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## A record linkage study on former police detainees who died in Amsterdam between 2013 and 2015

Daniël B. Smidt<sup>a,\*</sup>, Tina Dorn<sup>b</sup>, Udo J.L. Reijnders<sup>c</sup>

<sup>a</sup> Parnassia Groep, The Netherlands

<sup>b</sup> Amsterdam Public Health Service, Department of Epidemiology and Health Promotion, Amsterdam, The Netherlands

<sup>c</sup> Amsterdam Public Health Service, Department of Forensic Medicine, Amsterdam, The Netherlands

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### ABSTRACT

**Background:** Police detainees are known to have inferior health. This study identifies the number of former police detainees who received medical care among deaths examined by forensic physicians and presents their death characteristics.

**Methods:** We included all deaths that were examined by forensic physicians of the Public Health Service Amsterdam from 2013 to 2015. Patient files of subjects were scanned for the presence of a prior medical consultation in the police cell and death characteristics were collected from post-mortem examination reports. We performed statistical analyses to discover what characteristics at post-mortem examination were associated with a prior consultation in the police cell.

**Results:** We identified  $n = 2618$  subjects that met the inclusion criteria. Eight percent of subjects had one or more medical consultation(s) in the police cell in a mean follow up time of  $4.8 (\pm 3.0)$  years. No difference was found in the share of unnatural deaths between subjects with and without a prior consultation (68%), but distribution of death causes differed significantly. Male gender OR 2.3 ( $p < 0.001$ ), age OR 0.98 ( $p < 0.001$ ), unspecified unnatural death OR 1.8 ( $p = 0.002$ ), crime related death OR 2.2 ( $p = 0.012$ ) and accidental drowning and submerging death OR 4.6 ( $p < 0.001$ ) were independently associated with the presence of an earlier consultation in the police cell.

**Conclusion:** Our data suggest that a small percentage of police detainees seen by forensic physicians for provision of medical care are also examined after death by these physicians, typically young males who seem to display risk-taking and criminal behavior resulting in unnatural death.

### 1. Introduction

The health status of police detainees has been subject of international research in the past decade indicating high prevalence of psychiatric symptoms and substance use.<sup>1–6</sup> In Amsterdam, approximately half of all police detainees who had received medical care while in custody were diagnosed with psychological problems and a large share of prescribed medication in this setting was for treatment of addictive disorders.<sup>7</sup> Nearly 40% of Amsterdam police detainees submitted to screening qualified for a mental health care assessment.<sup>8</sup> Furthermore, up to one third of young violent offenders studied in Amsterdam were eligible for public mental health care.<sup>9</sup> Next to poor mental health, more chronic somatic conditions were seen among police detainees in Amsterdam when compared to the general population.<sup>10</sup>

Although there is a growing body of research on health issues in police detainees, studies on mortality in former police detainees are

absent to date. More extensive research on this subject has been done in prisoner populations. Prisoners, however, differ from police detainees because a large part of police detainees will not be sentenced to prison, but will be released following initial police contact. Moreover, in many countries, people with mental illness who are in need of psychiatric emergency care are temporarily brought to a police station, awaiting further assessment by mental healthcare professionals. Studies in prisoner populations, mostly executed in the US, have shown that prisoners alike police detainees, have significantly more health problems (psychiatric and somatic) when compared to the general population.<sup>11–13</sup> A Dutch review, largely based on Dutch studies confirms the higher prevalence of psychiatric and somatic complaints in (released) inmates.<sup>14</sup>

Studies that assess the risk of death in (released) prisoners compared to the general population are widely available.<sup>15–25</sup> A systematic review by Kinner, Forsyth and Williams of 29 record linkage studies on mortality in ex-prisoners revealed a pooled all-cause standardized mortality

\* Corresponding author.

E-mail address: [daniel.smidt@dijkenduin.nl](mailto:daniel.smidt@dijkenduin.nl) (D.B. Smidt).

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ratio (SMR) of 1.7 (95%CI 0.6–5.0) (25 studies). Pooled SMRs were 8.2 for suicide deaths (3 studies) and 8.4 for unnatural deaths (2 studies) in a mean follow up time varying from 12 weeks to 16.1 years. Follow up studies of 25–50 years in the Netherlands, Sweden and the USA in (ex) crime and/or violent offenders revealed comparable higher risks of death (1.6–2.0) when compared to the general population.<sup>15,18,20</sup> This risk increased further with recidivistic criminal offences and alcohol abuse.<sup>20</sup> Suicide deaths were more common among repeat violence offenders, violence offenders with a history of receiving psychiatric inpatient care and violence offenders with a history of substance abuse.<sup>20,26</sup>

As both prisoner and police detainee populations overlap, both populations might share comparable risk factors for ill-health and premature death. We performed the current study in order to shed more light on mortality in former police detainees to explore the possible role for forensic physician guided preventive interventions.

