

- a) Requirement 1, differential pressure: Differential pressure of the material $\leq 60 \text{ Pa}/\text{cm}^2$; or
- b) Requirement 2, breathing resistance:
 - 1) Inhalation resistance of 2.4 mbar; and
 - 2) Exhalation resistance of 3 mbar.

Testing shall be carried out in accordance with 6.5.

6 Test methods

6.1 General

The producer shall ensure that verification and validation tests are performed before placing any community face covering on the market.

The producer shall establish and document routine checks (production control) to ensure the performance of the community face coverings.

6.2 Visual and manual inspection

Visual and manual inspection shall be carried out by the producer or test laboratory on production samples of the finished community face coverings.

If there are any defects (e.g. tears, holes, detachment of the fastening, sharp edges), the community face covering shall be deemed non-compliant.

For reusable community face coverings, the visual and manual inspection shall be carried out on samples before and after cleaning, as per the manufacturers' instructions.

6.3 Fastening strength test

Mount the face covering securely in accordance with [BS EN ISO 13934-2](#). Apply an axial tensile force of 10 N or 50 N, as required in 5.7, to the fastenings for 10 s, and record the results.

A total of three face coverings shall be tested: single-use face coverings shall be tested as received only, reusable face coverings shall be tested as received, and after five consecutive washes.

NOTE During the test, it is acceptable if the direction of the force shifts from the plane of affixation. The force is applied progressively avoiding an initial shock or jerking motion to the strap.

6.4 Material filtration efficiency test

The filtration efficiency shall be tested either:

- a) in accordance with the sodium chloride test method in [BS EN 13274-7:2019](#), Clause 6 with a flow through the face covering of 95 l/min and a particle size of $(3.0 \pm 0.5) \mu\text{m}$; or
- b) tested in accordance with [BS EN 14683:2019](#), Annex B.

A total of three face coverings shall be tested: single-use face coverings shall be tested as received only, reusable face coverings shall be tested as received, and after five consecutive washes.

6.5 Breathing resistance

To determine the breathing resistance, one of the following tests shall apply as appropriate to the selected requirements used in 5.10:

- a) Method 1, Differential pressure
Differential pressure: test in accordance with [BS EN 14683:2019](#), Annex C on the material; or
- b) Method 2, Breathing resistance
Breathing resistance: test in accordance with [BS EN 13274-3:2001](#), Clause 6, Method 1: Static breathing resistance using a constant flow of 95 l/min through the face covering.

A total of three face coverings shall be tested: single-use face coverings shall be tested as received only, reusable face coverings shall be tested as received, and after five consecutive washes.

7 Labelling and instructions for use to be provided with the community face covering

7.1 Labelling

Community face coverings to be placed on the market shall be clearly and durably labelled with the information below, which shall be legible through the packaging if the packaging is transparent.

- a) The producer name, trademark, or other means of identification.
 - b) The postal address at which the producer can be contacted.
 - c) A means of product identification e.g. catalogue or model number.
 - d) The type of community face coverings, i.e. “reusable” or “single-use”.
 - e) The type of user the community face covering is intended for, i.e. “child” or “adult”.
 - f) The age appropriate restriction warning, i.e. “WARNING. Not suitable for children under 3 years of age due to suffocation hazard.”
 - g) Guidance that enables purchasers to decide which size they need to buy prior to purchasing.
- NOTE 1** National regulations might require additional labelling information.
- NOTE 2** The designation “BSI Flex 5555” followed by the version of the document can be included on the label.

7.2 Information and instructions for use

The information provided by the producer in the instructions for use shall include at least the following elements:

- a) The cleaning instructions (washing and drying) in accordance with [BS EN ISO 3758](#) and instructions to clean the reusable community face covering after each use. It shall also include instructions not to wash using eco or quick wash cycles, not dry clean, and not to use fabric conditioner/softener or scent boosters.
- b) For reusable community face coverings, the maximum number of cleaning cycles for which the community face covering is guaranteed to be compliant.
- c) The purpose of the community face covering, for example, to reduce airborne transmission of the virus from the wearer to others.
- d) The producer’s recommendation on duration of use after washing (e.g. a maximum duration of continuous wear of 4 hours; a minimum of 30 minutes rest before wearing a clean/new face covering).
- e) Instructions on how to fit, use, put on (don) and remove (doff) the community face covering, which may be informed by a pictogram, including instructions for use of additional adjustment elements, where provided.
- f) Instructions on correct disposal, taking into account the impact on the environment. See Clause 8.
- g) The warnings below, with the words “WARNING” in front of them:
 - 1) This is not PPE or a medical face mask.
 - 2) If you are ill, this community face covering might be unsuitable. Seek advice from your doctor.
 - 3) Do not use when participating in vigorous physical activity.
- h) The instructions for use below:
 - 1) Always check that the community face covering is correctly fitted and covers your nose, mouth and chin. It is recommended that this community face covering be worn on bare skin; facial hair can reduce the filtration efficiency of the face covering.
 - 2) It is recommended that children between 3 and 11 years are supervised while wearing the community face covering.
 - 3) A community face covering which hinders the wearer’s ability to breathe when first put on is deemed unsuitable. It can take time to become comfortable with the community face covering. A community face covering which hinders the wearer’s vision is deemed unsuitable.
 - 4) This community face covering does not replace protective measures including regular hand-washing, physical separation, and reduced contact with other people. It can reduce the projection of the wearer’s respiratory droplets and saliva into the environment.
 - 5) Stop using this product at the first signs of damage.

8 Environmental considerations

Manufacturers shall include instructions regarding the correct disposal of community face coverings, taking into account the impact on the environment.

NOTE 1 *Consideration should be given to sustainable disposal of single-use and reusable community face coverings, and their packaging.*

NOTE 2 *Optional parameters to consider for reusable community face coverings, in addition to the essential performance parameters, include the following:*

- a) *for both disposable and reusable community face coverings, using materials known to be collected and recycled or composted within the destination market, to reduce environmental impact;*
- b) *where possible, materials used should include recycled material;*
- c) *limiting the number of different materials used, to reduce environmental impact;*
- d) *using sustainably sourced materials; and*
- e) *the relevant markings/labelling standards for the destination markets, indicating the disposal method and end of life treatment for both the face coverings and their packaging.*

Annex A (informative)

Community face coverings for children

Community face coverings for children under 36 months (infants) are not recommended because the use of a face covering can harm a young child of this age.

Where a community face covering is uncomfortable for adults or older children, perhaps making breathing difficult, the wearer would remove it as an automatic reaction. However, an infant under 36 months is unlikely to recognize it is having breathing difficulties, and very young babies might not have the motor skills to remove a community face covering or language skills to ask for help.

Furthermore, an infant's face has not yet fully developed: the nose is almost flat to the cheeks. This contrasts with an older child or adult, where the nose protrudes and the chin is formed. If an infant is sleeping, any community face covering could mould to their face shape, with the possibility of them re-breathing their exhaled air (which includes a high concentration of carbon dioxide) and overheating.

NOTE *Covering a baby's head and face can result in fatalities.*

It is important to note that:

- a) respiratory function of both infants and children is both quantitatively and qualitatively different to adults;
- b) the lung volume of infants is disproportionately small in relation to their body size; and
- c) since the infant's metabolic rate is nearly twice that of an adult, the ventilatory requirement per unit lung volume in infants is greatly increased, making it harder for them to breathe through a community face covering.

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Other publications

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