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The assessment of age in migrants claiming to be children

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Introduction

The unprecedented increase in human migration worldwide generates major challenges for countries in managing the influx of individuals seeking refuge, asylum or better economic prospects.

Most rich countries have proud traditions of giving refuge to those persecuted, but the harsh economic and political reality is that not everyone who tries to enter them for a new life can do so, and democratic governments must have the right to legislate for who stays and who goes. The marked increase in economic migrants is in danger of overloading processes and resources to secure the protection of those who are genuinely fleeing persecution.

There are important and immediate conflicts between supporting human compassion for the disadvantaged and destitute, yet tempered by the economic and political realities in different countries. Whatever practical processes are implemented by Border Agencies to judge suitability for acceptance, they should be consistent with upholding the fundamental human rights that countries world-wide agree to by signing international conventions.

Of special concern is the increase in the number of unaccompanied minors, often deeply traumatised from their experiences that lead them to be separated from their families. Sadly, adult migrants and traffickers exploiting their migration have learned that children are given special status that demand full protection of benefits and opportunity. As a consequence, Border Agencies and their staff have a serious practical problem in how to decide who is a child and who is adult, this being made more difficult by many individuals not having official documents to confirm age.

This review sets out to explore the practical reality of age determination. It will consider currently available methods, identify areas of uncertainty that demand further research, and outline a pragmatic approach.

It is grounded in the circumstance of countries within the European Union and in particular from the author's experience in the United Kingdom, but its principles should be relevant to others.

The context of age assessment

The assessment of age is an issue not only for Border Agencies in the control of immigration, but also for other areas of public life including the regulation of sport. There is much to be learned from the approaches taken by the international sports organisations, and the level of interest in the subject can be seen from the voluminous bibliography of articles, comment, guidelines and research that can be obtained by entering the phrase 'age assessment' into the internet search engines.

The issue of age assessment has had considerable scrutiny in the sports medicine world, with important research appearing in the last two to three years relevant to methods for the evaluation of migrants. Much of this may not have been noted by practitioners in the immigration services.

In international-level sport, most activities are classified on the basis of chronological age, with competition being compartmentalised by age group to ensure equal chances of success. Increasing maturity is likely to lead to greater strength and endurance, and so there is every reason to be as certain as possible that competitors are the age they claim to be. Unfortunately, in a number of sports, it is suspected that the chronological age of the competitors is higher than the age stated even on key official documents. This has led the *International Olympic Committee* to issue guidance (see below).

Furthermore, the *Federation Internationale de Football Association* (FIFA) since 2003 through its Medical Assessment and Research Centre has also been concerned over the age verification of players in the under 17 tournaments, (see below).

The methods used in these approaches are summarised below.

1) ***It is recommended that those who are determining policy for the age assessment of migrants should be aware of and take note of methodological and policy developments in the field of sports medicine.***

The 'journey' of individuals seeking acceptance.

The assessment of age is only one milestone in the 'journey' of individuals seeking acceptance. The 'journey' encompasses the following 'milestones':

1) The point of first contact with immigration authorities usually, but not always, at border crossings.
2) The screening process and estimation of age
3) Care of unaccompanied minors
4) Arrest, detention and deportation of failed acceptance-seeking families and children
5) Return to country of origin

It follows that age assessment is but one part of a complex set of policy issues, but has implications for every one of the above.

2) ***It is recommended that age assessment is seen within an overall government policy for immigration control and not as an isolated matter***

The importance of listening to the lived experiences of individuals subject to immigration control

As Children's Commissioner for England, an independent post created by Parliament to be the voice for all children in England, the United Nations Convention on the Rights of the Child (1) underpinned the author's work. Of especial relevance is Article 12 which states that:

'Children have the right to say what should happen when adults are making decisions that affect them, and to have their opinions taken in to account' (1)

Listening to the lived experiences of children at each of the milestones listed above can provide very important insights into the practical impact and effectiveness of services. There is an especially important role for *independent* Ombudsmen or Children's Commissioners to have the power to enter premises to listen to the views expressed. Such activity in England led to the publication of hard-hitting reports on the unsatisfactory practices of immigration authorities in managing children and families (2-5)

Two examples are the documentation of the arrest, detention and deportation of failed asylum seeking families, and claiming asylum at a screening unit published by 11MILLION, the Office of the Children's Commissioner for England:

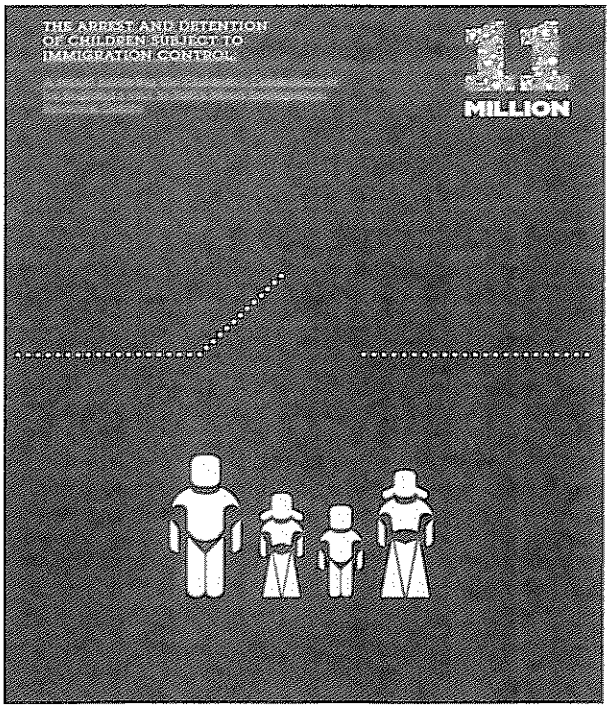


Figure 1 *'The arrest and detention of children subject to immigration control'*. Office of the Children's Commissioner' 2008

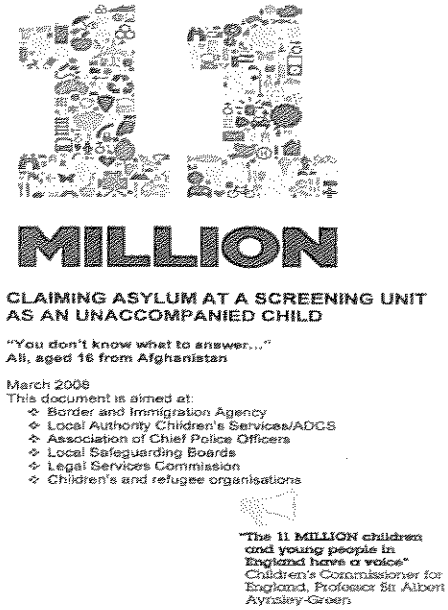


Figure 2: *'Claiming asylum at a screening unit as an unaccompanied child'*. Office of the Children's Commissioner 2006

Comments made to the Children's Commissioner for England from young people having experienced age assessment processes include:

'The worst experience of all'
'Nobody believed me'
'They said I was lying'
'They just looked at me and said I must be an adult'
'Nobody told me what to expect'
'I didn't understand the questions'

3) ***It is recommended that formalised independent processes should be introduced to collect routinely the views of those experiencing immigration control processes.***

Similarly, the views of staff conducting processes also need to be listened to For example, testimony from an immigration officer stated:

'Many of these individuals are trained to say they are children because they know they will get a better deal if they are assessed to be a child'.

These views may shape powerfully how individual officers approach the task through promoting a culture of disbelief. The attitudes and prejudices of staff must be taken seriously when developing practical protocols and made relevant to training programmes.

4) ***It is recommended that training of border control staff should include seeking and understanding the experiences of age-assessed individuals and the attitudes and culture of staff***

Why is age assessment important?

Age assessment during the adolescent years is biologically unimportant – knowing whether someone is 14 years old or 19 has very little biological significance in view of the considerable range of the speed of normal physical development during adolescence. It is also irrelevant in many counties such as Afghanistan, where there may be limited official documentation of birth, age being considered in a family context of maturity, usually through oral history.

The UN Convention on the Rights of the Child, however, in Article 7 (1) states '*The child shall have the right to a legally registered name*', this being taken to be synonymous with birth registration.

It has been estimated that over 50 million births go unregistered each year, especially in South Asia and sub-Saharan Africa (6). Population migrations as a result of war, famine or natural disasters may lead to the loss of birth registration papers even when they had been provided. In 2008, there were over 800,000 migrants worldwide, with 44%, ie over 320,000 being children (7).

A proven identity with confirmation of chronological age is fundamentally important in developed countries since age determines how the individual will be treated by the state. Age defines access to services such as child protection, education and health care when a child, and benefits, empowerments and citizen entitlements when adult, including employment legislation, banking, driving licenses and pensions. Age will also often determine the success or otherwise of a claim for refuge. It is, therefore, a matter of very considerable importance demanding public confidence in the processes and methods being used, this being especially important as many countries are experiencing strong public and media attitudes directed against migrants.

The assessment of age in migrants has serious implications for cost to the state. Thus, an individual judged to be a child will be entitled to the full protection of the state, with expensive education, health and social support. This may not be the case for adults. At a time of major international financial turmoil and serious retrenchment of state spending in many EU countries, there could be an unforeseen consequence of age assessment, namely, a conflict of interest in those making the assessments. For example, if they are officials who also carry budgetary responsibility for social care services, there might be a temptation to judge people to be adult rather than children to save money.