In this study we attempt to answer the following questions:

1. What percentage of all individuals examined post-mortem by forensic physicians of the Public Health Service Amsterdam have a history of receiving medical care in the police cell?
2. Do individuals examined post-mortem by forensic physicians with a history of receiving medical care in the police cell differ from individuals without such a history with regards to manner of death, cause of death, age, and gender as reported at the post-mortem examination?

## 2. Methods

### 2.1. Setting

In the Netherlands, forensic physicians provide medical care in the police cell. This care is comparable to the care provided by a general practitioner. The forensic physician needs to decide whether a detainee can stay in the cell from a medical point of view. If not, hospital referral or referrals to psychiatric emergency services will be organized by the forensic physician. Another major task of forensic physicians in the Netherlands is the external examination of all (potentially) unnatural deaths. If the forensic physician concludes an unnatural death, the case is discussed with the prosecutor who might order further police investigations and/or a medicolegal autopsy by a forensic pathologist.

### 2.2. Design

A retrospective cohort was identified by searching the electronic patient register of the forensic medical department of the PHS Amsterdam. This register contains records of all activities executed by forensic physicians of the department starting 01-01-2005. Record linkage was based on unique identifiers. Data sources that have been linked concern the module on medical care and the module on post-mortem examinations (both are two modules within the same database). All individuals who were examined post-mortem by forensic physicians between 01 and 01-2013 and 31-12-2015 were included as subjects to provide the most recent sample of post-mortem examinations executed by forensic physicians in the Amsterdam area. Only cases of physician-assisted death in this period were excluded. In the case of physician assisted death, the forensic physician monitors whether the physician who assisted in the death acted according to the procedures specified by Dutch law.

The outcome of interest was the presence of one or more prior care contacts in the police cell in the catchment area of the PHS Amsterdam between 01 and 01-2005 and the date of the post-mortem examination. This design resulted in different retrospective intervals for included subjects. A prior care contact was defined as the presence of at least one contact of care in the electronic patient file, besides the post-mortem examination itself and contacts on the same day of the post-mortem

examination or after death.

The following variables were automatically retrieved from the post-mortem examination reports of all subjects: Age at death, gender, manner of death, cause of death, reporting caller, and site of the body on examination. All data were anonymized and imported into the IBM SPSS statistics<sup>®</sup> program.

## 3. Statistical analysis

Statistical analyses were executed with the IBM SPSS Statistics<sup>®</sup> program. Comparative analyses were made to assess differences in findings at post-mortem examination between both groups. For categorical variables effect sizes were calculated as odds ratios. For age (continuous variable) the mean difference was calculated as effect size. Statistical tests were used to assess significance of differences found. For age, an independent sample's *t*-test was used. For categorical variables we used Pearson chi-squared tests. Assumptions for valid testing were confirmed before analyses.

Variables that differed significantly in the univariate analysis were assessed in a binary logistic regression model (enter method), with prior consultation (yes/no) as outcome variable. Effects sizes were calculated as odds ratio's.

## 4. Results

We identified 2650 post-mortem examination reports that met all criteria by using the electronic patient register to search for eligible subjects. We excluded 1575 cases of physician-assisted death. In our final analyses, we included 2618 reports. Reasons for exclusion were: the presence of a second post-mortem examination report on the same case or not being able to identify a full post-mortem examination report.

## 5. General characteristics

Mean age ( $\pm$  SD) at death of subjects was 63 ( $\pm$  21) years, but differed significantly ( $p < 0.001$ , *t*-test) between male 59 ( $\pm$  20) and female subjects 70 ( $\pm$  20) (data not shown). The majority of 2618 subjects was male (66%).

In 68% of all deaths referred to the forensic physician, the manner of death was confirmed as unnatural after the post-mortem examination. The most common cause of an unnatural death was a falling accident (23%), which showed an association with high age at death (mean age 82  $\pm$  13; data not shown). The majority of natural deaths examined by the forensic physician cannot be assigned a specific cause of death (44%) after the post-mortem examination.

Most deaths (53%) were signaled to the forensic physician by the police force. Deaths referred by the police were assigned an unnatural manner of death by the forensic physician in 55% of cases. Deaths referred by general practitioners were assigned an unnatural manner of death in 61% (data not shown).

## 6. Post-mortem examination findings of ex police detainees

Of 2618 individuals, 213 (8%) had one or more prior consultations in the police cell by a forensic physician before death. Age at death was lower in the group that received medical care in the police cell 50 ( $\pm$  14) with a mean difference of 14.5 (11.7–17.4) years ( $p < 0.001$ ) and subjects with a prior consultation were more often male when compared to subjects without prior history, OR 3.5 (2.4–5.3) ( $p < 0.001$ ).

No difference was found in overall manner of death between individuals with and without a prior consultation (68%). [Table 1](#) shows, however, that distribution of unnatural causes of death differed between both groups. A high incidence of accidental drowning and submerging deaths was found in the prior consultation population 5.2%

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