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Erroneous age assessment of young asylum seekers

OPINIONS

SVEIN AARSETH

svein.aarseth@legeforeningen.no
Svein Aarseth, specialist in general practice and occupational medicine, and head of the Council for Medical Ethics.
The author has completed the ICMJE form and declares no conflicts of interest.

TORBJØRN SUND

Torbjørn Sund, D.Eng., retired researcher from the University of Tromsø and Telenor.
The author has completed the ICMJE form and declares no conflicts of interest.

LIL-SOFIE ORDING MÜLLER

Lil-Sofie Ording Müller, specialist in radiology, with specialist expertise in paediatric radiology and musculoskeletal disorders in children, and senior consultant at the Department of Radiology and Nuclear Medicine, Oslo University Hospital.
The author has completed the ICMJE form and declares no conflicts of interest.

JOHAN BRING

Johan Bring, associate professor, and statistician at Statisticon.
The author has completed the ICMJE form and declares no conflicts of interest.

Today's use of BioAlder, a tool for assessing the likely age range of asylum seekers, is based on a statistical fallacy. Minors risk being classified as adults.

The BioAlder tool yields a probable interval for chronological age according to the degree of skeletal and/or dental maturation of the person being tested (1). We believe that the practice of the Norwegian Directorate of Immigration (UDI) and the courts has been to interpret these probabilities as absolute. Unknown age distribution in the tested population can lead to potentially serious statistical inaccuracies. The result can be incorrect classification, both of minors as adults and adults as minors.

Under the provisions of the Immigration Act, the UDI has for many years X-rayed the skeleton and/or wisdom teeth of asylum seekers in order to estimate their age. These X-ray images are compared with Greulich and Pyle's (2) radiographic atlas of skeletal development of the hand and wrist and Demirjian's (3) staging of wisdom teeth formation. This gives an indication of biological age, originally interpreted directly as chronological age. In 2018, the inaccuracy of such age estimates led the Council for Medical Ethics to level criticism at a doctor who assessed the age of asylum seekers based on these methods. The criticism was primarily aimed at the imprecision of the method and the challenges in obtaining meaningful informed consent from the asylum seekers.

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Following this, the Department of Forensic Medicine at Oslo University Hospital was commissioned to develop the BioAlder tool to obtain more accurate estimates and give a better indication of the degree of inaccuracy (4). BioAlder is based on data from a large body of published studies of the relationship between chronological age and degree of maturation, as classified according to Greulich and Pyle or Demirjian. However, despite the use of data from around the world, the uncertainty remains in terms of failing to establish the age composition of the population of asylum seekers being tested (5).

Use of BioAlder by the authorities

After an asylum seeker has been tested, the result that the UDI receives from BioAlder is presented with 75 % and 95 % confidence intervals for the asylum seeker's chronological age. If the lower limit of the specified 75 % confidence interval for age is 18 years, only 12.5 % of the confidence interval is below 18 years of age, while 87.5 % is above the age of majority. The UDI's standard practice is to interpret this to mean that there is an 87.5 % *probability* that the applicant is 18 years or older.

Circular UDI 2020 - 007 concerning age assessment of unaccompanied minor asylum seekers (6) states: 'To request an age assessment, there must be specific doubt as to whether the person is over or under 18 years of age. (...) If it has not been proven that, on the balance of probabilities, the applicant is a minor, the age will normally be set at 18'. However, this is a statistical fallacy, as post-test probability varies according to the age composition of the group being tested.

The legal system, as reflected in, for example, Court of Appeal (7) and Supreme Court (8) rulings, also regards the results yielded in BioAlder to be conclusive. The former seems to assume that the probability indicated by BioAlder is 100 % absolute, stating that: 'A safety margin has been built into BioAlder to avoid anyone being incorrectly assessed to be older than they are.' Again, we see the same fallacy (5).

The statistical fallacy

Correct interpretation of the results from BioAlder will be analogous to the assessment of a diagnostic test, where the positive predictive value of the test will vary according to the prevalence in the population. When testing a low-prevalence population, as in the case of screening, the proportion of false positives can be higher than true positives in certain cases.

Imagine that in a given period of time, 100 asylum seekers claim to be 17 years old. Then assume that ten of these are 18 years old. In order to identify these, all of the 100 are subjected to a BioAlder assessment. At 90 % sensitivity (proportion of 18-year-olds that the test indicates are at least 18 years of age, with 87.5 % as the decision limit), nine out of ten will be intercepted. However, due to natural variation in biological maturation, the test will also identify some of the 17-year-olds as being at least 18 years of age. At 94 % specificity (proportion of 17-year-olds that the test indicates are no more than 17 years old), 6 %, i.e. five of the 17-year-olds, will be classified as at least 18 years old. Consequently, the 87.5 % test will classify 14 asylum seekers as 18 or older, when only nine of them actually are. Thus, the probability that any one of these is 18 years or older is 64 %, not 87.5 %.

In Sweden, dental X-rays and MRI of the femur are used to estimate the age of young asylum seekers. The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) has recently published two reports (9, 10) in which these methods are assessed. SBU argues (11) that it is fundamentally wrong to use the results of age testing on individuals or a group when the age distribution in the tested population is unknown.

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The confidence intervals yielded in BioAlder, and which the UDI and the legal system use as a basis to assess age, assume a known and even age distribution. If this distribution is not exactly what is assumed – and it seldom will be – the results will be misleading, as illustrated above.

Correct use

Being misclassified as an adult can have serious ramifications for a 17-year-old asylum seeker. We therefore encourage the UDI to reconsider the role of radiological methods in age assessment. It is also the responsibility of the developers of BioAlder to ensure that the interpretation of results is statistically correct and that the inaccuracy in age estimates is made clear to those using the tool. Age assessment with BioAlder in its current form represents a source of statistical error that is not clarified in the results it produces.

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