5) ***It is recommended that special attention is paid to the designation of those who make age assessments in relation to budgetary responsibility for services. Age assessment should always be carried out by personnel independent of any budgetary responsibility for social care or other statutory services***

There are also considerations with respect to risk to individuals that follow from age assessment. Thus, a child incorrectly judged to be an adult may be at risk of abuse or exploitation if placed with adult migrants or criminals. Conversely adults incorrectly judged to be children could expose to risk other children they are in contact with. In the author's view, this latter concern has skewed the UK government in its approach and mind set to age assessment in its argument that adults claiming to be children are a major issue. This has not been verified from published data.

Thus, practitioners should be alert to unintended consequences of decisions taken, and processes should be in place to make regular reviews of outcomes of age assessed individuals.

6) ***It is recommended that comprehensive data are made available on the numbers of age-assessed individuals, the numbers claiming to be children, and the results of age assessments in age disputed cases coupled with outcomes of appeals against the judgement***

The practical challenge

The key practical challenge, therefore, is how to assess the age of a person who claims to be a child yet has no reliable documents to prove it.

Governments want a 'scientific' method that will tell the precise chronological age of the person. BUT no such method exists. The fundamental importance of this statement cannot be overemphasised, and it will be explored in the following sections.

7) ***It is recommended that the fact that no scientific method exists that will give precise chronological age should be repeatedly emphasised to government and officials***

Age assessment practices: the international context.

An important recent publication from UNICEF by Smith and Brownless (8) is key reading for those considering age assessment practices worldwide. It sets out a comprehensive analysis through a literature review and annotated bibliography, focussing in particular on childhood as a cultural construct, and the implications of the UN Convention on the Rights of the Child.

The review in its conclusions states that: ' *....where assessments of age are carried out, there is too great a focus on attempts to determine a child's exact*

age even though age assessment is not an exact science and most commentators would acknowledge that whatever method employed a significant margin of error must always be allowed'.

Legislative Context within Europe

The publication below from the European Migration Network (9) sets out clearly the international and EU legislative framework for the management of unaccompanied minors, the motivations and circumstances for entering the EU, and describes entry processes and reception arrangements. It also provides a helpful overview of arrangements for age assessment in 22 EU countries.

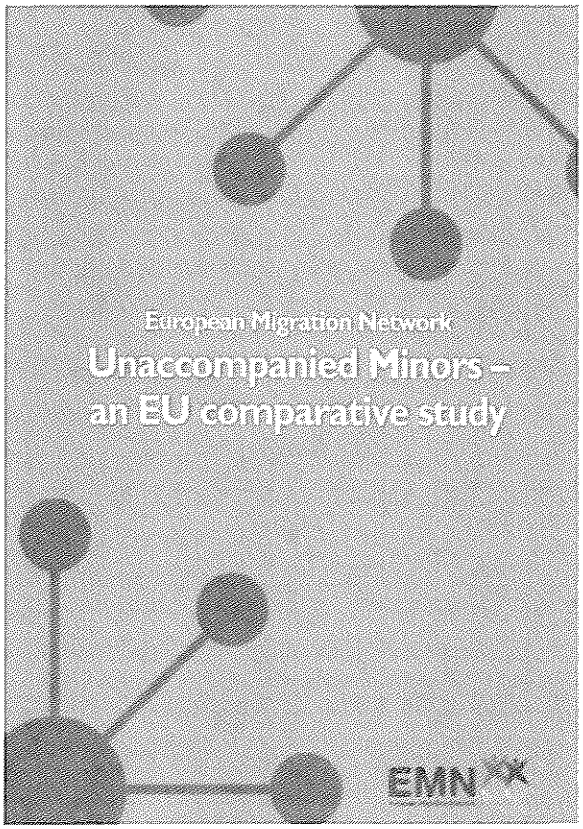


Figure 3: Unaccompanied Minors – an EU comparative study (9)

This analysis shows that all 22 member states studied attempt to determine the age of minors using one or more of the following methods:

- Interview and or documentation used by all bar two countries
- Assessment by a doctor in seven states
- Dental analysis by ten countries
- Skeletal Assessment in sixteen
- Psychological methods in five countries

This analysis, although of interest, sadly gives no precise detail of exactly what is done by whom in each country or against what defined protocol. It is not possible, therefore to examine the rigour of these methods. Further research is urgently needed before any true comparative analysis can be done. What is clear is that there is no consistency across Europe as to what constitutes best practice.

8) ***It is recommended that further EU-wide research is performed to analyse the detail of exactly how age assessment processes operate in practice in EU member states.***

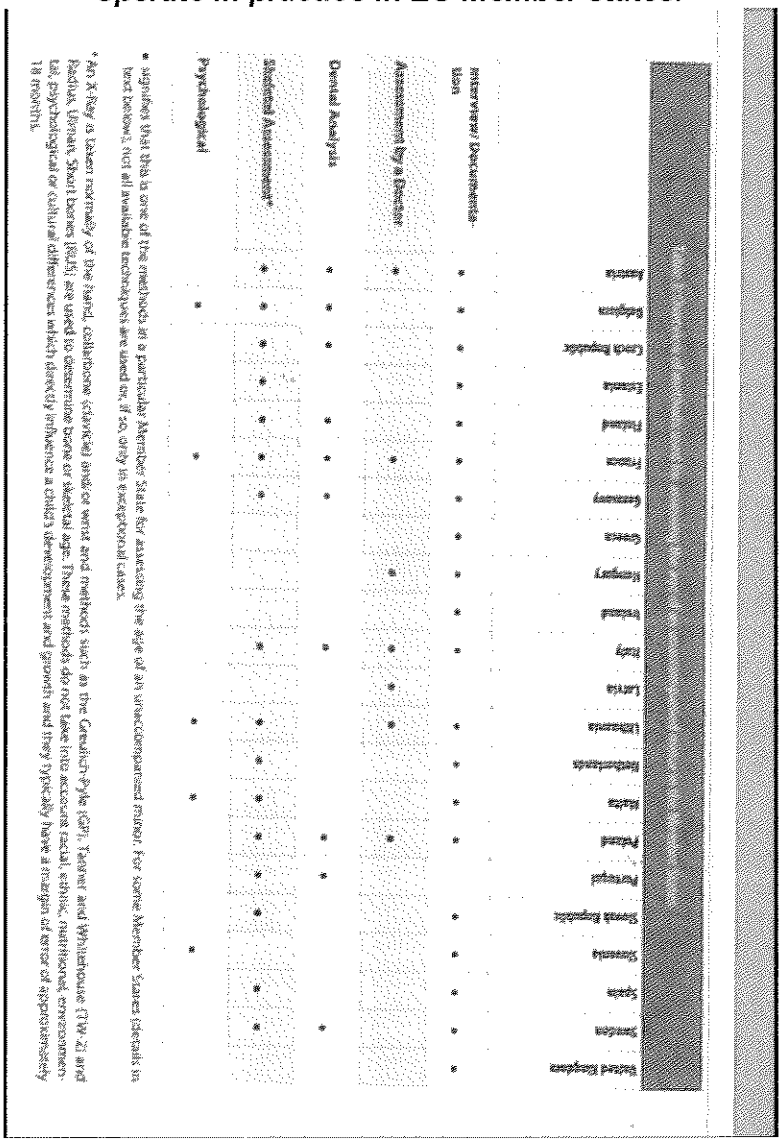


Table 1

This table is taken from Table 3 of the European Migration Network publication 'Unaccompanied Minors – an EU comparative study' (9). This report has been produced by the European Migration Network (EMN), and was completed by the European Commission, in co-operation with the EMN National Contract Points participating in this activity. This report does not necessarily reflect the opinions and views of the European Commission, or the EMN National Contact Points, nor are they bound by its conclusions.

The report comments, for example, that in France, available information from 2005 and 2006 shows that 25% of people who stated they were minors were subjected to a medical examination under the order of the public prosecutor's office. On the other hand, the high cost of such examinations means that there is no large scale verification of age in the Czech Republic. If assessment is demanded, refusal to agree constitutes the conclusion that the applicant is adult.

In Belgium, there is a 'triple' test consisting of a clinical 'impression' of an experienced dentist coupled with radiological examination of teeth, clavicles and hand and wrist, whilst in Spain, the *Special Prosecutors for Alien Affairs* are assigned the task of co-ordination, supervision and transfer of the procedures to be followed. If there is insufficient evidence, the *Prosecution Office* can authorise medical tests, including wrist and hand radiology.

In the United Kingdom, a comprehensive review of the evidence for age assessment and procedures has been produced by Dr Heaven Crawley for the Immigration Law Practitioners Association (10)

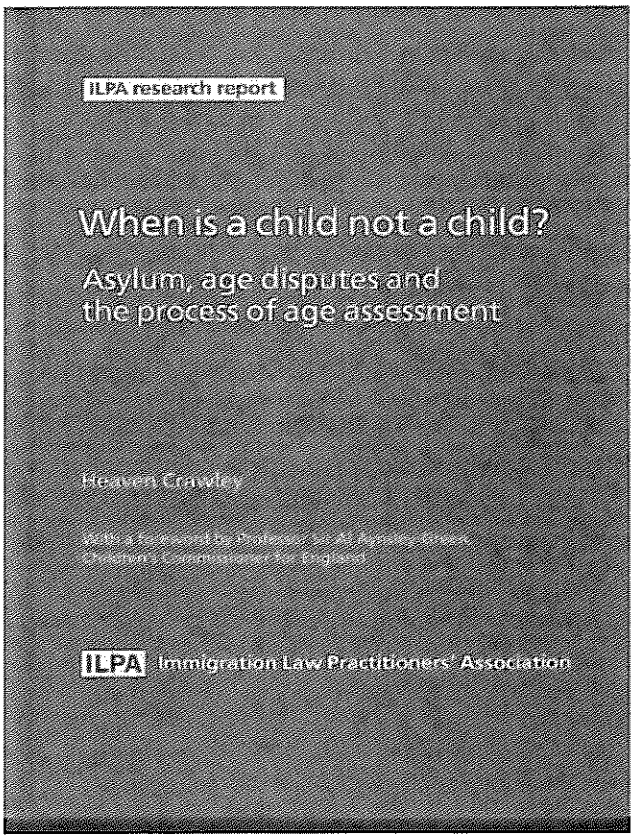


Figure 4: When is a child not a child? Published by the Immigration Law Practitioner's Association 2007 (10) with permission

This publication, although published in 2007, is recommended since it gives important insights into the controversies over the UK government's policies, examines the implications and consequences of age disputes, and identifies child protection issues. It tries to identify concrete and practical policy recommendations, and is a useful model for discussions in other countries.

