

IMPLEMENTATION OF THE IMMUNISATION PROGRAMME AGAINST BIOLOGICAL WARFARE AGENTS FOR UK FORCES DURING THE GULF CONFLICT 1990/1991

SUMMARY

1. MOD has sought, by interviewing 200 key personnel who served in the Gulf conflict (Operation GRANBY) and by searching for relevant documentation, to reconstruct so far as possible the implementation of the anti-Biological warfare (anti-BW) immunisation programme for UK forces during the 1990/91 Gulf conflict. With a few exceptions only tentative conclusions can be offered on the specific detail in any particular unit. More robust conclusions can be drawn about more general issues.
2. The directives issued by MOD Headquarters gave clear instructions and guidance about important aspects of the anti-BW immunisation programme. In particular, that the anti-BW programme was voluntary, that those being immunised were to be told both the nature of the threat they faced and of the vaccines they were to be offered, that there were expected to be transitory side effects and that the immunisation programme was to be recorded.
3. These instructions were cascaded down the command chain by signal, and generally repeated these important instructions. But in some cases, such signals did not properly communicate the voluntary nature of the immunisation programme. They were often inconsistent or contradictory in other aspects, notably where and how to record the immunisations, which immunisations to give and the codewords used for the immunisations.
4. We could not document comprehensively what happened between the lowest levels to which these signals reached in the chain of command and the individual service person on the ground. However, from interviews with Gulf veterans, it was clear that the implementation of the anti-BW programme differed, sometimes markedly, by Service, type of unit, when a unit was sent to theatre and where it operated.
5. Many UK Service personnel were aware of the nature of the anti-BW programme and that it was voluntary. However, some had no real understanding at the time of what the programme involved, or what vaccines they had been given.
6. The security classification of the programme had the unintended effect of inhibiting the flow of information within the UK forces, to the point where codewords for the vaccines were sometimes consciously used in medical records instead of their real names. This led to serious misconceptions, which persisted for some years after the conflict.
7. Some of the medical officers in the Gulf expressed unease at the time about their inability to obtain additional information to satisfy their professional concerns and questions about the programme. In one instance formal advice was promulgated to some units that was significantly different from that originating in the UK.
8. It appears that the voluntary nature of the programme was clearly understood and implemented in some units, but not in others. With hindsight it is apparent that unit commanders were given no advice about how they were to ensure that adequate

information was made available to individuals, bearing in mind the unprecedented nature of the immunisation programme and the need to carry it out in the field at a time of intense pre-battle preparation. The evidence at interview was that some commanders, for what they generally regarded as operational reasons, either included their unit in, or removed it from, the anti-BW programme en bloc.

9. A combination of leadership by example, peer pressure and lack of clear instructions left some UK Service personnel with either no conception that they could refuse the immunisations, or a definite understanding that they were not expected to do so. Where detailed documentary evidence exists it clearly shows a proportion of personnel refusing immunisation, implying proper application of the voluntary policy in at least these cases.

10. The rate of uptake for the first anthrax and pertussis immunisations was high. It was probably over 75% of all personnel deployed to the Gulf region and close to 100% in many units. The uptake of the second dose of anthrax and pertussis vaccine and the first plague vaccine was less and varied between and within formations. Uptake of the third dose of anthrax vaccine and the second dose of plague vaccine was rare. Factors leading to this drop in uptake included operational circumstances in the run up to the land campaign and that the land campaign finished before the final doses were due, side-effects from earlier doses, and knowledge that others were going to refuse.

11. The recording of the anti-BW immunisations took a number of forms, many of which deviated from the extant or promulgated instructions. In some cases the recording was inadequate from the start. It is certain that there was a significant failure to transfer temporary immunisation data onto permanent medical records after the Gulf conflict and that much of that data is probably now irrecoverable. At interview individuals who were immunised and those administering the programme assessed the initial uptake of immunisations as high, whereas the incidence of Gulf veterans' medical records showing receipt of these immunisations is low. We conclude that the receipt of anti-BW immunisations in 1991 is significantly under-recorded.

12. By combining interview data and medical records where available, a tentative assessment of uptake of the anti-BW immunisations in most units which served in the Gulf has been achieved. Provided the limited basis for this assessment is borne in mind, it should provide a better picture of what veterans, for some of whom no individual records of immunisations exists, are likely to have received (see Chapter 5).

13. Almost all personnel who were deployed on Op GRANBY would have had their routine immunisations reviewed and updated as necessary updated prior to deployment or shortly after arriving in theatre.

14. The taking of antimalarials was patchy, and the advice given to units was inconsistent, but it is likely that those who started taking these tablets before deployment ceased to do so shortly after arriving in theatre.

15. Uptake of Nerve Agent Pretreatment Set (NAPS) tablets can only be assessed from individual testimony. However, we concluded that most UK service personnel started taking NAPS around 18 January 1991, on receipt of the order to do so. Thereafter it appears that most stopped doing so at varying times prior the end of the Gulf conflict (and the order to stop), either because they forgot, it was inconvenient, or they were experiencing some minor side effects.

16. Biological Antibiotic Treatment Sets (BATS) were issued to all UK Service personnel in theatre and were to be taken on the orders of local commanders. However, there is no evidence to suggest that orders were given to authorise the use of BATS, or that they were taken.

17. There is no evidence to indicate that any other anti-BW or unusual immunisations were given during the Gulf conflict.

NEW EVIDENCE

18. **MOD has been publicly committed to publishing this paper for some time. Whilst we now believe that we have as full and accurate account of the immunisation programme as is likely to be achieved, it is always possible that further evidence may come to light. If so, we will make that public. If anyone reading this paper, particularly the veterans concerned, has evidence, in the form of contemporary documentation, records or photographs, which they believe might shed further light on this issue, they are encouraged to contact the Gulf Veterans' Illnesses Unit at the address shown on the title page.**

CHAPTER ONE – BACKGROUND

Introduction

19. During the Gulf conflict in 1990/91, a programme of immunisation against certain biological warfare agents was undertaken as part of a range of measures to protect UK forces against Iraqi biological weapons. This paper presents the outcome of a review, undertaken by a Ministry of Defence (MOD) Fact Finding Team (FFT), of the way in which that programme was implemented. It assesses the level of uptake of immunisations across the various units of the UK Armed Forces that participated in the Gulf conflict. The FFT also examined the routine immunisations and prophylactics and other medical countermeasures (e.g. NAPS) that were given to personnel.

Structure

20. Chapters 1-3 of this paper give the background and explain the methodology used in the review. They also provide general information about immunisation for the UK population, and more specifically for the UK Armed Forces.

21. The rest of the paper describes the procurement and issue of the vaccines, how the decisions to vaccinate were transmitted to the units and how the vaccines were then administered to Service personnel. It then examines some of the factors that had a bearing on whether individuals understood the programme and whether they were immunised. Medical record keeping is also addressed.

22. The main data collected by the FFT is presented as a set of tables showing what is currently known about the uptake of vaccines used in the anti-BW immunisation programme across the individual units. Collation of this data allowed some general conclusions to be drawn about the uptake of immunisations. A glossary of abbreviations can be found at Annex JJ.

Context

Operation GRANBY

23. GRANBY was the MOD's codename for the UK element of the Coalition operation that began after Iraqi troops invaded Kuwait on 2 August 1990. Following an air campaign that started early in the morning (local time) of 17 January 1991, Coalition forces initiated a ground offensive on 24 February that drove the Iraqis out of Kuwait. A cease-fire was announced 100 hours later, on 28 February 1991.

24. As part of these operations, approximately 53,500 UK Service personnel were deployed to the Gulf region between 1 September 1990 and 30 June 1991. They served in Royal Navy ships, with formations and units of the British Army and in squadrons and detachments of the RAF, with the necessary logistic infrastructure to support operations far from their home bases for a considerable period of time.

25. During Operation GRANBY, the MOD had an anti-BW immunisation programme in which only three vaccines were used: anthrax and plague vaccines against the assessed

threat of Iraqi biological warfare agents and pertussis vaccine as an adjuvant¹. Details of this programme were declassified in December 1996 and an explanation of the vaccines used and the reasoning behind the programme was published in October 1997².

Gulf veterans' illnesses

26. Since returning from the Gulf conflict in 1991, some UK veterans have become ill. Although there is no medical or scientific consensus on the aetiology of these illnesses, many veterans believe that this ill health is unusual and directly related to participation in the conflict. In particular, some Gulf veterans believe that their illnesses may be related to the vaccines they received under the anti-BW immunisation programme.

27. The MOD has acknowledged for some time that poor medical record keeping during and after the Gulf conflict has meant that many veterans do not know what anti-BW immunisations they received in 1990/91. MOD's policy statement "Gulf Veterans' Illnesses: A New Beginning", which was published on 14 July 1997, announced the establishment of the FFT "to look into the implementation of the vaccination programme in-theatre, based on oral testimony and extant documentary evidence". The FFT was particularly directed to discover the actual uptake of immunisation for particular units and places.

