Proof of age required

Estimating age in adults without birth records

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Background

Many adults from refugee source countries do not have documents of birth, either because they have been lost in flight, or because the civil infrastructure is too fragile to support routine recording of birth. In Western countries, date of birth is used as a basic identifier, and access to services and support tends to be age regulated. Doctors are not infrequently asked to write formal reports estimating the true age of adult refugees; however, there are no existing guidelines to assist in this task.

Objective

To provide an overview of methods to estimate age in living adults, and outline recommendations for best practice.

Discussion

Age should be estimated through physical examination; life history, matching local or national events with personal milestones; and existing nonformal documents. Accuracy of age estimation should be subject to three tests: biological plausibility, historical plausibility, and corroboration from reputable sources.

Keywords: refugee; age determination; records as a topic

In many non-Western countries, it is common for people not to know the date and month of their birth, and in some areas and socioeconomic strata, it is common not to know one's year of birth. There are many reasons for inaccurate or indeterminate birth dates: dates of birth may be customarily pegged against agricultural dates such as the first harvest; documents may have been lost or destroyed due to war or displacement; or births may not have been registered because of a lack of access to governmental institutions. While the issue of 'indeterminate age' is becoming less frequent in the younger generation of refugees, it is widespread among the older cohort. This problem has many repercussions in a country like Australia in which correct identification – based on correct name and date of birth – is paramount to legitimacy and thus 'membership' of the citizenry. Age is one of the most frequently used criteria to determine access to essential services, systems and entitlements, particularly important to newly arrived refugees.

Patients without documents often have a date of birth accorded to them by a clerk working in a refugee camp, or assisting them to apply for a visa. An incorrectly estimated age can result in an elderly woman being required to look for work rather than receiving the age pension, an adult man being obliged to enrol in secondary school, or unanticipated side effects from medication due to failure to adjust for age related changes in pharmacokinetics and pharmacodynamics. In some cases, parents in Australia have been unable to sponsor their children out because their visa age is incompatible with the ages of their children.

Changing a documented date of birth is not a simple process. To make a case for changing dates of birth, doctors may be called upon to provide reports on a patient's chronological age. Although there is some existing work on estimating age in children,[1] the literature on estimating age in living adults is sparse. Visual estimates of age need not always be poor ways of estimating age,[2] but discrepancies between actual and estimated ages are more marked when the estimator belongs to a different ethnic group from the patient.[3,4]

Most work on age estimation of adults relates to forensic work on corpses using bones or dentition. Estimates of age made by forensic scientists and archaeologists tend to underestimate the ages of older people, and overestimate the ages of younger people, reflecting in part a regression to the mean phenomenon.[5] The international, interdisciplinary Study Group on

Forensic Age Diagnostics has produced guidelines on age estimation of living adults in order to estimate whether a suspect has reached the age of criminal responsibility (between 14–21 years of age, depending on the country).[6,7] These guidelines recommend a combination of a physical examination, an X-ray of the hand and/or clavicle, a dental examination recording dentition, and an orthopantomogram (OPG). These guidelines are not intended to apply to adults in later life, and involve intensive imaging, which is not always available or advisable in mainstream general practice.

There is an emerging body of literature on age estimation using telomere shortening for older patients.[8,9] Telomeres, the regions of repetitive DNA at the end of chromosomes that prevent deterioration (as an aglet protects a shoelace from deteriorating),[10] shorten with aging, and can be used to predict the rough age of forensic samples.[8] However, this method is not yet advanced enough to be considered a reliable forensic method.

Methods for determining age in living adults

In this article the authors outline and compare three methods for assessing age in adult refugees: morphology; patient narrative; and unofficial and corroborating documents (*Table 1*). We then make recommendations for fair and evidence based estimation of age.

Morphological markers

Morphological markers of advancing chronological age tend to be variable and nonspecific, at best providing support for minimum age estimations. The phenomena we typically associate with aging (greying of hair, arcus senilis and loss of skin elasticity) are complex phenomena that also reflect genetic and environmental patterns and occurrence of illness. Although there is little data on cross cultural differences, some of these phenomena may not occur at the same ages across different settings. Arcus senilis, for example, appears to occur at an earlier age in African Americans, than in Caucasian Americans,[11] but this may be confounded by smoking or hypercholesterolaemia. There is no correlation between arcus width and increasing age.[11] Africans had a lower and later incidence of alopecia in the one study reporting hair growth characteristics in those born in Africa;[12] on the other hand, some African hair care and styling practices can lead to traction or chemical alopecia.[13] Loss of skin elasticity is associated with aging, but both stress and prolonged sun exposure (both of which would occur in camps in source countries for Australia's refugee population) can accelerate the process.