It is relevant to highlight that in the UK important developments have occurred since this review was published. Thus, there has been increasing involvement of the courts, including the Supreme Court, with key judgements concluding that the courts must make final decision of age in disputed cases (11). This raises very important issues over the capacity, understanding and training of legal colleagues in the processes of age assessment, especially medical, that might be carried out.

9) ***It is recommended that special provision should be made to improve the capacity and training of lawyers and courts in understanding age assessment***

In the UK, an initial assessment is made at the start of the screening process by social workers. If the physical appearance, narrative and overall demeanour very strongly suggest that the person is 'significantly' over the age of 18, the applicant is normally treated as an adult. If thought close to 18, then they are treated as a minor unless and until they are subsequently judged to be an adult through an age assessment process.

In the light of judgements by the courts in a disputed case in the London borough of Merton, the concept of 'Merton Compliance' has been introduced (10,11) This means that two trained social workers are expected to perform an assessment of the applicant's physical appearance, social development, their account of the family life and educational history. If this suggests that the individual is under the age of 18, then this is usually accepted by the UK Border Agency in assessing the claim, unless there is credible evidence to the contrary. In 2008, 1400 applications were judged 'age disputed', of which approximately half were subsequently assessed to be minors.

There is a long history in the UK of opposition to the use of X-rays from Parliamentarians and others (12). Despite this, however, in 2006, the UK government in evidence to Parliament proposed that X-rays of the hand and wrist and teeth should again be considered as part of the examination. The Children's Commissioner facilitated very substantial opposition to this from all relevant professional bodies and organisations and their views were conveyed to an Age Assessment Working Group set up by Government to advise it on an agreed approach. The conclusions of this Working Group have never been published, but the evidence led to the retraction of the proposal. Radiology is not now part of the routine screening process for age in the UK, this position be re-stated in Parliament in a House of Lords debate in March 2009 (12). The background to this is further explored below.

It is clear that age assessment is a very serious matter for all EU countries, but despite this there is no consensus on what methods should be used, let

alone any concerted analysis of the rigour of the protocols or audit of performance.

The lack of consistency across EU member states means that the conclusion of age in one country could well be disputed should the individual move to another member state. Already there are anecdotal reports of individuals being judged to be a child in one country, but when facing removal through the EU country of first contact are re-assessed to be adult, thereby depriving the individual of the protection of the state.

10) It is recommended that there is an urgent need to define a consistent approach to age assessment worldwide, but particularly across EU member states

These controversies led to helpful conferences in Oslo and in Brussels at the end of 2010 (13, 14). Of special reference is the briefing document prepared by Seidel and Kanics for the UNICEF Child Rights Advocacy and Education Section in Geneva that was presented to the Brussels conference (14), whilst the summary of the Oslo meeting (13) is helpful in exposing the extent of the uncertainties and the urgent need for further research to define best practice.

Fundamental principles for assessing age

Seidel and Kanics defined 11 key principles for age assessment (14):

- Age assessment should only be carried out if there is a serious doubt about the individual's age and should therefore only be initiated as a measure of last resort.
- In case of doubt, the individual should always be treated as a child; this includes the provision of a guardian, suitable accommodation and prohibition on detention
- The individual should give informed consent to age assessment procedures. Therefore, the individual should receive information on the procedure and its medical risks as well as potential consequences. The information must be provided in an age- and gender- appropriate manner in a language that s/he understands
- The methods should be interdisciplinary (ie not solely medical) and respect individual's dignity. They and those performing them must be sensitive to his/her age, gender and culture
- The whole margin of error of the methods employed should be recognised, documented and applied in favour of the individual
- The assessment should be conducted by independent and appropriately skilled practitioners, not by law enforcement or judicial officials
- The individual should be exempt from removal until the assessment and any appeal has been completed. Appropriate legal aid and information should be available

Furthermore,

- All steps undertaken must be documented and communicated in a child-friendly way
- Provisional identification documents should be provided to the individual
- The result must be subject to right of appeal
- Removal of a young person should not depend solely on the result of age assessment, the whole situation and vulnerability of the person must be taken into account.

The author of this review now also proposes in addition:

Methods should be:

1. transparent, and defined with rigorous protocols open to external independent scrutiny, audit and accountability
2. evidence-based
3. consistent with human rights conventions
4. delivered in the context of the best interests of the child, with adequate processes for child protection
5. lawful, and performed where possible with documented evidence of consent for the estimation having been obtained
6. supported by expert legal advice for applicants
7. nested within a robust ethical framework for medical examinations
8. developed in partnership with representatives of key education, social care and medical experts
9. supported by adequate training of relevant staff including lawyers, border agencies and staff in social care, education and medicine
10. delivered in an environment that includes adequate provision of interpreters and legal representation
11. informed by the views and experiences of those subjected to assessment

The publication 'When is a child not a child' listed above (10) provides an excellent approach to considering methods, not least by being grounded in the real experiences of individual children.

11) ***It is recommended that key principles should be built into protocols and training processes.***

It is argued that whilst any number of principles can be defined, what matters in practice is how the assessments are performed. Experience in the UK has shown that the Children's Commissioner has had a crucially important role in exposing to public view unsatisfactory processes (2-5).

12) ***It is recommended that there should be independent processes, perhaps led by Children's Commissioners or an Ombudsman's Office, to inspect the reality of age determinations in practice.***

Approaches to age assessment

From the above analysis of methods in use across the EU, the following broad categories of approaches can be proposed:

1. Non-medical, incorporating evaluation of existing documentation, interviews and analysis of narrative
2. Medical, including physical examination, anthropometry, analysis of sexual development, mental and emotional development and imaging of bones and/or teeth
3. Combined, bringing together aspects of 1 and 2, but excluding radiology
4. Future developments

Non-medical methods used commonly include analysis of existing documentation (10), but this is fraught with difficulty not least in the training of staff, especially at border crossings, in understanding the processes and use of age-related documents in the countries from which applicants have arrived. Real practical concerns over the credibility of the documents and the possibility of them being false may lead to a 'culture of disbelief' that may pre-judge the assessment of age (10).

Interviews are used universally, but yet again, research shows that there can be difficulties in the often intimidating environment in which they occur, the rigour and processes for so doing, and the attitudes of the staff conducting the interviews (4, 5, 10). The quality of interpreters who are present is key, not least to ensure that individuals understand what is being done for and to them.

Analysis of the narrative given by the subject is fundamentally important. To be performed properly, however, this demands time, often involving several separate interviews, and expertise in the interviewers in understanding the lives, education and culture of children in the countries from which they have come.

A key overall conclusion from Crawley's work above (10) is that when rigorous research is undertaken into practices, widespread anomalies and confusion exist, often as a result of not implementing existing guidance.

Using the power given by Parliament to enter premises to interview children, the author visited an asylum screening centre to see for himself the practices therein (4). He sat in with the interviews performed by social workers, and noted concerns over the lack of protocol, defined checklist and approach that was not consistent with the training of a paediatrician in taking a routine clinical history.

More recently, the involvement and intervention of the author in a High Court Case in Belfast, Northern Ireland, has exposed some serious and

fundamental matters of concern relating to the adequacy of the training programmes for social workers involved in age assessments, and the records kept of the interview process (15)

13) **It is recommended that in documenting the individual's narrative, there should be written protocols and checklists of data needed for the record.**

14) **It is recommended that effective and consistent training must be given to those performing the interviews**

15) **It is recommended that video records of age assessment interviews should be kept with the applicant's case file**

Physical appearance

This is often used as an initial method of age assessment at border crossings and in screening centres (10). This is, once more, fraught with difficulty, best illustrated by asking the reader to remember his or her days at school when aged 14. Many children in the class looked as though they were 18, yet many others as though they were only 12. This reflects the very substantial range in the normal rate of physical development during adolescence. Too frequently the author heard from applicants that they have been told that *'you do not look like a child'*, this conclusion being based on the interviewer's socially constructed understanding of what a child should look like (10).

Crawley's evidence shows that over-reliance on physical appearance leads to outcomes that are arbitrary and inconsistent.

16) **It is recommended that physical appearance alone has no place in the accurate assessment of age.**

Because of the difficulties of assessing age from analysis of documents and interview, governments have been seeking a 'scientific' method that will give a 'precise' answer. This has led to a focus on medical assessment.

There is no 'scientific method' that will allow the assessment of chronological age to the precision that is sought from government and border agencies especially around the critical ages of 15-20 years.