Methodology

Task

28. The FFT sought to confirm MOD's anti-BW immunisation programme, track the vaccine stocks used, and make assessments of the uptake of the anti-BW immunisations in different units and the extent to which immunisations were recorded on medical documents. There were two main sources of information – individuals' memories and contemporary written records (official files and accounts, together with unofficial notebooks and working folders).

Documentary evidence

29. The FFT examined MOD files and records, many containing classified material. Documents that were central to the review have been declassified and are included in this paper (generally in the Annexes).

30. The FFT tracked vaccines, from receipt into the Service supply chain at the then Defence Medical Equipment Depot (DMED) at Ludgershall³, to their subsequent issue to units and then to the Medical Officers and orderlies who administered them (see paragraphs [68 to 77]). The FFT physically counted the many thousands of doses of Gulf era anti-BW vaccines which still exist at Ludgershall and which provide useful collateral evidence of probable uptake (paragraphs 171 to 176).

¹ An adjuvant, when given with a vaccine, is a substance which is intended to accelerate the immunisation effect.

² Background to the Use of Medical Countermeasures to protect British Forces during the Gulf War (Operation GRANBY), MOD October 1997.

³ This is now the Medical Supplies Agency (MSA) of the MOD.

31. The FFT checked extant records from units and for individuals to determine where possible who had received which immunisation and where and how those immunisations had been administered. FFT had access to immunisation data on the outside of Personal Medical Folders (F Med 4s) or the vaccination data in Personal Medical Records (B Med 27s) (see paragraphs 60 to 64).

32. Documentation describing the actual implementation of the anti-BW immunisation programme was limited, particularly that covering the implementation in the Gulf itself. Much of the information that the FFT obtained on the implementation came from contemporary signals and unit Commander's Diaries. Some of the most useful information was in the form of personal working papers and notes which had been preserved by individuals involved in the programme rather than official documentation.

Individuals' recollections

33. The ability of individuals to remember details from Operation GRANBY was central to the ability of the FFT to reconstruct what happened. The team carried out a series of individual interviews, most in person, some by telephone, with personnel who had served during the Gulf conflict, to establish their recollection of the uptake of the immunisation programme. The interviews were based on a series of about 70 detailed questions.

34. The interviews provided amplification and confirmation of the data contained in documentary immunisation records. Where no immunisation records were available, interviews were the sole direct source of information on the uptake and coverage of the immunisation programme in particular units.

35. In all, the FFT contacted over 250 individuals who were involved in the Gulf conflict 200 of whom were interviewed. The majority of those interviewed were from the British Army because the Army constituted 70% of the UK Service personnel on Operation GRANBY. The Army also had a much more widely dispersed chain of command for Operation GRANBY than the RN or the RAF and the scope for differences in its implementation of the anti-BW immunisation programme was greater.

36. The FFT aimed to interview at least one person, preferably starting with the unit commander, from every major and minor unit⁴ that took part in Operation GRANBY. Unit commanders were selected because they had an overall view of what was happening in their unit. If they were not available, the second in command or someone with an overview of the unit's administration was chosen. In addition, unit doctors were interviewed, as were a number of other ranks.

37. Early on in their work, the FFT located RN computer records which show the vaccines issued to ships in the Gulf that were apparently comprehensive. Therefore, it was only considered necessary to conduct a small number of follow-up interviews to confirm the uptake of immunisations in the RN. Records also show that some RN personnel received anti-BW immunisations at locations in the UK.

38. Similarly, it was not necessary to interview a large number of RAF personnel. Most RAF personnel were stationed at a small number of bases in the Gulf region. To establish the uptake of the immunisations at each of these locations, the FFT interviewed the

4 A major unit consists of approximately 650 personnel such as an Infantry Battalion. A minor unit consists of approximately 100 personnel such as a Transport Squadron or Company.

administrative officers. The FFT also interviewed three RAF squadron commanders and two RAF doctors.

Limitations

Memory

39. The FFT was very conscious of the inherent limitations of evidence based on memory. More than eight years have now elapsed since the Gulf conflict and memories have faded. Moreover, in the intervening period there has been considerable media coverage of Gulf veterans' illnesses and the anti-BW immunisation programme, which may have influenced individuals' recollections.

Organisational change

40. Many of the organisations and procedures that were in place in 1990/91 have since changed. The FFT endeavoured to locate and use documentation that was extant at the time of the Gulf conflict. However, superseded documentation has not always been preserved for future reference.

Disclosure

41. Those who were interviewed were open, helpful and frank about the events of the Gulf conflict. However, the FFT was aware that all personal testimony is based on individual perceptions of the issues. The fact that a review was taking place may in itself have suggested to interviewees that their actions in 1990/91 were being called into question and thus conditioned their responses. Accordingly the FFT took steps both to reassure individuals that the emphasis of this review was on determining the facts and to ensure that so far as possible the testimony of a single person was not treated as determining any critical issue.

Civilians

42. There is firm evidence that a considerable number of MOD civilians and contractors' staff were offered anti-BW immunisation and documentary evidence confirms that some at least were immunised. However, limitations on time and available data prevented the FFT from undertaking any systematic analysis of the uptake of vaccines amongst civilians.

Warning

43. Despite the FFT's efforts to trawl for hard documentary evidence, there are significant gaps in our knowledge about exactly what happened to specific units or individuals within units. This paper presents the FFT's findings in terms of generalised statements that relate to likely experience across a number of units. It is not a definitive statement about what happened to any particular Gulf veteran or any particular unit during the anti-BW immunisation programme.

CHAPTER TWO - IMMUNISATION AGAINST INFECTIOUS DISEASE

44. This Chapter gives some basic background about the immunisations that people in the UK receive routinely and about how they are administered and recorded.

Reasons for immunisation

Childhood immunisation against infectious disease

45. Since the introduction of routine immunisation, some diseases formerly endemic in the UK have either been eradicated or controlled¹. A central element of this achievement is the UK childhood immunisation programme, which is currently as follows:

Age	Immunisations
By 6 Months	3 doses of diphtheria, pertussis (whooping cough), tetanus, poliomyelitis, haemophilus influenzae type b and meningitis C
By 15 Months	Measles, mumps and rubella (MMR)
By school entry	4 th diphtheria, tetanus and poliomyelitis ² , 2 nd MMR
Between 10 and 14	Bacillus Calmette-Guerin immunisation (BCG –protection against tuberculosis)
Before leaving school	5 th diphtheria, tetanus and poliomyelitis

Overseas travel

46. A range of endemic diseases exist against which people living in the UK will not normally have been immunised. Therefore, before travelling overseas, people are advised as a matter of routine to consider additional immunisation. The appropriate vaccinations vary depending on the area to be visited and on any particular health risk at the time. Up to date advice can be obtained from General Practitioners (GPs) and is also contained in the Department of Health leaflet "Health Advice for Travellers"³.

¹ "Immunisation Against Infectious Disease", Departments of Health, HMSO, 1996, incorporating revised Chapter 23, 18 October 1999

² Live Oral polio vaccine (OPV) is routinely used for immunisation in the UK and is always given by mouth.

³ "Health Advice for Travellers", Departments of Health, HMSO, 1999

47. The general guidance contained in the Department of Health leaflet currently lists the following immunisations for travel to Kuwait: poliomyelitis, tetanus, typhoid, hepatitis A, and diphtheria. For travel to Saudi Arabia, the leaflet additionally lists yellow fever (in certain circumstances), meningitis (depending on the area visited and the time of year), and protection against malaria (depending on area visited).

After injury

48. Immunisations may be administered in response to a possibly contaminated wound, e.g. a tetanus booster.

Protection against a disease outbreak

49. It is sometimes necessary to protect vulnerable members of the population against the potential or actual outbreak of particular diseases. For example, the elderly and others at particular risk are routinely offered immunisation against influenza each winter. Similarly, populations of young people (e.g. students living in a university hall of residence) may have emergency immunisation in response to a meningitis outbreak.

Occupational

50. Immunisation is also used as a protective measure against the risks associated with a particular employment. For example, hepatitis B vaccine is given to health workers, anthrax vaccine is given to those concerned with animal hides and by-products, and plague vaccine is given to laboratory workers who work with the bacterium.

Administration of immunisations

51. Immunisations may be administered by doctors, practice nurses, district nurses or health visitors. These vaccinations may be carried out in schools, in homes, in Local Health Authority clinics, or in GP surgeries (either at immunisation clinics or during normal appointments).

Recording of immunisations

52. Guidance on the recording of immunisations is given in the Department of Health handbook on the 'Immunisation Against Infectious Disease', which states that:

"The date of immunisation, title of vaccine and batch number must be recorded on the recipient's record. When 2 vaccines are given simultaneously, the relevant sites should be recorded to allow any reactions to be related to the causative vaccine"⁴.

⁴ "Immunisation Against Infectious Disease", Departments of Health, HMSO 1996.