In summary, individual morphological markers have a poor positive predictive value for age, but in combination, are suggestive of advancing age.

Table 1. History taking and examination elements for determining age in adults without birth records

Method	Elements of history taking and examination
Life history	**Identify key dates** • In the source country or refuge country • From personal history (eg. year of marriage, first child, deaths in family, or entry into refugee camp) Sample interview questions • Can you tell me how old you were at the time of [known event]? • If female: had your periods started at the time of [known event]? • If male: when did you develop a deep voice and physical strength in relation to [known event]? • When and under what circumstances were you accorded your current date of birth as used on your documents?
Morphology	**Examination findings suggestive of advancing age** • Arcus senilis • Elasticity of skin in sun protected areas • Evidence of osteoarthritis • Gingival shrinkage • Greying and thinning of hair • Cataracts • Kyphosis
Unofficial, corroborating documents	• Letters from family members • Ration cards from refugee camps • Newspaper articles • Statements by key community members (eg. teachers or priests) **Sample interview questions** • Who is the producer of this document? • How reliable is the writer of this document? (Includes dictated documents if the producer is not literate) • If the document is written by a scribe: how reliable is the scribe? What is the background of the scribe? • If the document is written in English, and the writer is from a non-English speaking background: describe the quality of the writer's English. Why was this document not written in the first language of the person writing or dictating the document?

Patient narrative

Significant biological or personal events can often be related to national or local historical events. Patients should be asked what national and local events occurred at the same time as significant biological or personal events (eg. birth, puberty, marriage, first childbirth, menopause). The consultation eliciting this data creates a type of life history. The questioner should be aware of critical events in the history of the patient's nation (eg. coups, massacres, royal visits and natural disasters) and cultural norms (eg. age at first marriage) that can be related to biological evidence presented by the patient. *Case study 1* illustrates age estimation in an older patient in whom biological events (puberty) are related to a national event (royal visit).

There are marked secular trends in age at puberty.[14] Immigrant children from refugee source countries growing up in first world settlement countries are likely to attain puberty at an earlier

age than their parents did growing up in poor or conflict affected countries. Age at menopause appears to be located in the fifth decade with only minor crosscultural variation.[15] However, there is little data from Africa, the source region for many immigrants without birth documents. In addition, the influence of extreme stress on age of menopause onset is well documented.[16,17] It may be that women who have had experiences of war may become menopausal at earlier ages than other populations.

Children born in refugee camps generally have good documentation of date of birth. These documents can be crossmatched with a life history to support a minimum age estimation for their parents.

Unofficial and corroborating documentation

Although some patients may not have formal birth documents, many will have formal documents of other events, such as registration at a refugee camp, a feeding station or school. It is not uncommon for these documents to include the incorrect birth date, especially if one was given to them by a clerk with some administrative responsibility.

Some patients are able to produce declarations from family members that they were born at a particular time, or in a particular year, to support the argument made by the patient. However, many documents and patient reports may not use the Gregorian calendar that is used in Western countries (*Table 2*), and this needs to be considered when dating documentation (see *Resources*).

Case study 1 – a royal visit as a benchmarking event

Aisha, an African woman, had documents stating her date of birth as 1 January 1960. She was not literate, and this birth date was provided by a scribe who had written her visa application. As someone with a document age of 49 years she was required to seek work and was finding this very difficult. A Centrelink official, concerned about the mismatch between her physical appearance and her stated age, suggested that she have a formal age assessment. Aisha was accompanied to interview by her fourth son who was 39 years of age.

Aisha appeared older than her documented age. She had grey hair; thin, wrinkled skin in sun protected parts of her body; and Heberden nodes on her distal interphalangeal joints. She had gone through menopause 'a long time ago'.

A life history, exploring significant events in her life, was undertaken. Aisha had been married at the usual time for her culture (just after puberty, or 'when my breasts dropped'). This was typically around the age of 17–18 years. She gave birth to her first child the following year. Aisha could not remember the years her children were born. The son accompanying her said he did not know the age of the oldest child, who was from a different marriage and was now dead.

At the suggestion of the interpreter, Aisha was asked to recount her memories of where she was when Queen Elizabeth II visited their country. This was a signal event that had engaged the whole country. She recalled with animation and vivid detail taking her young stepsister and walking to the capital city to see the Queen, even describing the flowers that she picked to take with her. At the time her breasts had just dropped. She was married the following year.

Using the life history, we estimated that at the time of the Queen's visit (1961) she was about 16 years of age. The date of birth on her documents was clearly wrong as this would have made her 1 year of age at the time of the Queen's visit. We estimated her year of birth to be 1946, and her age at interview to be about 63 years.