Medical assessment

There are fundamental problems over the use of any of the medical methods, and their limitations must be realised and confronted in their application in practice. Sadly, and all too frequently, the nuances of medical assessment may not be understood by politicians let alone staff both inside and outside of clinical medicine who may deny the reality of these difficulties.

Problems:

1. The critical age of 15-20. In the UK, the critical age pre-occupying policy and practice is that of 18; below this the individual is judged to be a child, whereas above that, to be an adult.

   The central difficulty in interpreting data is the very wide range of the speed of normal growth, sexual development and bone and tooth maturity during adolescence.

2. The influence of ethnicity, genetic background, nutrition and deprivation and previous & current illnesses and endocrine diseases, all of which have profound effects on the speed of physical development and skeletal and tooth maturity. For example, in some families, adolescent development may be either faster or slower than the average child whilst in some ethnic groups stature is naturally higher than in others. Disorders of hormone secretion can have powerful effects on stature and sexual maturation leading to either early or late physical development.

Physical examination

In some countries, physical examination by a doctor is included in the assessment (10). Anthropometric measurements of height, weight, skin-fold thickness and stages of sexual development are used. However, none of these measurements by themselves gives any reliable assessment of age. Details of the classification scheme for assessing sexual maturation is to be found in Marshall and Tanner, 1970, (16), and in pictures, for example, in Wales et al 1996 (17)

Sexual development in girls is assessed by:

- Age of menarche (first menstrual period)
- Pubic hair stage – amount and distribution of pubic hair
- Amount of breast development

And in boys by:

- Penis length
- Testicular volume
- Pubic hair stage – amount and distribution of pubic hair

However, physical signs of puberty do not correlate closely with chronological age.

Of greater importance, does intimate genital examination for administrative purposes constitute sexual abuse and assault?

Sexual development is an issue of exquisite privacy and sensitivity for normal adolescents, and particularly in many ethnic groups. Moreover, many have been subjected to the traumas of female genital mutilation, rape or other sexual molestation. There are important ethical issues over the propriety of such examinations purely for administrative purposes, but in the author's

experience of dialogue in international meetings, these ethical aspects are rarely discussed.

Self-assessment of sexual development could be an alternative approach (18), but this requires validation, not least in testing the reliability of the reports should the age dispute be referred to the courts.

It has to be recognised that assessment of sexual development is highly intrusive and ethically questionable when performed without medical or therapeutic benefit.

17) It is recommended that there should be explicit consideration to the ethical dimensions of physical examination

The figure below, based on the approach of Tanner et al 1966 (19) illustrates a typical growth chart used in the UK that also incorporates stages of puberty. It must be emphasised that secular trends in the pattern of increasing growth and earlier physical maturity has led to the need to construct updated centile charts (20). A wide range of different charts is in use in different countries including those from the CDC in the United States of America and the World Health Organisation, and practitioners using these charts must be aware of their provenance and limitations.

The chart shows the ranges of height obtained by measuring large numbers of British children in a cross sectional analysis at different known ages, together with longitudinal data during adolescence (19).

In most charts, the 50th centile line is the average height for each age, the 3rd and 97th centile lines representing + and – 1.9 Standard Deviations from the mean. This means that three percent of normal children can expect to have a height on or above, or on or below these values. However, please note that some three percent of normal 14 year-old boys will have the average height of an adult male.

The chart also shows the wide range of normality for the physical signs of adolescence in boys, ie Tanner staging of pubic hair development, and penile length, together with testicular volume as measured with a Prader orchidometer. Testicular volume is measured by comparative palpation of the individual's testicle against the volume in millilitres of prosthesis which most closely matches it.

Similar growth charts exist for girls, with the centiles for breast and pubic hair development coupled with report of the age of menarche (first menstrual period).

Growth charts are used by paediatric endocrinologists in two ways:

1) Height achieved in a single assessment. This allows a 'one-off' estimation of the height achieved on that day at that particular age.

2) Sequential measurements to assess growth speed (velocity). Clearly, if reliable measurements over an interval of not less than three months show evidence of growth, then the person cannot be fully mature.

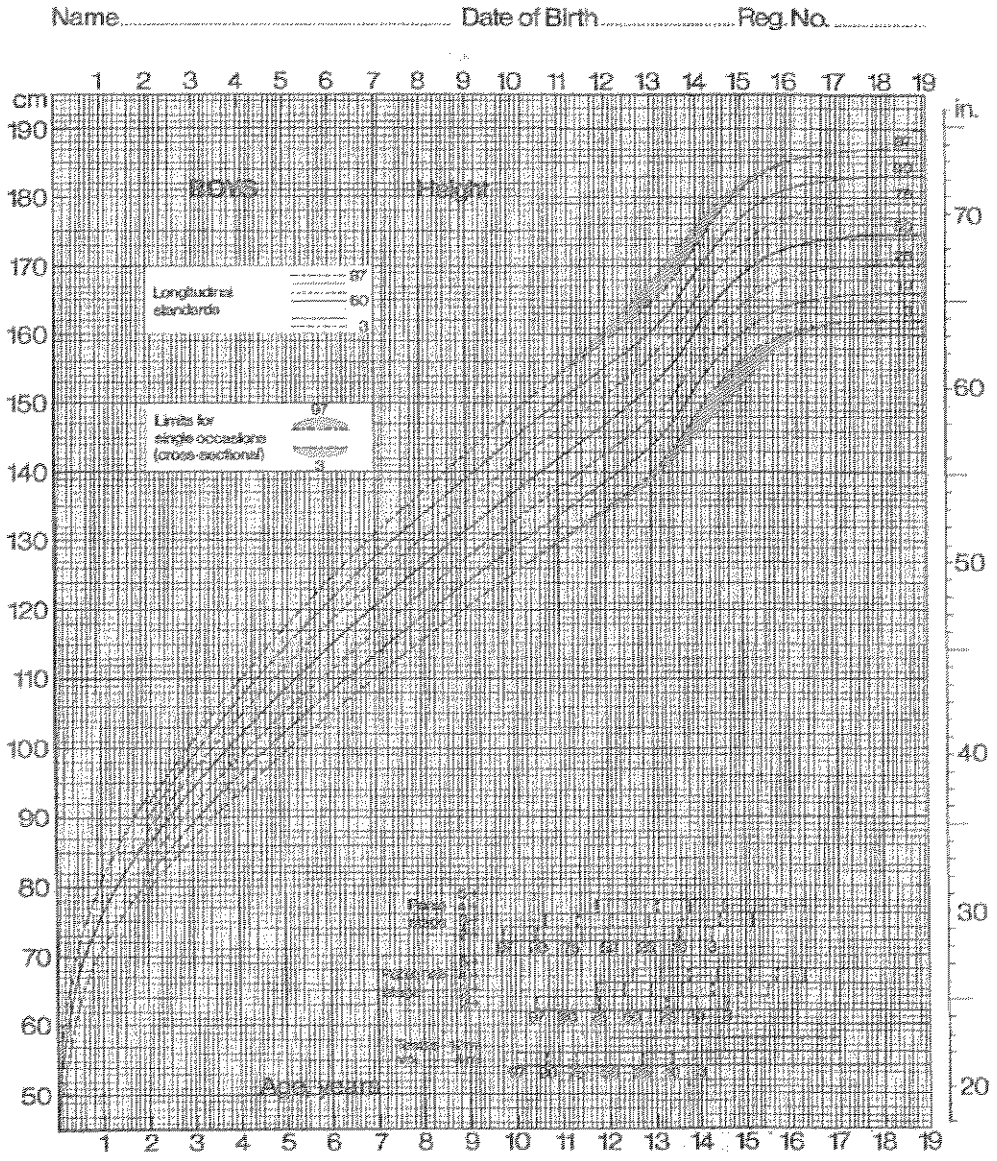


Figure 5: Growth chart (GDB 11A) produced by Messrs Castlemead Publications for boys. This also includes the range of sexual development characterised by penile length, pubic hair stage and testicular volume. Updated versions of these charts for boys and girls are available through sales@castlemeadpublications.com

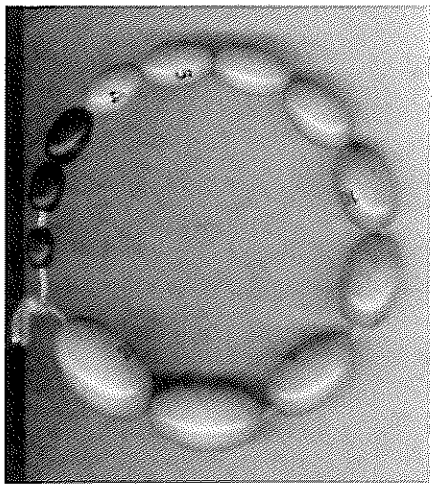


Figure 6: The Prader Orchidometer. The prostheses are measured in millilitres. Those in blue are the volumes before adolescence, the first physical manifestation of which is an increase in volume to 4 or 5 ml.

The role of paediatricians

In the UK there has been considerable controversy over the role and importance of involving paediatricians in age assessment of unaccompanied minors, and the Royal College of Paediatrics and Child Health is to be commended for the lead it has taken in addressing these controversies (21).

The quality of the evidence from paediatric assessment has been questioned by the courts, driven by exposing the fact that such evidence may not always be based on rigorous protocols or sound and auditable methods, and often overlaid by subjective opinion or ill-defined 'clinical experience'.

Moreover, there have been only a small number of paediatricians who, because of the contentious nature of the work, have been prepared to be involved in age assessment. These considerations have created a real challenge to the Royal College of Paediatrics and Child Health in being the custodians of training programmes. It is currently working with others to define appropriate training programmes for increasing the capacity and expertise of doctors involved with age assessment, and this is urgently needed.

