ENDGAMES

We welcome contributions that would help doctors with postgraduate examinations
▶ See bmj.com/endgames for details

STATISTICAL QUESTION Stratified cluster sampling

Researchers investigated the suitability of a newly developed famine scale as an international definition of famine to guide humanitarian response, funding, and accountability. The scale had been proposed by Howe and Devereux, and it defined famine on the basis of intensity and magnitude. The scale was applied retrospectively to the humanitarian crisis during 2005 in Niger, west Africa, to determine whether famine had occurred. A cross sectional study design was used. Households were recruited using a stratified two stage cluster sampling method. Niger was stratified into its eight regions. Within each region, 26 villages were randomly selected, with the probability of selection proportional to the size of the village. Within each village, 20 households were systematically randomly selected. A census of the entire household was undertaken by administering a questionnaire to the head of each selected household.

   The researchers concluded that on the basis of the famine scale developed by Howe and Devereux, most regions in Niger in 2005 experienced food crisis conditions, and some areas approached famine. Furthermore, it was suggested that the scale afforded more objective criteria than did previous approaches while providing early warning systems that might help guide the level of response in future situations.

Which of the following statements, if any, are true?

a) Cluster sampling meant that resources could be concentrated in a limited number of areas of the country

b) The stratified two stage cluster sampling approach constituted a multistage sampling method with three stages

c) Systematic random sampling of households in each village required the construction of a sampling frame

Submitted by Philip Sedgwick
Cite this as: *BMJ* 2013;347:f7016

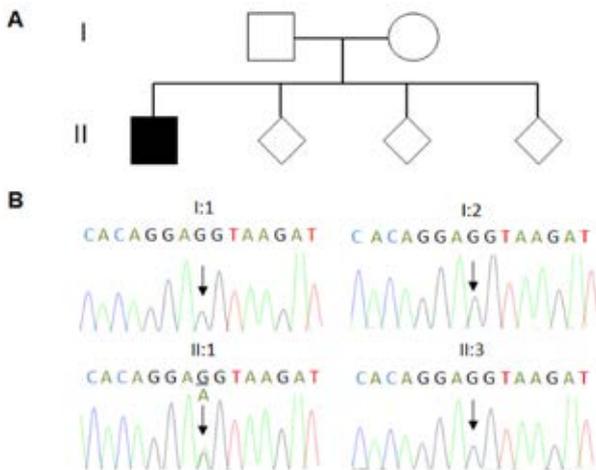## ANATOMY QUIZ Diagnostic parotid sialogram
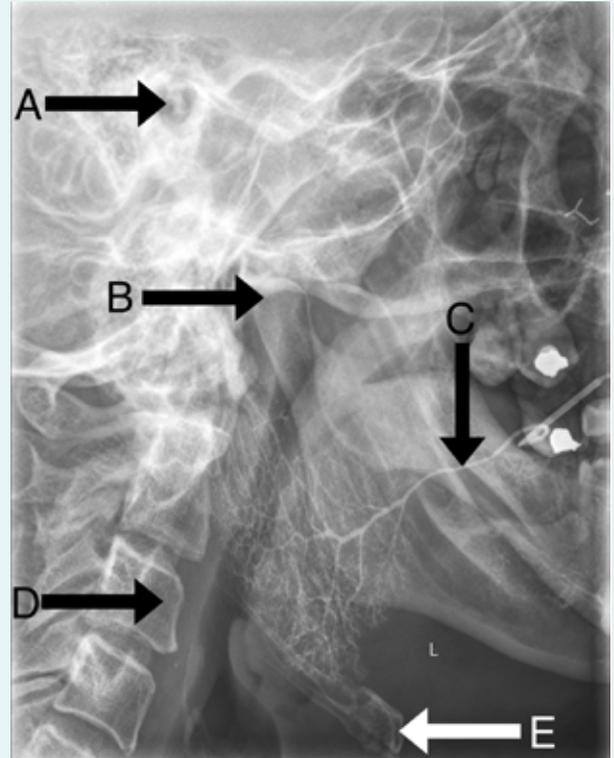
Identify the structures labelled A-E in this lateral view of a left parotid sialogram performed on an adult patient.

Submitted by Simon Christopher Harvey and John Julian Harvey
Cite this as: *BMJ* 2013;347:f6107

CASE REPORT

Patterns of inheritance, not always easily visible

This case report describes a boy with a rare ophthalmic disorder that uniquely demonstrates the complexities of clinically identifying the mode of disease inheritance. Although readers are unlikely to encounter this exact disorder, knowledge of the analytical approach needed to answer the questions posed will be of benefit to all specialties of medicine.

   A 4 year old boy presented with symmetrical leucocoria (whitening of his ocular red reflex). His three younger siblings all had a normal eye examination, as did his parents (figure). He was diagnosed as having an inherited corneal disease (Schnyder corneal dystrophy) caused by mutations in the *UBIAD1* gene. This gene encodes a protein that localises to the mitochondria and regulates cholesterol and lipid metabolism. In the disease state these products become abnormally deposited within the cornea, leading to opacification.

1 What are the possible modes of inheritance in this case?

2 How do we confirm the inheritance pattern?

3 What are the implications for future (parental) pregnancies?

4 What are the chances of the patient passing on this condition to his children?

Submitted by Kamron N Khan, Manir Ali, James A Poulter, Martin McKibbin, and Chris F Inglehearn
Cite this as: *BMJ* 2013;347:f6610