Ministry of Defence

Bi–Annual Tracking Afghanistan VSI/SI Operational Casualties: 8 October 2007 to 30 September 2014

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Issued By:
Defence Statistics (Health)
Abbey Wood (North)
Oak 0 West #6028
Bristol
BS34 8JH

Enquiries
Press Office:
020 721 83253

Statistical Enquiries:
Head of Health
Tel: 03067984423
Fax: 0117 9319632
DefStrat-Stat-Health-PQ-FOI@mod.uk

Internet:
www.gov.uk/government/organisations/ministry-of-defence/about/statistics

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INTRODUCTION

1. This report produces statistical information on patients that were very seriously injured (VSI) or seriously injured (SI) on Operation HERRICK (Afghanistan) between 8 October 2007 (start of the Defence Patient Tracking System) and 30 September 2014 (latest information available) as listed on the initial Notification of Casualties (NOTICAS) signal. It complements and expands upon the monthly publication of operational casualty and fatality statistics which include counts of Service personnel VSI or SI.

2. This report only includes patients that were injured and not those that became ill[a] on Operation HERRICK (Afghanistan) between 8 October 2007 and 30 September 2014 as listed on the initial Notification of Casualties (NOTICAS) signal.

3. The findings in this report focus on the casualty care pathway both when they are in theatre in Afghanistan and when they have been returned to the UK. In addition, the number of VSI/SI casualties who have been medically discharged from Service and the number of casualties who have registered, or been awarded, a claim for compensation under the Armed Forces and Reserve Forces Compensation Scheme (AFCS) has been provided.

KEY POINTS

4. Between 8 October 2007 and 30 September 2014 there were 581 casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK (315 were VSI, 266 were SI). As at 2 December 2014, 54 had died of wounds or the injuries sustained and 527 casualties had survived.

5. Of the 581 casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014, 547 returned to the UK for further treatment.

6. As at 2 December 2014, 447 personnel who had an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014 had survived their injuries and had closed care pathways, indicating that no further specialist care was required.
   a. 106 were still in Service and of these 64 were medically fully deployable (MFD; as at 1 December 2014)
   b. 341 were no longer in service, of which 216 were discharged on medical grounds (as at 31 March 2014)

7. As at 30 September 2014, 515 of the 581 casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014 had claimed for compensation under the Armed Forces Compensation Scheme (AFCS). For the 54 personnel who died as a result of their VSI or SI, 17 survivors claims have been registered.

8. It is estimated that 50% of casualties treated in the UK with an initial NOTICAS classification of VSI will have finished their care pathway by 941 days (2 years 11 months) after injury; by comparison, 50% of casualties treated in the UK with an initial NOTICAS classification of SI will have finished their care pathways by 757 days (2 years 1 month).

[a] Injury is the result of an external cause (environmental events or circumstances that result in a medical condition); illness refers to any medical condition that is not a result of external causes (this will include bacterial infections (where not the result an injury), viral infections (where not the result of biological weaponry) and musculoskeletal pain (where not the result of an injury)).

CONTENTS

BACKGROUND

9. This report has been provided in response to the number of requests for information about injured UK Service Personnel. The requests vary from requesting more detail on the injuries sustained to understanding the long-term outcome of those injured.

10. The MOD are committed to making information on Operational Casualties public but have to draw a line between how much information is provided regularly in the public domain and information which compromise operational security of UK Armed Forces Personnel or which risks breaching an individual's right to medical confidentiality. This report along with the quarterly release of the Afghanistan and Iraq Amputation Statistics is supporting the MOD's commitment to release information wherever possible.

11. The findings presented in this report will assist in the future planning of medical care for patients VSI or SI on Operations in Afghanistan or in future conflicts where the types of injuries sustained are comparable. This includes estimating the number of casualties that will be treated at hospitals and other medical facilities and the length of time they are likely to be a patient at these locations. The findings will also provide the Permanent Joint Headquarters (PJHQ) and Commanding Officers a guide as the length of time that casualties will be in treatment and therefore non deployable or deployable in a restricted role.

12. This report **does not** include detailed information on the casualty care pathway for those VSI or SI in Afghanistan on Op HERRICK or Op VERITAS between 7 October 2001 (start of Operations in Afghanistan) and 7 October 2007. This is because this time period predates the set-up of the Defence Patient Tracking System (DPTS) on 8 October 2007. The DPTS was set up to monitor the progress of Armed Forces patients undergoing specialist treatment, to ensure that their care is delivered promptly and coherently, and to coordinate clinical, administrative and welfare aspects of their support. The DPTS was set up as previously this information was not stored centrally and could only be accessed through individual medical records. However, it has been possible for this group of patients to provide some information presented in the final section of this report:
    - The number of casualties by NOTICAS listing (VSI or SI).
    - The number of casualties who died of their wounds/died as a result of their injuries from non enemy action.
    - The number of casualties who have been discharged from Service.
    - The number of casualties who have been medically discharged from Service.
    - The number of casualties that return to medically fully deployable or medically limited deployable status.

DATA, DEFINITIONS AND METHODS

Very Seriously Injured (VSI) and Seriously Injured (SI)

13. The VSI and SI categories are defined by Joint Casualty and Compassionate Policy and Procedures. They are not strictly 'medical categories' but are designed to give an indication of the severity of the injury to inform the next of kin and the chain of command.

14. Casualties are listed as VSI and SI in the Notification of Casualty (NOTICAS). NOTICAS is the name for the formalised system of reporting casualties within the UK Armed Forces. It sets in train the MOD's procedure for informing next of kin. The MOD's Joint Casualty and Compassionate Policy and Procedures set out the guidance under which a NOTICAS report is to be raised. NOTICAS takes precedence over all but the most urgent operational and security matters.

15. This report only includes patients that were injured and not those that became ill[b] on Operation HERRICK (Afghanistan) between 8 October 2007 and 30 September 2014 as listed on the initial Notification of Casualties (NOTICAS) signal.

16. Hostile Action (Battle Injury) refers to any injury sustained whilst under direct and indirect fire. Whilst this is frequently applied to injuries such as gunshot and fragmentation wounds, it is also applied to injuries sustained whilst avoiding hostile fire and friendly fire.

17. Non Hostile Action (Non-Battle Injury) refers to any injury sustained as a result of external causes not as a result of direct or indirect fire. This includes:

[b] Injury is the result of an external cause (environmental events or circumstances that result in a medical condition); illness refers to any medical condition that is not a result of external causes (this will include bacterial infections (where not the result an injury), viral infections (where not the result of biological weaponry) and musculoskeletal pain (where not the result of an injury)).

a. Injuries caused by sports and other external factors (e.g. training, normal duties and negligent discharge of a firearm)

b. Bites and stings

c. Heat and cold injuries

d. Accidental poisonings & allergic reactions (excluding asthma and other respiratory conditions)

18. The NOTICAS reports raised for casualties contain information on how serious medical staff in theatre judge their condition to be. This information is used to inform what the next of kin are told. "VSI" and "SI" are the two most serious categories into which personnel can be classified:
    - Very Seriously Injured or VSI is the definition used where the injury is of such severity that life or reason is imminently endangered.
    - Seriously Injured or SI is the definition used where the patient's condition is of such severity that there is cause for immediate concern, but there is no imminent danger to life or reason.

19. The NOTICAS system is initiated very early in the patient's admission to the field hospital, the classification of a casualty will change as time progresses. The initial signal listing of VSI or SI may in some cases be followed by an updated less serious listing if the case appeared worse on admission than transpires. This report only includes casualties with an initial NOTICAS listing of VSI or SI.

20. The Ministry of Defence publishes the VSI and SI casualty statistics for Operation HERRICK every month. These can be obtained from Gov.uk[c]. Please note that the figures presented in this report will not match those reported in the VSI and SI casualty statistics, as this report includes VSI and SI personnel that have subsequently Died of Wounds or Died Not Enemy Action.

Died of Wounds (DOW) and Died Not Enemy Action (DNEA)

Hostile Action

21. *Killed in Action (KIA)*: A battle casualty who is killed outright or who dies as a result of wounds or other injuries before reaching a medical treatment facility.

22. *Died of Wounds (DOW)*: A battle casualty who died of wounds or other injuries received in action, after having reached a medical treatment facility. This only includes those who have died of wounds whilst under the care of Defence Medical Services.

Non-Hostile Action

23. *Died on Operations (DOP)*: A casualty who died whilst deployed on, or as a result of operations but was not KIA or DOW. Includes operational accidents, road traffic accidents, assaults, suicides and deaths as a result of natural causes. If the casualty died outright they are classified as Killed Not Enemy Action (KNEA) and if they died of their injuries after reaching a medical treatment facility they are classified as Died Not Enemy Action (DNEA).

Operations in Afghanistan

Operation VERITAS

24. Operation VERITAS is the name for UK operations in Afghanistan which started in October 2001. The UK was involved in Afghanistan alongside Coalition forces, led by the US under Operation Enduring Freedom (OEF), from the first attacks in October 2001.

Operation HERRICK

25. Operation HERRICK is the name for UK operations in Afghanistan which started in April 2006 and ended on 30 November 2014. UK Forces are deployed to Afghanistan in support of the UN authorised, NATO led International Security Assistance Force (ISAF) mission.

26. **Operation Panther's Claw** was preceded by several other operations carried out by British and Afghan government forces with the purpose of "taking and holding ground" in Helmand Province prior to the Afghanistan elections in 2009.

[c] www.gov.uk/government/organisations/ministry-of-defence/about/statistics

27. **Op TORAL** is the UK's post 2014 contribution to operations in Afghanistan under the NATO RESOLUTE SUPPORT MISSION and commenced on 1 December 2014.

Operation TELIC

28. Operation TELIC is the name for UK operations in Iraq which started in March 2003. There was a drawdown of troops in July 2009 and Operation TELIC finished on 21 May 2011. UK Forces were deployed to Iraq to support the Government's objective to remove the threat that Saddam posed to his neighbours and his people and, based on the evidence available at the time, disarm him of his weapons of mass destruction. The Government also undertook to support the Iraqi people in their desire for peace, prosperity, freedom and good government.

Roulemont

29. A roulemont in Afghanistan comprises a six month time period from April to October or October to April[d]. Some of the results in this report are presented by these time periods representing the summer and winter deployments. Each six month time period is assigned a sequential number, the time periods covered by each roulemont are:
    - HERRICK 4: 15 April 2006 to 14 October 2006
    - HERRICK 5: 15 October 2006 to 14 April 2007
    - HERRICK 6: 15 April 2007 to 14 October 2007
    - HERRICK 7: 15 October 2007 to 14 April 2008
    - HERRICK 8: 15 April 2008 to 14 October 2008
    - HERRICK 9: 15 October 2008 to 14 April 2009
    - HERRICK 10: 15 April 2009 to 14 October 2009
    - HERRICK 11: 15 October 2009 to 14 April 2010
    - HERRICK 12: 15 April 2010 to 14 October 2010
    - HERRICK 13: 15 October 2010 to 14 April 2011
    - HERRICK 14: 15 April 2011 to 14 October 2011
    - HERRICK 15: 15 October 2011 to 14 April 2012
    - HERRICK 16: 15 April 2012 to 14 October 2012
    - HERRICK 17: 15 October 2012 to 14 April 2013
    - HERRICK 18: 15 April 2013 to 14 October 2013
    - HERRICK 19: 15 October 2013 to 9 June 2014
    - HERRICK 20: 10 June 2014 to 30 November 2014

Amputee

30. An amputee is defined as live UK Service personnel who have an injury coded in the Joint Theatre Trauma Register (JTTR) as Amputation (traumatic), partial or complete, for either upper or lower limbs using the Abbreviated Injury Scale (AIS) Dictionary 2005 (Military Edition), and live UK Service personnel who had a surgical amputation performed either at the field hospital or at a UK hospital (the majority of these will be at the Royal Centre for Defence Medicine). A traumatic or surgical amputation can range from the loss of part of a finger or toe up to the loss of entire limbs. Only amputees with an initial NOTICAS listing of VSI or SI have been included in this report.

Data sources

31. The information provided in this report includes Naval Service Personnel (includes the Royal Navy and the Royal Marines), Army Personnel including those from the Gibraltar Regiment, RAF Personnel and Reservists.

32. The information has been compiled from a number of sources:
    - Notification of Casualty (NOTICAS)
    - Field Hospital Admissions from J97 Returns and Operational Emergency Department Attendance Register (OpEDAR)
    - The Joint Theatre Trauma Registry (JTTR)
    - DMRC Headley Court Prosthetics Database
    - DMRC Headley Court Complex Trauma Database
    - The Defence Patient Tracking System (DPTS)
    - Defence Statistics' Mental Health Returns Database
    - Defence Statistics' Medical Discharge Database
    - Compensation and Pension System (CAPS)
    - Joint Personnel Administration (JPA)
    - Defence Medical Information Capability Programme (DMICP).

[d] HERRICK 19 was extended until 9 June 2014 as part of the Op HERRICK drawdown.

33. Detailed information on these datasets and how they were used in this report is contained in **ANNEX A.**

Pseudo-anonymisation

34. Prior to analysis data sources have been linked using a pseudo-anonymisation process. The individual identifiers were stripped from datasets and replaced by a pseudo-anonymiser, generated by an automated sequential numbering system. The key to the system is that it recognises previous occurrences of a given Service number and allocates the same pseudo-anonymiser on each occasion. The pseudo-anonymisation process can only be reversed in exceptional circumstances controlled by the Caldicott Guardian under strict protocols.

Statistical Methods

35. Information on length of stay and length of pathways has been presented as a median average with an inter-quartile range, rather than a mean average and standard deviation as these statistics are affected less by outliers. An outlier is an observation within a dataset that appears to be inconsistent with the remainder of the dataset[e].
    a. The median is the value in the centre of the data set when they are arranged from smallest to largest.
    b. A quartile is any of three values (first/lower quartile, second quartile (median), third/upper quartile) that divides the sorted (from smallest value to largest value) dataset into four equal parts. The lower quartile is the value that at which 25% of the values in the dataset will be below. The upper quartile is the value that at which 75% of the values in the dataset will be below.
    c. The inter-quartile range is the range in which the middle 50% of the data points fall (i.e. the distance between the lower and upper quartile). The longer the inter-quartile range the wider the spread of data.