The author argues that paediatricians have unique skills that allow them to make an important contribution to a multi-disciplinary approach to age assessment.

Thus paediatricians are skilled in taking clinical histories; they are well used to the principles of growth assessment, and understand normal and abnormal physical, sexual and psychological development in children and adolescents.

Of special significance is their now routine involvement with children requiring child protection, including leading multi-professional case conferences and involvement in care proceedings.

It could be argued that unaccompanied minors should also be regarded as children requiring protection, and be subjected to the same process for safeguarding their interests as non-asylum seeking children.

This illustrates an important fundamental principle, namely, that any assessment of age must be through a multi-disciplinary approach with key input from adequately trained paediatricians.

18) It is recommended that paediatricians have a key role to play in age assessment, but this depends on rigorous training, and use of auditable protocols

19) Age assessment must be a multi-disciplinary process following the model used for child protection

20) It is recommended that dialogue between the British Royal College of Paediatrics and Child Health and the equivalent Australian bodies could be helpful.

Paediatric endocrinologists are paediatricians who specialise in understanding normal hormone secretion in childhood and the disorders that follow from abnormal secretion. Such disorders can have profound effects on the speed of growth, skeletal maturation and sexual development. X-rays of the skeleton are used routinely to investigate such disorders and to monitor treatment.

21) It is recommended that paediatric endocrinologists are involved in discussions with government over the design of age assessment methods

Radiological and other imaging assessment

The 'science' of radiology is highly attractive to government because of the aura that it will give a precise 'scientific' result. But its use is fraught with difficulties, and these must be spelled out to government and officials.

From analysis of the literature regarding age assessment, no study until this current report has spelled out to non-specialists exactly what is done in interpreting the X-ray and the statistical and other limitations of the methods used.

In the author's view (22) radiology for age assessment is inaccurate, not fit for purpose proposed, unethical and potentially unlawful.

First, imaging of bones or teeth can NEVER tell precisely the chronological age of the individual. All it can do is to provide an estimate of the degree of maturity the person has experienced when compared to images from control subjects, and within the very substantial range of normal development during adolescence. The methods used were not designed to assess disputed chronological age – they were prepared for medical use in diagnosis and monitoring of disorders of growth.

Second, it should be performed by a comparative assessment of the image of the individual against standards of normality for the population from which the person comes. Such standards for children from many countries in Asia, Africa or the Middle East are not available, and it is unsatisfactory to assess their images from standards derived from Caucasian, European or North American standards. Even when comparative normative images exist, at best chronological age correlates to +/- 2 years of maturity age. In some entirely normal children this may be discordant for as much as 4-5 years.

Third, although superficially easy to do, it demands expert interpretation by experienced paediatricians, dentists or radiologists.

Fourth, radiology inflicts a radiation dose which, for age assessment of undocumented migrants, is driven solely by government's administrative convenience and without therapeutic benefit to the individual. This raises profound ethical objections to its use.

Fifth, such estimations should only be performed with the full informed consent of the individual. Performing such studies without such consent is, in the UK at least, unlawful, and could lead to practitioners so doing facing legal charges of assault and professional misconduct.

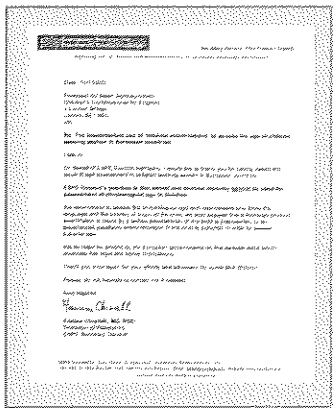
Because of the concerns that such methods are inaccurate, unethical and potentially unlawful , ***every*** *relevant statutory and professional body in the UK has argued that radiology should not be used for the administrative purpose of age determination (23).*

These organisations include:

- Professional organisations including the British Medical and Dental Associations
- Statutory regulatory bodies - the General Medical and Dental Councils
- Medical Royal Colleges responsible for professional training and standards – the Royal Colleges of Paediatrics and Child Health, and the Royal College of Radiology
- Leading Ethicists
- Senior officers in the government's own Department of Health – the nation's Chief Medical and Dental Officers
- Specialty societies including the British Society for Paediatric Endocrinology and Metabolism, and the Council of the European Society for Paediatric Endocrinology (ESPE).

The weight of this expert opinion has led the UK Government to retract its intention to promote X-rays for age assessment, this position being reinforced and re-iterated in March 2009 by the Minster for Immigration in a debate the Westminster Parliament House of Lords (12)

Contact with the Council of ESPE revealed that many paediatric endocrinologists, the experts in growth and sexual development, were unaware of the practices on age assessment in their countries, and had not been involved in the design of protocols. Council has, however issued a robust position statement.



ESPE Council's position is that dental and skeletal maturity cannot be used for assessment of chronological age in children

Figure 7: Letter from Secretary General ESPE

Moreover, the International Olympic Committee and FIFA have also agreed that radiology should not be used to assess age (24,25), a stance supported by the World Health Organisation and international atomic energy authorities.

Even though the radiation dose from an X-ray of the hand is small (equivalent to 0.00017mSv ie one hour exposure to background radiation in many cities), (quoted in 24) in the author's opinion, it is not acceptable for radiologists, dentists and others to say that 'It's only a little bit of radiation that will do no harm!' The recent events in Japan following the March 2011 earthquake and nuclear disaster have re-emphasised the risks from any amount of radiation.

22) It is recommended that radiology should have no place in the assessment of age in undocumented migrants. It could be argued that in view of the enormity of professional opposition to these methods, countries which employ them could be charged with breaches of fundamental human rights.

It is noteworthy that in discussion at the Brussels meeting on age assessment in 2010, there was confusion even in specialists in human rights as to whether

medical ethical considerations were synonymous and indeed covered by legislation on human rights.

23)It is recommended that there should be urgent discussion between medical ethicists and human rights specialists to consider and define the interface between the two areas.

Despite the developments in the UK (which have led to its government rejecting radiology for age assessment) and the international criticism from the world's leading paediatric endocrine and sport associations, bone and dental maturity continue to be used widely in EU member states.

Let us look at the practical processes by which these methods are used since the author has encountered a fundamental lack of understanding of the practicalities and limitations by government officials, immigration staff and even medical professionals including some radiologists.

It is also important to state that some radiologists, dentists and others can generate income for themselves or for their departments from performing and assessing the X-rays of asylum seeking individuals or undocumented individuals in conflict with the law. Since these investigations do not confer therapeutic benefit it has to be asked whether such practices are morally let alone ethically defensible.

The assessment of skeletal maturity using the most common atlas method of Greulich and Pyle.

This atlas of bone development in the left hand and wrist was published in the 1950s by two American authors using X-rays from 1000 largely white middle class American children born in the 1930s (26). The atlas builds on earlier work by Todd (27) and others, and comprises a series of pages with a representative X-ray from a single child of known age on each. The radiologist then takes the X-ray from the individual being assessed and turns the pages to find the X-ray which most closely corresponds to it. The chronological age of the child in the atlas radiograph is then given to the individual's X-ray.

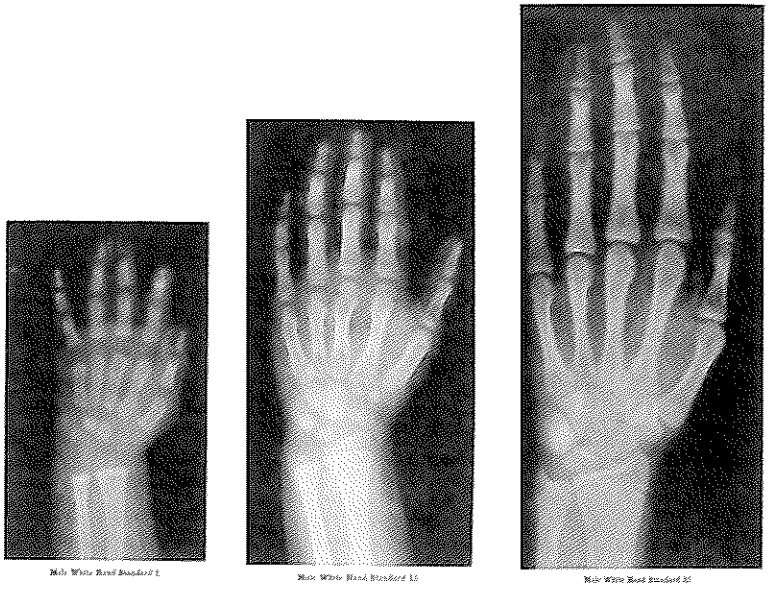


Figure 8 Radiographs of three children from Todd in 1937 (27)

The above three radiographs show the appearances of the hand in three children – that on the left being of a young child, that on the right being that of an adult (27).

Growth takes place at the ends of each long bone where there is an ossification centre with a growth plate or epiphysis of soft bone (cartilage). As the child's wrist develops, sequential changes occur in the amount of bone being laid down in the cartilages of the wrist and finger bones (the white substances in the images), and sex hormones during adolescence lead to deposition of bone in the growth plates. This leads to 'epiphyseal closure' after which no further growth can occur, the bones being fully mature. If there is clear evidence of linear growth from measuring a child's height sequentially, then the epiphyses cannot be closed and therefore the individual is not fully mature.

