On the Right Track

To a New Forecasting model for forensic products within the criminal justice chain

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Summary

Each year the Research and Documentation Centre (WODC) of the Ministry of Justice and Security updates the so-called forecasting model PMJ that is used for the estimations concerning the need for products within the criminal justice chain. These estimations are also to substantiate the budget of the Ministry of Justice and Security. The current model does not work well for forensic products. The aim of this research has been to explore factors that determine the annual requirement for a number of important forensic products. The results of this research can be used to adapt the forecasting model PMJ in a follow-up phase.

During the research several relevant factors have been identified by means of literature research, face-to-face interviews, two expert meetings as well as a statistical analysis of saved traces at the National Police. Furthermore, ways were searched to operationalize these factors into measurable variables.

The forensic playground
The National Police, the Public Prosecutor Service and the National Forensic Institute (NFI) are the main actors regarding forensic investigation. To search and secure traces is usually a police activity. The forensic analysis is partly done by police personnel and is partly outsourced to the NFI. With the help of the Service Level Agreement (SLA), demand (police and Public Prosecutor Service) and supply (NFI) – within the budgetary limits – are matched as good as possible. In addition to the NFI, there are also other external parties that deliver forensic products. The financing of external forensic analysis, other than by NFI, is arranged through an One-Stop-Shop.

Two expert meetings
Two expert meetings were organized with eight to ten representatives of the National Police, the Public Prosecutor Service, the National Forensic Institute, Criminal Courts and academic and private research institutes. During these two meetings the focus was on three themes, namely: DNA, Illicit Drugs and Digital devices. Topic of discussion was the ‘real need’ for forensic analysis, followed by the question which factors influence this need.

Secured traces at the police
All secured traces are registered in the police system (BVH) by an unique SIN-number. The datafile contains 201,253 SIN-numbers, secured in 2016. In theft and burglary cases three to four traces are secured on average, whereas in the case of illicit trade (weapons / narcotics) this average increases to five to seven traces. By far the most traces are secured in murder and manslaughter cases; 22 on average. On average, most traces are secured in murder and manslaughter cases, but this category

only accounts for 9.3 percent of all secured traces. Theft and domestic burglary account for 27.4 percent of all secured traces followed by illicit drug trafficking (16.0 percent).

Ingredients of the forecasting model PMJ

For the model, we searched for forensic products that can be counted. In addition, comparable products are placed within the same product group. For these reasons the forecasting model does not include all forensic products. The products included in the model account for most forensic products measured in numbers. In terms of time investment (hours), the products included in the model represent still a substantial part of forensic investigation, but a considerable part of the forensic work is not included in the proposed model.

Figure R1 Overview of products that are included / not included in the forecasting model

Forensic products *included* in the model	**Forensic products *not* included in the model**
Human traces	Scratch and shape traces
Reference material	Other digital investigation
Alcohol and illicit drugs	Other forensic products
Digital devices	

In the forecasting model forensic products of the police as well as the NFI are included.

Figure R2 Overview of forensic products of the police and the NFI

	Police	**NFI**
Human traces	• Analysis of fingerprints • DNA-preliminary analysis	• Analysis of fingerprints • DNA-research (minus reference material
Reference material		• DNA-analysis reference material convicts
Alcohol and illicit drugs	• Breath analysis • Illicit drugs analysis	• Toxicological analysis • Illicit drugs analysis
Digital traces	• Analysis of digital devices	• Analysis of digital devices

In the current model, selected forms of registered crime are seen as factors that affect the number of forensic products. This is a logical choice: Forensic analysis to support criminal investigation is the result of criminal acts. For Alcohol and illicit drugs products, the relationship with the registered crime rate is expected to be linear. In fact, this concerns the enforcement efforts of the police. In the Human and Digital Tracks product groups, the relationship with the extent of registered criminality is more diffuse due to technical developments (more human traces may be secured) and the digitization of society (more digital devices available). For the Reference Material product group, the number of convicted persons for a crime, for which pre-trial detention is permitted, is decisive.

The proposed forecasting model for forensic products is as follows:

Figure R3 Forecasting model forensic products