36. The Non-Parametric Mann-Whitney U Test for Independent samples has been used to test if the distribution of length of admission time is different for VSI and SI patients at both RCDM and at DMRC. The same test has also been used to test if the distribution of length of admission time is different for patients with injuries resulting from hostile or non-hostile action at RCDM and to test if the distribution of the number of admissions to DMRC is different for VSI and SI patients.
37.
38. Survival analysis has been used to investigate the care pathway lengths for:

    a. Personnel with an initial NOTICAS classification of VSI compared to personnel with an initial NOTICAS classification of SI

    b. Personnel with injuries resulting in an amputation compared to non-amputees

39. Survival analysis is a statistical methodology designed to identify if two or more populations show differences in the rate of a "failure" event over time, and to predict the probability that a failure will or will not have occurred after a set period of time. Examples of datasets to which survival analysis could be applied include:

    a. Survival time of patients after diagnosis

    b. Lifetime of an engine component

    c. Time taken to pass a driving test

40. In the context of this report "Survival" does not refer to the death of a patient, but to the length of time for which a patient is receiving specialist care for their injury. A "failure" or termination of a patients care can occur as a result of three actions:

    a. The patient no longer requires specialist care (hospital or rehabilitation unit)

    b. The patient leaves the Armed Forces

    c. The patient dies

[e] Barnett, V. and Lewis, T. (1978) *Outliers in Statistical Data,* Chichester: John Wiley & Sons.

41. Please note that the results of survival analysis should not be utilised to estimate the length of specialist care required by individual patients.

42. Further information on this technique is included in **ANNEX C.**

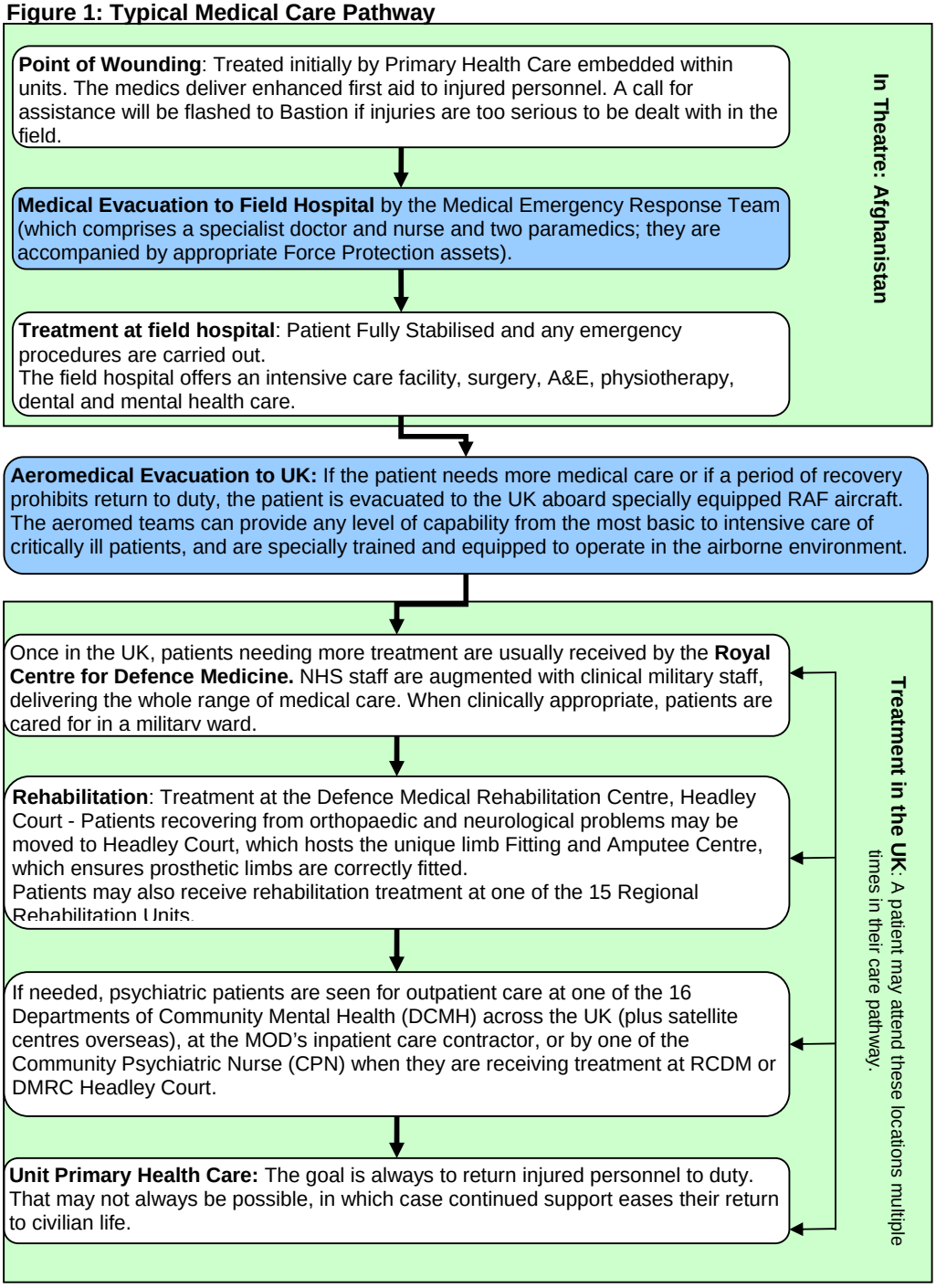
43. A small number of the figures presented in this report have been suppressed in line with the Defence Statistics' rounding policy for health statistics (May 2009), and in keeping with the Office for National Statistics Guidelines, have been referred to as less than five. This measure has been taken to match other reports containing this information produced by Defence Statistics and to ensure individual identities have not been revealed inadvertently.

44. Some of the data sources used in this report are live systems that are constantly being updated. This means figures can occasionally change. Any amendments made since the last release have been indicated by an 'r'.

Medical Care Pathway

45. **Figure 1** presents an example of a *typical* medical care pathway for a UK Service Personnel VSI or SI whilst on Operation HERRICK.

Figure 1: Typical Medical Care Pathway



Specialist Treatment Locations

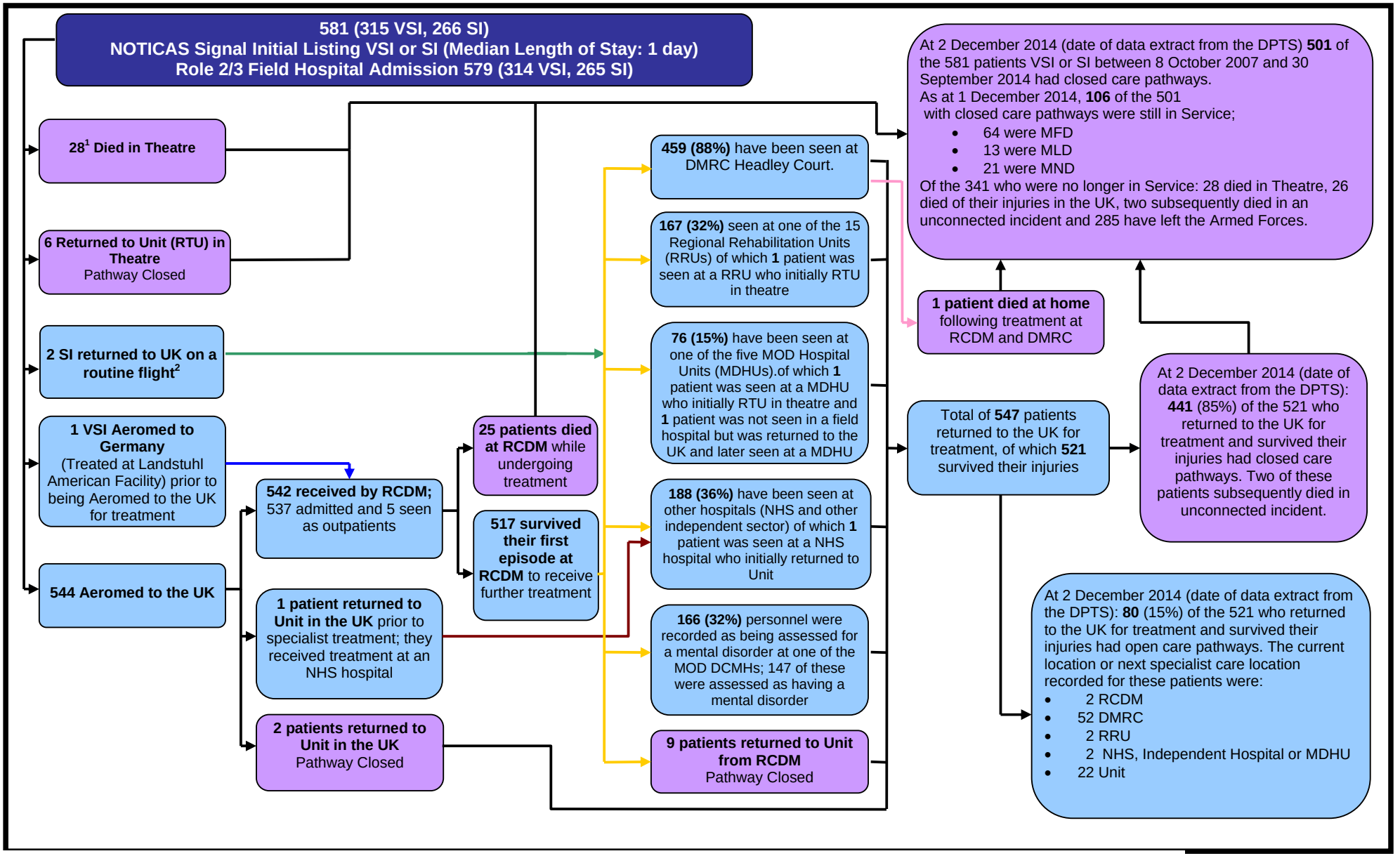
46. More detailed information on the Specialist Treatment locations included in this report is contained in **ANNEX B**.

FINDINGS

47. **Figure 2** presents a summary of the VSI/SI patient treatment pathway for those injured between 8 October 2007 and 30 September 2014.

Colour Key
Blue = Open Care Pathway
Purple = Closed Care Pathway

Figure 2: Summary of care pathways for VSI/SI casualties, 8 October 2007 – 30 September 2014



[1]27 died in a field hospital in Afghanistan and one died while on decompression training in Cyprus.
[2]One personnel returned to unit in theatre after treatment in an Afghanistan field hospital, prior to their return for treatment in the UK. The other personnel returned to the UK without attending the field hospital in Afghanistan, the NOTICAS was raised in the UK.

Number of Personnel Very Seriously Injured or Seriously Injured

48. **Table 1** shows the number of casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014, by initial NOTICAS classification and type of casualty.

Table 1: Casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK 8 October 2007 - 30 September 2014, by financial year, injury classification and type of casualty, Numbers

	All	VSI	SI	Hostile Action	Non-Hostile Action
All	**581**	**315**	**266**	**540**	**41**
8 Oct 2007 - 31 Mar 2008	**38**	12	26	36	2
2008/09	**68**	34	34	63	5
2009/10	**190**	114	76	179	11
2010/11	**161**	83	78	148	13
2011/12	**61**	39	22	59	2
2012/13	**48**	26	22	44	4
2013/14	**10**	4	6	8	2
1 Apr 2014 - 30 Sep 2014	**5**	3	2	3	2

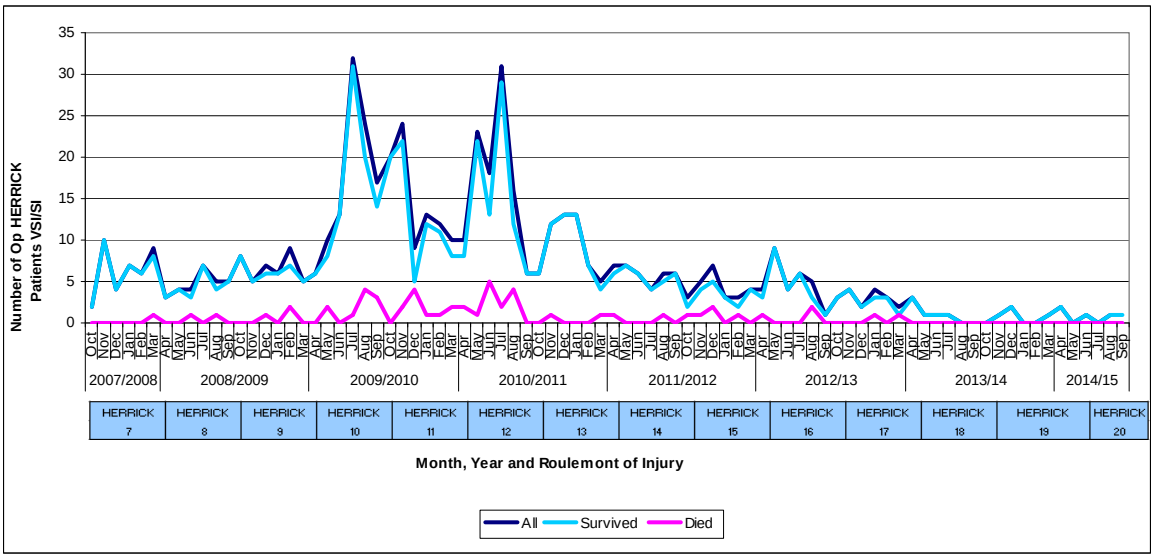
Source: Initial NOTICAS

49. As at 4 December 2014, 51 had died of wounds (50 VSI, one SI), three had died as a result of their injuries from non enemy action (all VSI) and 527[f] casualties had survived their injuries.

50. Of the 581[g] VSI/SI casualties, 73 were Naval Service personnel (all Royal Marine personnel), 495 were Army personnel and 13 were Royal Air Force personnel.

51. **Figure 3** presents the number of casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK by month of injury and roulemont. The fluctuations seen are largely due to Operational tempo. The rise on HERRICK 10 (summer 2009 tour) was largely due to Operation Panther's Claw and the rise in HERRICK 12 (summer 2010 tour) was largely due to the Operational tempo in the province of Sangin.

Figure 3: Personnel with an initial NOTICAS classification of VSI or SI on Operation HERRICK by month of injury and Roulemont, 8 October 2007 – 30 September 2014, Numbers[1]



Source: Initial NOTICAS

[1]Includes 54 personnel who died of wounds/died as a result of their injuries from non enemy action as at 2 December 2014 and two patients, who survived their operational injury and were returned to duty but later died in unconnected incidents.