CHAPTER THREE - IMMUNISATION AGAINST DISEASE IN THE UK ARMED FORCES

53. As members of the general population, Service personnel will have had a range of immunisations before they join the Armed Forces. In the Services they are likely to receive additional immunisations. There are also a number of differences between Service and civilian immunisation practice.

Immunisations routinely given to Service personnel

54. When a civilian joins the UK Armed Forces, his or her immunisations for poliomyelitis, tetanus and yellow fever (“standard Service immunisations”) are brought up to date. He or she would also be tested for tuberculosis immunity (the Heaf test). However, only a small number of recruits would receive a BCG immunisation against tuberculosis as the majority of individuals should have been immunised at school age. At the time of the Gulf conflict, recruits would also have been brought up to date with typhoid immunisation and automatically tested for diphtheria immunity (the Schick test)¹. Again, only a small number of individuals would have received a diphtheria immunisation as the majority of individuals should have been immunised at school age.

55. As in civilian life, Service personnel also receive specific immunisations appropriate to their work, such as hepatitis B for health workers, (“occupational immunisations”). Whenever Service personnel are due to be deployed overseas, individuals will be immunised against the known threat from endemic disease in the area of deployment (“regional immunisations”).

56. Service personnel are therefore likely to receive more immunisations than most of their civilian contemporaries and they generally accept such immunisations as a part of their way of life. Collectively, the vaccines used by the UK Armed Forces for the various public health reasons described above are referred to as “routine immunisations” in this report.

How Service personnel are immunised

57. The current MOD procedures for administering vaccinations and maintaining medical records are contained in the Joint Service Manual of Immunological Procedures, JSP 311 (published in 1993), Part 2 of which is the Department of Health’s handbook, ‘Immunisation Against Infectious Disease’. The edition of JSP 311 extant in 1990 appears to have been the 1968 edition as amended to January 1981, hereafter referred to as JSP 311(1981), although the authors of JSP 311 have not been able to confirm this from their records.

58. In addition, the Army also refers to Volume Two of the Army General and Administrative Instructions (AGAls). These were introduced in 1973 to cover permanent instructions for the Army which do not fit into Queen’s Regulations or other regulations. Chapter 66 of the AGAls, titled “Medical Including Dental: Casualties, Treatment,

¹ There is no longer a routine requirement to test for diphtheria immunity when entering the Armed Forces nor is there a requirement for routine diphtheria immunisation.

Inspection, Immunization and Records” has a section which covers immunological procedures. The version of Volume Two, Chapter 66 of AGAs extant in 1990 appears to have been that published in April 1987, hereafter referred to as Vol 2, Ch 66 of AGAs. Among other things, this Instruction sets out the responsibilities of unit Commanding Officers, Medical Officers and Senior Administrative Medical Officers when conducting immunisations. The relevant extract is at Annex A.

59. Immunisation can take place either on an individual basis, or at an immunisation parade if a large number of personnel need to be immunised at the same time. Immunisations are generally given at a unit medical centre by Service medical personnel².

Recording of immunisations

60. Details of the immunisation should be recorded on one or both of two medical documents: the Personal Medical Folder (the F Med 4), and the Personal Medical Record (the B Med 27).

F Med 4

61. The individual medical records for each member of the UK Armed Forces are kept in an F Med 4. Immunisations are recorded on the outside of this folder. An F Med 4 should be held at a Service person’s unit medical centre and is not intended to be taken with units on deployment. The exception is the Royal Navy where the F Med 4 should be held on ship, if the individual is serving at sea. However, during Operation GRANBY contemporary documentation confirms that a number of units took F Med 4s to the Gulf despite instructions to the contrary. The FFT is aware that units did return F Med 4s to the UK or Germany once it was discovered they should not have been taken to the Gulf, but it could not establish whether all were returned. Examples of the different versions of F Med 4s that were in use during the Gulf conflict are at Annexes B and C³.

B Med 27

62. The B Med 27 is a summary of key F Med 4 information, including immunisations. It also holds any International Certificates of Vaccination and details of important diagnostic or therapeutic information. The immunisation details which should be entered on the form include the date and place of vaccination, the vaccine, its dose, batch number and manufacturer. These should be initialled by the vaccinator⁴.

63. The B Med 27 is generally held with the F Med 4, but may be issued to the individual in certain circumstances. During Operation GRANBY, Joint Headquarters High Wycombe (JHQ) issued instructions which stated that all RAF personnel were to deploy with “Current Inoculation certs”. Given that these were held in the B Med 27, it is clear that RAF personnel were to deploy with this form. However, the FFT found evidence that B Med 27s were not available for RAF personnel in theatre. A number of contemporary

² Functionally, a unit medical centre in a barracks is similar to a civilian medical practice. Depending on the size of the military community, the unit medical centre employs one or more civilian and/or military doctors, with civilian specialist medical practitioners being brought in as required. A range of supporting personnel including nurses and clerical staff will also be employed in the centre.

³ The smallpox vaccination box was removed for the 1987 revision of the F Med 4 (see Annex C) because smallpox vaccine was no longer being administered routinely. However, both versions were still in use at the time of the Gulf conflict.

⁴ See Memorandum on Immunological Procedures, JSP 311 (1981) (see Annex T)

Army documents also refer to personnel carrying their B Med 27s when deploying to the Gulf. The 7 Armoured Brigade Group Medical Administrative and Technical Instructions issued in November 1990 also instructed Army personnel receiving routine immunisations to bring both their B Med 27s and F Med 4s.

64. On leaving the Armed Forces, Service personnel should be given their B Med 27 for retention. A copy of a B Med 27 used at the time of the Gulf conflict is at Annex D. It had a buff cardboard cover. The B Med 27 was revised in 1993 in a different format with a soft blue cover. A new document, the Operational Medical Record (F Med 965) was brought into use in 1997.

CHAPTER FOUR - THE GULF CONFLICT: IMMUNISATION OF UK SERVICE PERSONNEL

65. The decision to send UK forces to the Gulf region in 1990 led to many concurrent activities to prepare and deploy the force, including the correct protection against diseases endemic to the region. The FFT saw a number of documents, not all of them consistent, containing instructions to ensure that personnel were brought up to date with their routine immunisations. A summary of those documents, together with a list of routine immunisations which troops deploying may have received, is attached at Annex E.

66. In addition, in the light of intelligence reports indicating that there was a threat from Iraqi biological weapons, the MOD initiated a programme of immunisation against certain biological warfare agents. Details of the background to that decision and the vaccines used were published in October 1997¹. In summary, a decision was made to offer immunisation against anthrax and to use pertussis (whooping cough) vaccine as an adjuvant to accelerate the immunisation effect. A further decision was then made to offer immunisation against plague.

67. In order to provide protection against an attack using botulinum toxin (BTx), consideration was given to both prophylactic and post-attack countermeasures. In the event, the MOD did not have any BTx vaccine in stock. Troops were not therefore offered immunisation against BTx (see paragraphs 87 and 88 below). A programme was established to produce doses of anti-toxin as a post-attack therapy. These were available during the conflict but were not used because no attack took place².

The procurement and issue of vaccines

68. The unit responsible for supplying all three Services with medical stores and equipment was the Defence Medical Equipment Depot (DMED) at Ludgershall. DMED purchased the stores required for the medical units that supported UK forces in Saudi Arabia, including vaccines against biological warfare agents³.

¹ See "Background to the Use of Medical Countermeasures to Protect British Forces During the Gulf War (Operation GRANBY)", MOD, October 1997.

² Ibid.

³ FFT found one reference in 1 Armoured Field Ambulance records which indicate that there was local purchase in Germany of routine vaccines. At least in this case therefore DMED Ludgershall was not the sole route of supply.

Purchase of vaccines by DMED Ludgershall

69. The FFT checked all the vouchers/invoices (approximately 50,000) covering purchases by DMED between 1 October 1990 and 31 March 1991. They found documentation for anthrax and pertussis vaccine and various routine vaccines. The suppliers of vaccines purchased for this period were:

Vaccine	Suppliers
Anthrax	PHLS ⁴ (CAMR ⁵)
Pertussis	Pasteur Merieux and Wellcome
Poliomyelitis	Smithkline Beecham
Tetanus	Evans Medical and Wellcome
Yellow Fever	Evans Medical and Wellcome
Hepatitis B	Pasteur Merieux and Smithkline Beecham
Meningococcal meningitis	Pasteur Merieux and Smithkline Beecham

70. The plague vaccine was purchased as a Foreign Military Sale (FMS) direct from the US Government and the purchase was not processed through DMED. Copies of the requests to purchase plague vaccine from the US Government were located and the quantities requested tally with the quantity brought to account by DMED. The plague vaccine was produced by Cutter Biological in the USA and supplied by the US DoD⁶. Details of the purchase vouchers for anthrax and pertussis are at Annex F.

