



Annual Report for the Year 2009

Cytogenetic European Quality Assessment

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1. Introduction

Cytogenetic European Quality Assessment (CEQA) was set up in 2005 by a Forum of European EQA Providers as part of the Eurogentest Network of Excellence in Genetics to address the lack of a pan European EQA Scheme and to help harmonise existing national schemes.

CEQA operates through a password-protected website containing clinical cytogenetic cases for analysis. Participating laboratories are provided with clinical information, technical details, metaphase and/or FISH images as well as DNA samples (Microarray/ArrayCGH Pilot EQA) from selected diagnostic cases to analyse and report. Results can be submitted in eleven European languages. Submissions are then assessed by a panel of expert assessors (see section 5) and laboratories are issued with Individual Laboratory Reports (ILRs) giving the expected result and any comments from the assessors. In addition, for each EQA a Summary Letter is issued to all participants. This document offers further information about the EQA and allows the laboratory to benchmark their performance against the other participants.

In the past 5 years the Scheme has grown from offering a Constitutional Pilot EQA (one prenatal and one postnatal case) to a limited number of laboratories into an internationally recognised scheme offering four full EQAs as well as one Pilot EQA (for a full list of EQAs offered in 2009 see Section 3)

In 2009 Laboratory registrations rose by 59% to 203 laboratories from 36 countries with a considerable number of laboratories taking part from Spain, Italy, France, Germany, the Czech Republic and the Netherlands. CEQA is now the largest Cytogenetic EQA Scheme in Europe.

Registration Increase 2006 - 2009

	2006	2007	2008	2009
New labs	19	38	71	75
Total Registered labs	19	57	128	203
Countries	18	23	28	36

2. CEQA Structure

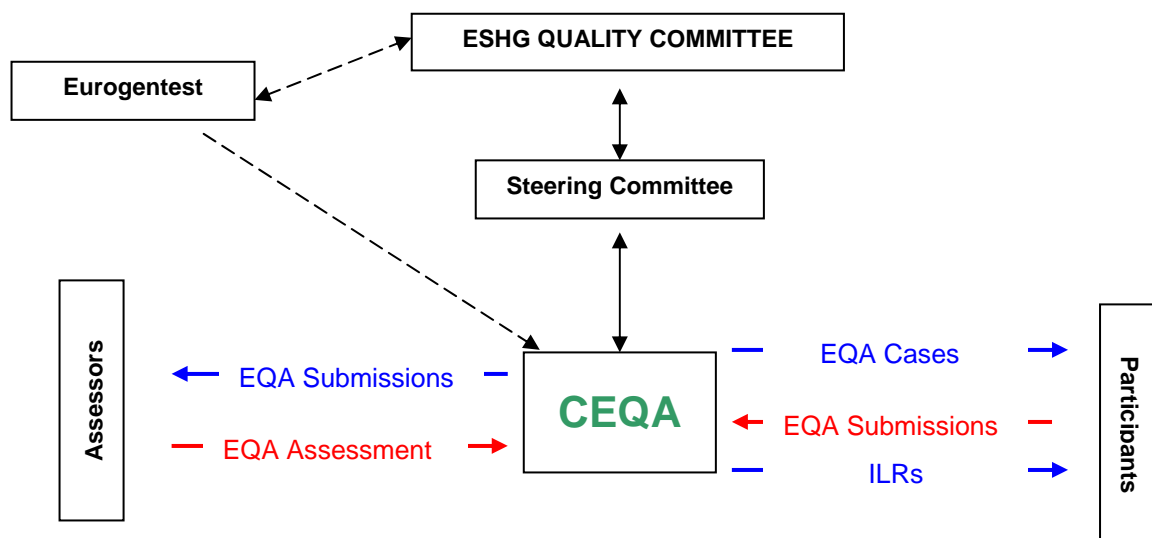
The CEQA Scheme Office is based at the John Radcliffe Hospital in Oxford, UK. A Scheme Co-ordinator and a Quality Manager oversee the day to day running of the Scheme.

