

The Use of Biological Methods in Asylum Age Assessments



The Nationality and Borders Bill (2021-22) sets out reforms to immigration and asylum policy. It would allow new approaches to the process of assessing the age of asylum seekers. This briefing is an overview of current age assessment processes used in the UK and internationally. It outlines some biological methods that could be considered to inform age assessments under the new legislation and provides an overview of the evidence on their validity and limitations. It also considers the wider ethical issues arising from their use.

Background

Age assessments are used in the asylum system to determine whether an asylum seeker is under 18 years old. They are needed where an individual's age is unknown or disputed, and where there is little or no supporting evidence.¹ People seeking sanctuary in the UK and granted asylum² have the right to receive protection and assistance.³ A person's age is important in determining how an asylum claim is processed and the state support received, notably educational, health and welfare services to meet a child's needs (Box 1).⁴ The UK Government has expressed a concern that the current approach to determine the age of asylum seekers is "highly subjective".⁵ It states that it can lead to costly and protracted legal disputes when Home Office decisions are challenged, alongside safeguarding issues when a child is determined to be an adult and vice versa. The Nationality and Borders Bill, which proposes wider immigration policy reform, will allow the introduction of

Overview

- Age assessments are carried out when an individual's age is unknown or disputed. One of their uses is to distinguish children from adults in the asylum system.
- In the absence of documentary evidence, current policy determines an individual's age by an initial visual assessment of physical appearance. Where doubt remains, age is assessed by examining social and biographical data.
- New legislation allowing for unspecified "scientific methods" in age assessments is intended to minimise subjectivity.
- Biological methods to estimate age are used in asylum policy and processing in other countries. Common techniques involve examining the skeleton and teeth, but these are imprecise, with wide margins of error.
- Many stakeholders state that these methods should not be relied upon or replace holistic assessments that draw on a wide range of relevant data.

"scientific methods" to the age assessment process; their scope and validity is discussed here.⁶ In the Bill, the term scientific methods is used to describe approaches examining physical characteristics, referred to here as biological methods.

Recent trends in asylum applications

The Home Office reports asylum statistics.⁷ Table 1 outlines recent trends. In 2021, 44,778 asylum claims were made, of which 8% (3,762) were from unaccompanied children (94% of which were males). The most common nationalities of unaccompanied children applying for asylum since 2017 are Iranian, Eritrean, Sudanese, Afghan and Iraqi.⁷

Age disputes in asylum applications

Age disputes occur where there is doubt about a person's claimed age and there is little or no supporting evidence. There were 700-900 age disputes every year between 2017-2020; this increased to 2,517 in 2021.⁷ This is the highest figure recorded

since this data collection began. Between 2017-2021, 57% of asylum seekers whose age was disputed were determined to be adults.⁷ In that period, the median age of those found to be adults and children was 23 and 16 respectively. Some assessments are overturned after legal challenges.

Table 1. UK asylum applications⁷

	2018	2019	2020	2021
Adults	26,441	31,962	27,042	44,778
unaccompanied children	3,063	3,775	2,773	3,762
Total	29,504	35,737	29,815	48,540

Reasons why asylum seekers are undocumented

Age is usually verified with documents provided by the state. People seeking asylum may lack these documents as they often come from countries that have experienced economic and social displacement through war, political instability and humanitarian crises.⁸⁻¹⁰ Many are born in countries with underdeveloped birth registration systems or may have had their identity documents destroyed or lost.¹¹

Impact of an individual's age in asylum policy

International law, UK and devolved legislation enshrines state support for unaccompanied children seeking asylum. A person's age is important in determining how an asylum claim is processed and the state support received, notably educational, health and welfare services to meet a child's needs (Box 1). Several other issues can arise where someone is mistakenly determined to be a child or vice versa.

- **Safeguarding risks:** if a child is detained in adult settings, such as immigration detention centres or unsupervised spaces such as hotels.^{1,12-16} Risks to children can arise where adults presumed to be children share spaces with them.^{17,18}
- **Risk of unlawful detention and removal:** children entitled to remain in the UK may be at risk of unlawful detention, putting them at risk of harm and denying them the rights of protection afforded to children in the UK.^{1,19}
- **Mental health impacts:** age disputes have mental health impacts on young people, and can result in lengthy and costly legal challenges.^{5,20,21} This can mean that a child reaches age 18 by the time the matter is resolved.