71. This DMED record is obviously incomplete. The FFT did further research in the extant MOD policy papers, and reviewed the CAMR despatch records for anthrax. These show that whilst DMED invoices roughly tally with CAMR despatch records for Batches 338E to 344E, they understate delivery of 337E and 345E and fail to include 346E, which was delivered from CAMR on 26 February 1991 and thus would have been available for Phase 3 of the programme. CAMR records show MOD receiving a total of 142,720 anthrax doses up to 26 February 1991. No more became available before the anti-BW immunisation programme ended. Just over 130,000 pertussis vaccine doses were purchased for this programme, as announced by MOD in October 1997⁶.

Issue of vaccines by DMED Ludgershall

72. Because the MOD stores accounting procedures require the retention of issue vouchers for only three years, the FFT was not able to track the issue of all the vaccines using vouchers. However, the FFT found some working documents relating to the issues of vaccines at DMED. Amongst these were lists showing to whom and when the vaccines

⁴ Public Health Laboratory Service

⁵ Centre for Applied Microbiology and Research

⁶ See "Background to the use of Medical Countermeasures to Protect British Forces During the Gulf War (Operation GRANBY)", MOD October 1997.

had been issued. The lists for anthrax, pertussis and plague show vaccine being issued to units in the UK, Germany, Cyprus, Gibraltar and the Gulf (see paragraphs 73 to 77 below). These lists are reproduced at Annex G. Where a voucher number is shown, it indicates that the FFT located the relevant voucher.

Distribution of vaccines to units

73. Within the UK, DMED Ludgershall issued stores to medical units using area distribution points around the country. This was used for the issue of the anti-BW vaccines. From there, they were collected by the unit to whom they were consigned. Within the British Army on the Rhine (BAOR) in 1990 there was a unit called DMED BAOR, since closed, also known as DMED Bielefeld, to whom DMED Ludgershall issued medical stores for onward distribution to units. This system was used for units whose personnel were vaccinated in Germany. The FFT identified some of the issue vouchers from DMED Ludgershall to DMED BAOR for anti-BW vaccines, but found no paperwork generated by DMED BAOR. This was not surprising as in accordance with established MOD stores accounting procedures these records would have been destroyed two years after creation.

74. The issue records show that anti-BW vaccines were issued from DMED Ludgershall to Cyprus and to Gibraltar. In Cyprus, RAF Akrotiri received the vaccines, where some were sent to await the arrival of HMS ARK ROYAL. Vaccines for HMS HECLA were issued by DMED to the Royal Naval Hospital, Gibraltar. Details are at Annex H.

75. In 1990, 84 Field Medical Equipment Depot (84 FMED) was the unit responsible for the re-supply of medical stores for forces deployed on operations. It was responsible for issuing vaccines to units of all three Services in the Gulf. In September 1990, 84 FMED deployed a Medical Supply Section (MSS) collocated with 22 Field Hospital (Fd Hosp) in Bahrain. Initially, all stores from DMED Ludgershall went through the MSS in Bahrain. As more UK forces deployed to the Gulf, 84 FMED deployed more personnel to the region, locating its headquarters in Al Jubayl in Saudi Arabia. Subsequently it had detachments collocated with various UK Field and General hospitals.

76. At the end of the conflict some of the documents from the MSS in Bahrain were returned to DMED Ludgershall. The FFT located those documents, which record receipts up to 17 January 1991. These documents contain vouchers for various medications, but not for the anti-BW vaccines. The FFT could not, therefore, confirm the date on which the anti-BW vaccines arrived in the Gulf. The FFT located only two records generated by 84 FMED relating to anti-BW products. One was an Issue and Receipt Voucher for the delivery of 3,050 strips of Biological Antibiotic Treatment Sets (BATS) to Supply and Transport Officer Navy (STO(N)) Middle East at Jebel Ali in Dubai; the other was for the issue of 150 ampoules of anthrax and pertussis vaccine (called V1 and V2 in the Voucher) and 180 bottles of Plague vaccine (titled V4 in the Voucher) to the Royal Navy Liaison Office (RNLO) located in Dubai. The latter voucher is reproduced at Annex I.

77. In addition to the records above, the FFT found a computer record of the vaccine issues to RN and Royal Fleet Auxiliary (RFA) ships afloat, which is at Annex J.

Communicating the decision to immunise

78. The decision to immunise troops on Operation GRANBY against biological warfare agents was communicated down the chain of command in writing and/or orally depending on the level of command. High level policy and guidance on the anti-BW immunisation programme was passed from MOD by secure signal to Joint Headquarters High Wycombe (JHQ) and senior commands in the UK, Germany and the Gulf. In the UK and Germany this information was then disseminated by secure signal down to formation and unit level, as appropriate. Commanding Officers would then have briefed their staff and issued written orders as required. In the Gulf, details were disseminated by secure signal from HQ British Forces Middle East (BFME), to RN task groups, HQ 1 (UK) Armoured Division, HQ Force Maintenance Area (FMA), HQ 4 and 7 Armoured Brigades and RAF detachments. These HQs then forwarded the decision to immunise by secure radio/telephone to the Commanding Officers of individual ships or units who would have briefed their staff and issued written orders as required. In the case of the Army, which represents by far the majority of those immunised, such orders could have been in the form of Part One Orders. Part One Orders are issued daily by or on behalf of the unit Commanding Officer and detail the unit's orders for the day including administrative tasks such as attending immunisation parades. Two examples of Part One Orders are transcribed at Annex K.

Immunisation against anthrax - warning order

79. A warning order⁷ to allow the planning of the vaccination programme to start was sent from JHQ to HQ BFME on 26 December 1990. This is reproduced at Annex L. It was a signal, classified SECRET (see paragraph 125). It outlined the threat and gave detailed instructions for the MOD's immunisation programme against anthrax to commence on 2 January 1991. The guidance given included the following:

- One dose of vaccine was to be given at the initial date (anthrax 1), the second dose at 3 weeks (anthrax 2) and a third dose at 7 weeks (anthrax 3).
- Each 0.5ml intramuscular dose was to be administered into the deltoid muscle.
- Each dose to be accompanied by a simultaneous intramuscular injection into an adjacent site on the same deltoid muscle of 0.5ml of whooping cough vaccine as an adjuvant.
- Expected side effects might include a painful arm and a slight fever lasting 24 hours.
- The programme was to be voluntary.
- Vaccinations were to be recorded on medical documents B Med 27 and F Med 4.
- The vaccines were to be stored at between 2° and 8°C.
- An initial distribution plan was outlined.
- Units deploying to theatre before midnight on 5 January 1991 were to receive their first vaccination in the Middle East.
- Units deploying after 5 January 1991 were to receive their first vaccination in their current locations.
- The Warning Order was to be dealt with under strict need to know criteria and was not to be released beyond unit Commanding Officer level pending the issue of the final directive.

Starting the immunisation against anthrax

⁷ A warning order is an instruction advising of an expected future action or event.

80. Following the warning order, a directive, also SECRET, initiating the immunisation programme against anthrax was sent on 28 December 1990 by MOD to JHQ, copied to HQ BFME and major headquarters in the UK and Germany. This was the BW Immunisation Directive 001 and is reproduced at Annex M. The main points were:

- Plan and execute a programme based on 3 doses over a 7-week period.
- The programme to be administered with an adjuvant (whooping cough).
- The programme to be voluntary and personnel were to be so informed. Personnel also to be informed of the nature of the product, why it was being given and its possible side effects.
- Vaccinations to be recorded on medical documents (B Med 27 and F Med 4).
- Units deploying to theatre before about 6 January 1991 to receive their first vaccination in the Middle East, the cut off date to be at the discretion of HQBFME.
- Units deploying after about 6 January 1991 to receive their first vaccination (and second if applicable) in their current locations.
- Units to be vaccinated according to a specified priority list.
- The immunisation programme against anthrax was one of a number of measures to counter the threat from biological warfare agents.
- 20,000 doses of serum to counter the threat from BTx should be available by 21 January 1991 with the intention for it to be used post attack.
- Consideration was being given to providing medical countermeasures against plague.

81. The subsequent signal which was sent by HQ BFME down the command chain is reproduced at Annex N and was very similar in content and phrasing to BW Immunisation Directive 001. The signal sent by HQ 1 (UK) Armoured Division, which in this instance went to major units as well as to 4 and 7 Armoured Brigades, was again very similar in content and phrasing. The FFT was unable to trace a transmitted copy of this signal, but what is believed to be the final version is at Annex O.

82. Although the voluntary nature of the programme was widely communicated, it does not appear to have been universally so. Attached at Annex P are transcripts of two signals, one from CINCFLEET and one from Headquarters 4 Armoured Division in BAOR, where there is no mention of the voluntary aspect, and which state that personnel "require vaccination before deployment" and that they "must have the following vaccinations..." This would indicate that some scope for confusion about the nature of the programme was generated at relatively high level in some chains of command.

Starting the immunisation against plague

83. The assessment that Iraq possibly had plague available as a biological weapon was made in November 1990, at a time when discussion of the options available for countering the threat of anthrax and BTx were fairly well advanced. Accordingly, the procurement and administration of plague vaccine took place after the anthrax immunisation programme had begun.

