# NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

## Equality impact assessment

# Digital technologies for applying algorithms to spirometry to support asthma and COPD diagnosis in primary care and community diagnostic centres

## Scoping

**1. Have any potential equality issues been identified during the scoping process, and, if so, what are they?**

Some people may particularly benefit from the technologies in this assessment, for example:

- People who live in geographical areas where there is less access to diagnostic tests and larger waiting lists. These people may have received no diagnosis at all, or may go on to receive an incorrect diagnosis that is based on clinical history alone.
- People who are unable to leave their home to undergo diagnostic spirometry. Technologies that enable spirometry to be performed at home have the potential to make spirometry more accessible for these people.
- Children for whom diagnostic spirometry is recommended but find it difficult to perform spirometry in current practice. Technologies that have paediatric spirometry coaching and incentives may help children to correctly perform spirometry.

**2. Have any potential health inequality issues been identified during the scoping process? If so, what are they?**

There are some potential equality issues relating to lung conditions:

- Incidence and mortality rates of respiratory disease are higher in people with lower socioeconomic backgrounds or those who live in areas of

social deprivation, where there is often higher smoking incidence, exposure to higher levels of air pollution, poor housing conditions and exposure to occupational hazards. These factors drive to increase health inequalities in lung conditions in the most deprived communities. People in the poorest areas are five times more likely to die from COPD and three times more likely to die from asthma than the richest areas. There is a stronger link between respiratory deaths and deprivation than for any other major disease area (Asthma + Lung UK, 2023a).

- In many areas in the country, objective testing (including spirometry), is not available. For people in these areas, a diagnosis may be based on clinical assessment alone. This means that many people living with lung conditions are either not diagnosed, or receive an incorrect diagnosis (Asthma + Lung UK, 2023a).
- There are concerns over not only regional inequity in spirometry, but also the inequity of all services for respiratory patients when compared with those with other diseases (such as cardiovascular diseases) (Doe et al., 2023).
- NICE's guideline on asthma recommends spirometry for diagnosis in children aged 5 and over (Overview | Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN) | Guidance | NICE). No evidence was available for diagnostic tests in children under 5 when this guideline was developed. The age at which a child can co-operate with tests will vary, but it is usually necessary to manage these children pragmatically based on symptoms and signs only.
- It is recommended in NICE's guidance on COPD that European Respiratory Journal GLI 2012 and GLI 2022 reference values are used for spirometry, but it is recognised that these values are not applicable for all ethnic groups.
- Some lung diseases, such as COPD do not commonly occur in children. Restrictive lung diseases are also less common in children, but obesity may contribute to the development of some of these conditions.

There are some considerations to ensure the technologies do not add to health inequalities, for example:

- The patient population used in the training and validation set for artificial intelligence technologies may be biased, and may not be inclusive of people from all ethnic backgrounds, ages or sex.
- For some patient groups, spirometry testing may be difficult to perform in certain settings, or at all. For example, some people with cognitive impairment or neurodiversity.
- Patient views and acceptability of artificial intelligence.

**3. What is the preliminary view as to what extent the committee needs to address the potential issues set out in questions 1 and 2?**

The potential equality issues will be considered by the committee during decision making.

**4. Has any change to the draft scope been agreed to highlight the potential issues set out in questions 1 and 2?**

It was discussed that home-based testing may make spirometry more accessible for a number of different patient groups. Technologies that enable spirometry to be performed at home (with the subsequent diagnosis being made in primary care or community diagnostic centres) have been included in the final scope.

Subgroups based on age have been included so that data can be considered to see if children may gain greater benefit from the technologies.

**5. Has the stakeholder list been updated as a result of additional equality or health inequality issues identified during the scoping process?**

No.

**Approved by Associate Director:** Rebecca Albrow

**Date:** 21/08/2025

# Draft guidance

**6. Have the potential equality issues identified during the scoping process been addressed by the committee? If so, how?**

The committee considered the equality issues identified during the scoping process. It noted that there is regional variation in access to diagnostic spirometry, with some regions having limited to no access to diagnostic spirometry. Many people living in these areas will have a lung condition for which they do not have a diagnosis or may have received an incorrect diagnosis (due to limited diagnostic resources). Algorithms to support spirometry may increase the number of primary care settings and community diagnostic centres that are able to offer spirometry as part of their services, potentially increasing access to diagnostic spirometry in regions that currently have limited access. This may have a larger benefit for people who live in areas of social deprivation, for whom incidence and mortality rates of respiratory disease are higher (due to factors including higher smoking incidence, exposure to higher levels of air pollution, poor housing conditions and exposure to occupational hazards).

