



# Learning from PPO investigations

## Deaths from circulatory diseases

PRISONS AND PROBATION OMBUDSMAN

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OMBUDSMAN



## Contents

### Learning from PPO investigations: Deaths from circulatory diseases

Foreword	3
Executive Summary	4
PPO Fatal Incident Investigations	5
Deaths from Circulatory Diseases	6
Methodology and Sample	6
Sample Overview	7
Deaths from Ischaemic Heart Disease	9
Deaths from all Circulatory Diseases	15
Prison Service Guidance	19
Implications for Practice	20



## Foreword

By their very nature, the fatal incident investigations conducted by the Ombudsman's office focus on the circumstances surrounding the end of one person's life. Since being entrusted with this responsibility in 2004, over 1,200 investigations have been opened into the deaths of prisoners, immigration detainees, and the residents of National Offender Management Service (NOMS) probation Approved Premises. This is the second paper published by my office to begin to draw collective lessons based on a number of cases. It will be followed by further papers, likewise identifying collective learning.

This paper presents an analysis of the 115 deaths from circulatory diseases that occurred in the prisons of England, Wales and Guernsey between January 2007 and December 2009. Particular focus is given to the care provided to those prisoners whose deaths were due to ischaemic heart diseases, and to the emergency response where death or collapse prior to death

occurred in cell. Whilst in the majority of cases the care provided was satisfactory, issues were raised about the quality of some of the clinical care. An area of particular concern is emergency response, a theme commented upon in the Ombudsman's 2009-2010 annual report. Whilst the difficulty responding to medical emergencies in custodial settings is acknowledged, we continue to identify areas where performance could be improved. This report highlights areas where Prison Service guidance on deaths in custody could be developed or amended. A greater emphasis on medical emergencies and deaths from natural causes more broadly would be beneficial.

I would like to thank my colleague, David Ryan-Mills, for preparing this report. David's position as research officer is funded by the Department of Health, whose support I should also like publicly to acknowledge.

**Jane Webb**  
**Acting Prisons and Probation Ombudsman**

**November 2010**



## Executive Summary

- This report presents a review of 115 PPO investigations into deaths from circulatory diseases in the prisons of England, Wales and Guernsey between 1 January 2007 and 31 December 2009. Particular attention is paid to the care provided to 82 of the prisoners whose deaths were from ischaemic heart diseases (71 per cent of all deaths from circulatory diseases), and to the 63 cases where the death or collapse leading to death occurred in the cell.
- The deaths were evenly distributed geographically across NOMS prison regions and Strategic Health Authorities, with category B or C training prisons the most common establishment type (50 of 115).
- The average age at death from all circulatory diseases was 53 years. Thirty per cent of these deaths were of prisoners aged less than 45 years (34 of 115).
- In 63 cases where the individuals' clinical condition merited an emergency response (across all types of death from circulatory diseases) PPO investigators identified 27 cases (43 per cent) where the response could have been improved. This included seven cases where serious concerns were identified by PPO clinical reviewers. Emergency response was a greater issue in category B or C training prisons as opposed to busier category B local prisons.
- Of those who died as a result of ischaemic heart diseases (82 cases), 29 had been diagnosed with ischaemic heart diseases (most commonly angina) prior to death (35 per cent). A further 19 were receiving medication for high blood pressure and/or high cholesterol (23 per cent). Thirty four were neither diagnosed with nor receiving treatment to prevent development of heart disease (41 per cent).
- When heart disease or risk of its development was diagnosed, the care provided was largely satisfactory. However, clinical reviewers identified serious concerns in 21 per cent of cases (ten of 48). Concerns centred on monitoring of symptoms, referrals to specialists and emergency response. On at least two of these occasions reviewers reported that these failures may have led to death.
- Where no heart disease or risk of its development was diagnosed, serious concerns were identified in 29 per cent of cases (ten of 34). Half of these concerns related to emergency response, though failure to identify and manage risk also featured. Again, on at least two of these occasions reviewers reported that these failures may have led to death.
- A number of implications for practice are considered, including prison and Primary Care Trust review of protocols with local cardiology services, local ambulance services, and the provision of emergency first aid training for front-line staff.
- The report highlights the need for new or amended Prison Service guidance on deaths in custody, with a greater focus on deaths from natural causes.

# PPO Fatal Incident Investigations

The Prisons and Probation Ombudsman's fatal incidents team investigate deaths of prisoners, residents of probation Approved Premises, those held in Immigration Removal Centres and those subject to managed escort. At the Ombudsman's discretion, we also investigate the deaths of those who have been released from custody or detention, whether temporarily or permanently, where the case raises issues about the care provided. We have also investigated deaths in the Channel Islands at the request of the authorities there. Investigation reports are issued to the bereaved families, to HM Coroners, to the services in remit, and to the relevant Primary Care Trust (or, in the case of deaths in Wales, the Healthcare Inspectorate Wales).