84. There was no separate warning order for plague. Advance notice that consideration was being given to immunising UK forces against plague was included in BW Immunisation Directive 001. On 19 January 1991, the MOD sent a secret signal, BW Immunisation Directive 002 (reproduced at Annex Q), to JHQ, copied to HQ BFME. It directed JHQ to plan for and execute an immunisation programme against plague. The main points from the signal are:

- UK had purchased and tested plague vaccine from the US Department of Defense.
- The National Institute for Biological Standards and Control (NIBSC) had passed the plague vaccine for use.
- Stock of vaccines sufficient to give two doses to 50 000 personnel.
- Although the vaccine was not to be licensed⁸, the Secretary of State for Defence had agreed that troops on Operation GRANBY should be vaccinated against plague.
- The programme to be based on two doses over a period of 28 days.
- First dose to be administered from 21 January 1991, concurrently with the second dose of anthrax vaccine to take advantage of the adjuvant effect.
- Personnel deploying to the Middle East later than 21 January 1991 should receive first dose (and second if applicable) in current locations.
- The programme was to be voluntary and it stressed that personnel were to be so informed. They were also to be told the nature of the product, why it was being given and the likely side effects.

85. However, on the following day (20 January 1991) JHQ issued a signal which outlined how the anti-BW immunisation programme was to be implemented (reproduced at Annex R). Paragraphs 3A and B of this signal gave different advice on the administration of plague vaccine. The main points of this paragraph were:

- BW Immunisation Directive 002 to be implemented.
- Vaccine should be referred to as “Cutter” to avoid alarming connotation.
- Vaccine to be supplied in 20ml containers.
- First dose was to be 1ml, the second 0.2ml.
- The 1ml dose was to be used as a unit of measure for distribution purposes.
- Vaccine to be given in accordance with instructions already issued to HQBFME.
- Copies of instructions to be issued to vaccination centres in UK and Germany.
- Cutter vaccine could be given with, or up to seven days after, an anthrax and pertussis immunisation and still achieve maximum effectiveness.
- If the Cutter vaccine was administered outside the seven day period it should be given with an additional dose of pertussis vaccine.
- The second dose of Cutter vaccine should be given 28 days after the first, but could be given up to three months later if necessary.

It is not clear why this differing advice was promulgated, especially as the JHQ signal specifically refers to BW Immunisation Directive 002. Of specific note is the instruction to administer plague vaccine with an additional dose of pertussis if the plague immunisation was given over seven days after a combined anthrax/pertussis immunisation. Despite the potential for a third pertussis immunisation which this instruction created, during its work the FFT found no evidence of anyone receiving more than two pertussis immunisations (see paragraphs 114 and 115).

86. On 22 January 1991, HQ Strike Command sent a signal to RAF units in the Gulf concerning the anti-BW immunisation programme. This signal repeated the advice on

⁸ The vaccine was licensed in the US, but not in the UK. See “Background to the use of Medical Countermeasures to protect British Forces during the Gulf War (Operation GRANBY), MOD, October 1997.

plague immunisation given in Paragraph 3B of JHQ's signal of 20 January 1991 rather than using that outlined in BW Immunisation Directive 002.

Botulinum toxin (BTx)

87. On 12 February 1991, the MOD sent a SECRET signal to JHQ, copied to HQ BFME, BW Immunisation Directive 003, about BTx. The text is reproduced at Annex S. The main points of this signal were:

- The UK had produced and tested a BTx anti-toxin.
- The National Institute for Biological Standards and Control (NIBSC) had passed the anti-toxin for use.
- Although the anti-toxin was not to be licensed, the Secretary of State for Defence had agreed that it should be made available for troops deployed on Op GRANBY.
- The anti-toxin could not be produced in sufficient quantities for prophylactic use and, furthermore, there were some side effects, albeit mild.
- Accordingly, Ministers had decided that it was only to be used as a post attack treatment.
- Administration of the anti-toxin was to be on the basis of voluntary informed consent.

BTx anti-toxin was never administered to UK forces, because there were no attacks using this or any other BW agent.

88. Issue vouchers from DMED Ludgershall record BTx antitoxin stocks being sent out to the Gulf and, although no receipts were located, one individual working at 84 FMED recalls having the antitoxin in store. While the FFT did not locate any documentation that showed whether these stocks were returned to the UK at the end of the conflict, very substantial quantities of Gulf era anti-BW vaccines still exist at MSA Ludgershall. These were counted by the FFT and 24,542 2ml vials of BTx anti-toxin were found to be stored there.

Immunising UK Forces

Written guidance available to medical personnel

89. The medical staff of units deploying to the Gulf had generally not been aware that they might have to run a large scale, short notice immunisation programme using vaccines with which they were not familiar. The MOD guidance on immunisations was contained in JSP 311 (1981). JSP 311 (1981) gave general guidance on immunisation and states it may only be given with consent, after medical fitness and suitability have been established (see Annex T). It gave guidance on vaccinations against both anthrax and plague in the public health context, but did not address the use of anthrax and plague vaccinations as counters to biological warfare threats.

90. Further adhoc written advice was available. The FFT found copies of a letter dated 12 November 1990 from the Surgeon General's staff referring to medical policy papers to be disseminated to "all medical units under command", which included guidance on how anthrax and pertussis were to be administered. Note that this preceded the Warning Order and BW Immunisation Directive 001 by some six weeks. The extent to which this

document was distributed is unclear, but a copy was found with 1 Armoured Field Ambulance's contemporary paperwork.

91. The HQ 1 Armd Div Preventative Medicine Post Operation Report dated 18 March 1991 makes the point that information was readily available for the first anthrax/pertussis immunisation, but that this was not the case during the administration of the second anthrax/pertussis when the use of pertussis was questioned. It also states that similar information was not available for the plague immunisation and that decisions in theatre were based on textbooks brought from BAOR which were out of date.

The Immunisation Programme

92. BW Immunisation Directive 001 set out how the anti-BW immunisation programme was to be run. It allocated units a priority for immunisation. Priorities One to Three, in general, were allocated to units already deployed or in the process of deploying to the Gulf. In total 40,962 personnel from Priorities One to Three were to be immunised.

93. Stocks of vaccines were limited and it was therefore necessary to keep a tight control on the number issued. Commands in the UK and Germany as well as the Gulf (see paragraphs 94 to 113 below) were required to regularly inform JHQ of the number of doses of vaccines that they held and the number of personnel immunised. By mid-January 1991 it was found that a shortage of vaccines was placing the immunisation programme in jeopardy. Instead of the estimated 40,962 doses, it was found that 49,127 doses were actually issued, over 8,000 more than had been planned for. This left only 4,348 doses out of the original 54,000 doses of anthrax vaccine purchased by DMED and meant that JHQ could not maintain its stock of 10,000 doses for post attack treatment. Accordingly, on 15 January 1991 JHQ issued a signal expressing concern at the number of doses of anthrax vaccine. This is reproduced at Annex U. The main points of this signal were:

- The overrun of 8,000 doses was unacceptable and placed the anti-BW programme in jeopardy.
- JHQ must reserve some 10,000 doses for post attack treatment.
- The maximum production programme would just allow this to be achieved while providing a second dose on time but only if vaccination was restricted to the agreed 40,962.
- Commands were requested to report what unused vaccines were held at vaccination centres.
- The second dose for deployed forces will be issued to HQBFME by 22 January 1991 subject to delivery.
- HQBFME to estimate requirement for groups 1 to 3 only and report requirement to JHQ.
- First dose of anthrax for forces still in the UK and Germany will only be issued on instruction from JHQ.

The signal at Annex R details the result of JHQ's efforts and states that they believed that they had enough vaccine to retain 10,000 doses for post attack and commence the second series of anthrax immunisations. It also notes that reserves of vaccines were very small. However, even after JHQ's efforts it is clear that the problem of vaccine shortages was not resolved as on 29 January 1991 the Commander in Chief Fleet temporarily suspended the roulement of RN and RFA personnel because replacement personnel could not be offered anti-BW immunisations.

In the UK and Germany

94. The anti-BW immunisation programme was planned to take place in the UK, Germany and Cyprus as well as the Gulf. Vaccines were also sent to the Royal Navy Hospital, Gibraltar – for use on board HMS HECLA (see paragraph 74).

95. Royal Navy and Royal Fleet Auxiliary. In general Royal Naval personnel were immunised aboard ship as a company while in the Gulf. The number of Royal Navy locations in the UK to which vaccines were sent (see Annex G) suggests that many RN personnel would have received their first anti-BW immunisations in the UK. There is documentary evidence that a number of RN and RFA personnel would have been immunised in the UK. The CINCFLEET signal dated 10 January 1991 (see Annex P) nominates RNH Haslar, RNH Plymouth and DKMH Catterick as immunisation centres. The JHQ signal dated 20 January 1991 (see Annex R) also nominates Haslar as an immunisation centre. Annex G shows DMED issuing vaccines to Haslar, but also to Plymouth, RNAS Yeovilton, Portsmouth, Rosyth and RFA OLN.