The Scheme Co-ordinator reports to a Steering Committee consisting of European EQA Scheme Organisers (see Appendix A) and other selected experts in the field. The Steering Committee has set the poor performance criteria and deals with any appeals made by participants. Steering Committee appointments are for four years but can be extended for up to two further periods of two years.

The European Society of Human Genetics (ESHG) has recently formed a Quality Committee (see Appendix A). Duties of this committee include governance of the European EQA Schemes including CEQA. The committee will also advise on defining persistent poor performance.

Assessment of the participants' returns was undertaken by a panel of cytogeneticists or, for PGD only, PGD scientists with a wide range of experience (see Appendix A). A specialist group of assessors was assigned to each EQA. The Microarray/ArrayCGH EQA Pilot EQA is run in collaboration with the European Molecular Genetics Quality Network (EMQN). The full panel of assessors was only consulted in cases where particular problems required additional scrutiny.

CEQA Organisational Structure



3. EQAs offered and Scheme Participation

In 2009, CEQA offered the following EQA schemes:

- Amniotic Fluid (2 cases)
- Postnatal Blood (2 cases)
- Preimplantation Genetic Diagnosis (PGD)(Blastomere)
- Haemato-Oncology (ALL and LPD)
- Microarray/ArrayCGH (limited Pilot EQA in collaboration with EMQN)

Participation in the 2009 Amniotic Fluid and Blood EQAs has risen by approximately 50% over last year, with participation figures for Haemato-Oncology and PGD remaining static.

Participation Increase 2006 - 2009

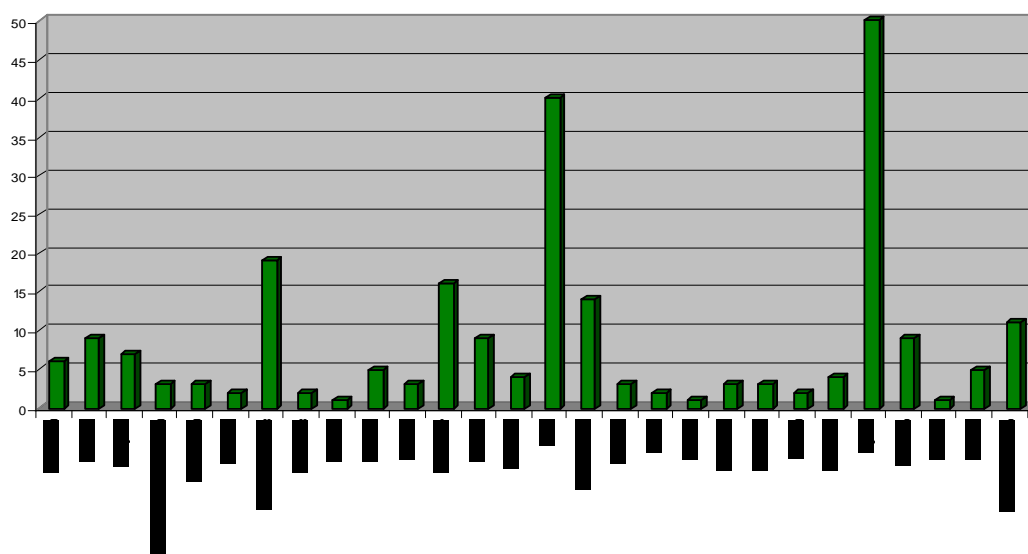
	2006	2007	2008	2009
Participations Total	16	51	187	248
Participations AF	16*	51*	54	77
Participations Blood	16*	51*	57	77
Participations Haemato Oncology	NA	NA	48	46
Participations Blastomere	NA	NA	28	33
Participations Microarray/Array CGH	NA	NA	NA	15**

Key: * Constitutional EQA consisting of one AF case and Postnatal Blood case
 ** refers to CEQA participation only (not EMQN)
 NA = Not Applicable

4. EQA Submissions

Participants submit their reports online and for the PGD EQA, additional “work-up” documents are also uploaded onto the website. In 2009 over 95% of all laboratories registered for the EQAs submitted results. EQA is considered an ongoing process and continuous participation is important as an external validation of the quality of the diagnostic service offered to the patient.