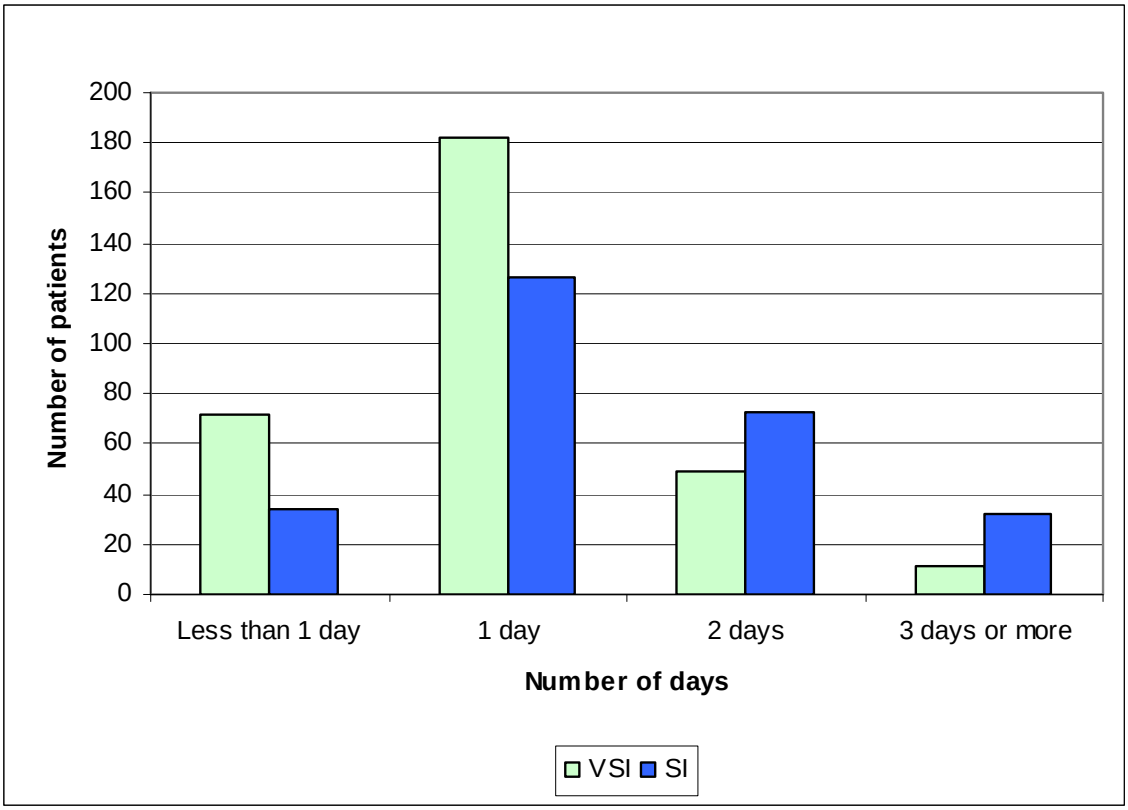
[f] Two patients survived and returned to duty but later died in unconnected incidents, thus they are counted throughout this report as having survived their operational injury

[g] One patient had two separate VSI/SI incidences and therefore has been counted twice totalling 576 personnel

Field Hospital

52. Of the 581 casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014 579 were admitted to a field hospital in Afghanistan; one casualty died of their injuries sustained while on decompression training[h] in Cyprus and one casualty returned to the UK before a NOTICAS was raised for an injury sustained in Afghanistan, therefore was not admitted to a field hospital in Afghanistan. The length of stay at the field hospital for these 579 casualties varied from less than one day to seven days, with a (median) length of stay of one day. The length of stay in the field hospital will have been based on individual circumstances, before leaving the field hospital the casualty will have been fully stabilised and any emergency procedures will have been carried out prior to their departure from the field hospital. **Figure 4** presents the length of stay of those admitted to the field hospital.

Figure 4: Days[1] in field hospital, initial VSI or SI NOTICAS, 8 October 2007– 30 September 2014, Numbers[2]



Source: Initial NOTICAS and J97 field hospital returns

[1] Dates into and out of the field hospital are recorded as date only and not date and time, therefore if a patient arrived and departed on the same day this would be recorded as less than a day. If a patient arrived one day and departed the following day this would be recorded as 1 day.

[2] Two casualties have been excluded, one because they died on decompression training in Cyprus and therefore were not admitted to a field hospital in Afghanistan and one because they were not seen at a field hospital in Afghanistan but were later seen at an MDHU when their injury became infected.

53. Although 54% of the 579 casualties were VSI (n=314) compared to 46% SI (n=265) there was a higher proportion of VSI casualties (81%, n=254) who spent less than 2 days in a field hospital, compared to SI casualties (60%, n=160). This reflects the urgency to return VSI casualties back to the UK to receive specialist treatment.

54. 27 (All VSI) of the 579 casualties admitted to a field hospital in Afghanistan subsequently died in the field hospital (26 died of wounds, one died as a result of their injuries from non enemy action).

[h] At the end of an operational tour, units may find that they require a period of decompression before returning home. This period of time is usually 24-36 hours and involves placing groups into a structured and monitored environment in which to begin winding down and rehabilitating to a routine, peacetime environment.

55. Seven casualties (one VSI and six SI) were treated in the field hospital and then returned to unit in theatre. These casualties may have had conditions that were less serious than originally judged or the treatment may have been readily available in the field hospital and the casualties did not require aeromedical evacuation to the UK. However one of these casualties subsequently returned to the UK on a routine flight and received specialist treatment in the UK.

56. Of the remaining 545 casualties, 544 were returned to the UK for treatment (via an aeromed flight) and one was returned (via an aeromed flight) to the US hospital in Germany for initial treatment for one month and then later returned to the UK for treatment. When patients require aeromedical evacuation they will be given appropriate degrees of Priority so that if the aircraft space is limited the more urgent patients may be evacuated before those with conditions less serious. Of the 540 patients:
    - 332 (61%) were returned as priority 1 – Urgent: These are patients for whom speedy evacuation is necessary to save life or limb, to prevent complication of serious illness or to avoid serious permanent disability. Priority 1 patients will normally be returned to the UK within 24 hours.
    - 129 (24%) were returned as priority 2 – Priority: These are patients who require specialised treatment not available locally and who are liable to suffer unnecessary pain or disability unless evacuated to the UK within 48 hours.
    - 84 (15%) were returned as priority 3 – Routine: These are patients whose immediate treatment requirements are available locally but whose prognosis would definitely benefit by air evacuation on routine flights. Most return to the UK within 3-4 days.
    - Occasionally patients, particularly those of greater dependency, may wait longer than 7 days in order to maximise fitness to fly and to reduce any risks associated with their movement by air. Such deferment would result from purely clinical considerations.

VSI/SI Personnel returned to the UK for treatment

First Location of Specialist Care

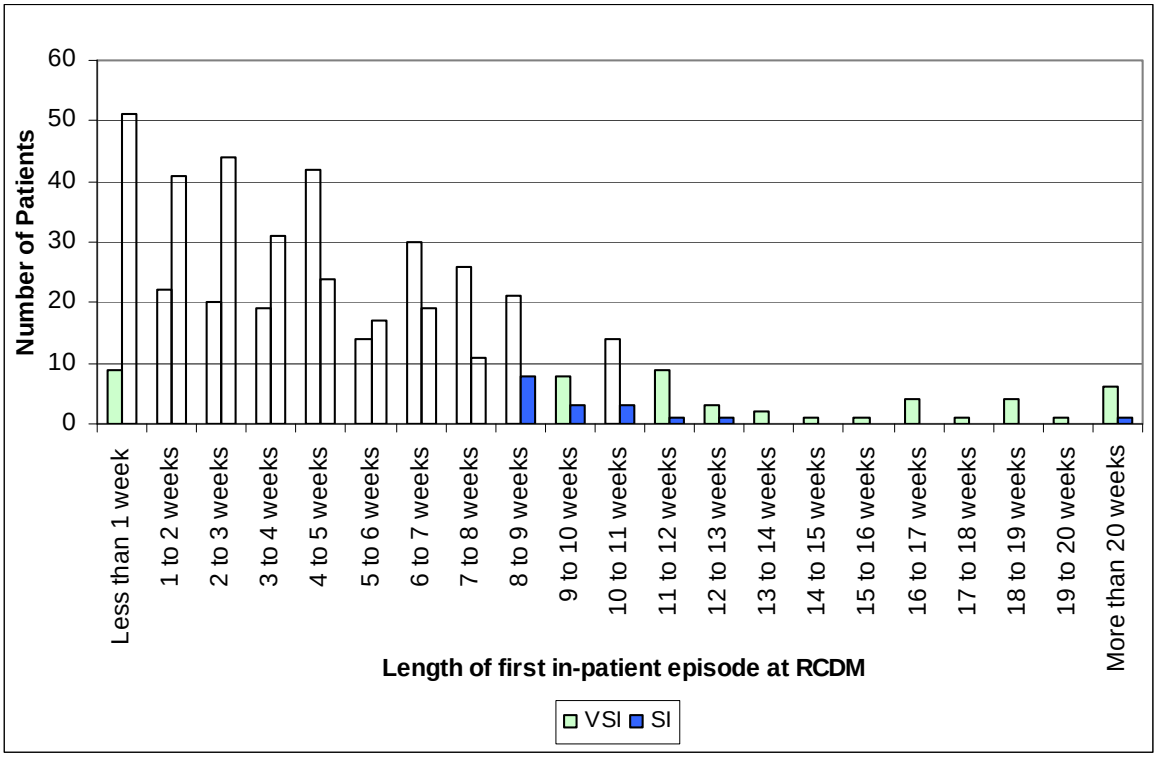
57. As the main receiving unit for military casualties evacuated from an operational theatre, the Defence Patient Tracking System (DPTS) recorded that the Royal Centre for Defence Medicine (RCDM) received 542 of the 545 VSI and SI casualties aeromed to the UK for treatment (including one patient aeromed via Germany). Of the 542 patients received by RCDM, 25 died whilst undergoing treatment in their first inpatient episode (24 died of wounds, one died as a result of their injuries from non enemy action). There were three patients recorded on the DPTS as not being received by RCDM:
    - Two casualties, one listed as VSI and one listed as SI, were returned to unit, receiving treatment/care at primary health care before having their care pathways closed.
    - One casualty, listed as SI, was returned to unit, receiving treatment/care at primary health care. This casualty was later seen at a NHS (Independent Sector) hospital thus has been included in subsequent sections of this report.

58. At RCDM, National Health Service (NHS) staff, augmented with clinical military staff, deliver the whole range of medical care. Serious casualties need and receive advanced levels of care across a wide range of medical disciplines that can only be found in a major trauma hospital. When clinically appropriate, patients are cared for in a military ward.

59. 537 of the 542 casualties received by RCDM were admitted as inpatients. **Figure 5** presents the length of stay for the 511[i] patients who were received by RCDM immediately following their evacuation from theatre and survived their first inpatient episode at RCDM. The length of stay for these patients varied between less than one day (less than one week) and 229 days (32-33 weeks), with an average (median) of 30 days (4-5 weeks), and an inter-quartile range of 34 days (lower quartile of 15 days and an upper quartile of 49 days).

[i] To avoid skewing the length of first inpatient episode at RCDM, 25 patients have been excluded as they died while undergoing their first inpatient episode at RCDM and one patient has been excluded that initially received treatment at a US hospital in Germany for one month prior to their first inpatient episode at RCDM.

Figure 5: Length of stay at first inpatient episode at RCDM (weeks), initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Numbers[1,2]



Source: Initial NOTICAS and DPTS

[1] For the weekly categories, 1 to 2 weeks, for example, includes patients at RCDM for 1 or more weeks but less than 2 weeks.

[2] Graph represents the length of stay for the 511 inpatients received by RCDM immediately following evacuation from theatre who survived their first inpatient episode.

60. **Table 2** shows the length of casualties' first episode as an inpatient at RCDM for VSI and SI casualties. The distribution of the length of episodes was significantly different for VSI and SI casualties[j]. VSI casualties spend longer at their initial episode at RCDM when compared to SI casualties. The time spent at their initial episode at RCDM varies more between VSI casualties in comparison to SI casualties.

Table 2: Length of stay at first inpatient episode at RCDM (days), initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Median, Lower Quartile, Upper Quartile and Inter-Quartile Range

Injury Classification	Median	Lower Quartile	Upper Quartile	Inter-Quartile Range
VSI	43	26	60	35
SI	20	10	35	25

Source: Initial NOTICAS and DPTS

61. **Table 3** shows the length of casualties' first episode as an inpatient at RCDM for patients injured as a result of hostile action and patients as a result of non-hostile action. The distribution of the length of casualties' first inpatient episodes were significantly different for those injured as a result of hostile action and those injured as a result of non-hostile action[f]. Hostile action casualties spend longer at their initial episode at RCDM when compared to non-hostile action casualties. The time spent at their initial episode at RCDM varies more between hostile action casualties in comparison to non-hostile action casualties.

[j] Difference in distributions tested using The Mann Whitney U statistic for independent samples at the 5% significance level.

Table 3: Length of stay at first inpatient episode at RCDM (days), hostile action and non-hostile action casualties, 8 October 2007 – 30 September 2014, Median, Lower Quartile, Upper Quartile and Inter-Quartile Range

Type of Injury	Median	Lower Quartile	Upper Quartile	Inter-Quartile Range
Hostile Action	31	15	50	35
Non-Hostile Action	11	4	19	15

Source: Initial NOTICAS and DPTS

62. The information shown in **Figure 5** would provide guidance on the length of time VSI or SI patients would spend in their initial inpatient episode at RCDM if they sustained comparable injuries in Afghanistan or in future conflicts.

Subsequent Locations of Specialist Care

63. As at 2 December 2014 (date of extract from the DPTS), of the 542 patients that were received by RCDM as either an inpatient (n=537[k]) or an outpatient (n=5), 517 survived their first episode. Of the 517 patients who survived their first episode at RCDM:
    - 507 have gone on to either receive further treatment at RCDM or to receive treatment at other specialist care locations.
    - Nine patients completed their first inpatient episode at RCDM before returning to unit and having their care pathway closed with no further specialist care required.
    - One patient went on to receive further treatment at RCDM and DMRC, but subsequently died of wounds at home, a year after their initial injury.

Royal Centre for Defence Medicine

64. As at the 2 December 2014 (date of data extract from the DPTS):
    - 331 (64%) of the 517 patients had received subsequent treatment as an inpatient or outpatient at RCDM**,** 209 of which were admitted as an inpatient more than once.
    - Two of the 517 patients was receiving treatment at RCDM or were awaiting their next episode at RCDM.

Defence Medical Rehabilitation Centre (DMRC), Headley Court

65. As at 2 December 2014 (date of data extract from the DPTS), 459 (88%) of the 522 patients (521 who returned to the UK for treatment and survived their injuries and one that returned to the UK and survived their first RCDM episode but subsequently died of wounds at home) have received treatment at DMRC Headley Court. Patients may move straight from their inpatient or outpatient care at RCDM to DMRC or they may have a period of time on sick leave to enable time to heal before starting rehabilitation or they may be seen at one of the Regional Rehabilitation Units before requiring treatment at DMRC.

66. As at 2 December 2014, 52 (10%) of the 522 patients were currently receiving treatment at DMRC or awaiting their next episode of care at DMRC.

67. All patients attending DMRC are initially seen by a team of experts from different medical fields who together agree on the course of treatment. The team includes specialist medical officers, nurses, fitness instructors, physiotherapists, occupational therapists, speech and language therapists, cognitive therapists and social workers. The team also help prepare the casualties for a gradual return to active duty where possible.

68. Of the 459 that have attended DMRC:
    - 373 (81%) were seen as inpatients[l], 332 (89%) of which were admitted as an inpatient more than once.
    - 437 (95%) were seen as outpatients.
    - 140 (31%) were seen as residential patients.

