The viability of drugs in oral fluid as a proficiency testing scheme

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Introduction
Oral fluid is a quick and non-invasive matrix choice for drug testing and as a consequence there has been an increasing need for the provision of a proficiency testing scheme. We will look at the mechanism by which drugs get into oral fluid, the advantages and disadvantages of this as a matrix and the progress of the oral fluid proficiency testing (PT) scheme over the last five years.

How do drugs get into the oral fluid?
The salivary glands are highly perfused (rapid transference of drugs from the capillaries into the oral fluid). Since Oral Fluid is slightly acidic, basic drugs tend to partition more since they are more soluble than acidic drugs. There may also be residual drug present in the Oral Fluid from drugs taken (chewing, smoking, snorting etc).

Advantages and disadvantages of drug testing of oral fluid
The main advantages are that it is a completely non-invasive procedure of collection, unlike traditional matrices such as blood, and can be performed in almost any location. Sample collection is also easily directly observed, therefore adulteration and substitution that can often occur with urine samples is much more difficult. The main disadvantage is the low volume of the sample; potentially limiting the amount of additional analysis that can be performed. In addition, the reproducibility of oral fluid sample collection volumes and the recovery of drugs from the collection device may impact on analytical results.

Scheme
The LGC drugs in oral fluid scheme (DOF) covers the main drugs of abuse including screening groups and individual drugs. New psychoactive substances (NPS) e.g. Mephedrone are included to reflect current trends.

The number of laboratories that participate in the scheme has shown a steady increase since 2009. This reflects the increase in the use of oral fluid as a viable matrix for drug testing.

Results
The results in Figure 2 show the consistently satisfactory performance scores for four commonly analysed drugs; Morphine, Amfetamine, Methadone and Dizazepam.

Table 3 shows that although both samples produced false negative results using CEDIA (Cloned Enzyme Donor Immunoassay) for Amfetamine, the adulterated sample showed significantly more false positive results. These findings suggest a substance in the mouthwash is cross-reacting with the CEDIA method leading to false-positive results

Summary / Conclusion
A drugs in oral fluid PT scheme is becoming increasingly more valuable as the prevalence of oral fluid as an alternative matrix increases. This is reflected in the increase in laboratories within the scheme and the increasing use for which this type of analysis can be undertaken. The use of natural non-stimulated human oral fluid, rather than synthetic or stimulated more accurately reflects real life samples. The results successfully show the need to reflect common drugs trends whilst still covering more ‘traditional’ drugs of abuse.