Current approach to age assessment

The current process relies on an evidence-informed, wide-ranging assessment drawing on information from documents and interviews.^{1,9} It is based on guidance from the Home Office, bodies involved in assessments and case law.^{1,4} A government official (such as a Border Force officer or a Home Office caseworker) is required to verify the age of those making an asylum claim. Where age is uncertain, and in order to avoid detaining children, the benefit of the doubt is applied.¹ Where there is uncertainty, the person is treated as a child and not detained, but referred to a Local Authority for a 'Merton'-compliant age assessment by a social worker (Box 2). Home Office policy states that a person should be treated as an adult if their physical appearance and demeanour "strongly suggest that they are significantly over 18 years of age".^{1,22,23}

Box 1: Protection for children claiming asylum

Children's rights are enshrined by the 1989 UN Convention on the Rights of the Child (Article 3), with a child's best interests a primary consideration, and the Human Rights Act 1998.²⁴ The Borders, Citizenship and Immigration Act 2009 places a statutory duty on the Home Office to safeguard and promote children's welfare in the context of all immigration decision-making.²⁵ The Children Act 1989 outlines a welfare checklist relating to decisions made about children's lives.²⁶ A child without a legal guardian or carer is entitled to state support under the Act, placing a statutory obligation on Local Authorities in England to support unaccompanied asylum-seeking children. They are entitled to access education, healthcare and accommodation until age 17, and some are entitled to Leaving Care Services until the age of 21.²⁷⁻³⁰ Equivalent legislation applies to support for children in the devolved administrations.³¹⁻³³

In contrast, state support is significantly different for adult asylum seekers.³⁴ Single adults being processed by the Home Office may be detained, have very limited access to education and employment,³⁵ and limited financial support.³⁶

The British Association of Social Workers (BASW),³⁷ The Association of Directors for Children's Services (ADCS)⁹ and organisations that advocate for children's rights²⁰ have best practice guidance for age assessments. Consistent in all guidance is that assessments should use evidence from a range of agencies and specialisms, including social workers, teachers, paediatricians, developmental psychologists and Home Office officials.^{1,9,37,38} Best practice also recognises that:

- populations across the world have different characteristics and rates of physical development.^{1,9,37,39,40} The timing of puberty is highly variable⁴¹ varying by up to 4 years between individuals.⁴²⁻⁴⁴
- the development, or maturity, of an individual's physical characteristics and demeanour should not be solely used to make a judgement about their age.^{1,16,45,46} This is reflected in current Home Office guidance which states that maturity can be assessed but that it is "not an accurate reflection of chronological age and... maturity itself can be variable".¹
- a person claiming asylum may have undergone traumatic experiences affecting their capacity to trust those in authority, negatively impacting their memory,⁴⁷ and altering their appearance such that they may appear older or younger than they are.^{1,9,37}

International practices

The European Commission³⁸ and the Council of Europe⁴⁸ last published best practice guidance on age assessments for Member States more than 10 years ago. They stated that the broad consensus was that biological methods are not supported by sound evidence. Prompted by the significant increase in asylum applications during the 2015-2016 European migrant crisis, Sweden,⁴⁹ Norway,⁵⁰ Finland⁵¹ and other countries reformed policies to include biological methods in age assessment procedures.^{45,46,53-55} As of February 2021, 22 EU countries were using at least one scientific method (most commonly by means of X-ray examinations of the skeleton or teeth, or both) to inform assessments, alongside interviews by professionals and reviews of biographical information.^{38,54}

Box 2: Requirements for UK age assessments

A court judgement (R v London Borough of Merton) outlined basic principles to guide practice, including:^{37,38,56}

- Age assessments should be carried out by two experienced social workers with specialist training.
- They should be completed in a standardised format, and be undertaken in a clear, transparent and fair way.
- An appropriate adult should be present to support a young asylum seeker.
- Interpreters should be used to ensure the young person is able to understand the purpose and nature of the process, and the consequences, and regularly check in to ensure they understand what is happening to them.

Practitioners completing age assessments are also expected to be sensitive to cultural differences that shape how young people interact with adults.^{57,58} Where possible, interviews of unaccompanied asylum-seeking children should be 'trauma-informed' to ensure appropriate psychological support is offered.^{13,59,60} Informed consent should be obtained from the young person to help ensure that they understand the process and its consequences for their asylum claim.

Biological approaches to estimating age

A person's age can be described in two main ways:

- **Chronological age** - a person's actual age measured by the passage of time from their date of birth.^{46,61} It is usually verified with identity documents such as a birth certificate.
- **Biological age** – an estimate of age based on physical markers of maturity in the body that can be identified and measured. Markers include the development of bones and teeth, the onset of menstruation and the production of sperm.^{62,63} Other markers are molecular, with emerging scientific techniques designed to analyse features of DNA.⁶⁴

Several scientific techniques have been developed to estimate age in order to track healthy growth in children^{65,66} and as a tool in forensic contexts.^{67,68} In the asylum context, these techniques can include physical examination and imaging technologies such as X-rays, ultrasound or magnetic resonance imaging (MRI).^{38,69} They give an estimate of a person's age based on the development of parts of the skeleton or dentition (or both).^{55,70-72} The following sections describe these methods, the range of uncertainty associated with them, and considerations as to their utility in this policy context.

