Normality and abnormality

'Normal' comes from the latin *norma*, a carpenter's square, and in mediaeval times meant something at a right angle or perpendicular. A few centuries later it came to mean conforming to a standard and was used in physics to refer to the average of a set of variables. If the variable concerned, such as head size or IQ, is continuous and has a normal distribution, by convention the normal range has come to include values falling within two standard deviations either side of the mean – defining about 4.6% of the population as abnormal. By a similar approach, if the variable has a skewed distribution, such as the age of walking, those lying outside the 2nd and 98th centiles are often defined as abnormal, while the normal is equated to the average. This can also lead to misunderstandings, as, for example, in some child-rearing books when parents are told that the normal age of walking is 12 months, which can mistakenly imply that the 50% of children, who by definition are not walking at that age, are abnormal.

The phrase 'Normal for Norfolk' is considered pejorative, at least in the English county itself. Nonetheless, using local norms is considered important, as shown in the paper by Hemming et al. in this issue (p 906) on the weight used to define small for gestational age, which found marked variation between different European countries, with obvious implications for epidemiological studies linking this variable to later outcomes. Much of the variance depended on inclusion and exclusion criteria. One interesting result was that the authors could not conclude that there is a real difference between countries in Europe, which is awkward for the argument that higher average birthweights in some countries reflect better models of social and health provision.

One feature of the definition of small for gestational age is the use of the 10th centile as the cut-off, which might be because the neonatal weight charts available some years ago did not show the 3rd centile. If such a substantial percentage of the population can be considered abnormal, does this apply to, for example, the similar percentage who are left-handed? In the same way, studies using the Movement Assessment Battery for Children frequently consider those children below the 15th centile at risk (about one-sixth of the population) and those below the 5th as definitely abnormal, which diagnoses a large number of children as having a motor disorder.

If defining what is abnormal with fairly objective measurements like these is challenging, definitions derived from more nebulous measurements, such as those concerning behaviour, seem even less certain. If 16% of children have attention-deficit–hyperactivity disorder (ADHD), should they all be considered abnormal? This question arises because over the years variations in diagnostic criteria have also affected the numbers, population prevalences appear to differ (e.g. between Hong Kong Chinese and United Kingdom children), and the tests used have varying specificity and sensitivity for the different components of the diagnosis.[1] This is another example where the behaviours concerned have a skewed distribution in the childhood population. If their distribution is skewed, is a 2nd or 3rd centile cut-off appropriate? Should the definition of abnormal be based on a lower centile? Another example is the widely discussed increase in diagnoses of autistic behaviour and its variants, which Guillem et al. (p 896) found may be due to a broadening diagnostic concept. While a prevalence of up to 1% of the population in recent studies is still largely outside conventional normal values, it would be interesting to know the distribution patterns of each of the cluster of behaviours used in the diagnosis.

Defining the abnormal raises important health issues as often it decides who should be treated. One aim of treatment is to help a person become normal, which is embodied in the World Health Organization's approach in the International Classification of Functioning, Disability and Health, with its emphasis on activity limitation and participation restriction. One problem with this approach is illustrated by Sullivan et al.'s report (p 877) on the effects of gastrostomy feeding in children with cerebral palsy, where a more normal body weight can be restored but not necessarily a normal body composition, with excess body fat. Another is illustrated by the 10% of males in North America who are receiving treatment for ADHD, especially in view of recent concerns about unwanted effects.[2] If, as is often suggested, Einstein had Asperger syndrome, and some form of treatment was available, would it have been beneficial for him to have received it? Treating other unusual behaviours raises ethical issues: e.g. when I asked a psychiatrist what to do for a patient with Duchenne who was cross-dressing at home and at school, the reply was nothing, as it was not considered an abnormality that needed treatment. In 'Of Human Bondage', Somerset Maugham's semi-autobiographical novel, while dissecting a cadaver, Newson says 'The normal's the thing you practically never get. That's why it's called the normal.' As well as taking care over the classification of abnormal, perhaps in some circumstances it is possible to be more accepting about abnormality. Might it be preferable for people with epilepsy if they were still considered to have a sacred illness, as in ancient times?

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References
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