

## Use of health care and drugs by police officers 8.5. years after the air disaster in Amsterdam

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This study examined the use of health care by police officers after the air disaster in Amsterdam. On average 8.5 years post-disaster, involved police officers ( $n=834$ , who reported disaster-related tasks), and their non-involved colleagues ( $n=634$ ) completed questionnaires on disaster involvement and health care in the preceding 12 months. Logistic regression showed that involved police officers more often used drugs on their own initiative, sleeping pills or tranquillisers, and consulted a general practitioner or medical specialist, a paramedical specialist, and a privately practicing psychologist or psychiatrist. Thus, even after years, police officers involved in disaster work may use more self-initiated health care.

**Keywords:** disasters, medical care utilization, police, rescue workers

In 1992, a cargo aircraft crashed into a residential area of Amsterdam, which killed 43 people and destroyed 266 apartments. A troublesome aftermath followed, with rumours on potential toxic exposures and health consequences.<sup>1–3</sup> Health concerns remained even though no excess morbidity was predicted in retrospective risk evaluations.<sup>1–3</sup>

Despite potential post-disaster mortality and morbidity, only few population-based observational studies addressed the impact of disasters on health care utilization. These showed an increased use of mental health services after 1 to 4 years,<sup>4,5</sup> of medical services after 6.5 years,<sup>6</sup> and of sedatives after 18 months.<sup>7</sup>

Besides those directly affected, involved rescue workers may need more health care. After a fireworks storage explosion in a residential area of the Dutch city of Enschede, for example, an elevated use of occupational health services for psychological, musculoskeletal and respiratory problems was found up to 2 years among rescue workers,<sup>8</sup> and of mental health care after 3 years among volunteer firefighters.<sup>9</sup> The present study aimed to examine the impact of the air disaster in Amsterdam on the utilization of health care by police officers, on average 8.5 years post-disaster.

### Methods

This study is part of the Epidemiological Study Air Disaster in Amsterdam.<sup>3</sup> The study population consists of the historic cohort of police officers who were employed at the

Amsterdam–Amstelland police force at the time of the disaster and at the start of the study. Data-collection by means of questionnaires took place between January 2000 and March 2002, i.e. on average 8.5 years post-disaster. The cohort was split into an occupationally involved group (who reported disaster-related tasks in a questionnaire) and a non-involved but otherwise comparable reference group (who did not report such tasks).

Another questionnaire assessed the utilization (yes versus no) in the preceding 12 months both of health care (i.e. general practitioner/medical specialist, paramedical specialist, hospitalization, and privately practicing psychologist or psychiatrist), and of drugs (i.e. any prescribed drugs; any drugs on own initiative; sleeping pills or tranquillisers). The following background characteristics were also assessed: age, sex, cigarette smoking and alcohol consumption, level of education, ethnicity and executive function.<sup>3</sup>

Logistic regression models with and without adjustment for the earlier mentioned background characteristics were used to compare involved to non-involved police officers. The analyses were performed with SPSS (version 10.1) and two-sided  $P$ -values  $<0.05$  were regarded as statistically significant.

### Results

#### *Response and population characteristics*

The historic cohort consisted of 2116 police officers. Almost all of them (99.8%) could be traced and invited to participate, which  $n=1489$  of them did (71%). Subsequently, 21 subjects were excluded from the statistical analyses, because they lived in the disaster area ( $n=18$ ), or had missing data on disaster-related tasks ( $n=2$ ) or the other questionnaires ( $n=1$ ). Thus, 1468 police officers were included in the statistical analysis, of which 57% were occupationally involved. The most prevalent tasks reported by the involved police officers were security and surveillance of the disaster area (79%), ‘other tasks’ (38%) such as traffic and communication management, support injured victims and workers (24%), rescue people (16%), identification and recovery of or search for victims and human remains (8%), transport of the wreckage (7%), and clean-up of the disaster area (5%). In addition, 75% of the involved police officers reported to have witnessed the immediate disaster scene, 6% reported that a close one of theirs was affected by

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the disaster and 0.4% reported personal injuries due to the disaster.

