20 Years proficiency testing GTFCh

Georg Schmitt[1], Gisela Skopp[2], Michael Herbold[3]

[1]Institute of Legal and Traffic Medicine, University Hospital, Heidelberg,
[2]Forensic Toxicological Centre (FTC), München,
[3]ARVECON GmbH, Walldorf

Aim: Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards. **Methods:** Proficiency tests are part of the internationally accepted accreditation procedure for forensic laboratories according to DIN EN ISO 17025. The GTFCh is the organizer of proficiency tests for forensic purposes. Technical and organizational tasks are regulated by the ARVECON GmbH. **Results and Discussion:** In 1994, the Federal Goverment introduced a draft bill amending §24a of the StVG (Road Traffic Act) under which the driving of motor vehicles under the acute influence of narcotics was to be punished as an administrative offence. Tetrahydrocannabinol, morphine and benzoylecgonine were listed as drugs to be tested for. Additionally tetrahydrocannabinolcarboxylic acid, cocaine and amphetamine were included in the tests. The GTFCh authorised the Institute of Legal and Traffic Medicine of the University Heidel-berg to organise the proficiency tests. Until the end of 1996 four tests for drugs in serum were realised. In 1998 the results were published in a report of the BASt (Federal Highway Research Institute). After this the proficiency testing scheme was continued by order of the GTFCh and continuously expanded. In the following 20 years 24 further proficiency tests were included in the scheme and the number of tests was expanded of 2 in 1995 to 76 in 2017. In that period the number of participations increased from 160 in 1996 to 3500 in 2016. Until 2016 laboratories of 34 countries have participated in the proficiency tests. **Conclusion:** The implementation of the proficiency tests for forensic analyses in Germany led to the increased introduction and application of reliable methods.

1. Introduction

Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards. Proficiency tests are part of the internationally accepted accreditation procedure for forensic laboratories according to DIN EN ISO 17025 [1].

2. Methods

The GTFCh is the organizer of proficiency tests for forensic purposes. Technical and organizational tasks are regulated by the ARVECON GmbH. Forensic laboratories must ensure that their results are accurate and that they comply with generally accepted quality standards [2, 3].

3. Results and Discussion

In 1994, the Federal Government introduced a draft bill amending section §24a of the StVG (Road Traffic Act). Accordingly, driving of motor vehicles under the acute influence of narcotics is to be punished with a fine and a license suspension. Initially, tetrahydrocannabinol, morphine and cocaine had been included as drugs to be tested. The aim of the interlabo-

ratory test was to prove that an adequate number of laboratories in Germany were able to perform the analyses with sufficient accuracy and precision.

The GTFCh authorized the Institute of Legal and Traffic Medicine, Heidelberg, to organize the tests. Until the end of 1996, four drug tests in serum were realized. At the beginning of the proficiency test program, the participants came exclusively from the members of the GTFCh. Over the years, the number of participants has grown steadily from within Europe and subsequently from outside Europe. In 1998, the results were published in a BASt report (Federal Highway Research Institute, Bergisch Gladbach) [4]. Then, the proficiency-testing scheme was continued by the GTFCh and continuously expanded (Fig.1).