The method is highly subjective with considerable inter-observer range of 'ages' given by different radiologists; furthermore, the X-rays are not derived from contemporaneous children, but reflect the speed of bone development over 70 years ago. Moreover, it is not known from where in the range of normal bone development the single reference standard at each age lies – it could have been taken from a 'late' or 'early' developing child.

Whilst other bones are also often assessed, for example the clavicle or elbow, the X-ray of the left hand remains the international standard.

A clear misunderstanding of the statistical interpretation of a Greulich and Pyle age assessment by a Government-appointed radiological expert in a

legal case in Australia led Professor Tim Cole, one of Europe's leading biomedical statisticians to comment (28): '

'The use of the Atlas in this way is inappropriate and the conclusions drawn are wrong '

He also states:

'The average age of 19 years for a mature x-ray as used is itself meaningless, since it can be seen at any age between 15 and 95+ years. What is needed is the mean age of attainment of a mature x-ray, i.e. the mean age at which the x-ray becomes mature. This age will be earlier by definition (the earliest age it can be seen in the individual), which will increase the probability of being <18 years. However it is not given in the Atlas, nor is it even considered there. It is important to realise that the Atlas's purpose was to estimate bone age in growing children. Greulich and Pyle had no interest in children whose x-rays were mature, as they could not ascribe a bone age to them. So they excluded such children from their calculations'.

In an attempt to improve the reliability and precision of the radiological approach for precise clinical purposes, Tanner and Whitehouse introduced a more complex process in 1962, the TW2 method (29) in which every one of the 20 bones of the hand and wrist is scored against pictorial and written criteria from 2700 British lower and middle class children's X-rays. The total score is calculated and then entered into centile charts similar to growth charts. The data for this method were updated in 1995 and 2001 (30), being updated in the TW3 version to accommodate the marked secular changes that have occurred in the speed of bone development in adolescence.

The TW method still inflicts a dose of radiation although it does reduce inter-observer variability.

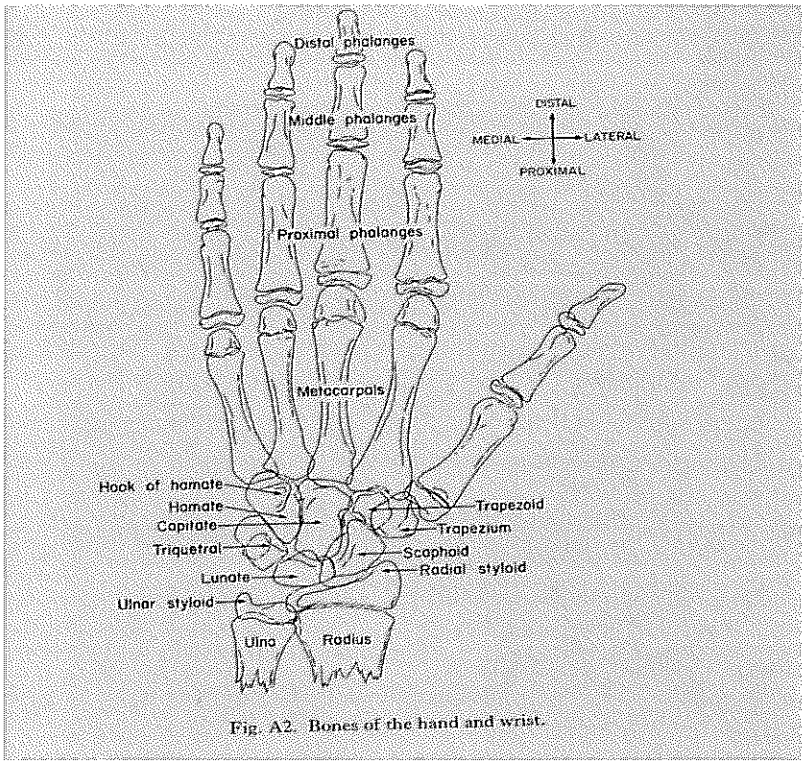


Figure 9: The bones of the hand and wrist. Taken from Fig A.2 in ref 29 with permission from the publisher.

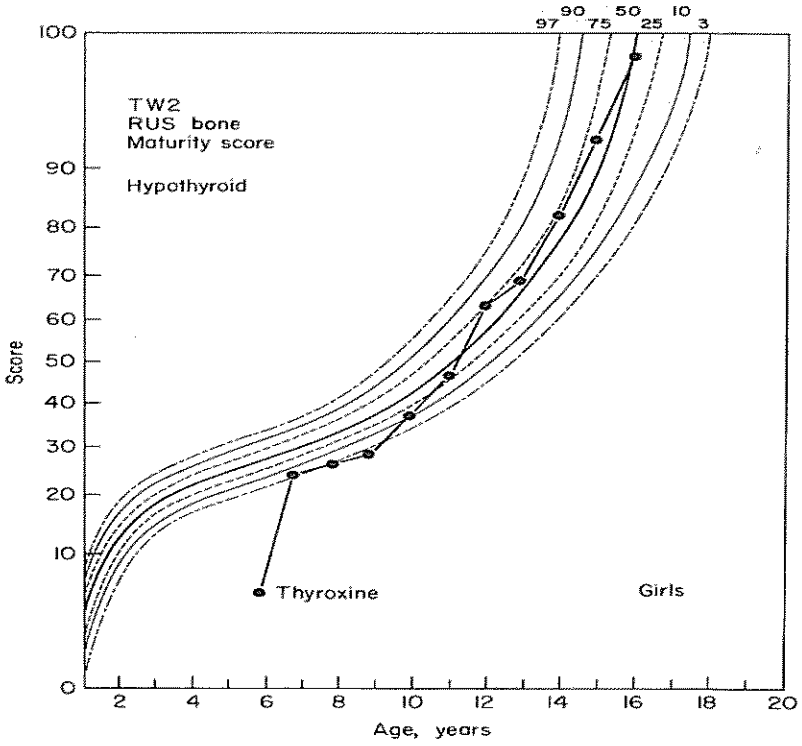


Fig 10: The range of distribution of the 20-bone scores from Figure 19 in reference 29 with permission from the publisher

The figure 10 above shows the range of distribution for the 20-bone score from which it can be seen that the average age at which full maturity occurs in girls is between15 and 16, but this can range from 13 to nearly 18 years.

The chart also shows the trajectory of bone development in a child found to be suffering from an underactive thyroid gland – at the age of 6 years, she had grossly retarded bone development, but as treatment was introduced, her bone 'age' rapidly increased, and with titration of the dose of treatment against growth and bone development, she achieved final average adult height with normal bone maturity. This is one example of the major effects that endocrine diseases can have on growth and bone development.

A more recent computer-aided skeletal age assessment tool has been proposed by Roche et al (31) but this has not gained widespread recognition

The overall message arising from the discussion in this section is that a maturity 'age' from an X-ray does not mean inevitably that the chronological age is the same.

Assessment of dental maturity by radiology.

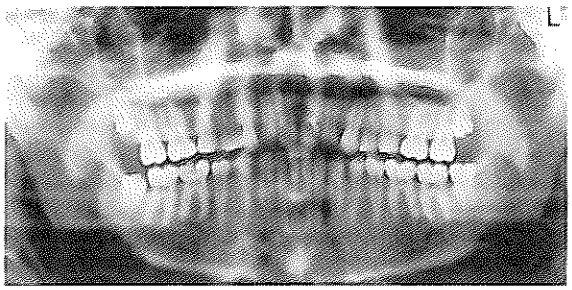


Fig 11: X-ray of teeth

The above image is an orthopantomogram – an x-ray of teeth. As for skeletal development, there are sequential changes in the eruption and structure of teeth during childhood growth (32). By the age of 16-20 all of the teeth but the third molars, or wisdom teeth, are fully formed, the latter showing a wide range of the developing crown and root. Because of its late development, the third molars are the ones most often examined when estimating age.

A range of different methods has been proposed, and much work on forensic validation has been performed by Schmeling and colleagues in the German Study Group on Forensic Age Diagnostics (33, 34). It is noteworthy that this group recommends physical and dental examination coupled with X-rays of the left hand and dentition, with additional X-ray of the clavicle in subjects where the hand X-ray shows complete skeletal development. Perhaps this approach, which increases the numbers of X-rays, should be challenged in view of the ethical dimensions of radiology discussed above.

Liversidge (35) showed in 2008 that using the classification system of Moorrees et al there was a significant difference in the development of third molar development between White and Bangladeshi children from London and Black African and Cape Coloured children in South Africa. Thevissen et al (36) examined data from nine country-specific populations concluding that although there were differences in speed and onset of development, the differences were small and not consistent over the considered age ranges. In a further study, Thevissen and colleagues (37) concluded that using Belgium instead of country specific information increased the percentage of correctly identified juveniles, but decreased the percentage of correctly identified adults.

Liversidge in 2010 (38) reported studies using Demirjian and Goldstein's method to interpret group differences from a very large data base of children of European origin in eight countries. She concluded that there is a wide 95% confidence interval for each stage of maturity and that the statistically significant differences do not reflect any biological differences at the population level. She further comments that Denirjian's method is inappropriate to assess population differences, and adapting scores for different groups of children is probably unnecessary.