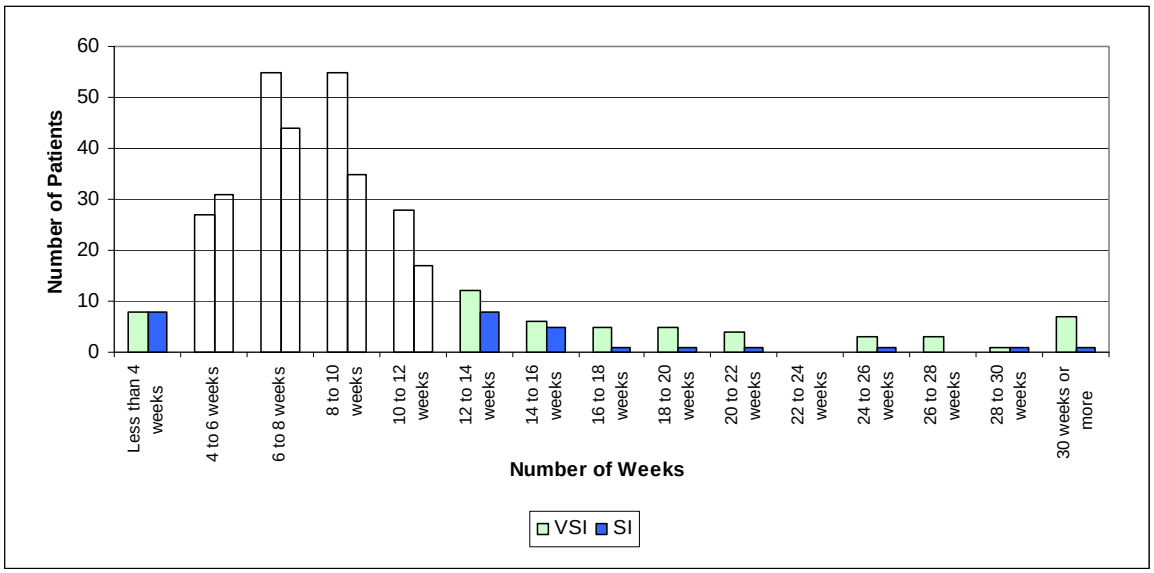
[k] Includes one patient that initially received treatment at a US hospital in Germany for one month prior to their first inpatient episode at RCDM

[l] An inpatient is a patient that has been admitted and allocated a ward bed. A residential patient is a patient that is a on a three week-rehab course; they are not allocated a ward bed, but reside in dormitory style accommodation. An outpatient is a non-resident patient attending DMRC for treatment.

Length of time between Injury and Inpatient Admissions

69. **Figure 6** presents the length of time between injury and the first inpatient episode of care at DMRC for the 373 patients who have been treated as an inpatient.

Figure 6: Length of time between injury and first inpatient episode of care at DMRC, initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Numbers[1]



Source: Initial NOTICAS and DPTS

[1] For the weekly categories, 4 to 6 weeks, for example, includes patients whose time between injury and arrival at their inpatient episode at DMRC is 4 or more weeks but less than 6 weeks.

70. The length of time between injury and first inpatient episode of care at DMRC varied between 12 days (less than two weeks) and 873 days (more than 124 weeks), with a median of 59 days (inter-quartile range of 30 days (lower quartile 45 days to upper quartile 75 days)). Therefore the impact of an increase in the number of VSI and SI casualties in theatre may lead to an increasing initial burden on DMRC 8 to 9 weeks after injury.

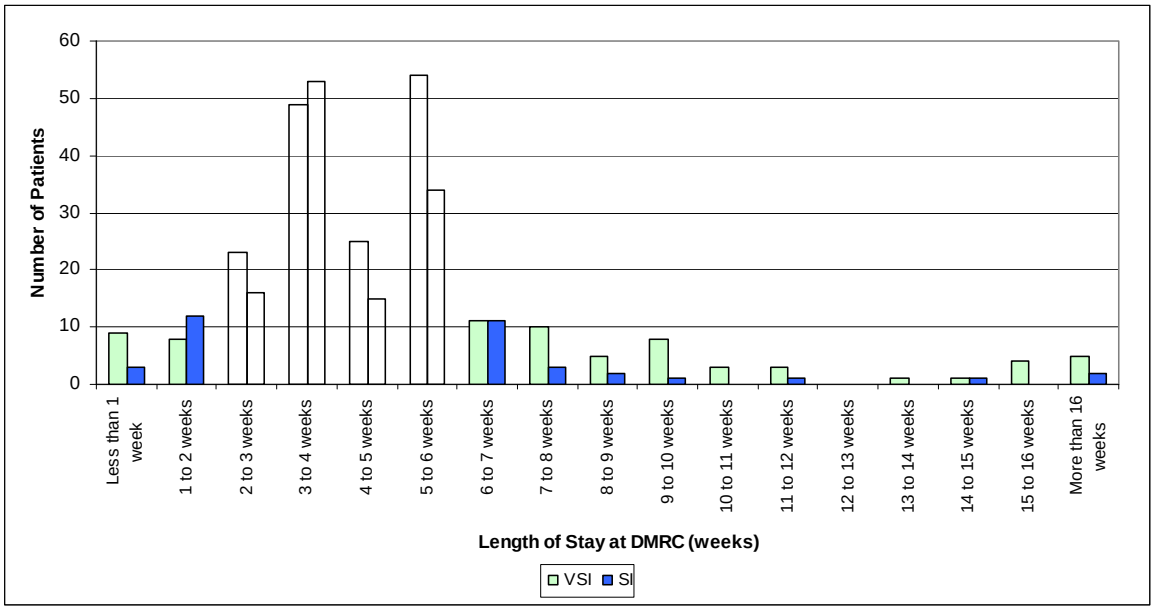
71. First inpatient admissions at DMRC show the smallest variation in the length of time between injury and admission. There are a few outliers in this data with some patients taking considerably longer than average to arrive at DMRC from their date of injury. Of these outliers, the majority were VSI patients indicating that they may need lengthier specialist care or longer recovery time prior to being admitted for rehabilitation. Subsequent admissions[m] are more variable in nature (with larger inter-quartile ranges) than the first admission:
    - On average (median) second inpatient admissions occur 17 weeks after injury, nine weeks after first admission.
    - Third inpatient admissions occur 25 weeks after injury, eight weeks after second admission.
    - Fourth inpatient admissions occur 34 weeks after injury, nine weeks after third admission.
    - Fifth inpatient admissions occur 44 weeks after injury, ten weeks after fourth admission.
    - Sixth inpatient admissions occur 54 weeks after injury, ten weeks after fifth admission.
    - Seventh inpatient admissions occur 66 weeks after injury, 12 weeks after sixth admission.
    - Eighth inpatient admissions occur 76 weeks after injury, ten weeks after seventh admission.

[m] Only eight admissions have been shown, however some patients have had more than 10 admissions.

Length of Inpatient Admissions

72. **Figure 7** shows that the median length of stay of first admission for SI inpatients at DMRC was 3 to 4 weeks, whilst for VSI inpatients the median length of stay was 4 to 5 weeks.

Figure 7: First Inpatient length of stay at DMRC, initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Numbers[1,2]



Source: Initial NOTICAS and DPTS

[1] For the weekly categories, 1 to 2 weeks, for example, includes patients at DMRC for 1 or more weeks but less than 2 weeks.

73. **Figure 8** and **Table 4** show that the distribution of the length of inpatients first stay at DMRC was significantly different for VSI and SI patients[n]. VSI casualties spend longer at their initial episode at DMRC when compared to SI casualties.

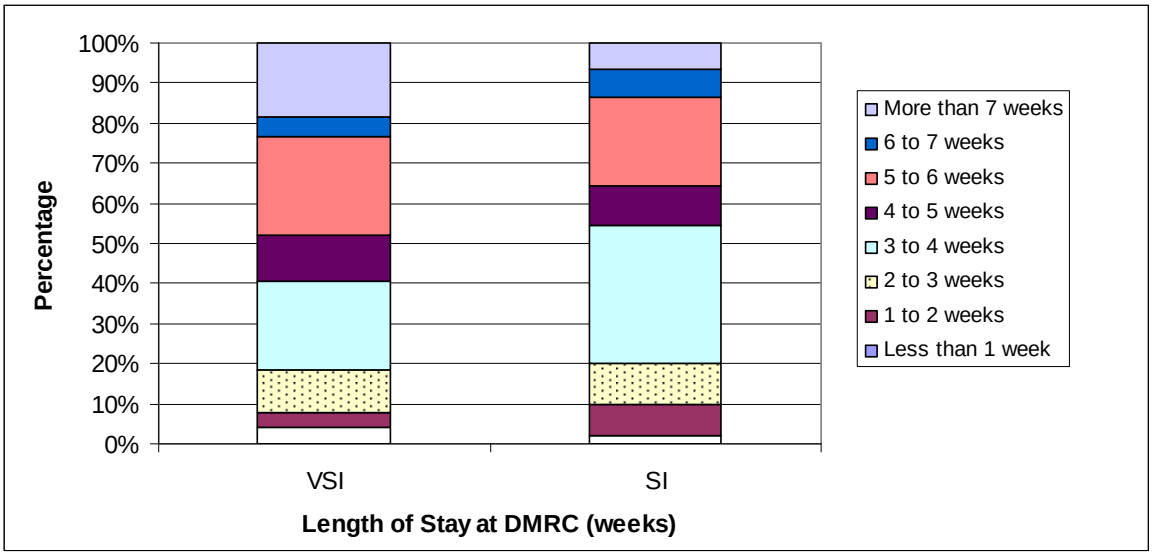
Table 4: Length of stay at first inpatient episode at DMRC (days), initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Median, Lower Quartile, Upper Quartile and Inter-Quartile Range

Injury Classification	Median	Lower Quartile	Upper Quartile	Inter-Quartile Range
VSI	32	23	41	18
SI	24	22	38	16

Source: Initial NOTICAS and DPTS

[n] Difference in distributions tested using The Mann Whitney U statistic for independent samples at the 5% significance level.

Figure 8: First Inpatient length of stay at DMRC, initial VSI or SI NOTICAS, 8 October 2007 - 30 September 2014, Percentage



Source: Initial NOTICAS and DPTS

74. On average the first inpatient admission was the longest admission for these 373 patients with an median admission length of 30 days. There were some outliers in this data with four patients spending considerably less time than average during their first inpatient admission (less than three days) and a number of patients spending considerably longer than average during their first inpatient admission (more than 50 days). Both VSI and SI inpatients have extreme outliers surrounding their average length of first inpatient admissions indicating that first inpatient length of stay is dependent on individual circumstances.

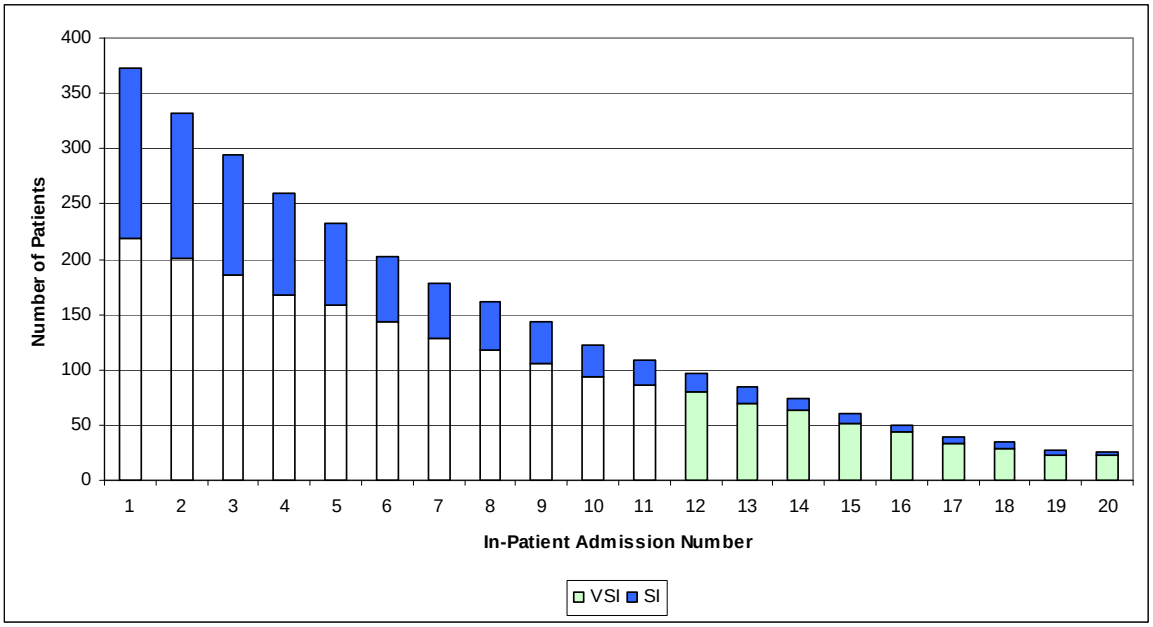
75. The median length of stay for each subsequent admission (admission number is incremental, first inpatient episode is admission one, second inpatient episode is admission two etc) is less than the first but remains relatively stable at around 19 days. **Figure 9** presents the number of inpatient admissions by VSI and SI classification. The current maximum number of inpatient admissions is 35 (admissions 21-35 do not appear on the graph due to small numbers). However, these numbers are likely to change as many patients have yet to complete their care pathway.

76. The number of inpatients admitted decreases with every subsequent admission; of the 373 inpatients:
    - 332 (89%) went on to have a second admission,
    - 295 (79%) went on to have a third admission,
    - 260 (70%) went on to have a fourth admission,
    - 233 (62%) went on to have a fifth admission,
    - 203 (54%) went on to have a sixth admission,
    - 178 (48%) went on to have a seventh admission,
    - 161 (43%) went on to have an eighth admission,
    - 143 (38%) went on to have a ninth admission,
    - 122 (33%) of all first inpatient admissions go on to have ten or more admissions.

77. The distribution of the number of admissions was significantly different for VSI and SI patient[o]. The median number of admissions for VSI patients (eight admissions; inter-quartile range of 10 (lower quartile of four and an upper quartile of 14)) was higher than for SI patients (five admissions; inter-quartile range of six (lower quartile of two and an upper quartile of eight)). This may reflect the more severe injuries that are sustained by VSI patients that require additional inpatient rehabilitation admissions.

[o] Difference in distributions tested using The Mann Whitney U statistic for independent samples at the 5% significance level.

Figure 9: Inpatient Admissions to DMRC, initial VSI or SI NOTICAS, 8 October 2007 - 30 September 2014, Numbers



Source: Initial NOTICAS and DPTS

Regional Rehabilitation Units (RRUs)

78. As at 2 December 2014 (date of data extract from the DPTS):
    - 167 (32%) of the 522 patients had received subsequent treatment at one of the 15 RRUs. Of these 167; 164 had been seen at multi-disciplinary assessment clinics (MIAC) and 49 had been treated on three week rehabilitation courses (26 had been on one rehabilitation course, 19 had been on two rehabilitation courses, three had been on three rehabilitation courses and one had been on four rehabilitation courses).
    - Two of the 522 patients were currently receiving treatment at a RRU or awaiting their next episode at an RRU.