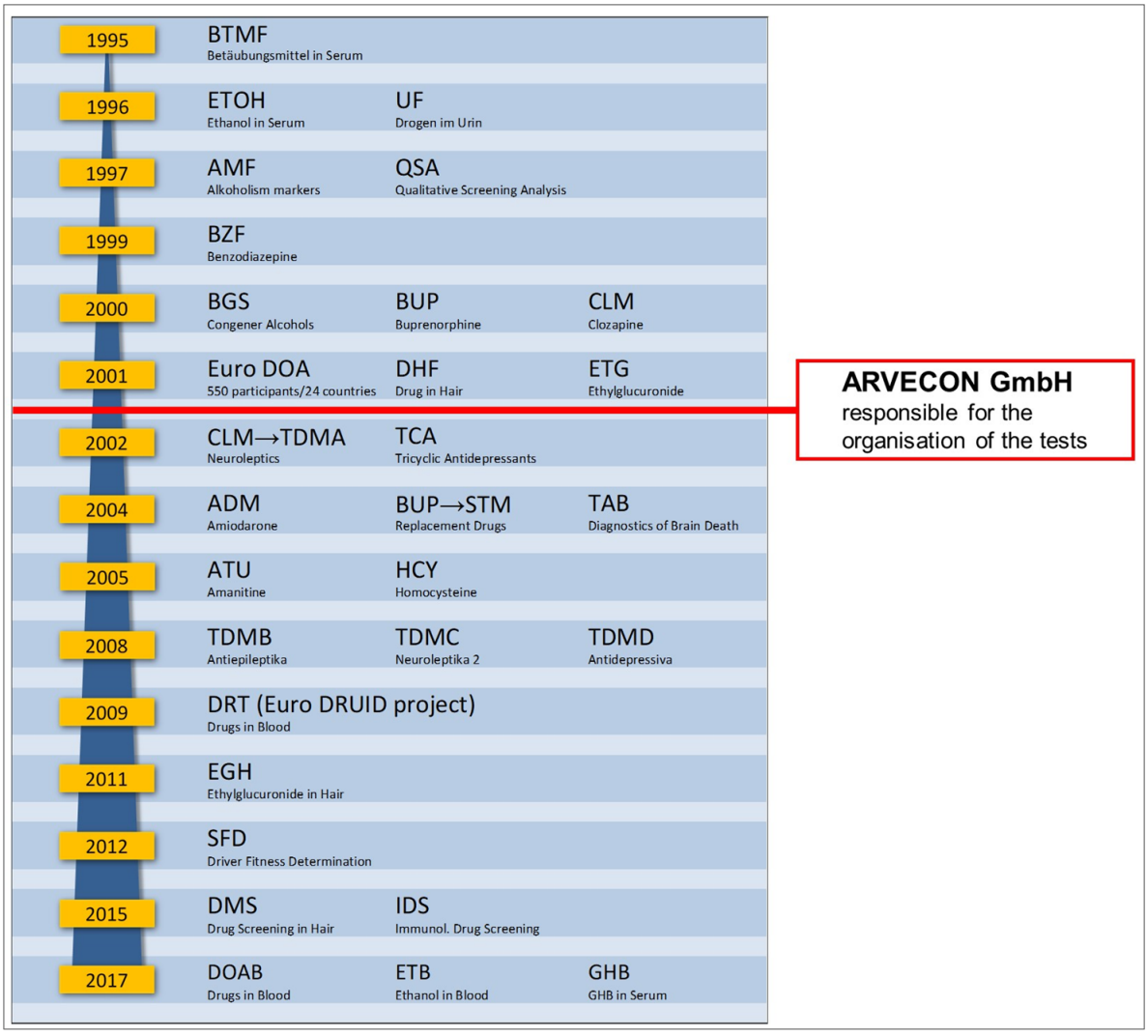

Fig. 1. Time course from 1995 until 2017.

In the following 20 years, 24 further proficiency tests were included and the number of tests was expanded from 2 in 1995 to 76 in 2017 (Fig.2). In that period, the number of participations increased from 160 in 1996 to 3500 in 2016 (Fig.3).

Origin of participants

Until 2016, laboratories of 34 countries have participated in the proficiency tests covering forensic and clinical toxicology as well as therapeutic drug monitoring (Fig.4). Primarily proficiency tests are an instrument for external quality assurance, but the remaining sample material of the tests is also useful for internal quality assurance.

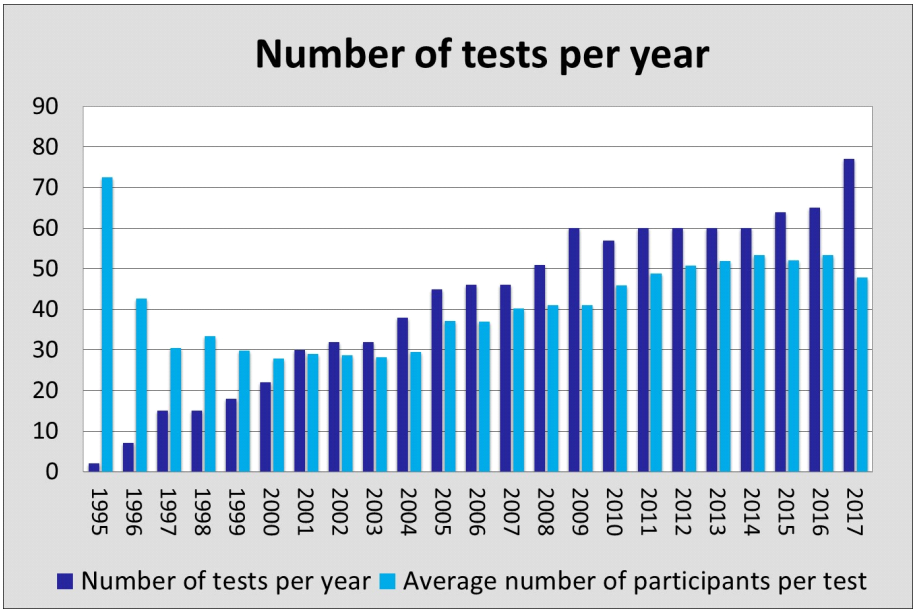

Fig. 2. Number of proficiency tests from 1995 until 2017.