Roberts and colleagues have suggested a 'simple' scoring system in which each individual tooth is scored against criteria (39). Cole has published a critical commentary on the statistical validity of the interpretations and conclusions of Roberts' method, emphasising the lack of rigour in understanding the statistical basis for the method (40). He focuses especially on the difficulties in assessing 3rd molar teeth with the last two G and H stages. These two stages bracket the age of 18, stage G having a mean age of 17.5 years, with a 95% confidence interval of +/- 2.8 'years'. Yet stage H can be seen in emerging adults of 15, whilst stage G as late as 23 years

He concludes by saying categorically that X-rays of teeth are not suitable for age assessment (40). This conclusion triggered Aynsley-Green's assertion that radiological assessment is inaccurate, not fit for purpose, unethical and potentially unlawful (22). Roberts and colleagues issued a vigorous response to these criticisms (41) despite the rejection of radiology for age assessment by the UK dental profession's regulatory and professional standards organisations.

It would seem that there is considerable controversy amongst dental experts on the reliability and validity of the different methods for assessing dental maturity. The wide range of variability in the speed of dental development, the need or otherwise to take ethnic differences into account, and the applicability of population standards to the assessment of the individual child in the border setting create real challenges for those trying to define best practice. These difficulties underpinned the conclusions of the International Workshop on Age Assessment in Norway in 2010 (13).

These difficulties coupled with ethical considerations, leads the author now to conclude that:

24) It is recommended that routine dental radiology is not accepted for the assessment of age in undocumented individuals

Non-radiological methods of imaging bone development.

Because of the ethical limitation in using X-rays, the use of non-ionizing radiation methods is intuitively attractive. FIFA has explored the use of magnetic resonance imaging (MRI) in under-17 year football tournaments (42).

Although these methods are claimed to show greater inter-observer reliability, emerging evidence suggests that they underestimate bone maturation when compared to X-rays (42) and the same reservations must apply in that there will also be very considerable variation in the MRI-assessed speed of bone development during adolescence and age of attainment of maturity.

It has to be concluded that much further work must be done to validate the MRI approach to assessing age in normal populations before considering their use as a routine method for asylum seekers. Furthermore, the technology demands expensive equipment and specialist expertise limited to few locations.

Finally, because of its low cost, freedom from radiation, portability and ease of use, commercial interest has been expressed in the use of ultrasound for wrist bone development (43,44), but questions also exist regarding reliability and reproducibility, together with the same concerns over the effects of ethnicity, coupled with the range of normality for bone fusion. To date, there is no good information on the application of this technique to age assessment of asylum seekers.

It has to be concluded that at present there is no method using any source of imaging that will give immigration staff and politicians a 'scientific' answer to determining the precise age of an individual seeking refuge.

25) It is recommended that urgent research is needed to test the validity and applicability of non-ionizing methods of bone maturity in assessing age of undocumented individuals

The combined approach

This review has exposed the huge difficulties in methods available to assess age. Birch and her colleagues have published an alternative approach (18) based on the statistical argument that by aggregating a number of different measurements each with a wide confidence interval, then improved precision results from a narrowing of the overall confidence interval. This statistical approach is widely used in a range of industrial applications, including prediction of oil field reserves

Birch reports how an experienced adolescent physician performs an extensive evaluation of growth through measurements, physical examination, sexual development, dental inspection (without X-rays) and emotional and cognitive development.

She comments that the assessment of psychological and mental ability is very difficult in young people who have little or no education, or come from a different cultural background and who may have been traumatised. She offers a review of existing methods.

She has tested the combined approach through a 'Monte Carlo' statistical simulation. She comments that if the standard deviation of each of the five parameters is in the order of 2.1 'years', combining the data leads to a reduction of SD to 11 months. She has also been able to field-test the approach in 133 children in Afghanistan who have known and documented birth dates.

Her approach is thought provoking and interesting and requires further independent validation. The statistical assumptions have been challenged in High Court cases in the UK, and their validity needs to be explored further, but the most serious challenge relates to its general applicability since so much of the final conclusion depends upon the 'clinical experience' of one practitioner.

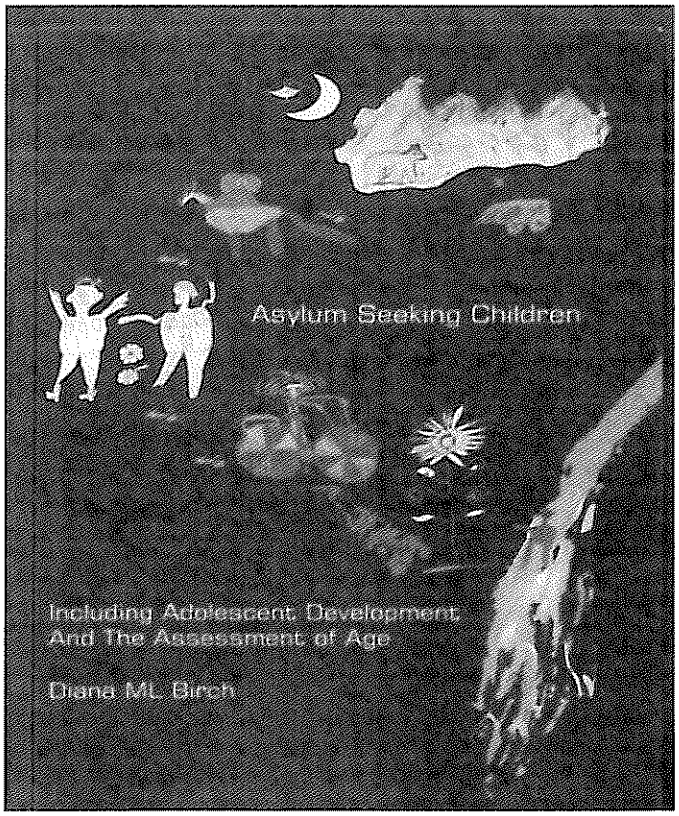


Figure 12: Cover page of reference 18 with permission

Future developments

As Engebretsen comments (24), biological markers of cellular age exist, including telomere shortening and expression of p16INK4a in circulating blood 'T' cells. However, their relevance to assessing children's chronological age is speculative, and even if valid still begs ethical questions over invasive blood sampling for administration purposes.

The circumstance of age assessment in Australia

I have recently been invited by Fisher Dore Lawyers in Brisbane, to offer specific expert commentary on the circumstances of an Indonesian individual, John Ndollu, in a case before the Courts in a dispute over assessed age (28). My report on the evidence I have scrutinised coupled with personal contact I have made with senior colleagues in the arena of paediatric medicine and paediatric endocrinology in Australia, coupled with contact with a Children's Commissioner allows me to make the following comments

1) The controversial and practical issues of age assessment do not appear to have been given the public or professional profile and scrutiny in Australia that they have in Europe, and particularly in the UK.

2) The case exposes aspects of the current process of assessing age in Australia that should cause grave concern.

3) Serious injustice is possible by a decision being driven by using a method involving wrist X-ray which has been rejected elsewhere, and which is unethical, not fit for purpose proposed, inaccurate and potentially unlawful.

4) The use of radiology deserves vigorous public, professional and ethical scrutiny

5) There appears to be a culture of disbelief in not accepting documentary evidence in the Prosecution and Police services. This should be challenged.

6) Australian society, professional organisations and its Courts need to define as a matter of urgency which methods of age assessment are acceptable, what limits of uncertainty are valid, and how a consensus can be reached in individual cases.

I recommend from the evidence I have seen:

- An urgent need to expose current practices to public scrutiny, ideally by giving Children's Commissioners or other statutory bodies the power given to the English Children's Commissioner to enter premises where

children are cared for, unannounced if necessary, to interview children in private, if the child agrees, and to witness the day to day processes involved in the screening and age assessment of individuals claiming to be children.

- Statutory and regulatory bodies must decide, aided by expert input from medical ethicists and human rights practitioners, whether Australia will continue to promote radiology for administrative purposes.

- Urgent credible and independent research should be funded to explore the development of the holistic multi-professional approach advocated in this commentary

So, what's to be done now?

In the midst of so much uncertainty and confusion over methodology, scrupulous honesty is needed from practitioners and governments in recognising that there is no easy answer. There should be wide public and professional discussion to get a consensus over what is ethically acceptable for the methods used, and morally acceptable in terms of error margin in assessing age. The benefit of the doubt should be given, although this may conflict with political and public pressure to be seen to be 'tough' on immigration.

Multi-professional assessment – a 'holistic' approach - involving a team of social workers, educationists, paediatricians and psychologists working in specialised Age Assessment Referral Units or within the existing structures for child protection would seem to be a pragmatic way forward in order to obtain a consensus decision on age.

26)It is recommended that serious effort should be put into research into refining the 'combined' and 'holistic' approaches, in order to test their applicability and practicability not least in terms of the capacity of competent staff to perform the evaluations in the context of the enormous burden on immigration control caused by a soaring rates of migration.

A consensus conclusion on age does not necessarily allow the definition of a birth date. Date of birth is a fundamental requirement for almost all citizen benefits and entitlements in developed countries, and so consideration will also have to be given to how this definition is agreed to.

Much can be done now, however, to examine the 'journey' of the individual, in exposing to public view from independent scrutiny their 'lived' experiences.

27)It is recommended that scrutiny of each of the 'milestones' of the individual's journey in the migration process should be routinely developed, with formal protocols for professional practice based on the needs of the individual.

28) An Ombudsman's Office or that of an independent Children's Commissioner would seem to be ideally placed to scrutinize the management of undocumented migrants and other unaccompanied minors

It is imperative for all concerned to:

- Stop believing that any method will give the precise result that politicians and officials are seeking.
- Educate officials and ministers of the reality.
- Engage in honest ethical debate.
- Stop using or promoting X-rays.
- Perform rigorous research to test the 'combined' and 'holistic' approaches.
- Produce agreed standardised & *auditable* protocols and guidance for professionals and courts.
- Involve children and young people in the design of processes, and listen to their experiences.
- Invest in serious training & professional education to improve capacity and confidence.
- Improve political advocacy for the 'best interests' concept.