CEQA 2009 EQA - Participations per Country



It is an important aspect of EQA that all reports/documents are anonymised and do not include

- Laboratory name, address or telephone number
- Clinician's/cytogeneticist's name/details

The importance of this is stressed in the Participants' Manual and in the EQA instructions; however, a few laboratories still uploaded reports/documents without prior anonymisation.

Scheme	Amniotic Fluid	Postnatal Blood	PGD	Haemato-oncology
Not anonymised	10	8	5	5

5. Assessment

CEQA sets out to examine the overall service provided to the patient, not just the analytical ability of the laboratory. If the laboratory itself does not routinely offer interpretive reports, it is expected that the Clinical Geneticist, or Clinical Haematologist making the final interpretation should be involved in the EQA submission. The following points were considered when marking the returns:

- The accuracy of the analysis;
- Whether appropriate cytogenetic tests were undertaken, including any additional studies necessary to make a thorough interpretation of the findings;
- The interpretation of the significance of the result in relation to the clinical summary given on the request card (in the case of PGD, whether or not the embryo should be transferred);
- The accuracy, clarity and clinical relevance of the report issued to the referring clinician, with reference to the European Cytogenetic Guidelines (www.biologia.uniba.it/eca/). The European Society of Human Reproduction of Embryology (ESHRE) guidelines are currently being revised.

Scoring System for 2009

Constitutional

Each case has a maximum of 9 points available. Points or half points are deducted where the assessors identify omissions or inaccuracies. Detailed scoring criteria will in future be published on the website.

Cost of analysis

The CEQA website is able to calculate a cost based on the number of tests selected/viewed. Therefore, it is possible to draw attention to inappropriate testing and inefficient use of laboratory time.

Cost allocation

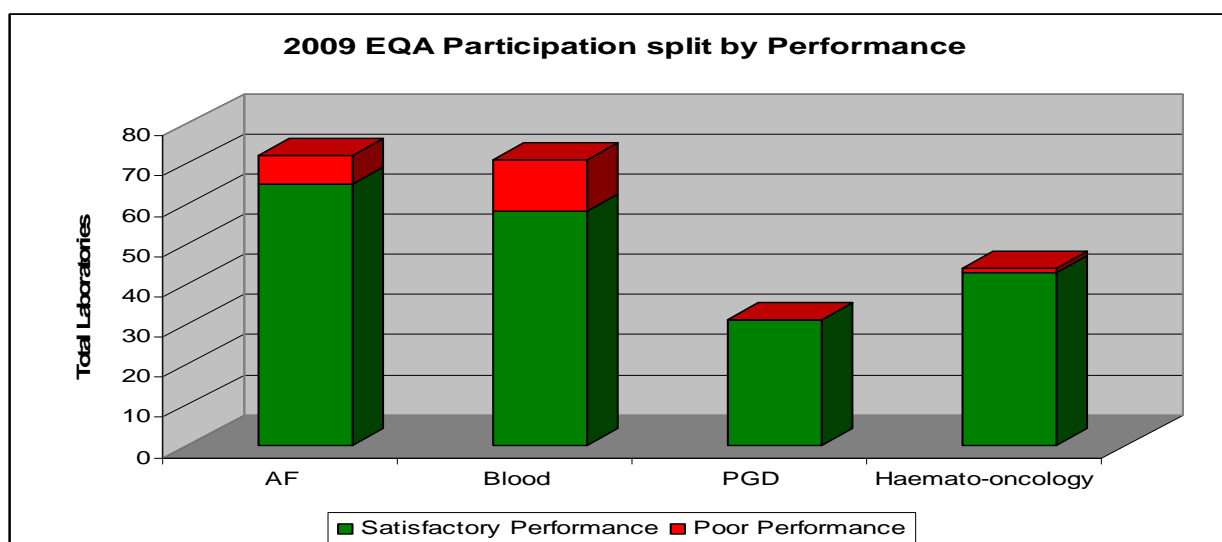
Sample/technique	Website Cost	Comments
Blood Analysis	10	
Amniotic Fluid Analysis	13	
CVS Analysis	14	
CVS +direct Analysis	21	
Solid Tissue Analysis	14	
Haematology Analysis	25	
Tumour Analysis	30	
Simple FISH	7	Microdeletion, wcp
Intermediate FISH	30	Octochrome, PGS
Complex FISH	50	Telomere screening, M-FISH
Aneuploidy screening (FISH)	11	
Breakage syndromes	15	
MLPA for telomeres	50	
QF-PCR/MLPA (aneuploidy)	13	