Involved and non-involved police officers were previously shown to be comparable regarding the background characteristics, although there were two small significant differences, i.e. a lower proportion of females (12% versus 15%) and former cigarette smokers (32% versus 38%) among involved compared to non-involved police officers, respectively.<sup>10</sup>

### Health care and drug utilization

Complete data on health care and drug utilization was provided by 98.3% of the police officers. The adjusted logistic regression analysis showed that involved police officers used health care more often (table 1), which was statistically significant for all items, except for hospitalization ( $P=0.097$ ). The self-initiated use of drugs (as opposed to the prescribed use) and of sleeping pills or tranquillisers was also reported more often by involved police officers (adjusted  $P=0.001$  and  $0.051$ , respectively) (table 1).

## Discussion

This study among police officers examined the impact of the air disaster in Amsterdam on the use of health care and drugs 8.5 years post-disaster. Compared to their non-involved colleagues, involved police officers reported significantly more often to have had consultations (i.e. with a general practitioner or medical specialist, a paramedical specialist, and a privately practicing psychologist or psychiatrist), and to have used drugs on their own initiative, and sleeping pills or tranquillisers. The elevated use seemed to be limited to self-initiated consumption, as the hospitalization rate and prescribed use of drugs were not significantly elevated. The

finding of higher health care utilization is consistent with previous population-based studies among rescue workers and volunteer firefighters<sup>8,9</sup> and survivors of disasters.<sup>4-7</sup>

One possible explanation for the increased health care and drug utilization by involved police officers might be long-term disaster-related morbidity. Elevated rates of self-reported physical and psychological symptoms among the involved police officers were previously reported.<sup>10,11</sup> Furthermore, 41% of the involved police officers with physical or psychological health complaints attributed these to the air disaster in Amsterdam, including its aftermath. The present study indicates that the involved police officers not only had more symptoms, but that they also more often consulted a clinician or psychologist and used drugs and sleeping pills or tranquillisers on their own initiative.

The higher rates of long-term health complaints among the involved police officers might theoretically be related to disaster-related injuries, post-traumatic stress symptoms and noxious exposures. However, only 0.4% of the involved police officers reported personal injuries due to the disaster. Also, 8.5 years post-disaster, only 2.4% of the involved police officers reported a high level of post-traumatic stress symptoms in relation to this disaster.<sup>12</sup> Furthermore, no evidence was previously found for disaster-related pathological processes.<sup>10,11</sup>

In addition to noxious exposures, perceived exposure to hazardous materials has been linked to increased symptom reports and health care utilization.<sup>13-16</sup> For example, Aubin *et al.* (1994)<sup>13</sup> suggested that 'fear resulting from exposure created a stronger motive to consult the clinic than physical symptoms and needs' based on a study comparing those evacuees who did and those who did not consult a specialized clinic after a fire in a warehouse storing polychlorinated biphenyls. In the extended aftermath of the air disaster in Amsterdam, rumours emerged on a variety of alleged disaster-