96. Army. The majority of regular Army units assigned to GRANBY had already deployed, or were in transit to the Gulf by the time BW Immunisation Directive 001 was issued. Units deploying to the Gulf after 6 January 1991 were to receive the first doses of anthrax and pertussis at their current locations. Regular Army personnel deploying after 6 January 1991 would have been immunised at unit medical centres in the UK and Germany. However, the JHQ signal dated 20 January 1991 (see Annex R) states that South Cerney in the UK (the pre-deployment staging area for Army personnel) should be used to immunise individuals deploying to the Gulf. A centre was also to be established in Germany, but the FFT was unable to identify where it was located. Annex G lists the locations/units which had anti-BW vaccines issued to them.

97. The majority of Territorial Army (TA) personnel and Reservists serving on Op GRANBY were medical personnel. Following the calling out of the Reserve Forces on 17 December 1990, the Royal Army Medical Corps (RAMC) Training Centre at Keogh Barracks became Temporary Mobilisation Centre 4 (TMC 4) for the mobilisation of Reservist and TA medical personnel (see Annex V). During this activity, routine immunisations were updated. From Keogh, individuals would have been assigned to units (mainly Field or General Hospitals).

98. TA and Reservist medical personnel who passed through Keogh Barracks prior to 6 January would have had their anti-BW immunisations administered by the unit to which they were attached; some of these were conducted at Saighton Camp⁹. Copies of individual vaccination records for 205 (Scottish) General Hospital (Volunteer) (205 Gen Hosp (V)), which was one of the units to go through Saighton Camp, were located by the FFT. A summary of the immunisation programme conducted by 205 Gen Hosp (V) is at Annex W. Only those TA personnel and Reservists passing through Keogh Barracks after 6 January 1991 would have been given anti-BW immunisations at Keogh Barracks.

99. RAF. By the time BW Immunisation Directive 001 was issued, most RAF units were deployed or were in transit. Units deploying to the Gulf after 6 January 1991 were to receive the first doses of anthrax and pertussis at their Gulf locations. What is believed to

⁹ Saighton Camp, Chester was the Army Medical Services TA training camp, and was used in this role during Op GRANBY, particularly for NBC Training of all RAMC TA and Reservist personnel.

be the final version of a secret signal concerning the immunisation of RAF Strike Command personnel was sent from Strike Command, High Wycombe on 25 January 1991. The text is reproduced at Annex X. The main points of this signal were:

- All personnel other than formed units to receive anti-BW immunisation at RAF Innsworth.
- Formed units may receive anti-BW immunisations at parent unit.
- RAF Lyneham and Brize Norton are to continue to give anti-BW immunisations to air transport aircrew and aeromedical teams.
- All other (routine) immunisations to be given at unit level.

This signal is evidence that RAF anti-BW immunisations were taking place on at least three locations in the UK. Other locations can be deduced from the list of anti-BW vaccine issues at Annex G. Annex R shows that some vaccines were held at RAF Wyton, Hullavington and Kinloss at an earlier date. Issues by DMED (Annex G) support this, with stocks going additionally to RAF Marham, Lyneham, Brize Norton, Lossiemouth, Leeming Cottesmore, Coltishall and Northolt. A vaccination centre was also to be established in Germany, but the FFT was unable to identify where it was located.

100. In accordance with RAF practice, the medical centre at RAF Innsworth maintained an immunisation record book which gives the names of personnel and the vaccines they received. The FFT located that book as well as the immunisation record books from several other RAF stations (see paragraph 190 below). The Innsworth record book shows a total of 264 UK personnel receiving anti-BW immunisations between 30 January and 14 March 1991. Of these 189 were RAF, 57 civilians, 16 Royal Navy, and two Army. Of these 35 are recorded as receiving only Anthrax and Pertussis (34 on 30/31 January 1991, before Plague was being recorded in the book), and 16 recorded as receiving plague only. 18 other records are annotated as “refused” against all anti-BW immunisations.

In Cyprus and the Mediterranean area

101. The FFT was able to collect very little detail about how the anti-BW immunisation programme was carried out in Cyprus and in the Mediterranean area, but Annex H sets out what information was found and Annex G details the vaccines issued.

In the Gulf

102. The directives to immunise arrived in the Gulf at a time of intense pre-battle preparation while many personnel were being moved into their pre-assault positions. The anti-BW immunisation programme became another factor that had to be considered, planned and executed by exceptionally busy units. It was co-ordinated by the Defence Medical Services (DMS). The units ranged from a large General Hospital at Riyadh to one or two doctors in a regimental aid post (RAP) with an infantry battalion. These differing arrangements greatly influenced the manner in which vaccines were administered. Moreover, the manner in which vaccines were administered was also affected by where individuals were physically located at the time when the immunisations were taking place. A synopsis of the medical organisation for Operation GRANBY is at Annex Y.

103. As in the UK an examination of contemporary records shows that anti-BW vaccines were in short supply in the Gulf throughout January 1991. Commander Medical’s (Comd Med) diary shows that by 7 January 1991 there was no stock of anthrax vaccine in the Gulf which led to delays in ensuring all units received immunisation. By 11 January 1991

vaccine was available and the administration of the first anthrax immunisation was generally completed by 12 January 1991. Delays were also experienced in late January 1991 when administering the second anthrax immunisation. This was due to the late delivery of the vaccines in the Gulf and delays in releasing stocks to units.

104. Another problem which was identified in the 1 Armd Div Operation GRANBY Preventative Medicine Post Operation Report dated 18 March 1991 was that the supply of needles and syringes did not match the number of doses of vaccine which had to be given. Again, this would have effected the ability of units to run the anti-BW immunisation programme effectively.

105. RN and RFA - At sea, the Royal Navy, supported by the Royal Fleet Auxiliary (RFA), was conducting maritime embargo operations and preparing for the active phase of hostilities when the anti-BW immunisation programme began. However, by this time RFA ARGUS, fitted out as a Primary Casualty Reception Ship, was on station in the Gulf and had the task of planning and running the anti-BW immunisation programme. All requests for anti-BW vaccines, Nerve Agent Pretreatment Sets (NAPS) and Biological Antibiotic Treatment Sets (BATS) were processed through RFA ARGUS, which in turn was responsible for ordering all of the RN's and RFA's requirements from 84 FMED. Immunisations on board ships were normally conducted by their own doctors and medical staff, usually in the sick bay. It is likely that for ships that did not have their own doctor, namely the Mine Counter Measure Vessels (MCMVs), a doctor and staff from HMS HERALD, the support ship for the MCMVs, would visit the ship to administer the vaccines. However, signal traffic shows that on at least one occasion two medical officers from RFA ARGUS were loaned to the MCMV group in order to conduct the anti-BW immunisation of ships' crews.

106. From signal traffic it is also clear that each ship was required to keep a record of the number of crew who had received a particular anti-BW immunisation; the number who still required a particular immunisation; the number who had refused immunisation; a tally of vaccine stocks stored aboard; and the number of additional vaccines required. Records were also kept of the number of side effects that were experienced. This was all reported to RFA ARGUS which kept a central record.

107. ARMY - For Army units in the Gulf the anti-BW immunisation programme was run by the three Field Ambulance (Fd Amb) units. The responsibilities of each Fd Amb was set out in the 2 January 1991 signal issued by HQ 1 (UK) Armd Div notifying units of the commencement of the programme (see Annex O). Under the tasking of HQ FMA Med, 24 Airmobile Field Ambulance had the responsibility for units in the FMA and FFMA; Dressing Station 5A (DS 5A - part of 5 Armoured Fd Amb) was responsible for 4 Armoured Brigade units; DS 1A (part of 1 Armoured Fd Amb) was responsible for 7 Armoured Brigade units; and DS 1B was responsible for Divisional Troops.

108. Under this arrangement the Fd Ambs were responsible for the provision of anti-BW vaccines to their affiliated units. Units were required to report the number of vaccines that were stored, the number used and the number required on a daily basis. This information was supplied to the Fd Ambs who in turn reported up the chain of command to HQ 1 (UK) Armd Div. HQ 1 (UK) Armd Div would then report the figures to JHQ. This arrangement allowed tight control of the storage and issue of vaccines and thus ensured that as little vaccine as possible was wasted.

109. Battle preparations could have had a significant impact on the anti-BW immunisation programme. A unit in a stationary position would have its personnel available for immunisation, whereas a unit in transit could have had sub-units scattered over a wide area. In addition, stores were being moved daily up the 'Tapline'¹⁰ Road' from Al Jubayl to the Forward Force Maintenance Area (FFMA), a distance of approximately 300 km. Some units always had many of their personnel spread out along the length of the 'Tapline Road' (see map at Annex Z). Units with dispersed personnel would have found it much more difficult to implement an immunisation programme systematically.

