



Doorrekening van het centralisatie- scenario voor forensisch medisch onderzoek en lijkschouw

Rapport II voor de
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Summary

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Summary

This summary describes the results of the study *“Exploring a centralisation scenario for forensic clinical research and forensic post-mortems”*. This study is the sequel of the study *“Inventory of forensic clinical research and medical care for detainees”*. The main question concerns the feasibility of a centralised organisation model to guarantee high quality and sustainable forensic clinical research and post-mortems in the Netherlands. As medical care for detainees can be organised in other models, this forensic-medical service is excluded from this study.

Currently 22 municipal health service centres and four private companies provide forensic-medical services based in 26 locations dispersed over the country. They employ 242 forensic doctors who are called by the police to execute forensic clinical research and forensic post-mortems. The Dutch police is organised by one national police force comprising ten regional units (so called ‘police-regions’).

The centralisation scenario that is investigated and explored in this study is predefined by five conditions or key requirements:

1. All forensic doctors are contracted by one national and public organisation that organises the central delivery of forensic clinical research and forensic post-mortems across the Netherlands;
2. This ‘national’ organisation has a minimum number of base locations at which forensic doctors are standby to operate;
3. Each forensic doctor spends at least 16 hours per week on forensic clinical research and forensic post-mortems;
4. At any given time and each location, forensic doctors are constantly standby to operate 24/7, 7 days a week;
5. The travel time of forensic doctors to a forensic clinical research case or forensic post-mortem is as short as possible (preferably less than two hours).

Different models, methods and data sources are used for this study. Literature and desk research is performed to describe the current delivery and demand for forensic clinical research and forensic post-mortems in The Netherlands, and by police region. Triangulating different sources, it is estimated that 15,000 cases of forensic clinical research are yearly executed by forensic doctors in the Netherlands. The costs of this service are approximately 2,5 million euro per year. In a similar vein, it is estimated that a total of 16,000 post-mortems are conducted by forensic doctors per year, against annual costs of approximately 5 million euro per year. It is further described that the number of forensic clinical research cases has not changed much over the years and does not differ much between the ten police regions. The number of post-mortems however, has grown significantly over the past years. Specifically due to an increased number of euthanasia. All in all, it can be expected that the demand for forensic doctors to execute forensic clinical research and forensic post-mortems will keep growing in the Netherlands.

Meeting the five requirements of the potential centralisation scenario as listed above, two simulation models were developed.

The first simulation model was designed to calculate the optimal locations in the Netherlands to base the two forensic-medical services. This simulation model is based on the minimum, maximum and average travel times (by car) of forensic doctors to and from a forensic clinical research case or forensic post-mortem. Travel times are processed in the model assuming the most pessimistic day and time (i.e. the busiest day and time of the week as known from national traffic statistics, being Thursday afternoon 4 PM).

The simulation runs were executed to find the optimal locations within four location-combination option – selecting from the 26 locations that are already in place for providing forensic-clinical services. The model first calculated the optimal locations in the Netherlands aiming for a minimum number of locations, being a combination of two, three and four locations across the country. Secondly the model was ran for a combination of ten locations, in which each is located in one of the ten police regions. The optimal locations within each of the options were defined as the shortest travel time by car to every location within its service area, while reaching all Dutch inhabitants within a maximum driving time of two hours.

The second simulation model was developed to calculate the required number of forensic doctors to nationally and locally staff each of the optimal location-combinations on a permanent service basis. In addition, this model calculated the average share of time for each forensic doctor on duty between two cases, and their travel drive time to a case by car. The model was ran for the optimal two, three, four and ten location-combination as derived from the first simulation model. In addition, for each optimal location-combination the model was ran assuming that forensic doctors can be allocated for 16 hours per week on forensic clinical research and forensic post-mortems, and assuming they can be allocated for 24 hours per week to execute these forensic-medical services. The model took into account that forensic doctors can be allocated 42 weeks per year due to private and national holidays, sickness. This key result of the study is presented in Table 1.

Table 1: Results of the eight runs to simulate the consequences of a pre-defined centralisation scenario for forensic clinical research and forensic post-mortems in The Netherlands

	Total required number of forensic doctors per year	Total required number of forensic doctors at every location	Average share of time between two cases during duty (%)	Average travel time, one way (hours)
Two-location-combination (viz. Lelystad-Tilburg)				
Assuming forensic doctors can be allocated:				
16 hr/week	249	19	22,9	1,39
24 hr/week	166	19	22,9	1,39
Three-location-combination (viz. Zwolle-Haarlem-Tilburg)				
Assuming forensic doctors can be allocated:				
16 hr/week	237	18	27,7	1,15
24 hr/week	158	18	27,7	1,15
Four-location-combination (viz. Assen-Leiden-Venlo-Goes)				
Assuming forensic doctors can be allocated:				
16 hr/week	225	17	27,5	1,05
24 hr/week	150	17	27,5	1,05
Ten-location-combination (viz. Groningen-Nijmegen-Bussum-Alkmaar-Amsterdam-Den Haag-Rotterdam-Tilburg-Eindhoven-Geleen)				
Assuming forensic doctors can be allocated:				
16 hr/week	257	19	41,8	0,87
24 hr/week	171	19	41,8	0,87

The results demonstrate that it actually depends on the objectives what option fits best the centralisation scenario in its application.

If the objective is to minimise the number of locations than obviously the two location option (viz. Tilburg and Lelystad) is optimal, but it should be recognised that: (1) this requires 249 forensic doctors a year (if they are allocated 16 hours a week) or 166 (if they can be allocated 24 hours a week), (2) there will be slack or a share time of 23% during duties, and (3) the average driving time is 1.4 hours.

If the objective of centralisation scenario is to minimise the number of forensic doctors needed then the centralisation four location option (viz. Assen, Leiden, Venlo & Goes) is optimal. Allocating each of them for 24 hours per week requires 'only' 150 forensic doctors per year while (225 doctors are allocated 24 hours per week), the average share time is 28% and the average travel time 1.1 hour.

Another objective might be to minimise the average driving time. Then the ten location-combination option is obviously optimal with an average driving time of 0.87 hours. But it is clear that for this option a higher number forensic doctors is required (171 or 257) and the average share time between two calls during one duty is also significantly higher compared to the other options (42%).

Given that our previous study showed that the current 242 forensic doctors spent (on average) 16 hours per week on forensic clinical research and forensic post-mortems, we conclude that only the three and four location-combination options are feasible – in terms that they require less than 242 forensic doctors and the other consequences of these options are acceptable. It needs to be taken into account however, that the inflow of forensic doctors has been low for the last few years in The Netherlands. At the same time, a large number of the current workforce is expected to retire within a few years. If the inflow will not increase and compensate the outflow in the near future, none of the options of the centralisation scenario that were simulated will be feasible. This conclusion is obviously different if forensic doctor will (or: can, wish) increase their time spent on forensic clinical research and forensic post-mortems from 16 to 24 hours per week.

The answer to the main question of this study reads that a centralisation scenario that meets the preconditions is feasible, according to the constructed simulation models and given their assumptions. It is important to note however, that this study did not investigate the *practical* feasibility of a centralisation scenario i.e. the feasibility of its actual implementation. What can be concluded is that the further exploration and realisation of a centralisation scenario will take time, preparation and careful coordination concerning a large number of factors. These factors are not only related to capacity and staffing aspects such as the future in and outflow and working time of forensic doctors. Also several social and organisational aspects need to be taken into account, most importantly the attitude and willingness of the current workforce, their employers and other stakeholders to support the centralisation scenario.