Upon notification of a death in remit, a named investigator will lead the investigation and a family liaison officer will liaise with the bereaved family. The investigator will find out as much as possible about the circumstances surrounding the person's death. This involves examining all the relevant documents and policies, together with interviews with relevant staff and prisoners or residents, if required. A clinical review is commissioned from the local Primary Care Trust (PCT) or, in the case of deaths in Wales, the Healthcare Inspectorate Wales. In turn, they will appoint a suitably qualified clinical reviewer (or clinical reviewers) to review

the health care provided to the deceased and provide a report for evidence in the investigation. Once the PPO investigation is complete a report is produced. The report outlines the investigation findings, including any clinical matters, and may also recommend changes to improve the quality of care given by the prison, Approved Premises or Immigration Removal Centre in the future. Reports are issued in draft, giving the bereaved families and service provider an opportunity to comment on findings before the final report is issued.

Following inquest, the reports are anonymised and published on the PPO website<sup>1</sup>. Table 1 provides a summary of all investigations opened since the fatal incidents team's inception in April 2004.

Over 90 per cent of all investigations opened have been in the prison setting, of which just over half were from natural causes. Each investigation report contains detailed information on the circumstances surrounding an individual death. With over 1,000 reports now published, there is a large evidence base that can assist with the identification of learning and service improvement from these fatal incidents. This is the second paper published by the PPO that has looked at a sample of investigations in order to identify collective learning, though it is the first to look at one particular category of death: those from circulatory diseases.

**Table 1: All PPO Investigations**

Type of Death	Prison	Approved Premises	Discretionary	Immigration Removal Centres	Secure Training Unit	Total	Percentage of Total
Natural Causes	622	37	3	2	0	664	52%
Self-Inflicted	470	22	4	6	1	503	40%
Unclassified	28	3	3	1	0	35	3%
Illicit Drug Overdose	22	24	3	0	0	49	4%
Homicide or Attack	12	1	0	0	0	13	1%
Accidental	3	1	0	0	0	4	<1%
<b>Total</b>	<b>1,157</b>	<b>88</b>	<b>13</b>	<b>9</b>	<b>1</b>	<b>1,268<sup>2</sup></b>	<b>100%</b>

Percentages are rounded and therefore may not add up to 100 per cent.

<sup>1</sup><http://www.ppo.gov.uk/>

<sup>2</sup>At 22.09.2010

# Deaths from Circulatory Diseases

The PPO classifies the types of death they investigate according to the World Health Organisation standard International Classification of Diseases (ICD 10). Circulatory diseases (chapter IX: blocks I00-199) cover a range of conditions, all relating to the supply of blood to and from the heart, brain and the rest of the circulatory system. Deaths can range from those due to cerebrovascular diseases (block I60-69) such as from cerebrovascular accident (a stroke) to pulmonary diseases that affect blood supply to the lungs (block I26-28). However, the most common causes of death within the circulatory chapter are those from ischaemic heart diseases (block I20-25). These deaths involve reduced blood supply to the heart and often result in myocardial infarction (heart attack). Analysis of care provided in this paper is focused primarily on this particular type of death.

In common with the wider community, circulatory diseases have been the most common causes of death amongst prisoners in England and Wales in recent years. A 20-year mortality study of 574 natural deaths amongst male prisoners under 60 between 1978 and 1997 found that diseases of the circulatory system accounted for over half of all deaths<sup>3</sup>. Recently published research from our own office on 92 natural cause deaths amongst prisoners of all ages again found circulatory conditions as the most common cause of death (40 per cent), followed by neoplasms (cancers) (34 per cent) and respiratory conditions (12 per cent)<sup>4</sup>.

Despite the prevalence of such deaths in our investigation caseload, there has been little published research on this, or any other type of natural cause death we encounter. Indeed the contrast between this body of work and the research that has gone into the self-inflicted deaths we

investigate is vast – though there are more natural cause deaths and the Ombudsman’s investigations often raise just as many issues as in the case of self-inflicted deaths.

Deaths from circulatory diseases lend themselves to collective study for reasons beyond frequency alone. The deaths investigated of those aged less than 45 years have largely been a result of circulatory diseases. Investigation has found that some deaths may have been to some degree preventable if there had been appropriate emergency response. In other cases, had certain risk factors been identified earlier, or heart conditions managed more effectively, different outcomes might have also been possible.

## Methodology and Sample

Since June 2009, PPO investigators have completed a pro forma for each finalised investigation, providing the source data for the fatal incident investigation full information system (FIIFIS)<sup>5</sup>. Pro formas for those investigations published prior to June 2009 were completed by the research team. The pro forma captures quantitative information on the many issues that arise in a fatal incident investigation. Particular themes relevant to this study include:

- cause of death
- demographic information
- physical and mental health concerns / diagnosis
- medication and care management
- offence and sentence history
- emergency response
- key findings from clinical reviews.

<sup>3</sup>Fazel, S & Benning, R. (2006) Natural deaths in male prisoners: a 20-year mortality study. *European Journal of Public Health* 16(4) 441-444

<sup>4</sup>Ryan-Mills, D. (2010) Review: Fatal Incident Reports Sept 2008 - Aug 2009 [http://www.ppo.gov.uk/docs/PPO-FII-Report\\_March\\_2010.pdf](http://www.ppo.gov.uk/docs/PPO-FII-Report_March_2010.pdf)

<sup>5</sup>FIIFIS data is a Statistical Package for the Social Sciences (SPSS) dataset. This enables quantitative data analysis to be performed without exporting to another software package. The dataset contains 521 variables derived from 181 questions on the pro forma.