Human migration in the 21st century is unprecedented, and throws massive challenges to host countries. There are no easy answers to the challenges of assessing age, but societies have to decide what standards they are prepared to accept. This demands open, honest, informed and evidence-based discourse. At the end of the day, what would we expect for us or our children were we to be in the shoes of the many who are seeking refuge?

Conclusions

1. Of the importance of age assessment in developed countries there can be no doubt
2. This review exposes to sharp scrutiny the serious practical difficulties in assessing the age of individual migrants.
3. There is no consistency of approach across EU or international member states, and no credible research with which to inform best practice
4. At present there is no scientific method that will give governments what they are seeking, that is a safe, reliable, inexpensive 'scientific' method that can define chronological age precisely around the critical age of 18.
5. Radiological methods can tell easily whether an individual has achieved full skeletal or dental maturity. Maturity, however, does not inevitably imply the same chronological age or adult status since full radiological maturity can occur normally before the age of 18.
6. X-rays can only indicate at best to within +/- 2 years the likely chronological age of the individual who has not achieved maturity
7. X-rays cannot add to the assessment of chronological age in an individual who has achieved skeletal maturity

8. There has been overwhelming professional opposition to the use of radiology in the UK on the basis of methods being inaccurate, not designed for purpose, unethical and potentially unlawful; this has led to government abandoning its proposal that they should be used.
9. New methods including magnetic resonance imaging and ultrasound study of long bones could overcome ethical objections to inflicting X-rays for administrative purposes, but even if normative population data were to exist, they are likely to have the same limitations caused by the wide range in the speed of bone development.
10. The time-consuming 'combined' or 'holistic' approaches demand further validation, and, their general applicability to the routine assessment of age in hard-pressed border locations is to be questioned.
11. There should be effort by informed commentators to educate governments, ministers and agencies over the reality of the lack of precision in assessing age.
12. There is a need for rigorous training of staff in age assessment to improve capacity, consistency and competence.
13. There should be public discussion on the ethics of the various physical and investigative methods used, and society has to decide what limits of inaccuracy it is prepared to accept in reaching any conclusion on an individual's age, and whether the benefit of the doubt should apply.

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Summary:

This report examines the current 'state of the art' in assessing the age of individuals without documentary confirmation.

From the chronological thought train of the narrative, it recommends for consideration that:

1) *professional staff involved in determining policy for the age assessment of migrants should be aware of and take note of methodological and policy developments in the field of sports medicine.*
2) *age assessment is seen within an overall government policy for immigration control and not as an isolated matter.*
3) *formalised independent processes should be introduced to routinely collect the views of those experiencing immigration control processes.*
4) *training of border control staff should include seeking and understanding the experiences of age-assessed individuals and the attitudes and culture of staff*
5) *special attention is paid to the designation of those who make age assessments in relation to budgetary responsibility for services. Age assessment should always be carried out by personnel independent of any budgetary responsibility for social care or other statutory services*
6) *comprehensive data are made available on the numbers of individuals being age-assessed, the numbers claiming to be children and the results of age assessments in age disputed cases coupled with outcomes of appeals against the judgement*
7) *the fact that no scientific method exists that will give precise chronological age should be repeatedly emphasised to government and officials*
8) *further EU-wide research is performed to analyse the detail of exactly how age assessment processes operate in practice in EU member states.*
9) *special provision should be made to improve the capacity and training of lawyers and courts in understanding age assessment*
10) *there is an urgent need to define a consistent approach to age assessment worldwide, but particularly across EU member states*
11) *key principles should be built into protocols and training processes.*
12) *there should be independent processes, perhaps led by a Children's Commissioner's or Ombudsman's Office, to inspect the reality of age determinations in practice.*
13) *in documenting the individual's narrative, there should be written protocols and checklists of data needed for the record.*
14) *effective and consistent training must be given to those performing the interviews*
15) *video records of age assessment interviews should be kept with the applicant's case file*

16) *physical appearance has no place in the accurate assessment of age.*
17) *there should be explicit consideration to the ethical dimensions of physical examination*
18) *paediatricians have a key role to play in age assessment, but this depends on rigorous training, and use of auditable protocols*
19) *age assessment should be a multi-disciplinary process following the model used for child protection*
20) *dialogue between the British Royal College of Paediatrics and Child Health and the equivalent Australian bodies could be helpful*
21) *paediatric endocrinologists are involved in discussions with government over the design of age assessment methods*
22) *X-rays should have no place in the assessment of age in undocumented migrants. It could be argued that in view of the enormity of professional opposition to these methods, countries which employ them could be charged with breaches of fundamental human rights.*
23) *there should be urgent discussion between medical ethicists and human rights specialists to consider and define the interface between the two areas*
24) *dental radiology is not accepted for the routine assessment of age in undocumented individuals*
25) *urgent research is needed to test the validity and applicability of non-ionizing methods of bone maturity in assessing age*
26) *serious effort should be put into research into refining the 'combined' and 'holistic' approaches, and documenting their day to day applicability in the context of the enormous burden on immigration control caused by soaring rate of influx of migration*
27) *It is recommended that scrutiny of each of the 'milestones' of the individual's journey in the migration process should be routinely developed, with formal protocols for professional practice based on the needs of the individual*
28) *The Ombudsman's Office or that of an independent Children's Commissioner would seem to be ideally placed to be responsible for scrutinising the management of undocumented migrants and unaccompanied minors*

The overall conclusion is that

Multi-professional assessment involving social workers, educationists, paediatricians and psychologists working in specialised Age Assessment Referral Units or in existing child protection processes would seem to be a pragmatic way forward in order to obtain a consensus decision on age.

In Australia I recommend:

- An urgent need to expose current practices to public scrutiny, ideally by giving Children's Commissioners or other statutory bodies the power given to the English Children's Commissioner to enter premises where

children are cared for, unannounced if necessary, to interview children in private, if the child agrees, and to witness the day to day processes involved in the screening and age assessment of individuals claiming to be children.

- Statutory and regulatory bodies must decide, aided by expert input from medical ethicists and human rights practitioners, whether Australia will continue to promote radiology for administrative purposes
- Urgent credible and independent research should be funded to explore the development of the holistic multi-professional approach advocated in this commentary

Biography of Professor Sir Albert Aynsley-Green Kt.

Professional background and relevant experience.

My career in medicine began at Guy's Hospital in London before training as a specialist in paediatric endocrinology (the science of normal and abnormal secretion of hormones in childhood) in University hospitals in Oxford, England and Zurich, Switzerland.

I was Clinical and then University Lecturer in Paediatrics and Fellow of Green College at the University of Oxford, before being appointed James Spence Professor of Child Health and also Head of the School of Clinical Medical Sciences at the University of Newcastle upon Tyne. I then became Nuffield Professor of Child Health and Board level Executive Director for Clinical Research & Development at Great Ormond Street Hospital for Children and the Institute of Child Health in London.

I have been involved in the political arena of Children's Services since 2000. I was Chair of the first NHS Children's Task Force, and first National Clinical Director for Children in the Department of Health where I was responsible for producing the first National Standards for children's health services. I was appointed to be the first Children's Commissioner for England in 2005, stepping down after my five years of tenure in 2010.

I am now Professor Emeritus of Child Health, University College London, Honorary Fellow of UNICEF and Oriel College, University of Oxford, and Director, Aynsley-Green Consulting, acting as an advisor to governments and institutions in Europe, Australia and Canada on children's services and childhood.

I was knighted for my services to children and young people by Her Majesty the Queen in 2006, and have received many national and international indicators of esteem.

This commentary is informed by my professional training and over 30 years of clinical experience as a children's physician, specialist in paediatric endocrinology. I have been responsible for regional specialist endocrine and

growth clinics for children in Oxford and Newcastle upon Tyne, and for national and international patient referrals in Great Ormond Street Hospital for Children in London.

I have been Secretary General and President of the European Society for Paediatric Endocrinology, the leading international forum for such specialists, and the recipient of the Andrea Prader Prize of the Society, this being the highest award for leadership and contributions to the subject offered internationally to a specialist in the discipline.

As the first Children's Commissioner for England I led major inquiries into the circumstances of children and families seeking asylum in England, and my reports have led to significant changes in government policy, especially on the screening process, and the arrest, detention and deportation of failed asylum seeking families. My reports were grounded in the unique statutory power given to me by Parliament to enter any premises, unannounced if necessary, other than a child's home, and to interview any child and in private if the child agreed.

I was a member of an Expert Working Party set up by the previous UK government to examine the practice of age assessment in the UK, arguing in particular that X-rays should not be used as an assessment tool.

In the last year alone I have been invited three times to Norway to meetings arranged by the Norwegian Ombudsman for Children and then the Norwegian Immigration Directorate to give evidence in its Government's proposals for the practice of age assessment. I also gave evidence in December 2010 in events in Brussels organised by the Belgian Presidency of the EU and then the General Assembly of the European Paediatric Association, following which I was commissioned in January 2011 by the Office of the Spanish Ombudsman to prepare a comprehensive report on the assessment of age in undocumented migrants, and this was published in March 2011.

I have now been invited by Fisher Dore Lawyers in Brisbane, to offer specific expert commentary on the circumstances of John Ndollu, and also to prepare a detailed overarching and comprehensive report on age assessment which should be read in parallel in order to provide a context for the comments I make on the case.

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