

## External Quality Assurance Programme for Newborn Screening of Glucose-6-Phosphate Dehydrogenase Deficiency

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### Abstract

**Introduction:** The nationwide neonatal screening for glucose-6-phosphate dehydrogenase (G6PD) deficiency in Taiwan was started on 1 July 1987. A network of G6PD referral hospitals distributed all around Taiwan was organised for follow-up, confirmatory testing, medical care and genetic counselling. To assess the reliability of confirmatory and screening tests, an external quality assurance (QA) programme for G6PD assay was developed. **Materials and Methods:** Lyophilised quality control (QC) materials and dried blood spots were prepared from erythrocytes and whole blood for confirmatory and screening tests, respectively. The external QA surveys were carried out every 1 to 2 months. The QA results were evaluated and compared to the consensus result and reference value. The test results were submitted through internet by participating laboratories and the summary reports were published on a webpage (<http://www.g6pd.tw>) within 2 weeks. **Results:** Twenty-one referral laboratories in Taiwan and 16 screening laboratories in Germany, Lebanon, Mainland China, Philippines, Thailand, Taiwan, Turkey, and Vietnam have been participating in the QA programme. From 1988 to 2007, 144 QA surveys for confirmatory testing were sent to referral laboratories. Among the 2,622 reports received, 292 (11.1%) were found to be abnormal. Interlaboratory coefficient of variation (CV) for the confirmatory test has reached below 10% in recent years. The significant improvement in interlaboratory CV was found to be correlated with the preventive site visits to the referral laboratories since November 2004. From 1999 to 2007, 52 external QA surveys for the screening test were performed. Among 504 reports received, 97 (19.2%) were found to be abnormal. From the 5040 blood spots tested by the screening laboratories, 95 false negative (1.9%) and 187 false positive (3.7%) results were reported. **Conclusions:** The external QA programme has been useful for monitoring the performance of the referral hospitals and screening laboratories and helpful for the participating laboratories to improve their test quality.

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**Key words:** External Quality Assurance, Glucose-6-Phosphate Dehydrogenase, Newborn Screening