110. Major units such as infantry battalions, or armoured regiments which had their own Regimental Medical Officer (RMO) were responsible for immunising their own personnel. In these instances the Fd Ambs would collect the vaccines from one of 84 FMED's Medical Supply Sections and deliver the required number of vaccines to the requesting unit. For those based in or near a hospital, the immunisations generally took place in the hospital in conditions similar to those at a unit medical centre, albeit that the hospitals were generally housed in temporary accommodation. For those serving with Army HQs or rear area units the unit dining room, which could be a series of tents, was often used.

111. For smaller units without their own RMO arrangements were made with the appropriate Fd Amb for a team of medics to visit the unit or for the unit to visit the Fd Amb in order to receive the immunisations. In many instances medics from the Fd Ambs visited remote locations in poor weather conditions to ensure that small groups of soldiers were immunised. The unit to be immunised would supply the medical team with a nominal roll. Those being immunised would be checked-off against the nominal roll, given a short brief on the vaccines to be given and then told that they had the right to refuse an immunisation if they wished. A note of the immunisation given would also be made in the individual's B Med 27. The nominal roll was usually returned to the unit. When contacted, medics from the Fd Ambs conducting these immunisations were adamant that there was informed consent and that B Med 27s were correctly annotated. A typical immunisation parade in the Gulf is depicted at Annex AA.

112. RAF - The FFT found very little documentary information which detailed how the anti-BW immunisation programme was run by the RAF in the Gulf. As with the other two Services, 84 FMED was responsible for supplying vaccines to RAF units. In general, it is believed that vaccinations were administered by medical staff at the RAF stations in the Gulf, these being Dhahran, Muharraq, Tabuk, Seeb and Riyadh. Interviews with members of the Support Helicopter (SH) Force suggest that these personnel were immunised by their own medical staff.

113. UK Liaison Staff - Members of the UK forces who were deployed with Coalition units in a liaison capacity were given their anti-BW immunisations in situ by medical personnel from the Fd Ambs.

Modification of the anti-BW immunisation programme

114. The anti-BW immunisation programme was modified while it was in progress. On 12 February 1991, MOD recommended the dropping of pertussis from the third anthrax immunisation and greater flexibility in administering second plague and third anthrax. This

¹⁰ Trans Arabian Pipeline (Tapline)

signal, together with a commentary on it by Deputy Assistant Chief of Staff (DACOS) Medical at JHQ is reproduced at Annex BB. The motive behind these changes seems to have been to clear the decks for the assault into Iraq, which eventually started on 25 February 1991. Commanders may have had operational concerns about carrying out anthrax three/plague two immunisations in the same time scales as a possible attack, given the competing pressures, and the worries about short-term side effects reducing the efficiency of units about to do battle¹¹. JHQ are explicit that the decision was not being made on medical grounds. Given the timing of this advice in relation to the timing of the ground war and the original timing of the anthrax three/plague two immunisations which would commence on or about 21-22 February 1991, the upshot is likely to have been that very few second plague immunisations would have been given.

115. Advice to drop the third pertussis immunisation, and to vary the timing of the second plague immunisation was generated by representations in theatre early in February about the possible operational implications of short-term side effects from immunisation, especially plague. The decision to drop pertussis was also reinforced by medical advice that the third dose would be of uncertain usefulness in providing additional immunity. Ministers endorsed this advice on 13 February 1991.

After the Cease-Fire

116. A temporary cease-fire between Iraqi and Coalition forces came into effect at 0500 on 28 February 1991. At 0645 the same day, RFA ARGUS sent a signal to HQ BFME asking for guidance on the administration of third anthrax and second plague to RN and RFA personnel now that the cease-fire had come into effect and the taking of NAPS had ceased. The signal stated that without clear justification it was likely that uptake would be very poor. Although the FFT could not locate a copy of the signal, it is clear that HQ BFME sought advice from JHQ. At 1845 JHQ sent a signal to HQ BFME which said that as the cessation of hostilities was only temporary anti-BW immunisations were to continue, but that this policy would be reviewed in 72 hours.

117. On 1 March 1991 CINCFLEET issued instructions amending the RN and RFA anti-BW immunisation programme. All personnel deploying to the Gulf with the exception of RFA personnel, MOD civilians, personnel not part of the ship's company and Javelin missile detachments assigned to ships deploying before 13 May 1991 were to receive a course of anti-BW immunisations. Due to the low threat of BW attack, this requirement was changed to first anthrax only on 5 March 1991.

118. On 11 March 1991 HQ BFME sought urgent advice from JHQ on whether to continue the administration of anti-BW immunisations. The FFT did not find a copy of the response, but it is assumed that JHQ continued to advise that anti-BW immunisations should be given.

119. The FFT has considered what anti-BW immunisations were given in the period leading up to the cessation of the anti-BW immunisation programme. While it is clear from contemporary records that immunisation continued in the UK and Germany in accordance with JHQ's instruction, the FFT found no record of the policy that was being advocated in theatre. However, when reviewing extant immunisation records, the FFT found no record

¹¹ The Op GRANBY Master Casualty listing covering the period 17 January to 11 March 1991, shows a total of 1,301 admissions to hospital, including 44 due to reactions to immunisations.

of any anti-BW immunisation being administered in the Gulf after 28 February 1991. Therefore, the FFT is of the view that notwithstanding JHQ's instruction very few, if any, anti-BW immunisations were given in the Gulf after 28 February 1991 and that, in the Gulf at least, the programme had effectively ceased.

Ending the anti-BW immunisation programme

120. On 18 March 1991, the Secretary of State for Defence authorised the suspension of the anti-BW immunisation programme, with the exception of personnel involved in land munitions disposal operations. On 20 March 1991, MOD sent a signal directing JHQ to suspend the anti-BW immunisation programme. This signal was titled BW Immunisation Directive 004. The FFT was unable to trace a copy of this signal. However, a signal issued by JHQ on 20 March, which refers to the original MOD signal, has been found, and is reproduced at Annex CC.

121. The FFT also found a JHQ Operational Instruction dated 27 March 1991 which offered out of date advice. Annex D of this instruction titled "OP GRANBY – ADMINISTRATIVE INSTRUCTION FOR LAND FORCES" contained guidance on immunisations which stated "As an interim ruling, until S of S [Secretary of State's] decision, all personnel inside 7 days NTM [Notice to Move] should be offered on a voluntary basis V1 and V2 Anthrax as well as Cutter (BW injections)". Given that the Secretary of State had authorised the suspension of the anti-BW immunisation programme nine days earlier, it is believed that this instruction had been drafted prior to the suspension and that this was an error that escaped the proof reading process. A signal dated 1 April 1991 sent by 1 British Corps, Bielefeld, Germany to Army formations and units deploying personnel to the Gulf specifically states "ADMIN DETAILS AS FOR PREVIOUS GRANBY DEPLOYMENTS LESS NEED FOR BW VACCINATIONS".

122. In view of the conflicting evidence above, it is not possible to be categoric about precisely when the programme ended or when the last anti-BW immunisation was undertaken.

Other medical countermeasures

NAPS

123. UK service personnel were given a pretreatment regime of NAPS tablets to improve survival in the face of attack by chemical agents: one tablet containing 30mg of pyridostigmine bromide to be taken orally every eight hours. A week's supply consisting of 21 tablets was sealed in a single packet. The tablets were to be self-administered on command. Although BFCME had the authority to order theatre-wide taking of NAPS, and GOC 1(UK) Armoured Division had a similar authority over Division units, commanders had an element of discretion to assess the local situation and act accordingly. The Log Sheets for HQ BFME record that authorisation for the taking of NAPS was issued to UK forces theatre-wide at 0525 on 18 January 1991. The Log Sheets for both 4 and 7 Brigades record that on 1 March the NBC threat was assessed as low and that the taking of NAPS may cease. The majority of Service personnel would therefore have taken NAPS at some point between 18 January and 1 March 1991.

BATS

124. BATS were issued to all UK troops in theatre and were to be taken in the event of a biological attack on UK forces, with personnel taking two capsules per day for a five day period following such an attack. The capsules were held by individuals and taken on the orders of local commanders. However, no Iraqi chemical or biological attacks are assessed to have taken place during the Gulf conflict and there is no evidence that orders were given to authorise the use of BATS.

The effects of security

125. Some personnel said that they did not know at the time, and still did not know, what vaccines they had been given. Others believed that they were given secret, undisclosed, vaccines. There was a need to prevent Iraq learning what UK forces were doing, including what medical countermeasures were being used. The anti-BW immunisation programme, which related to the classified threat assessment of the Iraqi biological weapons capability, was itself classified.

126. In several of the classified documents giving information on the anti-BW immunisation programme there is a section with notes to be used for briefing down the command chain. For example, on 29 December 1990 HQ United Kingdom Land Forces (UKLF) issued two confidential signals to major headquarters and medical establishments in the UK which detailed the proposed programme to immunise against anthrax (see paragraphs 79 to 82). Copies of the signals are reproduced at Annex DD. Paragraph six of the first signal offered advice on security:

- Despite press briefing and disclosure in the media, the anti-BW immunisation programme remained a sensitive issue and discussion and speculation were forbidden to avoid disclosure of countermeasures.
- Vaccination centres were to maintain the security of the anti-BW immunisation plan and were to use the codes Victor One, Two and Three when ordering vaccines and syringes (see paragraph 197).