Combined method of estimating age

No one method on its own is completely acceptable, but in combination an accurate estimation of age is often possible.

We therefore recommend that three tests be applied to the evidence when making an assessment of the patient's age in the absence of birth documents:

- biological plausibility (is the age estimate supported by physical markers of age?)
- historical plausibility (is the age estimate supported by benchmarking life history events against key historical or local events?)
- corroborating documents (is the age estimate supported by documents that corroborate the life history?).

Case study 2 provides an example of all three methods being used to determine likely age in a relatively subtle case.

The most persuasive component of this assessment is generally the life history. In contrast to morphological evidence, careful use of life history can enable estimation of age within a narrow age band. Reliance on oral testimony about age at key events may appear to be problematic, as

Table 2. Non-Western calendars which may be used in documents

Type of calendar	Description	Country
Islamic	Lunar calendar: commenced 16 July 622 CE*	Islamic countries
Persian	Solar calendar	Iran, Afghanistan
Indian	Civil calendar: synchronises with Gregorian calendar, though commenced in 79 CE	India
Bahia	Cycle of 19 days: synchronises with Gregorian calendar	Iran
Hebrew	Dates from Monday 7 October, 3761 BCE**	Israel
Ethiopian	Commenced 11 September 7 CE: 13 month calendar	Ethiopian

* CE denotes 'common era', equivalent of the Latin *anno Domini* (AD); ** BCE denotes 'before common era', equivalent of before Christ (BC)

it could be argued that it offers an opportunity for patients to invent a convincing back story. However, this reliance on oral testimony is no different to the testimonial process accepted by signatories to the 1951 Convention Relating to the Status of Refugees[18] to support the determination of refugee status. If convincing, corroborated oral testimony is sufficient to provide applicants with a visa for permanent residence in Australia, it should also be accepted as evidence for a date of birth.

One limitation to the life history method is accurate data about key events in local and national history. 'History is written by victors', and many of the major events in the histories of marginalised populations may not be readily available in standard country histories. It may be necessary to seek corroboration of major events and develop timelines of major events in collaboration with local community members. Companion House Medical Service has developed corroborated timelines of major war, civil and natural disaster events for our key refugee populations (see *Resources*).

Conclusion

Accurate estimation of age for living adults is of central importance in ensuring access to correct services and medical care. Adults from countries with fragile civil infrastructure often have incorrect dates of birth accorded by clerical error, which they may need to change. Doctors should not rely on physical examination alone to estimate age, as there is significant interpersonal and intercultural variability in the relationship between morphological characteristics of aging and age. A combination of physical examination, careful life history, and corroborating documents is likely to produce a more accurate estimation of age.

Resources

- A converter between Gregorian and other calendar forms: www.fourmilab.ch/documents/calendar/
- Companion House Medical Service: info@companionhouse.org.au
- Benson J, Williams J. Age determination in refugee children. Aust Fam Physician 2008;37:821–4. Available at www.racgp.org.au/afp/200810/200810benson.pdf.

Case study 2 – combined method age assessment

Matthias, a young man from an African country, had the date of birth on his visa application as 13 April 1977, which gave him a document age of 32 years. Matthias presented saying that he knew his date of birth was 13 April 1981 and that he was actually 28 years of age. The incorrect date of birth had been stated by a cousin who had given it to an official at the refugee camp when they arrived in 1991. The cousin was his only living relative, and had begun to care for him that year, after he had fled from his village to hers following a massacre.

Matthias was deeply grateful to Australia for providing him with a new life. He wanted to be 'true' in every way to his adoptive country. In his view, he would dishonour his new country if he took on citizenship using a date of birth that he knew to be incorrect. He therefore requested a formal report so that he could change his date of birth.

Physical examination was consistent with a man in his late 20s or early 30s. It was not possible to use morphological evidence to narrow down his age beyond this. He had obtained a letter from a village elder, which had been dictated to someone who was literate in his own language, that stated Matthias was born in 1981 (a year that coincided with a flood in the local area).

Matthias then provided a life history. He stated that in 1991, when he entered the camp, he was very small, and was not sent to undertake the more heavy work like carrying water and food, a task that was customarily undertaken in the camp by children who had reached puberty. Instead he used to swarm to the head of queues to try to obtain food and supplies for his family. Several years later, he began to grow and become strong and then he moved on to the heavy work.

The tasks given to Matthias when he entered the refugee camp were consistent with him being prepubertal (ie. about 10 years of age), rather than the document age of 14 years. On the evidence from life history and documents, Matthias' true date of birth was assessed as being likely to be in 1981, making him now 28 years of age.

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Conflict of interest: none declared.

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