**Table 1** Police officers' use of health care and drugs in the past 12 months

	Involved (n = 831)		Non-involved (n = 624)		Odds Ratio (95% Confidence Interval)	
	n	%	n	%	Unadjusted	Adjusted <sup>a</sup>
<b>Health care</b>						
Consultation of a general practitioner or medical specialist	656	78.9	457	73.2	1.4 (1.1-1.8)*	1.4 (1.1-1.8)*
Hospitalization (i.e. spent more than 24 h in a hospital or clinic, excluding childbirth)	32	3.9	14	2.2	1.8 (0.93-3.3)	1.7 (0.91-3.3)
Consultation of a paramedical specialist (e.g. physiotherapist or dietician)	332	40.3	200	32.4	1.4 (1.1-1.8)*	1.4 (1.1-1.8)*
Consultation of a privately practicing psychologist or psychiatrist	58	7.0	27	4.3	1.7 (1.0-2.7)*	1.7 (1.0-2.7)*
<b>Drugs</b>						
Use of any prescribed drugs	420	53.1	300	51.1	1.1 (0.88-1.3)	1.1 (0.91-1.4)
Use of any drugs on own initiative	222	26.9	119	19.3	1.5 (1.2-2.0)*	1.6 (1.2-2.0)*
Use of sleeping pills or tranquillisers	93	11.2	49	7.9	1.5 (1.0-2.1)*	1.5 (1.1-2.2)*
On prescription <sup>b</sup>	63	7.6	37	5.9	1.3 (0.86-2.0)	1.3 (0.86-2.0)
On own initiative	29	3.5	11	1.8	2.0 (1.0-4.1)	2.0 (0.99-4.1)

\* $P < 0.05$ .

- a: Adjusted for age, sex, level of education, alcohol consumption, cigarette smoking, executive function and ethnicity, if applicable. Data on age and sex were complete, in order to prevent the exclusion of workers with occasional missings on the other background characteristics from the adjusted statistical analysis, an additional missing category was used for level of education (representing 6% of the police officers); while the median value of involved and non-involved police officers, respectively, was imputed instead of any missings on the other background variables (concerning less than 5% of the police officers).
- b: The answer categories 'on prescription only' and 'on prescription and on own initiative' were combined, because only a few police officers reported the latter category, i.e. six involved and four non-involved police officers.

related exposures and health consequences. Although retrospective risk evaluations did not predict increased morbidity due to disaster-related exposures,<sup>1–3</sup> health concerns about exposure could have been a reason for long-term health care utilization by the involved police officers. In calamities with potential exposure to hazardous materials, addressing concerns on exposure and timely adequate risk communication by, for example, general practitioners and occupational health services might help to prevent unnecessary health worries and related symptoms and health care utilization.

A major strength of this study is the comparable reference group consisting of colleagues from the same police force as the involved police officers, but who were not involved in disaster-related activities. The cohort was based on the historical registration of employment at the time of the disaster. Unfortunately, it had to be restricted to those who still worked for this employer at the start of the study. This would have introduced selection bias if quitting the police force between the disaster and the data-collection was associated with health status or disaster involvement. However, based on the experience of the police force and its occupational health service, there were no apparent reasons to suspect such associations. Among those invited, 71% actually participated. Unfortunately, it was not possible to perform a non-response analysis. Consequently, the rates of health care utilization may to some extent have been biased, yet the prime focus here was the comparison of involved and non-involved police officers.

The study is further limited by its retrospective, self-report data. It seems reasonable to assume that police officers were able to recollect whether they performed any disaster-related tasks, which defined their occupational disaster involvement. Recall bias may, however, have affected the reporting of health care utilization. Following the aim of this study, the questionnaire provided a general picture of health care utilization, i.e. it included physical and mental health care and drug utilization. However, it lacked certain details that would be of additional interest in future research, such as a separate assessment of consulting general practitioners and medical specialists, and more detailed information on the type of mental health care.

In conclusion, 8.5 years after the air disaster in Amsterdam, elevated symptom rates and self-initiated use of health care and drugs were found among involved police officers. This elevation is probably not related to consequences of injuries, long-term post-traumatic stress symptoms, or noxious exposures, but it might rather relate to the aggregated stress from the disaster and its problematic aftermath with perceived exposure. This study, therefore, illustrates that involvement of police officers in a disaster can have a long-term health impact, which is not only reflected in elevated symptom rates, but also in increased health care utilization.

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## Key points

- This study illustrates that the higher utilization rate of health care and drugs following disasters not only concerns those directly involved, but also those occupationally involved, even after years.
- The results stress the importance of the awareness and preparedness of occupational and public health services for the increased health care needs of police officers after disasters.
- Further research is needed to study the reasons for the increased utilization and to tailor health services to the needs of rescue workers.

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