

## **A note on the statistical analysis of data classified in group 6**

1. In order to make comparisons between different centres carrying out paediatric cardiac surgery, a grouping scheme was used to classify operations into those of clearly very high risk and other groups of rather lower risk.
2. This has been based on the OPCS 4 classification of operations. Each operation may have several operative procedures coded. The process has two important features that are relevant to the analysis of mortality in this group. It has been labelled as ASD, but as noted in the response to Mr Dhasmana dated December 2000, this group contains operations that are broader than simple ASDs. The second important feature is that with an ordered hierarchy of categories for the operations, group 6 is the lowest category for open heart surgery. The consequence of this is that, if a more complex operation also includes a procedure code that is within group 6 and the complex operation procedure is not covered by one of the other open heart surgery groups, then this more complex operation will be classified as group 6. Operations that are not classified in the higher graded categories can "fall" into this lowest category. There were a number of operative procedure codes that could not be unequivocally determined as open heart surgery or placed into one of the numbered groups. Some of the operations were nevertheless relatively complex, and as such could be classified within group 6. The clear consequence is that Group 6 operations, while including many that are truly low risk will have a few higher risk operations also included. These processes apply in all centres and not just in Bristol.
3. In the preliminary report on the local sources of data there were errors in the algorithm used for classification of operations; this resulted in a larger number of operations being put into group 6 than should have been the case. For example, an operative procedure should have been classified as Fontans, but "fell" into Group 6 because of the algorithmic error. At no stage did this affect any of the national analyses that compared mortality between centres. For the final reports, in particular the summary overview, this error in the algorithm has been corrected so that it becomes clearer that the agreement between the local sources and the national sources has been notably improved.
4. It is important for the Panel members and for those who read the reports on the statistical analysis to understand that the group including ASDs should not be interpreted as a group including only ASDs. It is also important to realise that the criteria applying to the grouping have been done in exactly the same way for each centre in the national comparisons of data. The classification ASD is a diagnosis rather than an operation. The consequence is that a surgeon who has access to a list of diagnoses will classify ASDs unequivocally. The statistical analysis is based on operation codes and not on diagnoses so will not be as precise in this instance.
5. Group 6 is an important aspect of the comparative analyses, since even with a broader classification than simple ASDs alone, it is still a relatively low risk group. The fact

that some differences in mortality were noted with Bristol having a higher rate in this group does not mean that it applies only to ASD operations. The data in themselves are valid and the comparisons between centres are valid, but a naive interpretation of the labelling of the group must be avoided.

6. It is possible to examine the individual local cases very carefully and to do this identifying particular surgeons. This will not be helpful since a similar exercise cannot be done for the national data.
7. So in summary the following points are relevant to discussion on ASDs:
  - The initial analysis of local sources had some misclassification
  - The national comparisons did not have these errors
  - The labelling of group 6 should be clearly understood as including more than simple ASDs
  - The classification process has been done in the same way for all centres so that comparisons of mortality between Bristol and other centres is valid for group 6
  - The performance of individual surgeons has not been done on a national basis

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