Assessing age by examining the skeleton

Biological age in young people is normally estimated by examining X-ray images of the left hand and wrist. The clavicle and knee can also be examined but this is less common.⁷³⁻⁷⁵ The hand and wrist are usually selected because they are well characterised, contain many bones, are easily imaged and are far enough away from the body's central organs to minimise the harmful effects of ionising radiation. The average dose of radiation from an X-ray of a limb is equivalent to exposure to 1.5 days of natural background radiation.^{76,77} Bones in the hand and wrist also develop in a sequential and fixed order and turn into bony tissue (ossify) at different rates, making it possible to identify different stages of development.⁶¹

Examining the maturity of specific bones relies on using reference images from children of known sex, age and background against which to make comparisons. Two methods commonly used in medicine are:

- **The Greulich and Pyle (GP) atlas** is widely used to assess bone growth and identify disorders.^{78,79} The atlas is a reference set of X-ray images of bones in the left hand and wrist, from American boys and girls in the 1940s. An X-ray of the left hand and wrist is compared with atlas images.
- **Tanner-Whitehouse (TW) methods**⁷⁸ examine bones of the wrist and hand, with individual bones scored against reference standards to give a composite score. Reference data was taken from European children in the 1960-90s.^{81,82}

The GP atlas is considered to be the most straightforward tool to use,⁸³ (and as with TW) can be combined with digital technologies to improve consistency in X-ray analysis.^{78,84,85} Studies report that although TW methods are more time consuming to use than the GP atlas, their results can be easier to reproduce and therefore may be more reliable.^{86,87} While variability arising from differences in interpretation^{88,89} can be partly minimised by using automated methods,⁹⁰⁻⁹² this does not significantly increase overall accuracy compared with non-automated methods.^{84,88,93-96}

Accuracy of examining bones to determine age

In non-medical contexts, bone development and skeletal maturity assessed by these methods is used to assess overall maturity as a proxy for chronological age.⁸³ The accuracy of these methods has been widely researched. Most children (95%) will have a skeletal maturity age within plus or minus 2 years of their chronological age.^{97,98} This approach is limited by the fact that many bones in the hand reach maturity by age 18 (50% of average European boys reach skeletal maturity by age 16.5 years).⁹⁸ This therefore shows only whether a bone has reached maturity or not, which could have happened before someone reaches the age of 18.⁸³

Systematic reviews of bone age assessment methods report that their accuracy and reliability depend on the ethnicity of the population studied.^{99,100} The average chronological age of reaching skeletal maturity varies according to a range of factors including ethnicity.^{86,99-102} Some studies show a difference between estimated bone age and actual age for Caucasian young people between the ages of 2 to 19, of between 2 and 12 months.^{79,82,103-106} Studies involving people of different ethnicities show a wider margin of error of between 6 months and 2 years.^{72,87,99,101,107-109} One reason for these differences is that these methods do not use reference data that are representative of wider populations, in particular, from those likely to be asylum seekers.^{78,83,110,111}

Assessing age by examining the teeth

Methods to estimate age are also based on analysis of dentition since teeth develop in a particular order and at similar points in development.¹¹² Some methods involve analysis of multiple teeth, while others focus on specific teeth (the third molars or wisdom teeth) that usually appear in late adolescence.¹¹³⁻¹¹⁹ Most teeth have developed by the age of 13 or 14 with the third molar one of the last to appear, on average between the ages of 17 and 21 years.^{120,121} This means that the third molar is often examined in age assessments. One recent technique seeks to determine someone's age based on markers of maturity associated with the appearance of certain features in

mature teeth.^{122,123} There are conflicting views in the scientific community as to the accuracy and ethics of this approach.^{124–130}

Accuracy of examining the teeth to determine age

Research has examined how age is under- or overestimated using these methods in child- and adulthood. Analyses of multiple individual studies indicate a wide margin of error.^{131–133} While the average under or over-estimate is reported as between 2 to 12 months,^{134–141} the range could be as much as 5 years, with complexity and uncertainty in the data related to a child's age, sex and ethnicity.^{119,138,142–145} The consensus in the dental community about this research is that the average difference between estimates of dental age and actual age is at least plus or minus 2 years.^{132,146,147}

Molecular techniques and other approaches

Understanding the ageing process by analysing DNA is an active research area (Box 3).^{64,148} This has been cited as an example of a potential method by the Government.¹⁷ There are mixed views in the scientific community as to whether this research is advanced or accurate enough to be used to assess an individual's age. Puberty markers (such as voice analysis^{62,149} and examining sexual maturation^{43,44,62}) are unsuited to this context since most children reach puberty before age 18.