Other Locations

79. As at 2 December 2014 (date of data extract from the DPTS):
    - 220 (42%) of the 522 patients had received subsequent treatment at another hospital (including NHS Hospitals, an Independent Sector Hospitals or a Ministry of Defence Hospital Unit (MDHU)).
    - Two of the 522 patients was currently receiving/awaiting treatment at a NHS or Independent Sector Hospital.

80. As at 30 September 2014 (latest date for which mental health data are available):
    - 166[p] (32%) of the 522 patients had been seen for assessment as new patients at one of the MOD's Departments of Community Mental Health (DCMH) after their date of injury. Of these 166 personnel, 147[q] were assessed as having a mental disorder. Of the 147 personnel:
        - o 126 were assessed with a neurotic disorder, of which 39 were assessed as having Post Traumatic Stress Disorder (PTSD).
        - o 22 were assessed with a mood disorder
    - 11 were assessed with another mental disorder; this includes those assessed with mental and behavioural disorders due to alcohol.
    - Six of the 522 patients were admitted to the MOD's inpatient contractor for mental health care.
    - None of the 522 patients were currently receiving treatment at a DCMH or awaiting their next episode at a DCMH.

[p] Please note that Defence Statistics cannot attribute DCMH attendance to a care pathway

[q] 20 personnel were assessed with more than one mental disorder and were counted once for each disorder grouping. Personnel with two assessments with the same disorder group are counted once.

Amputees

81. Of the 527 casualties with an initial NOTICAS classification of VSI or SI on Operation HERRICK between 8 October 2007 and 30 September 2014 who survived their injuries (as at 2 December 2014), 210 (40%) were identified as amputees as at 31 December 2014 (the latest amputations data available). Of these, 207 (99%) were the result of hostile action and three (1%) were the result of operational accidents. The 210 amputees are a subset of those reported in the Quarterly Afghanistan and Iraq Amputation Statistics produced by Defence Statistics[r], and do not match the statistics published in this report for several reasons;
    - their injury occurred before 8 October 2007 and the amputation was a surgical amputation that occurred after 8 October 2007;
    - their injuries resulted in an initial NOTICAS listing of 'Incapacitating Injury' or 'Unlisted injury' as the injuries were not of such severity that life or reason is imminently endangered (VSI) or of such severity that there is cause for immediate concern, but there is no imminent danger to life or reason (SI) (as some of the amputees include personnel who have lost a finger or toe).

82. As at 2 December 2014, 58 (28%) of the 210 amputees had open care pathways, indicating that they were still receiving specialist care. Of the 210 amputees:
    - All had been treated at RCDM (all 210 were seen as inpatients and 136 were seen as outpatients).
    - 208[s] had been treated at DMRC; 207 were seen as inpatients, all 208 were seen as outpatients and 50 were seen as residential patients. All 208 patients were seen at more than one type of appointment (inpatient, outpatient and residential).
    - 43 had received treatment at a RRU; all 43 were seen at a multi-disciplinary injury assessment clinic and three were treated on a rehabilitation course.
    - 121 had received subsequent treatment at another hospital (including NHS, Independent Sector Hospitals and Ministry of Defence Hospital Units).

Care Pathway Length and Closed Pathways

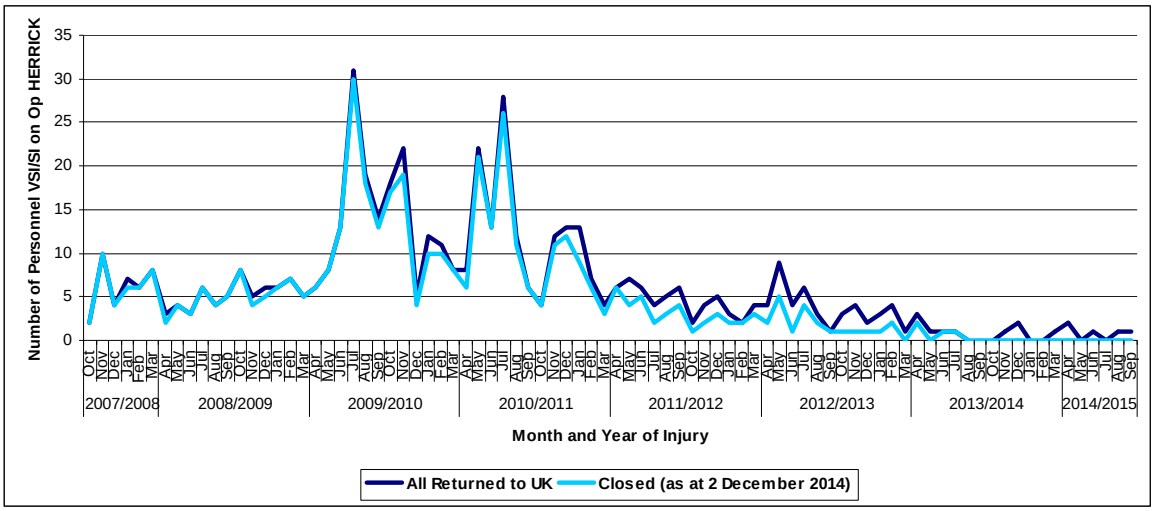
83. As at 2 December 2014 (date of data extract from the DPTS), 501 personnel out of the 581 with an initial NOTICAS listing of VSI or SI had a closed care pathway. Of the 501: 54 died of their wounds or injuries (28 died in theatre, 26 died in the UK) and 447 survived their injuries.

84. The graphs and commentary produced in this section only include the 521 personnel who returned to the UK for treatment and survived their injuries (as at 2 December 2014). Therefore, the six personnel who returned to unit in theatre and had their pathway closed, the 28 who died in theatre and the 26 who died in the UK were excluded from this section as they would skew the trends presented.

[r] Quarterly Afghanistan and Iraq amputation statistics can be found on Gov.uk.
[s] One amputee did not attend DMRC for treatment, this patient instead received treatment for their injuries at RCDM; and one amputee, injured in 2012/13, has yet to attend DMRC for treatment.

85. **Figure 10** presents the number of personnel returned to the UK for specialist treatment with an initial NOTICAS classification of VSI or SI on Operation HERRICK by month of injury and the number of these personnel with closed pathways as at 2 December 2014.

Figure 10: Personnel with an initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, returned to the UK by month of injury and closed care pathways, Numbers[1]



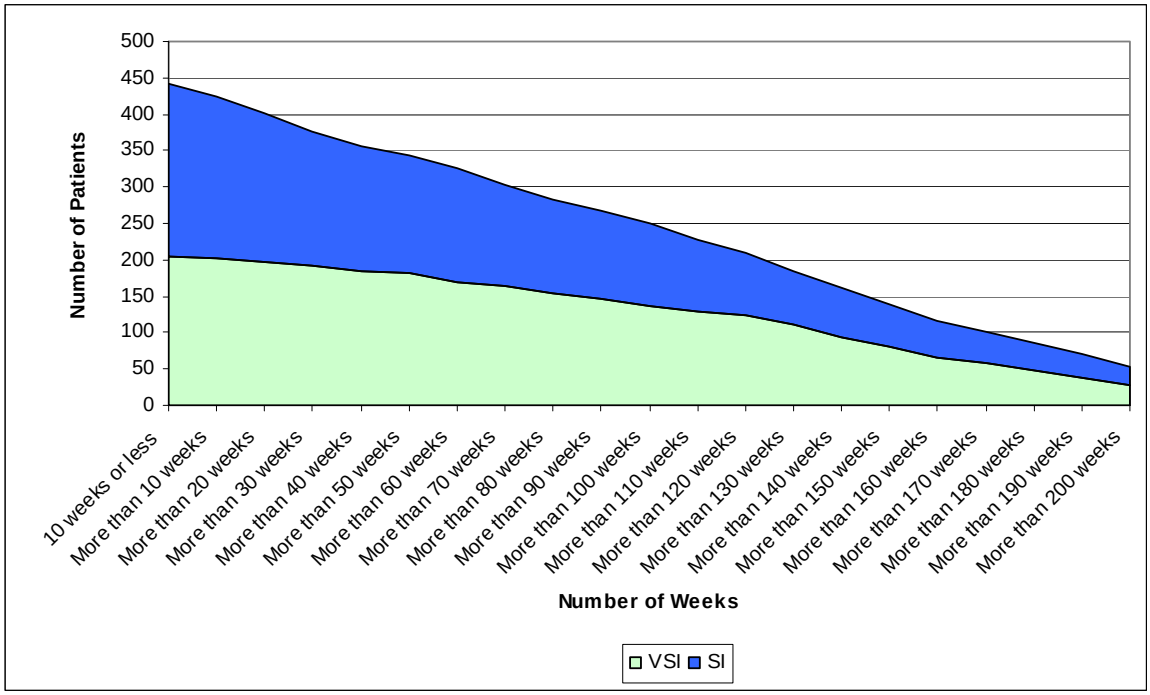
Source: Initial NOTICAS and DPTS

[1] Figures presented are for the 521 casualties who returned to the UK for treatment and survived their injuries (as at 2 December 2014).

86. As at 2 December 2014 (date of data extract from the DPTS), 80 (15%) of the 521 VSI/SI patients returned to the UK for treatment who survived their injuries had open care pathways. The remaining 441 had closed pathways indicating that no further specialist care was required (205 VSI and 236 SI). Of the 441 patients;
    - One had a new pathway initiated (nine months after the original closed pathway) as a result of their previous injury (SI). Their care pathway is now closed.
    - Two who required no further specialist follow-up for a VSI and SI were returned to duty, two later died in unconnected incidents and one was returned via aeromed from Operations for the same injury sustained in the original VSI incident and treated in Primary Health Care (their care pathway is now closed).

87. **Figure 11** presents the length of care pathway as a cumulative frequency graph for the 4 patients who returned to the UK for treatment and survived their injuries with **closed** pathways (as at 2 December 2014), calculated using the time between injury and date of pathway closure. For the patient with a subsequent pathway initiated only the length of time of the initial pathway has been calculated.

Figure 11: Length of care pathway for closed pathways (weeks), initial VSI or SI NOTICAS, 8 October 2007 – 30 September 2014, Cumulative Frequency



Source: Initial NOTICAS and DPTS

88. The length of closed care pathways[t] varied between 2 days (less than 1 week) and 2,507 days (between 358 and 359 weeks), with an average (median) of 857 days (between 122 and 123 weeks) and an inter-quartile range of 773 days (lower quartile 441 days (between 63 weeks) and upper quartile 1,214 days (between 173 and 174 weeks)).

89. Please note, there are some patients with open care pathways who were injured at the start of 2008 and thus at 2 December 2014 (date of data extract from the DPTS) these pathways were over five years in length.

Survival Analysis

90. Survival analysis is a statistical methodology that can be used to identify if two or more populations show differences in the rate of a "failure" event over time, and to predict the probability that a failure will or will not have occurred after a set period of time. In the context of this report "Survival" does not refer to the death of a patient, but to the length of time for which a patient is treated in secondary rehabilitation care for their injury. A "failure" or termination of a patients care can occur as a result of three actions:

    a. The patient no longer requires specialist care (hospital or rehabilitation unit)

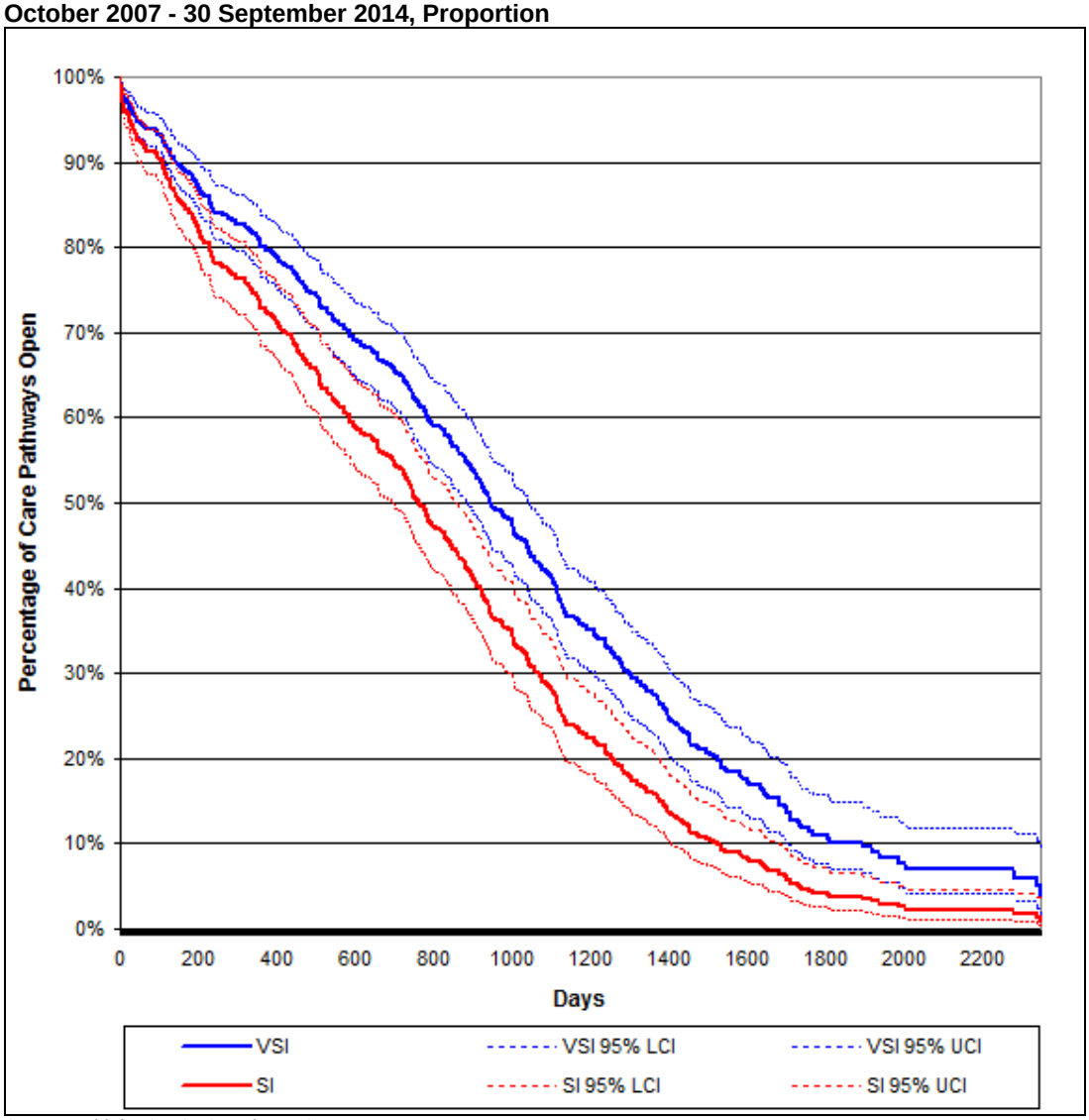
    b. The patient leaves the Armed Forces

    c. The patient dies

[t] Please note that Defence Statistics are aware of data issues with the date care pathways are closed and this is currently in the process of being validated. As such this data should be treated as provisional.

