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INTRODUCTION: The scope of the three Forensic Chemistry Laboratories of the National Department of Health in South Africa (Pretoria, Cape Town and Johannesburg) has changed greatly since the opening up of the country to the international community.

There have been no national statistics over the period and the pattern of drug abuse has not been monitored analytically. The only data available emanated from record of seizures of drugs by police and customs officials. There were major differences between the procedures used in the three laboratories, since each had run as a discrete entity. In particular, sample preparation methods varied, with SOXlet extraction being used in Cape Town, liquid-liquid extraction in Johannesburg and solid phase extraction in Pretoria. The chromatographic methods employed by all three laboratories included GLC with FID/NPD and MS detection and liquid chromatography with photo diode array and MS detectors.

METHODS: Since the laboratories were not computerized during the period of study, data was gathered by manually searching the records from the Pretoria, Johannesburg and Cape Town Laboratories and capturing the information in Excel. Since some records were in Afrikaans, considerable effort was required to convert the data into a searchable database.

The database consisted of all samples submitted to the three forensic chemistry laboratories for toxicological analysis in fatal cases over the period 1994-2004. Cases in which a drug of abuse (excluding cannabis) was detected were extracted and analysed in detail. The presence of an abused drug did not necessarily indicate that the drug(s) was/were the direct cause of death. Total numbers of cases positive for each of the major drug groupings were compared on an annual basis and trends expressed graphically.

RESULTS: A total of approximately 40 000 records were searched. The majority of these were from white patients in the first five years, with increasing numbers of black patients specimens being submitted since 1997. Of these, drugs of abuse were detected in 20% of cases. It was observed that in all three laboratories, findings for the presence of drugs of abuse had changed over the period from one that was specific to South Africa, where locally produced drugs such as methaqualone and cyclizine were most commonly found, to one that more reflects the pattern in developed nations, where cocaine, heroin and synthetic amphetamines predominate. There was a sharp change in the pattern over the period 1998-2000. The pattern now appears to have stabilized, although the laboratory data does not yet reflect the media reports of large amounts of methyl amphetamine being used in the Cape Town area.

DISCUSSION: It is unfortunate that a country like South Africa, which has had sophisticated analytical techniques available for many years, does not to date have any published data for abuse of drugs obtained by analysis. There is no national screening for drugs of abuse in drivers or other sub-groups of the population. The only available analytical results emanate from the specimens submitted to the Forensic Chemistry Laboratories. The data reported here provides the only baseline, albeit with flaws due to the lack of standardization of methods, against which to measure future trends.

CONCLUSION: Standardized methods are now being introduced into all three laboratories and the LIMS system, implemented in the Pretoria Laboratory at the beginning of 2006 is being upgraded and installed in Johannesburg and Cape Town. This should lead to the ability to produce standardized national statistics from 2006.

KEYWORDS: *Forensic chemistry, Statistics, Poisonings, Trend, Drugs, LIMS*

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