**Table 2: Prisoner deaths due to circulatory diseases 2007-2009**

Calendar year of death	Investigations opened into deaths from natural causes (prisons only)	Investigations opened into deaths from circulatory diseases (prisons only)	Percentage of natural cause deaths from circulatory diseases
2007	89	41	46%
2008	102	38	37%
2009	103	44	43%
<b>Total</b>	<b>294</b>	<b>123</b>	<b>42%</b>

The FIIFIS database serves as an in-house knowledge base for PPO investigations that can be used to explore patterns and trends, identify precedents and analyse emerging themes.

## Sample

This paper considers all available investigations into deaths from circulatory diseases that occurred in the prisons of England and Wales (and one discretionary investigation in the Channel Islands) between 1 January 2007 and 31 December 2009.

Over the three-year period, deaths from circulatory diseases accounted for 42 per cent of all natural cause prison deaths investigated (Table 2). At the time of analysis, eight investigations opened in 2009 had not reached the appropriate stage for data to be gathered due to reasons including (but not limited to) police involvement and delays in receiving clinical reviews. The total number of deaths considered is 115.

## Sample Overview

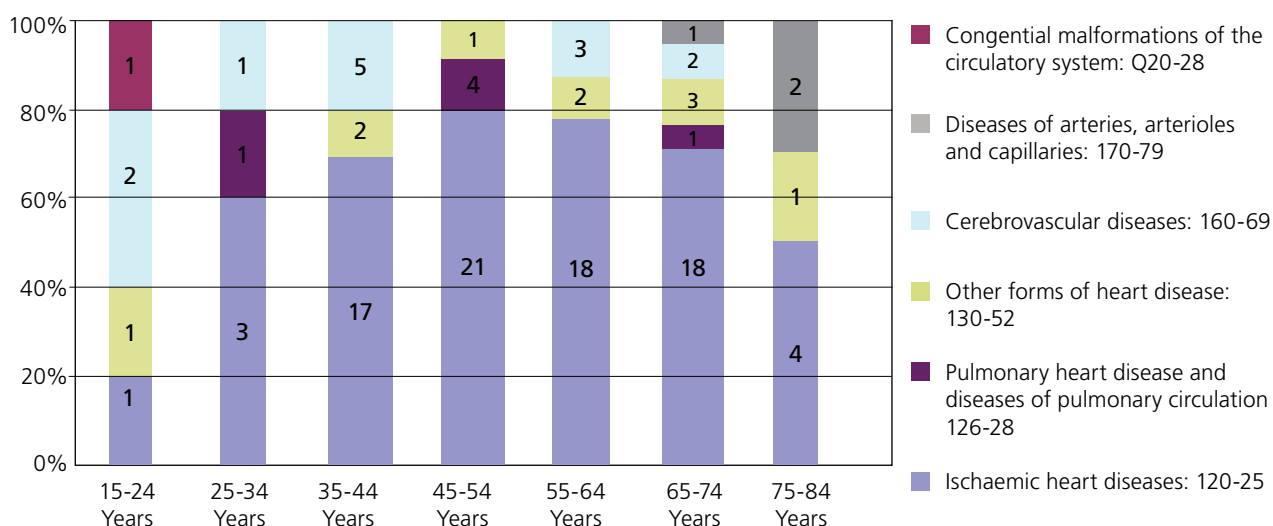
### Cause of death

Chart 1 provides a breakdown of the age of the deceased by the particular category of circulatory disease within the ICD10 circulatory chapter by age.

The most common causes of death in the sample were ischaemic (e.g. heart attack or other effects of reduced blood supply to the heart), 71 per cent of all investigations studied. The greatest number of these deaths occurred in the 45-54 year age group, though a significant proportion were young men: 21 were aged less than 45 years (26 per cent).

Smaller numbers of deaths from cerebrovascular diseases were recorded (11 per cent of all circulatory deaths), though more than half of these were of those aged less than 45 years. In the three deaths of those less than 35 years old, post

**Chart 1: Prisoner deaths due to circulatory diseases: N=115**



mortem findings revealed that death was the result of a subarachnoid haemorrhage (a congenital malformation) and were sudden and unavoidable.

Deaths from diseases of the arteries, arterioles and capillaries were a result of aortic aneurysms (dilation or narrowing of the aorta - the largest artery in the body) and such deaths occurred amongst the older prisoners in the sample. The 'other forms of heart disease' category included two cases of cardiac arrhythmia where alcohol withdrawal was a contributory factor in the younger age groups, and amongst the older age groups heart failure (congestive or otherwise) was prominent.

Only one death was of a female prisoner, a 54 year old woman with multiple care needs who died as a result of a pulmonary infarction (obstruction of the artery supplying blood from the heart to the lungs).