91. **Figure 12** shows estimated survival curves for the length of care pathways of the 547 VSI/SI UK Armed Forces personnel treated in the UK[u] by initial classification of injury, between 8 October 2007 and 30 September 2014.

Figure 12: Survival Curves of care pathway lengths[1,2], by initial NOTICAS listing (VSI/SI), 8 October 2007 - 30 September 2014, Proportion



Source: Initial NOTICAS and DPTS
1 - Time from injury to closure of care pathway
2 - As at 2 December 2014 (date of extract)
3 - Generated using a Cox proportional hazards survival model. For further information see **Annex C**
4 - UK Armed Forces personnel on Op HERRICK treated in the UK

92. **Figure 12** shows that 50% of VSI patients treated in the UK will have finished their care pathway by 941 days (2 years 11 months) after injury; by comparison 50% of SI patients treated in the UK will have finished their care pathways by 757 days (2 years 1 month).

93. The difference between the survival curves was statistically significant. This means that distribution of care pathway lengths differs between the two populations; patients with an initial NOTICAS classification of VSI tend to have longer care pathways than SI patients. This means that the difference seen in the care pathway lengths is not due to random chance.

94. **Table 5** shows the estimated number and percentage of open care pathways of VSI/SI UK Armed Forces personnel treated in the UK, after selected periods of time, by initial classification of injury,

[u] Includes the 26 personnel who died of their injuries after returning to the UK

between 8 October 2007 and 30 September 2014. The estimated figures are derived from the survival curves pictured in Figure 12.

Table 5: Estimated open care pathways of VSI/SI UK Armed Forces personnel treated in the UK, by time and initial VSI or SI NOTICAS, 8 October 2007 - 30 September 2014, Numbers and Percentages

	VSI			SI		
Time	**Number Open**	**Number Closed**	**% Closed**	**Number Open**	**Number Closed**	**% Closed**
0 months	286	0	0%	261	0	0%
6 months	253	33	12%	219	42	16%
1 year	229	57	20%	190	71	27%
2 years	183	103	36%	138	123	47%
3 years	119	167	58%	75	186	71%
4 years	62	224	78%	29	232	89%

Source: Initial NOTICAS and DPTS

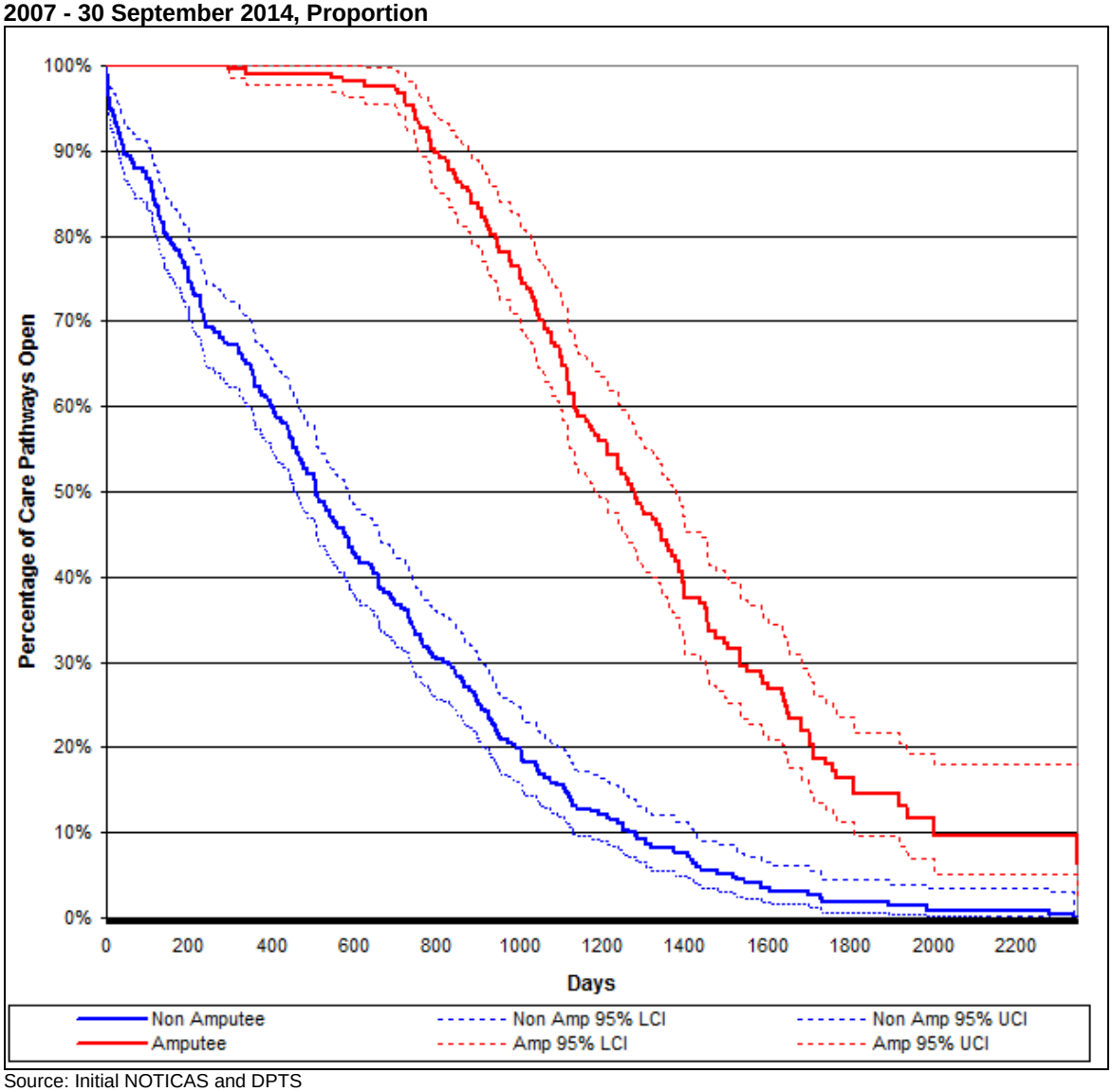
1 - Please note that as the number and proportion of closed care pathways are rounded estimates, percentages data may not match count data.

95. **Table 5** shows that we expect 73% of SI patients treated in the UK to have an open care pathway after 1 year, whereas we expect 80% of VSI patients treated in the UK to have an open care pathway after the same time period.

96. Approximately 22% of VSI and 11% of SI personnel have open care pathways more than four years after injury (and are therefore still receiving specialist care).

97. **Figure 13** shows estimated survival curves for the length of care pathways of the 547 VSI/SI UK Armed Forces personnel treated in the UK, by amputee and non-amputee, between 8 October 2007 and 30 September 2014.

Figure 13: Survival Curves of care pathway lengths[1,2], by amputee and non-amputee, 8 October 2007 - 30 September 2014, Proportion



Source: Initial NOTICAS and DPTS
1 - Time from injury to closure of care pathway
2 - As at 2 December 2014 (date of extract)
3 - Generated using a Kaplan-Meier survival model. For further information see **Annex C**.
4 - UK Armed Forces personnel on Op HERRICK treated in the UK

98. **Figure 13** shows that 50% of amputees treated in the UK will have finished their care pathway by 1,272 days (3 years 9 months) after injury; by comparison 50% of non-amputees patients treated in the UK will have finished their care pathways by 507 days (1 year 5 months) after injury.

99. The difference between the survival curves was statistically significant. This means that distribution of care pathway lengths differs between the two populations; amputees tend to have longer care pathways than non-amputees. This means that the difference seen in the care pathway lengths is not due to random chance.

100. **Table 6** shows the estimated number and percentage of open care pathways of VSI/SI UK Armed Forces personnel treated in the UK, after selected periods of time, by amputee and non-amputee, between 8 October 2007 and 30 September 2014. The estimated figures are derived from the survival curves pictured in Figure 13.

Table 6: Estimated open care pathways of VSI/SI UK Armed Forces personnel treated in the UK, after selected time periods, by amputee and non-amputee, 8 October 2007 – 30 September 2014, Numbers and Percentages

	Amputee			Non-Amputee		
Time	**Number Open**	**Number Closed**	**% Closed**	**Number Open**	**Number Closed**	**% Closed**
0 months	210	0	0%	337	0	0%
6 months	210	0	0%	261	76	23%
1 year	208	2	1%	210	127	38%
2 years	200	10	5%	119	218	65%
3 years	141	69	33%	40	285	85%
4 years	70	140	66%	19	318	94%

Source: Initial NOTICAS and DPTS

1 - Please note that as the number and proportion of closed care pathways are rounded estimates, percentages data may not match count data.

101. **Table 6** shows that we expect 99% of VSI/SI amputee patients treated in the UK to have an open care pathway after 1 year. In comparison, we expect 62% of VSI/SI non-amputee patients treated in the UK to have an open care pathway after 1 year.

102. We expect approximately 34% of amputees and 6% of non-amputees to have open care pathways more than four years after injury (and, therefore, be still receiving specialist care).

103. Further information on survival analysis can be found in **ANNEX C.**

Personnel who have Redeployed

104. As at 8 January 2015 (latest deployment data available), 52 of the 441[v] patients who returned to the UK for treatment in specialist care and survived their injuries with closed pathways had subsequently redeployed on Operation HERRICK and/or Operation TELIC after their care pathway closure date.

Current Joint Medical Employability Standard (JMES) for Personnel with Closed Pathways

105. 106 (24%) of the 447 patients who survived their injuries with closed pathways were still in Service on 1 December 2014 (the latest strength data available). The latest Medical Deployment Standard (MDS) as recorded on their medical record in the Defence Medical Information Capability Programme (DMICP) was identified;
    - 64 were medically fully deployable (MFD)
    - 13 were medically limited deployable (MLD)
    - 21 were medically non deployable (MND)
    - 8 personnel do not have a known MDS.

Discharged Personnel

106. As at 1 December 2014 (the latest strength data available), 341 (76%) of the 447 patients who survived their injuries with closed pathways were no longer in Service (two of which died in unconnected incidents, whilst still in Service). The remaining 186 VSI and SI casualties who survived their injuries (106 with closed pathways, 80 with open pathways) remain in Service. Of the 341:
    - 192 had a closed pathway in the DPTS and had then been discharged from Service.
    - 139 had a closed pathway in the DPTS as a result of leaving Service.
    - Two personnel had a closed pathway in the DPTS, returned to duty and later died in unconnected incidents.

Medically Discharged

107. As at 31 March 2014 (the latest date for which medical discharge data are available), 216 (63%) of the 341 VSI and SI casualties that were no longer in Service had been discharged from Service due to medical grounds. It should be noted that the principal condition leading to discharge may not be related to the VSI/SI injury sustained on Op HERRICK.

108. Of the 216 medically discharged from Service, Musculoskeletal disorders and injuries was the most common principal cause of medical discharge (182 cases). Other principal causes of medical discharge included blood disorders (fewer than five), clinical and laboratory findings (n = 7),

[v] Excludes Service personnel that returned to unit in theatre after sustaining their injury (VSI/SI) and includes two personnel who redeployed and died in an unconnected incident.

digestive system disorders (fewer than five), ear and mastoid process diseases (fewer than five), eye and adnexa diseases (fewer than five), factors influencing health status (n = 7), mental and behavioural disorders (n = 8) and nervous system disorders (fewer than five).

109. If a decision has been taken to medically discharge an individual from the Military the specific Defence Medical Services health team who have been caring for that individual will begin a liaison with appropriate civilian healthcare providers (e.g. General Practitioner / Primary Health Care Team / civil mental health team / NHS Trust) to ensure the transfer of care and patient history takes place.

110. Additionally the MOD have specialist health social workers who manage the individual's wider resettlement issues, liaising with relevant civil agencies such as local housing authorities, financial authorities, service welfare and charitable organisations; again to endeavour that the individual's transfer into the civilian environment is as smooth and as seamless as possible.

Armed Forces Compensation Scheme

111. This section provides statistics on claims and awards made under the Armed Forces and Reserve Forces Compensation Scheme by Very Seriously Injured and Seriously Injured personnel, paying compensation for injury, illness or death caused by Service.

112. The Armed Forces and Reserve Forces Compensation Scheme (AFCS) came into force on 6 April 2005 to pay compensation for injury, illness or death caused by Service that occurred on or after that date. It replaced the previous compensation arrangements provided by the War Pensions Scheme (WPS) and the attributable elements of the Armed Forces Pensions Scheme.

113. Injury claims are made by serving or former members of the Armed Forces for an injury or illness caused by Service. Additional claims are those made following in-Service, medical discharge, or post service claims, to include additional information not presented in the initial claim. Survivors' claims are made by surviving dependants of former members of the Armed Forces where death was caused by Service.

Claims registered

114. A claim is classed as registered when Defence Business Services (DBS) begin a workflow on the Compensation and Pension System (CAPS) for a claim.

115. As at 30 September 2014 (the latest date for which AFCS data are currently available), 515 of the 581 casualties (89%) had registered injury/illness claims under the Armed Forces and Reserve Forces Compensation Scheme (AFCS). These individuals made a total of 877 injury/illness claims, which included multiple and/or additional claims for some individuals.

116. Of the 581 VSI/SI casualties, 54 subsequently died as a result of their injuries. As at 30 September 2014, 17 survivor's claims have been registered under the AFCS as a result of these deaths.

117. 52 of the 581 VSI/SI casualties (9%) have not registered an injury/illness or survivor's claim (as at 30 September 2014). Currently, individuals have up to seven years from the date of injury to make an injury/illness claim and families have up to 3 years to make a claim as a result of a death caused by Service. Therefore, further claims may still be registered for these casualties in the future.

118. Please note that two of the 581 casualties registered an injury/illness claim and then subsequently died. A survivor's claim was then also registered for these casualties. These individuals are counted in the figures quoted in both paragraphs 115 and 116 and therefore the figures quoted will not sum to the total number of injury and survivors' claims.

Awards made for injury/illness claims

119. As at 30 September 2014, 512 of the 515 individuals (99%) who have claimed under the AFCS have been awarded compensation for an illness or injury related to their Service. A total of 650 compensation awards were made to these individuals.

120. A claim is awarded if the injury/illness is accepted as due to Service. Conditions are assessed against a tariff of injuries table where the lower numerical values (i.e. 1-4) reflect the more severe conditions that are awarded at the highest tariff level. Further details on the scheme can be found at https://www.gov.uk/government/publications/armed-forces-compensation/armed-forces-compensation

121. Under the AFCS individuals awarded for an injury/illness claim at tariff levels 1-11 receive a Guaranteed Income Payment (GIP), which is an index-linked, tax-free payment, in addition to their lump sum amount. Individuals awarded at tariff levels 12-15 will receive a lump sum amount only.