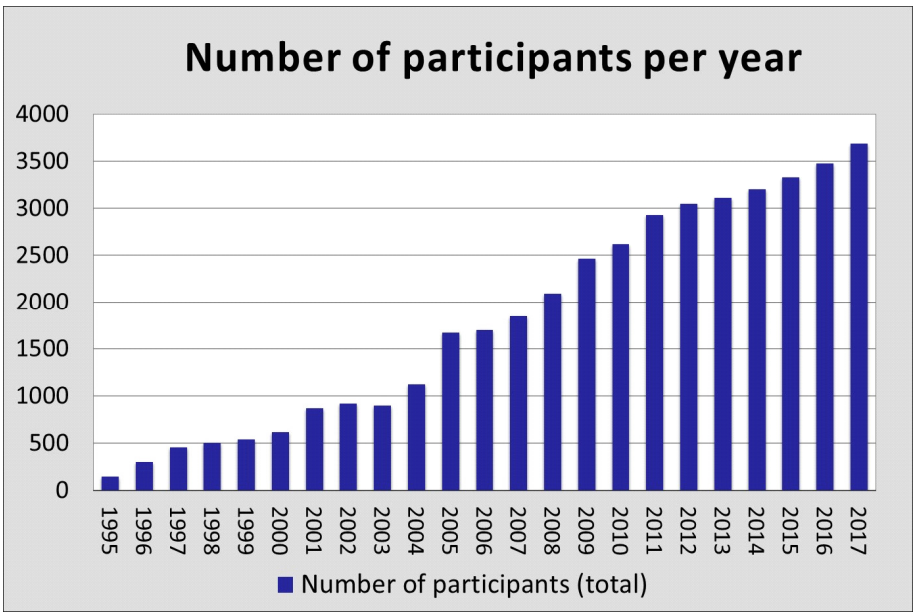

Fig. 3. Number of participants 1995 until 2017.

At the beginning of the proficiency test program the participants came exclusively from the members of the GTFCh. Over the years, the number of participants has grown steadily from within Europe and subsequently from outside Europe.

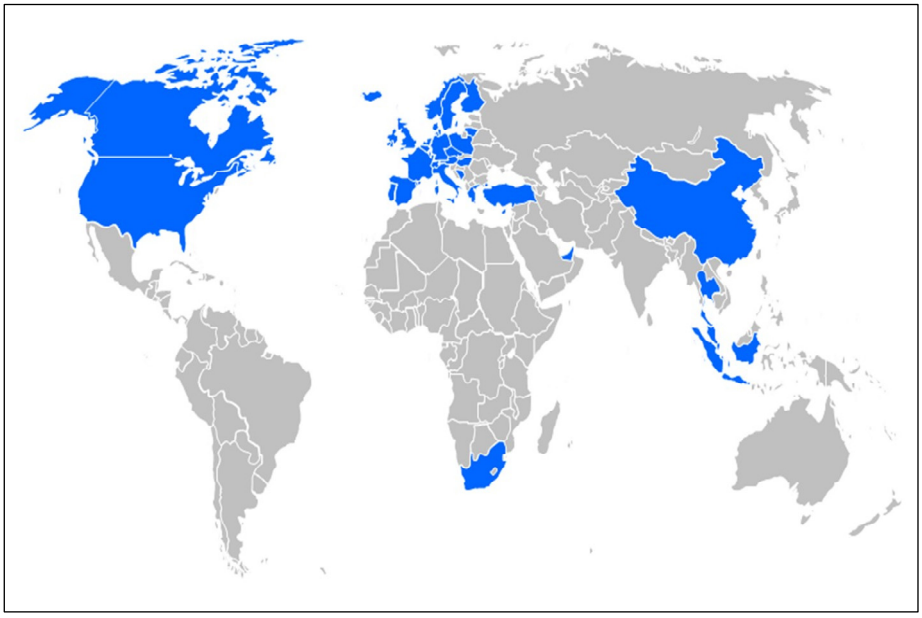

Fig. 4. Origin of participants.

Country	N	Country	N
Germany	317	Poland	14
Italy	249	Hungary, The Netherlands, Turkey	6
Switzerland	31	Denmark, Portugal, Spain	5
Belgium	26	China	4
Austria	24	Canada, Norway, Sweden, UAE	3
France	22	Finland, Ireland, South Africa, Thailand	2
USA	19	Cyprus, Greece, Iceland, Liechtenstein,	1
Czech Republic	18	Lithuania, Luxembourg, Malaysia,	
UK	16	Singapore, Bosnia Herzegovina	

Fig. 5. List of all countries with their total number (N).

4. Conclusion

The implementation of the proficiency tests for forensic analyses in Germany led to the introduction and application of reliable methods. Quality-assured toxicological analyses constitute an essential aspect allowing subjects to be treated equally in law.

5. References

[1] DIN EN ISO/IEC 17025:2005, General requirements for the competence of testing and calibration laboratories.
[2] DIN ISO 13528:2005, Statistische Verfahren für Eignungsprüfungen durch Ringversuche, Anhang C: 104-105.
[3] Thompson M., Wood R. International Harmonized Protocol for Proficiency Testing of Analytical Laboratories. IUPAC: Journal of AOAC International, Vol. 76, No. 4, 1993.
[4] Quantitative Analysen von Betäubungsmitteln im Blut (R. Aderjan, M. Herbold: Berichte der Bundesanstalt für Straßenwesen, Verlag für neue Wissenschaft, Bremerhaven 1998, Heft M 87).