## Age at death

We have tried to explore whether the age profile of the deceased is any different to what we would expect to see in the general population. To make a fair comparison it is necessary to take the different age profiles of the two populations into account. This was achieved by calculating standardised mortality ratios (SMRs). These calculations and their interpretations are limited in this review due to a number of factors such as the small number of deaths and the need for a denominator - the population at risk. The total number of people imprisoned throughout each year is unavailable, so we have used the same method as others<sup>6</sup> and used the number of people in prison on 30 June in each year.

SMRs compare the number of observed deaths in the population with the number of expected deaths if the age-specific death rates were the same as the

standard population. An SMR of 100 implies that the mortality rate is the same as the standard mortality rate. A number higher than 100 implies an excess mortality rate whereas a number below 100 implies below average mortality.

SMRs were calculated for all males who had died from diseases of the circulatory system in prison between 1st January 2007 and 31st December 2009 (ICD-10 codes I00-I99) (n=121). This includes eight deaths that have been excluded from further analysis due to protracted investigation processes, though where post mortem and age data were available. In these calculations, the age-specific death rates from diseases of the circulatory system in the general population were used as the standard population. The size and age profile of the prison population<sup>7,8</sup> in June 2007, 2008 and 2009 was provided by the Ministry of Justice. Separate SMRs were calculated for the prison population aged less than 45 years and those aged 45 years and over respectively.

Prisoners aged less than 45 years may have excess mortality from circulatory diseases compared with their peers in the general population (SMR 142.3 (95% confidence interval (CI) 99.1, 197.9)). The wide confidence interval - a consequence of the small number of deaths observed in this age-band - just includes 100 and therefore the possibility that there is no difference cannot be excluded. It should also be noted that any evidence of excess mortality in these calculations may be attributed to wider socio-demographic factors. There was no evidence that the rate of death from circulatory disease was any different between prisoners aged 45 years and over and their peers in the general population (SMR 108.2 (95% CI 86.5, 133.6)). The wide confidence intervals highlight the lack of precision with which current data can estimate differences between the prison and general populations.

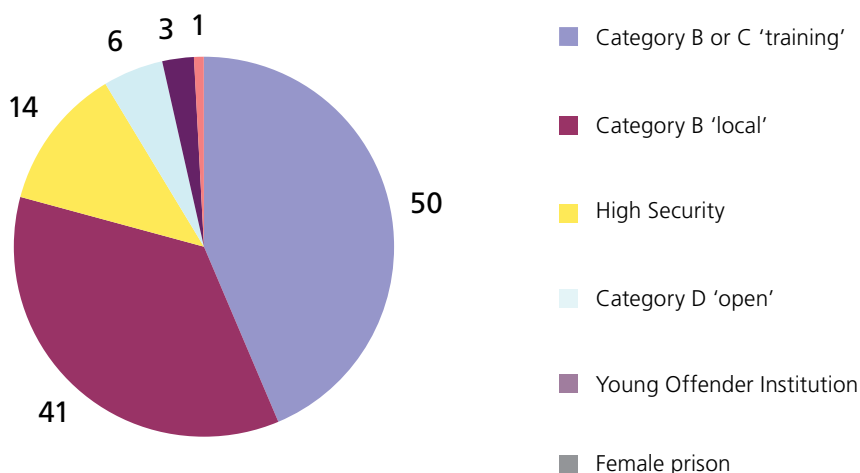
<sup>6</sup>Fazel, S & Benning, R. (2006) Natural deaths in male prisoners: a 20-year mortality study. *European Journal of Public Health* 16(4) 441-444

<sup>7</sup>Office for National Statistics (2008) *Mortality Statistics: Deaths registered in 2007*

<sup>8</sup>Office for National Statistics (2009) *Mortality Statistics: Deaths registered in 2008*



**Chart 2: Deaths by establishment type**



### Demographic profile

All but one of the deceased were men. They were largely white British (77 per cent) with no minority ethnic groups significantly over-represented compared to the rest of the prison population. Twelve were identified as foreign national prisoners (ten per cent), two of whom had difficulty in speaking English, and one needed a translator to communicate with prison and healthcare staff. The deaths were evenly distributed across NOMS prison regions and Strategic Health Authorities, though the types of establishment in which these deaths occurred varied. Nearly half of the deaths occurred in category B or C training prisons for sentenced prisoners (50 deaths, 44 per cent), with 41 in local category B prisons that serve the courts (36 per cent). Fourteen deaths occurred in the high security estate (12 per cent) whilst the remaining deaths occurred amongst those in category D 'open' conditions (five per cent), young offender institutions (less than three per cent) and the female estate (one death – less than one per cent) (Chart 2).

### Deaths from Ischaemic Heart Disease

In order to look at care provided, it is appropriate to draw distinctions between the different types of death in the sample. The most common cause of a circulatory disease death is ischaemic heart diseases (82 cases, 71 per cent of the sample). These deaths occur when the blood supply to the heart is significantly reduced and can often result in myocardial infarction (heart attack) and collapse.

A further distinction is drawn on clinical grounds. Deaths from ischaemic heart diseases can occur suddenly and without warning, before a diagnosis of an underlying heart condition is made. In such cases in this study, contact with healthcare services was infrequent. In other cases, individuals had an established diagnosis of ischaemic heart diseases (commonly angina) or conditions such as hypertension (high blood pressure) or hypercholesterolaemia (high cholesterol) that resulted in more frequent and planned monitoring of health.