Participants are encouraged to assess their laboratory's efficiency by comparison of their own usage of tests against the data histograms provided in the summary letters distributed together with the ILRs.

6. Performance

There are only two categories of performance in any EQA: **satisfactory** and **poor**. Satisfactory performance is defined as the standard which should be achieved by all laboratories. The assessors and Steering Committee were pleased to see the majority of participants demonstrating a competent approach to the EQAs, and many laboratories achieved high marks in their submissions (see figure below).

A **critical error**, defined as an error or omission that would have significant disadvantageous clinical consequences for the patient, automatically incurs a poor performance. Any critical error is given a zero score in the relevant category in which the error occurred, and in some instances leads to zero or low scores in other categories: for example, it is not possible to give a score for interpretive accuracy if the abnormality was not detected in the first place.



Registration, participation and performance certificates can be downloaded from the CEQA website for 2009. (Refer to the CEQA User Manual).

7. Appeals

In some case a participant may disagree with the EQA assessment and appeal against penalties or comments made by the assessors. There were 15 appeals: 2 for Amniotic Fluid, 8 for Postnatal Blood, 3 for Haemato-Oncology, 1 for PGD and 1 for Microarray/ArrayCGH. One appeal (Microarray/ArrayCGH) was due to a clerical error that was corrected. Of the remaining 14 appeals, 4 were upheld, 3 were partially upheld and 7 were not upheld by the Steering Committee (see Appendix B). Laboratories were informed of the outcome of their appeal.

8. Changes to the Scheme for 2010

Following consultation with the participants CEQA will introduce a CVS Pilot in 2010. The Pre-implantation Genetic Diagnosis EQA in 2010 will offer a Blastomere EQA and a Polar Body Pilot EQA. The Microarray/ArrayCGH Pilot (run in collaboration with EMQN) will be available for up to 60 participants in 2010.

The Scheme is applying for accreditation against ISO 17043 with UKAS.

9. Scheme Finances

Until June of 2010 CEQA is supported financially through EuroGentest (*European Network of Excellence, Sixth Framework Programme Priority FP6-512148*). CEQA is a not for profit organization and therefore, the fee structure agreed for 2010 was dependant on the level of participation in 2009.

10. Participants meeting at ECA

The Participants' Meeting for 2010 will be held on Sunday, 13th June during the ESHG Conference in Gothenburg, Room F6. There will be a review of the EQA cases from 2009, review of participants' feedback and an opportunity to discuss any issues you may have and to ask questions about CEQA.

Appendix A

CEQA Scheme Office

Scheme Co-ordinator: **Dr Ros Hastings**
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 E-mail: ros.hastings@orh.nhs.uk

Quality Manager: **Mrs Bettina Quellhorst-Pawley**
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 OX3 9DU
 UK

CEQA Assessors

Surname	First Name	Country	EQA
Doco	Martine	France	AF
Faas	Brigitte	Holland	AF
Held	Karsten	Germany	AF
Ramos	Carmen	Spain	AF
Bartsch	Oliver	Germany	Blood
Florida	Giovanna	Italy	Blood
Howell	Rod	UK	Blood
Rodriguez de Alba	Marta	Spain	Blood
Simola	Kalle	Finland	Blood
Slunga-Tallberg	Anna	Finland	Blood