122. Of the 650 compensation awards, 476 were made at tariff levels 1-11 and therefore included a Guaranteed Income Payment (GIP) in addition to the lump sum payment. The remaining 172 awards were made at tariff levels 12-15 and included a lump sum payment only.

123. Of the 476 awards including a Guaranteed Income Payment (GIP), 163 awards were made at 100% GIP percentage and therefore received 100% of the tariff amount for all awarded conditions. The two categories of conditions most frequently awarded in these cases were ‘injury, wounds and scarring’ and ‘amputations’.

124. Please note there was one individual where the claimed condition was accepted as being due to Service but did not meet the minimum tariff (level 15). This claim was therefore rejected.

125. As at 30 September 2014, there were no rejected claims where a condition was not accepted as being due to Service.

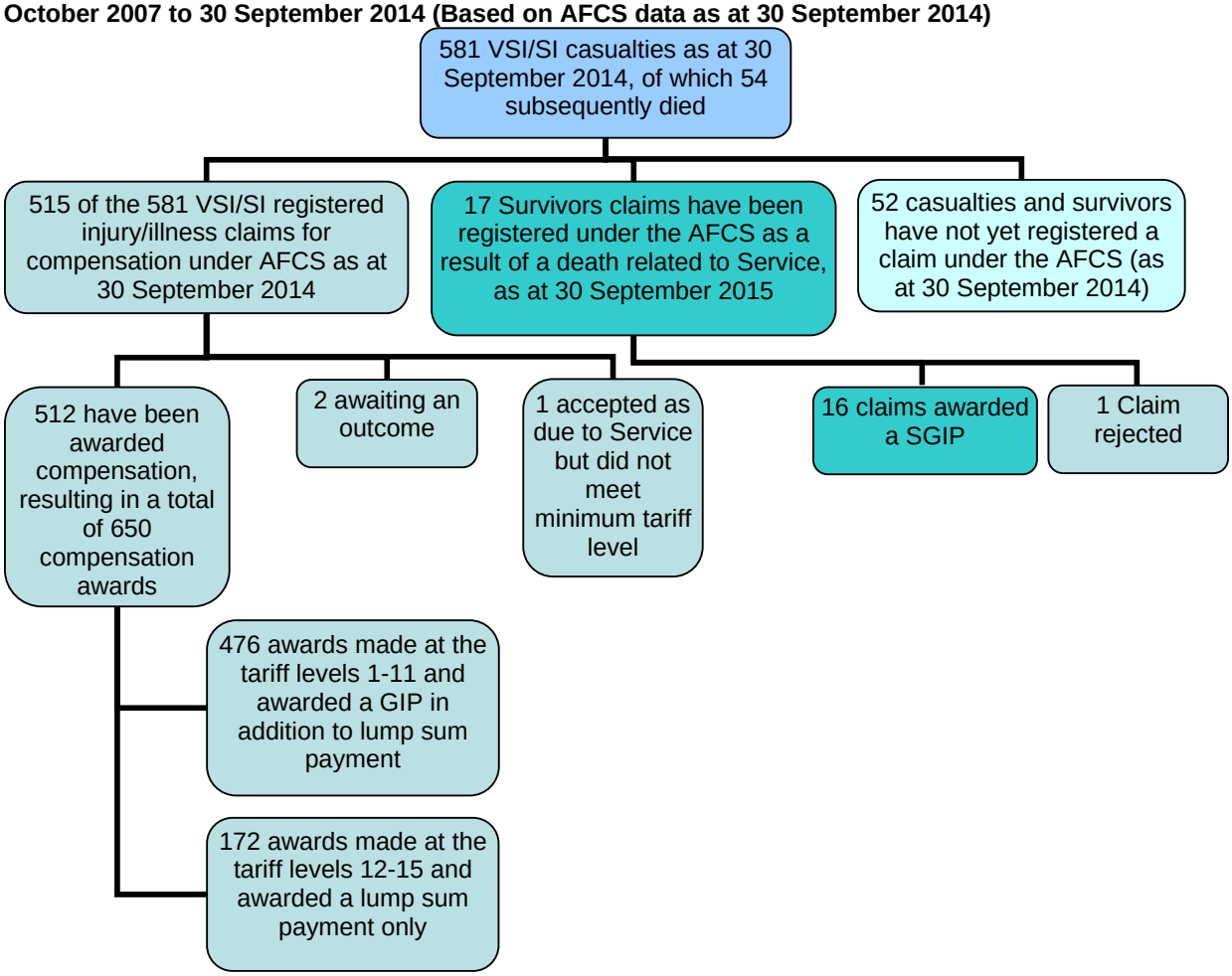
126. As at 30 September 2014, there were no outcomes recorded on the Compensation and Pension System (CAPS) for the claims of two VSI/SI casualties who had registered injury/illness claims under the AFCS.

Awards made for Survivors claims

127. Where death is caused by Service the AFCS provides an income stream known as the Survivor’s Guaranteed Income Payment (SGIP). This is payable to the spouse, civil partner or adult dependant for life. Compensation is also paid to eligible children, known as the Child Payment (CP).

128. Of the 17 survivors claims registered as at 30 September 2014, 16 were awarded a Survivor’s Guaranteed Income Payment and one claim had been rejected.

Figure 14: Summary of VSI/SI casualties claimed and awarded compensation under AFCS, 8 October 2007 to 30 September 2014 (Based on AFCS data as at 30 September 2014)



Source: Initial NOTICAS and AFCS

Discussion

129. As highlighted in the introduction to this report, the report has two aims:
    a. To provide more information to the public about personnel very seriously injured and seriously injured in Afghanistan with a focus on the treatment locations and broad outcome measures.
    b. To assist in the future planning of medical care and manning levels where patients who are VSI or SI on Operations in Afghanistan or in future conflicts where the types of injuries sustained are comparable.

130. In terms of meeting the first aim, the publication shows that these patients pass through a number of medical facilities and the length of time varies with the complexity of the injuries sustained. In terms of reporting outcome measures the report highlights that a large number of casualties who survived their injuries have now completed their care pathway (85%), many (n=341) of these have left the Armed Forces and a significant proportion (63%) of these left on a medical discharge. For those with closed care pathways that remain in the Armed Forces over half (n=64) are now fully Deployable, the remaining casualties are limited or non Deployable and may in the future be medically discharged.

131. In terms of meeting the second aim, the report provides guidance on the average length of time that patients spend at medical facilities, the number of times they are seen and the overall care pathway length.

132. This analysis is currently limited as there are still a number of patients that have not yet completed their care pathway (n=80) which impacts on the numbers presented. The statistics presented will become more robust over time as more casualties complete their care pathway. Survival analysis

techniques have been added to this report as they are capable of including personnel with incomplete care pathways.

Casualties VSI or SI in Afghanistan on Op HERRICK or Op VERITAS between 7 October 2001 and 7 October 2007

133. Between 7 October 2001 (the commencement of Op VERITAS) and 7 October 2007 (the day before the start of the Defence Patient Tracking System), there were 93 casualties with an initial NOTICAS classification of VSI or SI on Operations in Afghanistan (49 were VSI, 44 SI); 75 (81%) of these were the result of hostile action, 18 (19%) were the result of Operational accidents.

134. Six of the 93 casualties died as a result of their injuries; three died of wounds, three died as a result of their injuries from non enemy action (all VSI).

135. As at 1 December 2014 (the latest strength data available), 61 (70%) of the 87 casualties with an initial NOTICAS listing of VSI or SI on Operations in Afghanistan between 7 October 2001 and 7 October 2007 who survived their injuries were no longer in Service.

136. As at 31 March 2014 (the latest date for which medical discharge date are available) 37 (64%) of the 61 VSI and SI casualties that survived their injuries and were no longer in Service had been discharged from Service due to medical grounds and a further two were medically discharged and have since rejoined the services. It should be noted that the principal condition leading to discharge may not be related to the VSI/SI injury sustained.

137. Of the 37 medically discharged from Service, Musculoskeletal disorders and injuries was the most common principal cause of medical discharge (26 cases). Other principal causes of medical discharge included ear and mastoid process diseases, factors influencing health status, mental and behavioural disorders, nervous system disorders and skin and subcutaneous tissue diseases.

138. 26 of the 87 casualties with an initial NOTICAS listing of VSI or SI on Operations in Afghanistan between 7 October 2001 and 7 October 2007 who survived their injuries were still in Service on 1 May 2014 (the latest strength data available). The latest Medical Deployment Standard (MDS) as recorded on the Defence Medical Information Capability Programme (DMICP) was identified;
    - 14 were medically fully deployable (MFD)
    - Three were medically limited deployable (MLD)
    - Eight were medically non deployable (MND)
    - One had no MDS recorded after their injury on DMICP

Data Sources

NOTICAS

139. Notification of Casualty (NOTICAS) is the name for the formalised system of reporting casualties within the UK Armed Forces. It sets in train the MOD's next of kin informing procedure. The MOD's Joint Casualty and Compassionate Policy and procedures set out the guidance under which a NOTICAS report is to be raised. NOTICAS takes precedence over all but the most urgent operational and security matters.

140. The NOTICAS reports raised for casualties contain information on how seriously medical staff in theatre judge their condition to be. This information is used to inform what the next of kin are told. "VSI" and "SI" are the two most serious categories into which personnel can be classified:
    a. Very seriously injured/ill (VSI) is the definition we use where the injury/illness is of such severity that life is imminently endangered.
    b. Seriously injured/ill (SI) is the definition we use where the patient's condition is of such severity that there is cause for immediate concern, but there is no imminent danger to life.

141. The VSI and SI categories are defined by Joint Casualty and Compassionate Policy and Procedures. They are not strictly 'medical categories' but are designed to give an indication of the severity of the injury to inform the next of kin and the chain of command.

142. NOTICAS was used to identify those personnel whose initial listing was VSI or SI between 7 October 2001 and 30 September 2014. In these figures we have excluded individuals categorised as VSI or SI whose condition was identified to be caused by illness.

143. The number of Service personnel classified as VSI or SI as a result of injuries sustained on Op HERRICK is published monthly, a fortnight in arrears, and can be found on Gov.uk[w].

Aeromed

144. Defence Statistics routinely receive aeromedical evacuation records from the Aeromedical Evacuation Control Centre (AECC) at RAF Brize Norton for Operations in Afghanistan.

145. Not all Service personnel aeromedically evacuated from Afghanistan will receive specialist medical treatment (i.e. in a hospital, rehabilitation centre or mental health facility) but will be placed under the care of their unit Medical Officer/Medical Centre.

Field Hospital Admissions from J97 Returns and OpEDAR

146. There was a UK Field Hospital at Camp Bastion where the more seriously ill and injured were treated. This had an intensive care and high-dependency facility, as well as surgical, medical, A+E, physiotherapy, and dental, mental health, x-ray, CT scanner and laboratory facilities.

147. Defence Statistics received information on the patients who are admitted to the UK Field Hospital at Camp Bastion from the J97 Returns. This J97 return also includes those patients admitted to the following two locations:
    - The HQ of Multinational Brigade (South) in Kandahar also maintained a Field Hospital which provides support for ISAF and Coalition personnel. This facility includes additional capabilities to that of the Role 2 including specialist diagnostic resources and specialist surgical and medical capabilities.
    - In Kabul, UK Personnel may be admitted to either the French or Greek Field Hospital. There is also a US facility which provides physiotherapy and dentistry. In total, the UK deployed some 300 medical staff to support the operation.

148. Up until 31 December 2011, Defence Statistics also received information on admissions and attendances at the UK Field Hospital at Camp Bastion from the Operational Emergency Attendance Register (OpEDAR)).

149. Whilst most of the data is captured via drop down menus, some fields, including diagnosis, are free text, thus the quality of medical information captured is variable.

[w] www.gov.uk/government/organisations/ministry-of-defence/about/statistics

150. The OpEDAR system records all patients who have attended or have been admitted through the A&E department of a UK Operational hospital. The treatment classification broadly groups the data by injury treatment type. OpEDAR captures information at the initial assessment. It is possible for this to change over the course of treatment or for a patient to have multiple conditions; however, this information is not captured.

151. These two data sources have been used to report on length of stay in the field hospital and outcome from that admission.

Amputation Data

152. The VSI/SI casualties in Afghanistan between 8 October 2007 and 30 September 2014 were linked with amputation data which are compiled from five sources:
    - The Joint Theatre Trauma Register (JTTR), which commenced during 2003 to improve the care of the seriously injured patient from the point of injury to the point of discharge from hospital treatment.
    - The Complex Trauma Database managed by the Defence Medical Rehabilitation Centre, Headley Court which commenced in June 2008 to record information on patients receiving inpatient care on the complex trauma ward.
    - The Prosthetics Database managed by the Defence Medical Rehabilitation Centre, Headley Court which commenced in June 2006 to record information on patients fitted with a prosthetic limb(s).
    - The Defence Patient Tracking System (DPTS) which commenced on 8 October 2007. The DPTS was set up to enable the capture of tracking data for aeromedically evacuated patients at the place where healthcare is being delivered along the care pathway.
    - UK Service personnel who have sustained a partial or complete limb amputation as a result of injuries on Op HERRICK and Op TELIC prior 1 April 2006 have been identified from the dataset used to compile the following research paper: Dharm-datta, S; Etherington, J.; Mistlin A. & Clasper J, 2011, Outcome of amputees in relation to military Service, Journal of Bone and Joint Surgery - British Volume, Vol 93-B, Issue SUPP_I, 52.

153. A live UK Service personnel is defined as an amputee if they have an injury coded in the JTTR as Amputation (traumatic), partial or complete, for either upper or lower limbs using the Abbreviated Injury Scale (AIS) Dictionary 2005 (Military Edition), or who had a surgical amputation performed either at the field hospital or at a UK hospital (the majority of these will be at the Royal Centre for Defence Medicine). A traumatic or surgical amputation can range from the loss of part of a finger or toe up to the loss of entire limbs.

154. Live personnel are defined as either those undergoing treatment at Camp Bastion Field Hospital or the Royal Centre for Defence Medicine (RCDM) or those being discharged from hospital after receiving treatment for the injuries that resulted in an amputation(s).

155. The data from the JTTR is cross referenced with the Complex Trauma Database, the Prosthetics Database and the DPTS. Doctors may recommend and/or patients may elect to have an amputation at any point during their care pathway, thus any additional live UK Service personnel identified as an amputee from these data sources have been included in this report.

156. The number of amputations sustained as a result of Op HERRICK are released on a quarterly basis, one month in arrears, on Gov.uk[x].