NICE's guideline on asthma recommends spirometry for diagnosis in children aged 5 and over (Overview | Asthma: diagnosis, monitoring and chronic asthma management (BTS, NICE, SIGN) | Guidance | NICE). During scoping, it was noted that technologies that have paediatric spirometry coaching and incentives may help children to correctly perform spirometry. The committee acknowledged that testing in children can be challenging in terms of them performing the test, and having staff who are trained to deliver diagnostic spirometry in children. Some of the technologies are indicated for use in children, but the committee noted that evidence for these technologies was limited in children with suspected asthma. For quality feedback of spirometry performance and pattern recognition, ArtiQ.Spiro can be used with evidence generation in people aged 5 to 96. ArtiQ.Spiro can only be

used (with evidence generation) to give disease suggestions for people aged 18 and over (see section 1.1 of the draft guidance).

**7. Have the potential health inequality issues identified during the scoping process been addressed by the committee? If so, how?**

Lay specialist committee members discussed patient views on the technologies. Committee heard that while many people would feel comfortable trusting a diagnosis that was made by a less experienced staff member (with algorithm support), some people may prefer to have a diagnosis made by a more experienced member of staff (see section 3.22 of the draft guidance).

NuvoAir was a technology included in the assessment that enabled diagnostic spirometry to be performed by a person in their home. Committee discussed that digital exclusion and literacy would be important considerations for a technology used in the home setting. NuvoAir is no longer available to the NHS, so has not been included in the recommendations in section 1 of the guidance. These inequality issues would apply should any other technologies be available for use by patients in their homes in the future. The committee agreed that more evidence was needed in subgroups of people who may benefit differently from the technologies.

**8. Have any other potential equality or health inequality issues been raised in the stakeholder submissions or the assessment report? If so, how has the committee addressed these?**

In its assessment report the EAG highlighted the lack of evidence for patients with restrictive lung disease across all technologies. The committee noted that spirometry is not commonly used to diagnose restrictive lung diseases, and as such the recommendations focus on the diagnosis of obstructive lung conditions only (COPD and asthma). The committee noted that ArtiQ.Spiro should only be used in the NHS in line with the populations indicated by the manufacturer during the evidence generation period.

**9. Have any other potential equality issues been identified by the committee, and, if so, how has the committee addressed these?**

The committee noted that some people may not feel comfortable using components of the technologies' hardware or software. This may include people who are less familiar with using digital technologies or have limited access to equipment or the internet; neurodivergent people; people with learning disabilities, people with visual, hearing or cognitive impairments; people who have problems with manual dexterity; people who have difficulties reading, writing or understanding health-related information (including people who cannot read English). It discussed that digital exclusion may be of particular consideration for technologies that have patient-facing aspects.

Lay specialist committee members noted that some people may not feel comfortable in trusting a diagnosis that was made by a less experienced staff member (with algorithm support). These people may prefer to have a diagnosis made by a more experienced staff member (see section 3.22 of the draft guidance). The committee noted that more evidence is needed on the grade/experience of staff members that could use the technologies in primary care and community diagnostic centres to support diagnosis of asthma and COPD. This would show whether diagnostic accuracy is different depending on who is using the technology (see the evidence generation plan for further details).

The committee discussed barriers to accessing spirometry, such as time and costs incurred by families to go to hospitals for spirometry (e.g. paying for hospital parking). Incidence of lung conditions is higher in people living in areas of deprivation, but these same people may be unable to afford to travel to their nearest diagnostic spirometry service due to their financial situation. There may be other barriers to access for older people or people with severe symptoms who find it difficult to leave their home. Neurodiverse people may also benefit from testing that is offered in a setting that is more familiar to them. As the

technologies could lead to diagnostic spirometry being offered closer to patients' homes (in primary care and community diagnostic centres), they could make diagnostic spirometry more accessible for these people. However, there was no evidence to support this.

**10. Do the preliminary recommendations make it more difficult in practice for a specific group to access the technology compared with other groups? If so, what are the barriers to, or difficulties with, access for the specific group?**

No.

**11. Has the committee made any reasonable adjustments within its recommendations for the equality issues identified? That is, have any adjustments to the recommendations been made to remove or alleviate barriers to, or difficulties with, access to the technology needed to fulfil NICE's obligations to promote equality.**

No.

**12. Have the committee's considerations of equality and health inequality issues been described in the draft guidance? If so, where?**

Equality issues and considerations have been described in sections 3.34 to 3.35 of the draft guidance.

**Approved by Associate Director:** Rebecca Albrow

**Date:** 09/12/2025