Surname	First Name	Country	EQA
Vermeersch	Joris	Belgium	Microarray
Dastugue	Nicole	France	Haem
Howell	Rod	UK	Haem
Radford Weis	Isabelle	France	Haem
Siebert	Reiner	Germany	Haem
Sole	Francesc	Spain	Haem
Zemanova	Zuzana	Czech Rep	Haem
Coonen	Edith	Holland	PGD Blast
Harper	Joyce	UK	PGD Blast
Scriven	Paul	UK	PGD Blast

The Scheme Co-ordinator is involved in all the assessments.

CEQA Steering Committee

The Steering Committee		
Assessor	Location	Role
Nicole Dastugue	Toulouse	Oncology Expert
Brigitte Faas	Nijmegen	Constitutional Expert
Joyce Harper	London	Preimplantation Genetic Diagnosis Expert
Ros Hastings	Oxford	CEQA Scheme Co-ordinator
Karsten Held	Hamburg	Constitutional Expert
Rod Howell	Oxford	Constitutional Expert
Marta Rodriguez de Alba	Madrid	CEQA Deputy Scheme Co-ordinator
Bettina Quellhorst-Pawley	Oxford	Secretary
Kalle Simola	Tampere	Clinical Geneticist
Francesc Sole Ristol	Barcelona	Oncology Expert
Joris Vermeesch	Leuven	Microarray Expert
Zuzana Zemanova	Prague	Oncology Expert