Two broad groups of deaths from ischaemic heart diseases have been identified: Group A - where the deceased were diagnosed with ischaemic heart diseases, hypertension or hypercholesterolemia, and Group B - where the deceased were not diagnosed or treated for any circulatory disease prior to death.

## Deaths of those with recognised heart diseases (Group A: N=48)

Those in Group A (48 cases) were either diagnosed with ischaemic heart diseases prior to death (most commonly angina - 29 cases): or were prescribed medication such as anti-hypertensives to reduce blood pressure or statins to reduce cholesterol (a further 19 cases). The average age of this group was 61 years, and the majority had been in custody for two years or more (See Table 3 and 4).

Over two thirds of Group A (33 of 48) had their conditions recorded at their first or second health screen (13 upon arrival from court, 20 upon transfer from another prison): the remaining 15 were diagnosed with heart disease, or conditions that increase risk of heart disease, whilst in custody. Care for many in Group A began at reception, where PPO investigations identified in a small number of cases concerns over health screening: one reception health-screen was not carried out

and one was not carried out to an adequate standard. There were two cases where, upon having reported a history of heart disease at reception, the health care follow-up was deemed unsatisfactory.

Fourteen of the 48 received care as an in-patient in their establishment's own healthcare centre in the three months prior to death. The reasons for their admission were recorded as physical illness/injury (eight cases) or mobility needs (six cases). For the majority of Group A medication was kept in their possession whilst resident on the wings.

In the six months prior to death over half of the group had been referred to an NHS hospital for out-patient care (28 of 48), often to access 'chest-pain' clinics and cardiologists. Whilst access to secondary care was generally very good, six had appointments cancelled due to lack of escort. One of the deceased had 16 separate appointments rearranged due to poor protocol between secondary care providers and the prison.

Tables 3 and 4: Group A - Age group and time spent in custody (current sentence)

Age group	Deaths Investigated	Cumulative Total	Percentage of total
15-24	-	-	-
25-34	-	-	-
35-44	1	1	2%
45-54	12	13	25%
55-64	15	28	31%
65-74	16	44	33%
75-84	4	48	8%
<b>Total</b>	<b>48</b>	<b>100%</b>	<b>100%</b>

Percentages are rounded and therefore may not add up to 100 per cent.

Time in custody (current sentence)	Deaths Investigated	Cumulative Total	Percentage of Total
1 week to 1 month	1	1	2%
1 month to 6 months	6	7	13%
6 months to 1 year	7	14	15%
1 year to 2 years	6	20	13%
2 years to 5 years	13	33	27%
More than 5 years	15	48	31%
<b>Total</b>	<b>48</b>	<b>48</b>	<b>100%</b>

The provision of care in general was complicated in many cases by mental health issues: 15 of the 48 had recorded mental health concerns, ten of whom also had a history or risk of self-harm. Such issues could possibly act as a barrier to the provision of physical healthcare, particularly where a serious diagnosis is made (three in Group A were prescribed anti-psychotic medication). Refusal of prescribed medication was also frequent. In the three months prior to death there were seven documented cases of non-compliance with prescribed medications, including statins, anti-hypertensives and glyceryl trinitrate (GTN - used to control symptoms of angina). In three of these cases, the prisoners who refused their medication had a recorded mental health history.

## Chest pain

A common symptom in acute episodes of ischaemic heart diseases is chest pain. It may not always occur, though when it does it is typically described as a crushing pain, which may radiate down the arms (often one arm more than the other, frequently the left arm) and to the jaw and may be accompanied by sweating and clamminess of the skin. The British Heart Foundation advises patients with known ischaemic heart disease that chest pain that lasts more than 15 minutes is probably a heart attack.

Within this time patients are advised to use their glyceryl trinitrate (GTN) spray three times at five minute intervals before calling an ambulance.

Management of chest pain was a frequent issue in the reports considered. Eleven of the deceased in Group A reported chest pains on the day of death. On most occasions, the response of both healthcare and discipline staff was entirely appropriate. However, on three occasions the investigation showed failures to recognise the symptoms and a lack of urgency. In a further 14 cases chest pain was reported in the weeks and months prior to the day of death, and concerns were expressed in PPO reports on five of these occasions. Concerns centred on the absence of ECG readings (electrocardiogram - a test that records the rhythms and electrical activity in the heart), and a lack of referrals to cardiologists. There were also concerns, where referrals were made, about breakdowns in communication between primary and secondary care providers and referrals that were urgent not being marked as such.

## Unsatisfactory care

In ten cases (21 per cent of Group A) PPO's clinical reviewers identified serious concerns with the care provided to the deceased. The concerns are summarised in Table 5.

On at least two occasions, (once where there was a missed opportunity for a referral, and once, where the emergency response was poor) clinical reviewers reported that the failures might have contributed to death.