Defence Patient Tracking System (DPTS)

157. The DPTS was set up to monitor the progress of Armed Forces patients undergoing specialist treatment in the UK to ensure that their care is delivered promptly and coherently, and to coordinate clinical, administrative and welfare aspects of their support. The DPTS was set up as previously this information was not stored centrally. This data source has therefore been used to track the VSI/SI casualties through their specialist care pathway.

158. The DPTS is not a medical or welfare record system; medical records are held on the Defence Medical Information Capability Programme (Primary Health Care) and by the National Health Service (Secondary Health Care); welfare records are held in single Service welfare databases. The

[x] www.gov.uk/government/organisations/ministry-of-defence/about/statistics

DPTS is not an authoritative record of personnel and demographic details, these details are held on Joint Personnel Administration system.

159. The number of patients treated at RCDM and DMRC as a result of Op HERRICK are released on a monthly basis, one month in arrears, on Gov.uk[y].

Medical Discharge Data

160. Medical discharges are the result of a number of specialists (medical, occupational, psychological, personnel, etc) coming to the conclusion that an individual is suffering from a medical condition that pre-empts their continued service in the Armed Forces. Statistics based on these discharges do not represent measures of true morbidity or pathology. At best they indicate a minimum burden of ill-health in the Armed Forces. Furthermore, the number and diversity of processes involved with administering a medical discharge introduce a series of time lags, as well as impact on the quality of data recorded.

161. The information on cases was sourced from electronic personnel records and manually entered paper documents from medical boards. The primary purpose of these medical documents is to ensure the appropriate administration of each individual patient's discharge. Statistical analysis and reporting is a secondary function.

162. Although Medical Boards recommend medical discharges they do not attribute the principal disability leading to the board to Service. A Medical Board could take place many months or even years after an event or injury and it is not clinically possible in some cases to link an earlier injury to a later problem which may lead to a discharge. Decisions on attributability to Service are made by the Service Personnel and Veterans' Agency.

163. The number of UK Service personnel medically discharged from the Armed Forces by financial year is released annually on Gov.uk[y]. Medical discharge data for 2014/15 are currently being validated and will be available on 16 July 2015.

Mental Health Data

164. Defence Statistics (DS) receive mental health data covering all new episodes of care among UK Service Personnel at the MOD's Departments of Community Mental Health (DCMHs) for outpatient care, and new admissions to the MOD's inpatient care contractor. DS receive data from DCMH and in-patient providers for all UK regular Armed Forces personnel from the following sources :

- Since January 2007, DCMH have submitted relevant information required to produce this report to Defence Statistics on a monthly basis (captured on the DS database).
- Since April 2012, system developments enabled DCMH to begin recording on the MOD's electronic patient record system (Defence Medical Information Capability Programme) in a consistent way for reporting.
- Since January 2007, SSSFT and Guys and St Thomas' hospital have submitted relevant information required to produce this report to DS.

165. DCMH staff record the initial mental health assessment during a patient's first appointment, based on presenting complaints. The information is provisional and final diagnoses may differ as some patients do not present the full range of symptoms, signs or clinical history during their first appointment. The mental health assessment of condition data were categorised into three standard groupings of common mental disorders used by the World Health Organisation's International Statistical Classification of Diseases and Health-Related Disorders 10th revision (ICD-10).

166. The mental health data used in this report include regular UK Armed Forces personnel (including Gurkhas and Military Provost Guard Staff), mobilised reservists, Full Time Reserve Service personnel and Non-regular Permanent Staff as all of these individuals are eligible for assessment at a DCMH. Civilian or non-UK military personnel are not covered by this report.

167. A rigid pseudo-anonymisation process, and other measures preserving patient confidentiality, has enabled full verification and validation of the DCMH and in-patient records, importantly allowing identification of repeat attendances.

[y] www.gov.uk/government/organisations/ministry-of-defence/about/statistics

168. This data has been used to identify the VSI/SI patients that have attended a DCMH or inpatient care contractor as a new referral after the date of their injury.

169. The number of new episodes of care among Service personnel who have attended a MOD DCMH for outpatient care, and new admissions to the MOD's inpatient care contractor are released on a quarterly basis, three months in arrears, on Gov.uk[y].

Compensation and Pension System (CAPS)

170. The Compensation and Pension System (CAPS) holds the data regarding the Armed Forces and Reserve Forces Compensation Scheme (AFCS). The Armed Forces and Reserve Forces Compensation Scheme (AFCS) came into force on 6 April 2005 to pay compensation for injury, illness or death caused by Service that occurred on or after that date. It replaced the previous compensation arrangements provided by the War Pensions Scheme (WPS) and the attributable elements of the Armed Forces Pensions Scheme.

171. Under the AFCS, compensation payments include a tariff-based tax free lump sum for pain and suffering associated with the injury or illness, the size of which reflects the severity of the injury or illness. There are 15 tariff levels with associated lump sums. For more serious injuries, in addition to the lump sum, a tax-free index-linked income stream known as the Guaranteed Income Payment (GIP) is paid from service termination for life to recognise loss of future earnings due to the injury or illness. Under the AFCS, a claim can be made and awarded while still in Service.

172. There are a number of reasons why an individual may have been injured but not received any compensation under the AFCS:
    - The figures provided for the AFCS are based on claims awarded as at 30 September 2014 (the latest data currently available). Due to the time taken to process and award claims, and also the time lag in the receipt of Compensation and Pension System (CAPS) data, there may be other claims that have not yet been fully processed and cleared on CAPS.
    - Individuals have up to 7 years to make an injury/illness claim under the AFCS from the date of their injury. Therefore some individuals may not yet have registered a claim, but may go on to do so in the future.
    - Some injuries/illnesses may be accepted as predominantly caused by service but do not meet the criteria as set out in the tariff in the Armed Forces and Reserve Forces (Compensation Scheme) Order 2011, thus falling "below tariff". These claims are rejected and no compensation is paid.

173. Where death is caused by Service the AFCS provides an income stream known as the Survivor's Guaranteed Income Payment (SGIP). This is payable to the spouse, civil partner or adult dependant for life. Compensation is also paid to eligible children, known as the Child Payment (CP).

174. There are a number of reasons why some deaths may not result in AFCS compensation:
    - Deaths where there is no spouse/eligible partner or dependants will not result in any compensation under the AFCS.
    - The figures provided report on awarded claims as at 30 September 2014. There may be additional claims currently being processed by SPVA and therefore the numbers of awards may increase in future updates of these figures.
    - Families have up to three years to make a claim under the AFCS following a death in Service. Therefore some families who have not yet made claims may do so in the future.

175. All claims counted in this report occurred after the date of injury. However please note that the claim made under the AFCS may not be attributable to their VSI or SI sustained on Op HERRICK.

176. Defence Statistics publish a bi-annual AFCS National Statistic which can be found on Gov.uk[y].

Joint Personnel Administration (JPA)

177. JPA (the Armed Forces personnel system) has been used to identify if the Service personnel remains in Service and to identify if an individual has been re-deployed once their care pathway is complete (using JPA move and track).

Defence Medical Information Capability Programme

178. DMICP is the source of electronic, integrated healthcare records for primary healthcare and some MOD specialist care providers. This source has been used to obtain an individual's medical

deployability status (MDS) after injury. Once downgraded, Service personnel will be assessed as Medically Fully Deployable (MFD), Medically Limited Deployable (MLD) or Medically Non-Deployable (MND).

ANNEX B

Specialist Treatment Locations

Hospital Treatment

The Royal Centre for Defence Medicine (RCDM)

179. Since 2001, the Royal Centre for Defence Medicine (RCDM), based at the University Hospital Birmingham Foundation Trust (UHBFT), has been the main receiving unit for military casualties evacuated from an operational theatre. In the Birmingham area, military patients can benefit from the concentration of five specialist hospitals (including the new Queen Elizabeth Hospital) to receive the appropriate treatment. The Queen Elizabeth Hospital is at the leading edge in the medical care of the most common types of injuries (e.g. polytrauma) our casualties sustain, and the majority of casualties will be treated there, but others may be transferred to another hospital (in Birmingham or elsewhere) if that is where the best medical care can be given.

Ministry of Defence Hospital Units (MDHUs)

180. There are five Ministry of Defence Hospital Units (MDHUs) where Defence Medical Services personnel work alongside civilian colleagues in NHS hospitals. As well as contributing to the care provided by these hospitals, they gain the depth and range of experience necessary to be able to administer first class treatment when deployed on Operations. When clinically appropriate, military patients are kept together and treated by military staff at these units. They are located at: Deriford, Frimley Park, Peterborough, Portsmouth and Northallerton.

National Health Service (NHS) and Independent Sector Hospitals

181. Patients may also receive treatment at other NHS hospitals or independent sector hospitals. This may occur if the patient requires treatment at a particular specialist unit or to be nearer their home.

Rehabilitation

182. If military patients require further rehabilitation care following initial hospital treatment, they may be referred to the Defence Medical Rehabilitation Centre (DMRC) at Headley Court in Surrey, which provides advanced rehabilitation and includes inpatient facilities. Less serious cases may go on to one of MOD's 15 Regional Rehabilitation Units (RRUs) in the UK and Germany, which provide accessible, regionally based assessment and treatment, including physiotherapy and group rehabilitation facilities.

Psychiatric Treatment

183. Psychiatric patients in the UK Armed Forces are seen for outpatient care at one of the 16 Departments of Community Mental Health (DCMH) across the UK, at the MOD's inpatient care contractor, or by one of the Community Psychiatric Nurse (CPN) when they are receiving treatment at RCDM or DMRC Headley Court. Patients may also receive treatment at one of four mental health posts located in medical centres, attached to a DCMH, staffed by mental health nurses and operating in the same way as a DCMH; seeing and treating personnel referred for specialist care with suspected mental health disorders. Throughout this report the term DCMH included these four mental health posts.

184. Mental health services are configured to provide community-based mental health care in line with national best practice, providing assessment and treatment consistent with the guidelines and standards set by the National Institute for Health and Clinical Excellence and the National Service Frameworks.

185. The DCMHs are staffed by Community Mental Health Teams comprising psychiatrists and mental health nurses based on the catchment area population of the DCMH, with access to clinical psychologists and mental health social workers.

186. Until 1st March 2009, inpatient care has been provided regionally in specialised psychiatric units under a contract with the Priory Group. In November 2008 it was announced that the South Staffordshire and Shropshire NHS Foundation Trust network (in partnership with 5 other Foundation Trusts and one NHS Scotland Trust) has been awarded a three year contract for the provision of inpatient mental health services. The transfer of inpatient care from Priory Group occurred from 1st March 2009, at which point Priory Group ceased to admit patients. To ensure appropriate procedures were in place by 1st March 2009, selected patients were admitted to the South Staffordshire and Shropshire NHS Foundation Trust network from January 2009.

Survival Analysis

187. An initial analysis of the data was undertaken utilising Kaplan-Meier models. The advantage of this statistical technique is that it is non-parametric, and requires fewer assumptions regarding the data utilised. Two separate Kaplan-Meier models were produced, one evaluating the difference in care pathway length for VSI/SI patients, and the other the difference in care pathway length for amputees and non-amputees.

188. In order to evaluate the statistical significance of the survival curves produced by the Kaplan-Meier procedure, two tests were run: the Log-Rank Test and the Peto Test. **Tables C1** and **C2** show the results of these tests for the VSI/SI Kaplan Meier model.

Table C1: Logrank Test of Initial NOTICAS Classification Kaplan Meier model

	Number	Observed	Expected	(O-E)^2/E	(O-E)^2/V
VSI	261	238	197	8.52	14.9
SI	286	229	270	6.22	14.9
Chi squared	14.9	on 1 degrees of freedom			
p-value	0.000				

Source: Initial NOTICAS and DPTS

Table C2: Peto Test of Initial NOTICAS Classification Kaplan Meier model

	Number	Observed	Expected	(O-E)^2/E	(O-E)^2/V
VSI	261	140	112	6.54	16.9
SI	286	120	147	5.00	16.9
Chi squared	16.9	on 1 degrees of freedom			
p-value	0.000				

Source: Initial NOTICAS and DPTS

189. The results of both the Logrank and Peto tests shown in **Tables C1** and **C2** are statistically significant at greater than a 99% confidence level. This indicates that the difference between the survival times of VSI and SI casualties is not the result of chance, and therefore the application of the Kaplan Meier model on this data is valid.

190. **Tables C3** and **C4** show the results of the Logrank and Peto tests for the Amputee/Non-Amputee Kaplan Meier model.

Table C3: Logrank Test of Amputee/Non Amputee Kaplan-Meier model

	Number	Observed	Expected	(O-E)^2/E	(O-E)^2/V
Amputee	210	152	288	64.2	181
Non-Amputee	337	315	179	103.2	181
Chi squared	181	on 1 degrees of freedom			
p-value	0				

Source: Initial NOTICAS and DPTS

Table C4: Peto Test of Amputee/Non Amputee Kaplan-Meier model

	Number	Observed	Expected	(O-E)^2/E	(O-E)^2/V
Amputee	210	50.4	144	60.6	206
Non-Amputee	337	209.2	116	75.1	206
Chi squared	206	on 1 degrees of freedom			
p-value	0				

Source: Initial NOTICAS and DPTS

191. The results of both the Logrank and Peto tests shown in Tables A3 and A4 are both statistically significant at greater than a 99% confidence level. This indicates that the difference between the survival times of Amputees and Non-Amputees is not the result of chance, and therefore the application of the Kaplan-Meier model on this data is valid.

192. As well as producing Kaplan-Meier models, two Cox proportional hazard models were also fitted to the data - one splitting the data by initial NOTICAS category (VSI or SI), and the other by amputees

and non-amputees. The Cox Proportional Hazard technique has greater predictive power than the Kaplan Meier technique; however the relationship between the two populations must be proportional. This assumption must be tested prior to application of this method.

193. **Table C5** shows the results of the test utilised to determine whether a Cox proportion hazard model can be applied to the VSI/SI survival data. The p-value of greater than 0.05 indicates that we cannot reject the null hypothesis (at a 95% confidence level) that the proportional hazard assumption is appropriate for use on this dataset. Therefore, the Cox proportional hazards model has been utilised to produce survival curves of VSI/SI casualties in the main body of this report**.**

Table C5: Proportional hazard test of VSI/SI model

	Rho	Chi Squared	p-value
VSI/SI	0.0684	2.16	0.142

Source: Initial NOTICAS and DPTS

194. **Table C6** shows the results of the test utIlised to determine whether a Cox proportion hazard model can be applied to the amputee/non-amputee survival data. The p-value of less than 0.05 indicates that we should reject the null hypothesis (at a 95% confidence level) that the proportional hazard assumption is appropriate for use on this dataset. Therefore, the Kaplan-Meier model (as opposed to the Cox proportional hazards) has been utilised to produce survival curves of amputees/non amputees in the main body of this report**.**

Table C6: Cox proportional hazard test of Amputee/Non-Amputee model

	Rho	Chi Squared	p-value
Amputee/Non-Amputee	-0.372	52.2	0.000

Source: Initial NOTICAS and DPTS