Appendix B

Fig 1 Appeals by EQA and outcome

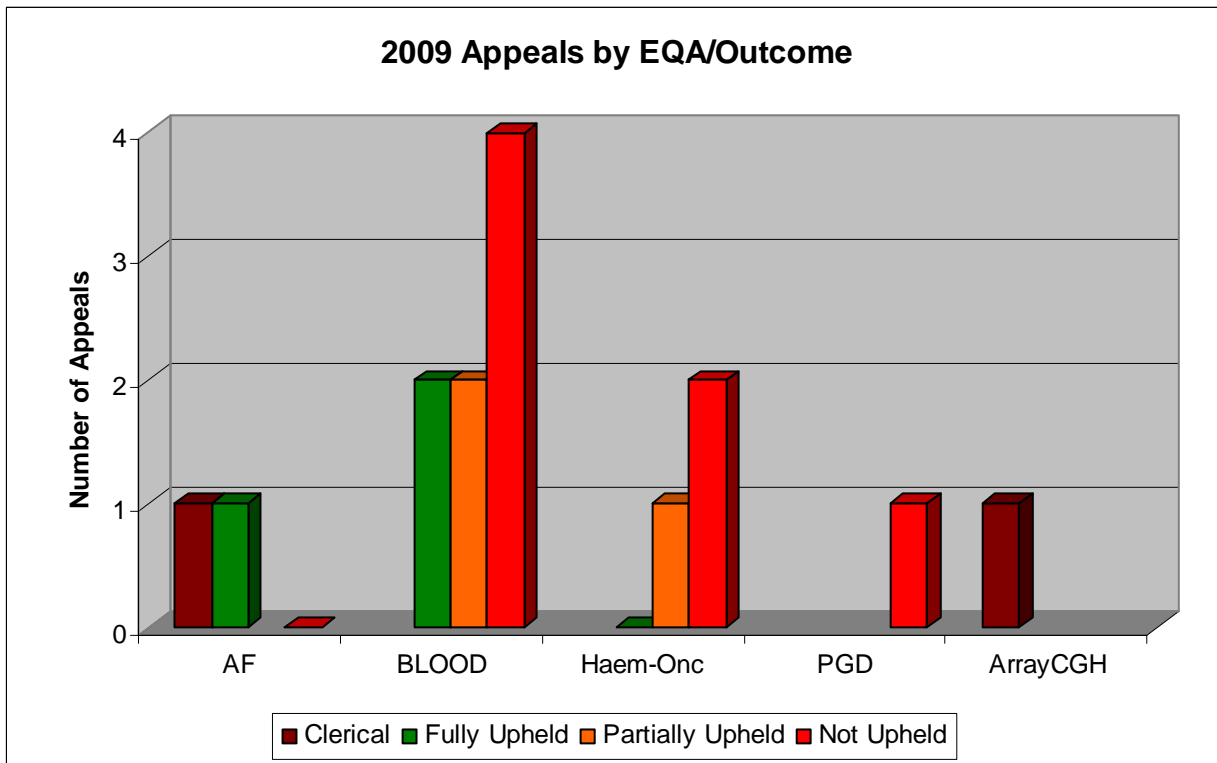
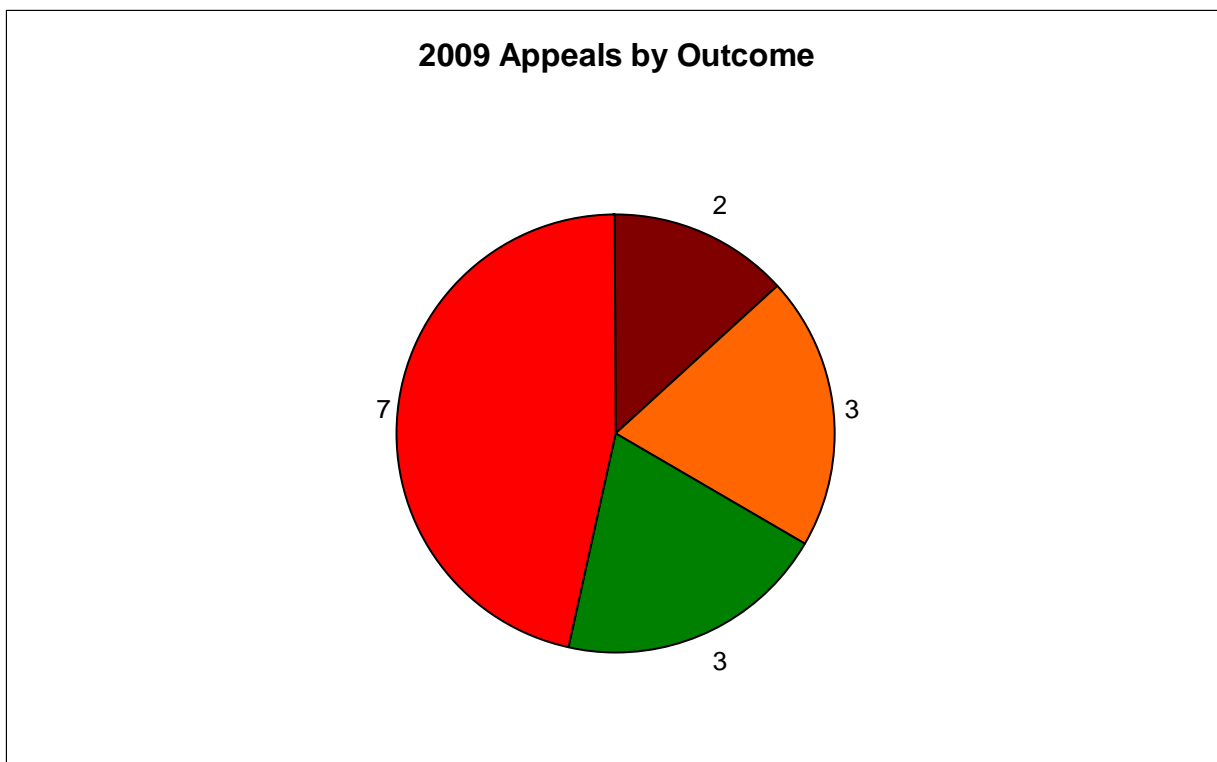


Fig 2 Overall outcome for all appeals



Key Fig 2 same as Fig 1