**Table 5: Group A: Reasons for unsatisfactory care**

Key Reasons	Number
Poor monitoring of blood pressure / cholesterol	3
Poor emergency response	2
Absence of a referral to a cardiologist / chest pain clinic	1
Serious failure linked to poor record keeping (no cholesterol check)	1
Absence of holistic approach to multiple care needs	1
Absence of a care plan for angina	1
Numerous missed appointments & failure to re-arrange	1
<b>Total</b>	<b>10</b>



### Deaths of those with no recognised heart disease (Group B: N=34)

Those in Group B (34 cases) were either not identified as at risk of developing heart disease, or were not prescribed medication to reduce their risk. These deaths were often completely unexpected, with few

reporting any symptoms of physical illness. In contrast with Group A, the majority of these deaths were of those aged less than 45 years, and they had also spent less time in custody: (See Table 6 and 7).

**Tables 6 and 7: Group B - Age group and time spent in custody (current sentence)**

Age group	Deaths Investigated	Percentage of total
15-24	1	3%
25-34	3	9%
35-44	16	47%
45-54	9	27%
55-64	3	9%
65-74	2	6%
Total	34	100%
<b>Total</b>	<b>48</b>	<b>100%</b>

Time in custody (current sentence)	Deaths Investigated	Percentage of Total
Within one week	2	6%
1 week to 1 month	4	12%
1 month to 6 months	6	18%
6 months to 1 year	4	12%
1 year to 2 years	9	27%
2 years to 5 years	3	9%
More than 5 years	6	18%
<b>Total</b>	<b>34</b>	<b>100%</b>

Percentages are rounded and therefore may not add up to 100 per cent.

The majority of these deaths (or incident/collapse leading to death if different) occurred in cell on normal location (26 of 34, 77 per cent). A further four occurred in healthcare centres, two in communal wing locations and one in a care and separation unit. Only one death occurred in an outside hospital: that of a prisoner who had reported chest pains whilst in prison.

## Chest pain

Fifteen of the deceased reported chest pain on the day of death (44 per cent of group A). The response was considered appropriate in ten of these cases, though concerns were expressed in the other five. Again, concerns centred on the lack of recognition of chest pain as a frequent symptom of a heart attack, a lack of urgency in response, and miscommunication between residential and healthcare staff. A recent British Heart Foundation campaign advises members of the public with unexpected chest pain that “a chest pain is your body saying call 999... doubt kills - call 999 immediately”.

It is apparent that this advice was not followed in a small number of cases.

## Risk factors

All of the deaths in Group B were unexpected, though it is useful to see whether the deceased displayed any of the common risk factors associated with the onset of ischaemic heart diseases. Table 8 shows the risk factors recorded in Group B.

Across 34 cases, a total of 64 risk factors (excluding gender) were recorded. One of the deceased had a recorded history of four risk factors, and a further six had a recorded history of three risk factors. It should be noted that risk factors may have gone unreported: some of the deceased may not have been aware of a family history of heart disease, and alcohol/substance misuse issues were recorded only when the prisoner acknowledged excessive use. The nature of substance misuse varied: there were five cases of previous dependency on heroin / other opiates and two cases of previous heavy cocaine and crack-cocaine use (where there is evidence of a strong link to heart diseases).

**Tables 8: Risk factors recorded in custody**

Risk Factor	Number of Cases	Percentage of sample (N=34)
Male	34	100%
Smoker	27	79%
History of problematic substance misuse	10	30%
History of problematic alcohol misuse	9	26%
Family history of heart disease	6	18%
High blood pressure recorded	5	15%
Obesity	5	15%
Diabetes Melitus	2	6%



### Unsatisfactory care

On ten occasions, (29 per cent of all cases in Group B) PPO clinical reviewers identified serious concerns with the care provided to those in the group. Serious concerns over care were more common than in Group A, with the type of concerns raised summarised in Table 9.

On at least two occasions in Group B where transfer to an outside hospital was not swift enough clinical reviewers reported that the failures in care might have contributed to death. In both Group A and B, emergency response has emerged as a key issue, with serious concerns in this area being identified in seven cases in total.

**Table 9: Group B: Reasons for unsatisfactory care**

Key Reasons	Number
Poor emergency response / failure to transfer to outside hospital	5
Failure to recognise risk of heart disease	2
Lack of follow up after a reading of high blood pressure	1
Absence of anti-hypertensive prescription	1
Absence of secondary health screen	1
<b>Total</b>	<b>10</b>

# Deaths from all Circulatory Diseases

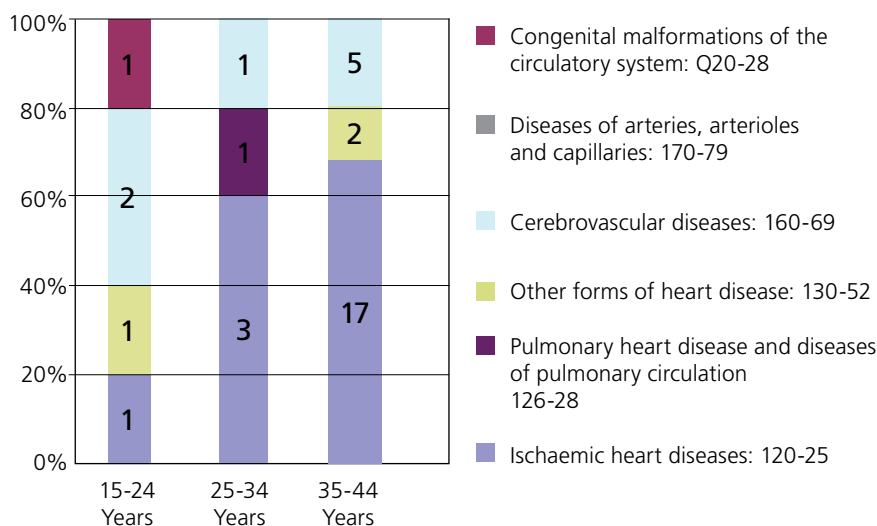
## Deaths of those aged less than 45 years