Scientific advice to Government

The Government has established the Age Estimation Scientific Advisory Committee. This will offer expertise on scientific approaches and report to the Home Office Chief Scientific Adviser.^{52,150} The Home Office will also establish a National Age Assessment Board, a decision-making body comprising expert social workers who will conduct age assessments referred to them.^{17,151} Evaluating how and which, if any, scientific approaches could inform the existing age assessment process is seen as important. The tolerance for margins of error for each method (or a combination of them), is an important policy consideration, since this will determine the probability that children will be misclassified as adults and vice versa.

Stakeholder perspectives on policy reform Scientific and medical community

Using biological age to assess chronological age in the immigration context is widely criticised in the research and medical community.^{41,62,68,83,98,124,152,153} There is broad consensus that age assessment should not rely exclusively, or for some stakeholders, at all, on analyses of the skeleton or the teeth.^{1,37,45} This is because these methods can only give age estimates with wide margins of error. Physical development varies significantly between individuals and markers of maturity do not correspond exactly to chronological age.^{62,83,98,101,154} On this basis, their use in this policy context has been contested in both UK and international courts.^{45,83,131,155,156}

Further caution in interpretation arises from the need to consider population-specific differences in children's development. These relate to ethnicity, socio-economic background, disease and disability, nutrition and other environmental factors including adversity and trauma.^{78,81,153,157,158} Stakeholders emphasise the importance of developing more diverse and representative reference data

Box 3: Assessing age using genetic tests

Genetic tests to assess biological age involve measuring a chemical modification of DNA called methylation.¹⁵⁹ This is a dynamic process throughout life that influences how genes are switched on and off. DNA methylation is an important biological process that is linked to ageing⁶⁴ and can be affected by factors such as smoking,¹⁶⁰ stress^{161,162} and disease.¹⁶³ DNA can be extracted from many sources, including blood¹⁶⁴ and saliva.¹⁶⁵

Reviews of studies that use DNA methylation to assess age in people of all ages report an average margin of error of between 2-5 years.^{148,165–169} Most studies have focused on a limited population subset of white Western Europeans. Further research is required to understand how ethnicity and other factors influence DNA methylation.¹⁷⁰ There is good evidence that trauma and adversity increase epigenetic age.^{171–177} Using DNA for these purposes raises ethical issues regarding consent and complexities in safeguarding privacy, storage and access to samples.^{178,179}

based on international populations, rather than relying on benchmarking data drawn from a limited group of children.

Ethical perspectives

Other criticisms relate to a range of ethical considerations.^{68,180–182} The British Dental Association argues that subjecting migrants to ionising radiation where there is no clinical benefit is unethical, and that if individuals are compelled to undergo such an intervention that would not constitute genuine informed consent.¹²⁴ Children may also lack capacity to fully understand and consent to medical procedures, even where not compelled. The Royal College of Paediatrics and Child Health and The British Society for Paediatric Endocrinology also argue that X-ray examination of the skeleton should not be used in age assessments, because of its inaccuracy.^{41,152} There is wide agreement that it is unethical to expose individuals to radiation in age assessments when it is unlikely to clarify their age with a high degree of certainty. Other stakeholders including charities, children's rights experts and those who work with young people have highlighted the negative mental health impacts of existing age assessments on vulnerable young people.^{183–185} Finally, some stakeholders are concerned that the Bill, as drafted, proposes that the credibility of an asylum seeker's claim will be damaged if they do not consent to examinations as part of the age assessment process.^{184,186}

Other perspectives

There are mixed views among other stakeholder groups. The British Association of Social Workers state that biological methods do not offer any increase in accuracy compared with existing approaches.¹⁸³ There is also no clarity as to how much weight a scientific test would carry relative to information produced from a wider holistic assessment.¹⁸⁷ Biological methods tend to attract support from groups concerned about abuse of the asylum system, in the belief that they can increase the reliability of age assessments, reduce the number of legal challenges and fraud (where adults claim to be children).¹⁸ Scrutinising the Bill, the Joint Committee on Human Rights said "we are not convinced there is any justification for the use of scientific methods", and noted that any future regulations must be closely scrutinised to ensure that children's human rights and privacy are protected.¹⁸³

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