In all 115 deaths from circulatory diseases studied, 34 were of those aged less than 45 years (30 per cent). Ten were aged less than 35 years (the youngest aged 19) whilst 24 were aged between 35 and 44 years. The deceased were largely in training (16, 47 per

cent) or local prisons (10, 39 per cent), with five in the high security estate and three in young offenders institutions. The particular causes of death varied by age (See Chart 3).

Clinical reviewers raised serious concerns over care provided in 11 of 34 investigations in those aged less than 45 years old (32 per cent). Where the deceased were aged 45 years or older clinical reviewers raised serious concerns in 18 of 81 investigations (22 per cent). The nature of the concerns raised differed across the two broad age groups (see Tables 10 and 11).

**Chart 3: Deaths of those aged less than 45 years**



**Table 10: Reasons for unsatisfactory care - those aged less than 45 years (N=34)**

Key Reasons	Number
Emergency response / response to chest pain / emergency transfer to outside hospital	6
Monitoring of blood pressure / cholesterol levels	5
<b>Total</b>	<b>11</b>

**Table 11: Reasons for unsatisfactory care - Those aged 45 years and above (N=81)**

Key Reasons	Number
Care planning / chronic disease management	5
Investigation of symptoms / absence of cardiac referral	4
Missed appointments / communication with secondary care providers	4
Monitoring of blood pressure / cholesterol levels	3
Emergency response	2
Medicines management	1
<b>Total</b>	<b>19</b>

PPO clinical reviewers identified concerns over care-planning and secondary-care arrangements more often in deaths amongst the older group of prisoners, particularly where the deceased may have had multiple care needs and various chronic conditions. Concerns over care of those aged less than 45 years surrounded missed opportunities to monitor blood pressure (particularly where the causes of death were cerebrovascular), with concerns over emergency response also particularly pronounced in this group.

### Emergency response

Responding to any emergency situation can be challenging, and an emergency situation in the prison setting presents additional challenges to those which may be encountered in the community:

- **The reliance on a “gate keeper”:** A prisoner cannot call an ambulance himself or herself. A prisoner has to get the attention of staff and rely on them to respond appropriately.
- **Security:** Concerns about security can delay decisions over when to enter a cell and whether to call an ambulance. Numerous locked gates can also lengthen the time it takes for healthcare staff and paramedics to reach a prisoner.

- **Geography:** Many prisons are located in isolated parts of England and Wales, where ambulance response times can be lengthy. Some prisons are likely to rely on air ambulances.

Looking at all deaths from circulatory diseases (N=115) and isolating the cases where death (or the incident / collapse leading to death if different) occurred in prison (excluding healthcare centres) provides 63 emergency situations to analyse.

In these 63 cases, investigations identified concern with the response provided on 27 occasions (43 per cent). This figure includes the seven cases in groups A and B where emergency response was identified as a serious concern by clinical reviewers. These concerns featured disproportionately in deaths that occurred in training prisons - or more often in training prisons than in any other establishment type: (See Table 12).



**Table 12: Emergency response concerns establishment type**

Establishment type		Where there any concerns over emergency response?		
		Yes	No	Total
<b>High Security</b>	Number	3	5	8
	% within category	38%	63%	
<b>Local Prison</b>	Count	6	10	16
	% within category	38%	63%	
<b>Training Prison</b>	Count	16	18	34
	% within category	47%	53%	
<b>Open Prison</b>	Count	1	3	4
	% within category	25%	75%	
<b>YOI</b>	Count	1	0	1
	% within category	100%	0%	
<b>All establishment types</b>	<b>Count</b>	<b>27</b>	<b>36</b>	<b>63</b>
	<b>% within category</b>	<b>43%</b>	<b>57%</b>	<b>100%</b>

Percentages are rounded and therefore may not add up to 100 per cent.

There might be a number of reasons why more concerns were identified in training prisons as opposed to local prisons. Training prisons do not always have a 24-hour healthcare service on site and emergency first aid may be required without the benefit of a registered nurse's expertise. Staff-to-prisoner ratios are often lower in training prisons, particularly in night state, and as such the speed and level of response

available may be hindered. Staff might also be less practised in responding to medical emergencies due to the rarity of such events in a number of smaller training prisons.

Across the 27 cases where emergency response was an issue, several more specific aspects of emergency response were identified as concerns. The nature of these concerns are summarised in Table 13.

**Table 13: Emergency response concerns (No. Cases: 27)**

Nature of concern	Number
Defibrillator concerns (lack of or inappropriate access to)	10
Delay in paramedics reaching prisoner	10
Lack of or inappropriate access to other emergency equipment	8
Ineffective radio use	6
Lack of up-to-date first aid training	6
Delays in entering cell	5
Delays in healthcare staff attending scene	5
Delays in calling an ambulance	5
Lack of access to functioning radio	4

Looking at the frequency of these concerns, it is clear that access to effective emergency equipment is a key issue. The positioning, availability and transportability of defibrillators, suction equipment and oxygen cylinders needs to be carefully considered in all prisons. Delays encountered by paramedics in getting to the prison are often unavoidable given the location of some prisons, though some delays in paramedics getting to the emergency scene might be avoidable. Establishing and reviewing protocols with local ambulance services, considering location, routes in and out of prisons, communication and preparation for arrival at the correct wing could be valuable for many prisons.

Good communication is critical in an emergency situation. It is disappointing that on four occasions the provision of radios was inadequate either in accommodation or healthcare centres to provide a swift and seamless response. Where radios were available, there were further concerns over how effectively they were used. Most prisons (particularly local prisons) use a colour-code system: red indicating blood injury and blue for respiratory matters. When either code is called from accommodation to healthcare, the responding party is made aware of the nature of the emergency they are attending and can bring the appropriate equipment to the scene. It is encouraging that recommendations made

to individual establishments to adopt a colour-code scheme are accepted, though such recommendations should be considered nationally.

The NHS advises that prompt treatment increases survival prospects following a heart attack<sup>9</sup>. With this in mind, it is particularly disappointing that there were delays in calling an ambulance on five occasions. Where acute myocardial infarction is suspected (as opposed to atypical chest pain) emergency ambulances should be summoned without delay. On the occasions where healthcare services are unavailable, ambulances should be summoned in all instances of chest pain in accordance with British Heart Foundation advice. All frontline prison staff should be supported and encouraged to authorise an ambulance request should they feel it necessary.

The provision of emergency first aid training to residential staff was an issue highlighted in six cases. Whilst there are competing demands on training budgets across all prisons, it would be appropriate for prisons to assess their need for emergency response training, and consider creative ways in which they can ensure that a suitable number of emergency first aid trained staff are available at any given time. This could be achieved by prioritising particular groups of officers for training e.g. permanent night staff or senior officers.

<sup>9</sup>NHS Choices: Heart Attack <http://www.nhs.uk/Conditions/Heart-attack/Pages/Introduction.aspx> [30/09/2010]



## Prison Service Guidance

A number of issues involving staff responses to medical emergencies have been raised in this study, particularly response to chest pain, summoning an ambulance and the delivery of emergency first aid. Clearly, there are occasions where the identification of symptoms and the management of a medical emergency becomes the responsibility of prison staff in the absence of healthcare professionals, and even where healthcare professionals are available, responsibility is largely shared. However, there is no specific Prison Service guidance available to staff as to how to best respond to medical emergencies - other than that covered by PSO 2700 (suicide prevention and self-harm management) and PSO 2710 (follow-up to deaths in custody). Both policy documents largely focus on emergency situations that are apparently self-inflicted as opposed to those resulting from natural causes.

First aid provision in establishments is covered in general workplace health and safety policy. This study provides the opportunity to consider areas where new or amended policy focusing on prevention of deaths from natural causes may be appropriate. Heart attacks and strokes are both examples of medical emergencies that may be capable of identification by laypersons, and so guidance would be useful. Post-incident support for staff involved in such events remains a priority.

PPO investigations into other types of natural cause deaths, such as those of terminally ill prisoners, frequently identify areas where further or clearer guidance would be useful: for example how and when to involve the family and clear guidance on applications for release on compassionate grounds.

## Implications for Practice

- Prisons and their healthcare services should continue to develop protocols for the management of and response to chest pain. Particular attention should be afforded to how such protocols are communicated (e.g. via a Governor's notice to Staff) and best practice for when and where healthcare staff are not available on site.
- Prison healthcare services and their PCTs should seek to establish and or strengthen prison links with local cardiology services, including specialists and rapid-access chest pain clinics.
- At a local level, establishments and their PCTs should regularly review ambulance protocols, radio use and emergency equipment, paying particular attention to concerns raised in PPO Investigations in their region.
- NOMS should give consideration to the number of emergency first-aid trained staff required across the prison estate. Particular consideration should be afforded in establishments without access to a 24 hour healthcare service, where at a local level creative approaches to providing such training are encouraged.
- NOMS should consider the need for new or amended policy that would address gaps in current Prison Service guidance around medical emergencies and deaths in custody resulting from natural causes.
- Prison healthcare services should continue their best efforts to follow up readings of high blood pressure or history of heart disease reported at reception.
- The profile of PPO investigations into deaths from circulatory diseases should be raised across the NOMS estate and amongst its healthcare providers. This paper has demonstrated how a significant proportion of such deaths are premature, and a number may also be avoidable. PPO investigations provide learning in each of these cases that should be shared beyond the establishment at which the investigation is focused.



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