At the end of the second signal there is a section on notes to be used for briefing by medical staff carrying out immunisations:

- There were reports that Iraq may have had biological warfare weapons as well as chemical weapons. Individual Protective Equipment (IPE) was effective against both but as a precaution, the Government had decided to vaccinate against anthrax.
- Anthrax vaccine had been used for many years by laboratory workers but was being produced in quantity. It was to be given with a whooping cough vaccine which increased its effectiveness.
- Like all vaccines there was a small risk of side effects confined to a sore arm and/or the possibility of a slight fever.
- Individuals would need a course of three vaccinations, one now, another after three weeks and a final after seven weeks. Protection increased with each vaccination.
- The Government had decided that the programme was voluntary so individuals did not have to accept the vaccination if they did not want to. However, if the

vaccine was refused, individuals would have been more at risk should Iraq attack with anthrax.

- This information was not to be divulged to anyone to avoid detail of the protective measures being used by Iraq.

127. These signals, along with similar advice, may have given rise to confusion and misconceptions regarding how much information could be given to Service personnel concerning the anti-BW immunisation programme. The fact that personnel were specifically instructed not to discuss the immunisations and the briefing they received with anyone could have led personnel to believe that they were being given a vaccine that was itself a secret item. The use of alternative names for the vaccines increased the uncertainty in some veterans' minds about what they were given. The use of codewords, symbols and alternative names is discussed in more detail at paragraphs 197 to 203 below.

128. Alternatively, those giving the briefings may have felt that they could not say very much about the vaccines because they were being constrained by security requirements. If this was the case then individual Service personnel may not have received very much information at all about the anti-BW immunisation programme. Both these hypotheses are sustainable from the interviews the FFT conducted.

Were the anti-BW immunisations voluntary in practice ?

129. The information passed down the military chain of command from MOD stated that the anti-BW immunisations were to be voluntary. The FFT found that units communicated and interpreted the voluntary nature of the programme differently. Other than the signals at Annex P, the FFT did not find any contemporary documents flowing from the chain of command, including official unit records, that stated or implied that the anti-BW vaccinations were in any way NOT voluntary.

130. The interviews show that many Service personnel, particularly Commanding Officers, were aware of the contents of the MOD briefing notes prior to immunisations being administered. However, it is also clear that some senior staff were unaware of the voluntary nature of the programme. It was found that there was even a considerable difference of opinion within units as to the voluntary nature of the programme with some stating at interviews that immunisation was voluntary whereas others thought it mandatory.

131. It was also found that some Commanding Officers took it upon themselves to decide whether their personnel would or would not be immunised. They either did not believe they had a choice, did not communicate the voluntary nature of the programme, or ordered immunisations. In a small number of cases this was done with knowledge of the MOD instruction that immunisation should be voluntary. However, the evidence from interview is subject to severe limitations and the small numbers interviewed may not be sufficient to provide total confidence on this point.

132. In addition, even where the voluntary programme was acknowledged there was frequent reference during interviews to a strong feeling that it would be wrong not to have the immunisations in case one became a casualty and put one's friends at risk. Also, peer pressure may have been a contributory and subtle factor in the minds of individuals when receiving an immunisation. In some units an individual could well have felt that he or she did not have any real choice in the matter.

133. It is noteworthy that both paragraph 4a of Annex M and paragraph 5 of Annex Q place the onus for telling personnel that the injections were voluntary on the “medical officers at the time of the vaccination”. If this was how things worked on the ground in practice, it might be inferred that troops had received no previous guidance on this from their chain of command, and that they would already be in the vaccination parade before hearing for the first time that these immunisations were voluntary. If this was the case, it would certainly have contributed to the impression that, whatever the MO said, there was not much option to back out at such a late stage.

134. The prevailing view amongst those interviewed was that, at the time, they believed it was in their own best interests to have the immunisations, because if there was a biological weapons attack, the vaccinations would give them the best chance of surviving the effects of exposure to biological warfare agents. The latter idea, commonly conveyed by interviewees, is very close to the statement in the signal from MOD, paragraph 126 above:

“However, if you do not have the vaccine, you will be more at risk should Iraq attack us with anthrax”

135. Nevertheless there is also extensive evidence that the voluntary nature of the programme was understood and operated in practice in certain areas. Records from RAF Innsworth and from 205 Gen Hosp (V) show individuals refusing or not receiving vaccinations, implying there must have been a choice. Some records of liaison staff at US 7 Corps also show some individuals not receiving vaccinations. The Part One Orders from 33 General Hospital which survive demonstrate that personnel were consistently being urged to take the plague vaccine, and that a significant number were not doing so. The FFT discovered evidence from HQBFME that medical staff there were definitely offering the plague vaccine on a voluntary basis: 3 personnel had refused it. Finally, all the medical staff at the three Field Ambulances contacted by the FFT who were chiefly responsible for the immunisation programme in the Gulf, and who conducted many of the immunisations for smaller units themselves, were categorical that their immunisations (including 1,500 soldiers in smaller units in the FMA and FFMA) were always given on a voluntary basis.

Consent forms

136. Some Gulf veterans have suggested they signed forms consenting to receiving the anti-BW immunisations. The FFT could not locate any examples of such forms or other signed paperwork with the F Med 4s or B Med 27s consenting to immunisations for any service personnel. Although use of consent forms was tentatively suggested to the Chiefs of Staff in December 1990, they and Ministers took the view that this was unusual and likely to give rise to concerns about the safety of the anti-BW vaccines. Use of consent forms was ruled out, on the understanding that the medical officer administering the vaccine would tell each individual about the product, why it was being offered, the side effects and that the immunisation was voluntary. A separate but identical decision was made for the plague immunisations in January 1991.

137. A service person might have signed a piece of paper, other than a consent form, in connection with the anti-BW immunisation programme in certain circumstances. At interview, the doctor with the Support Helicopter (SH) Force advised that a written brief on the vaccines, expected side effects and perceived threat was read by those in the SH Force attending for immunisation (no copy of the brief was located by FFT). Recipients of the vaccines were then asked to sign a register (often on a loose sheet of paper) and print

their name and unit. The doctor believed that the register had been returned to Germany. However, no documents consistent with those described were located. The use of such a register is similar to the routine used to record immunisations used by the RAF in their unit medical centres (see paragraph 190 below) and therefore could have been a natural step in some units. In the RAF Innsworth record book, it would appear that individuals sometimes printed and signed their own names when attending for immunisation.

138. The set of immunisation records for 205 Gen Hosp (V) which were located in the course of the FFT's review show that 25 records were either signed by the individual, or the individual and the medical officer, to confirm that they had declined anti-BW immunisations. In 6 of these cases the individual changed his/her mind and subsequently had anti-BW immunisations. In addition, 73 records were either unsigned or have been signed by the medical officer denoting that the individual declined anti-BW immunisations. In 14 of these cases the individual changed his/her mind and subsequently had the anti-BW immunisations.

139. The FFT found no evidence to support suggestions that some service personnel were required to sign waivers if they refused immunisation, exempting the MOD from any claim if they were subsequently injured or died from anthrax or plague.

205 (Scottish) General Hospital (Volunteer) Trial

140. 205 Gen Hosp (V) recorded the vaccine reactions of some of the personnel at their unit. During its research into the anti-BW immunisation programme, the FFT found several examples of units and ships recording this data. However, in the case of 205 Gen Hosp (V), evidence exists that this was done as a trial or study to discover the effect of vaccine reactions on unit. The FFT has looked at this in more detail because of suggestions made by some Gulf veterans that they were made to take part in trials or experiments with vaccines.

141. As is discussed at paragraphs 148 to 155 below, both the CO and the Comd Med of 1 (UK) Armd Div were concerned about the plague vaccine's reactogenicity. It was thought that the decision to immunise against plague would lead to a large number of personnel being bedded down in hospitals as a result of severe vaccine reactions. Comd Med 1 (UK) Armd Div has stated that HQ BFME decided a trial should be conducted at 205 Gen Hosp (V) to assess how many personnel would suffer severe reactions as a result of plague immunisation before other units in theatre began the administration of plague vaccine. The results of the trial would give an indication of the number of personnel that would be affected by severe vaccine reactions and therefore unavailable for duty.

142. A medical situation report (MEDSITREP NO 114) for 28 January 1991 states that the reactions observed at 205 Gen Hosp (V) were:

- 50% had painful arms.
- 15% had systemic shivers.
- 3% bedded down for 48 hours.
- Older personnel were more likely to react to the plague vaccine.

143. A signal from MODUK to JHQ dated 29 January 1991 stated that the results of the trial at 205 Gen Hosp (V) “showed less severe reactions than might have been anticipated. In view of this encouraging response vaccination programme to continue.” This conclusion was completely the opposite of that reached by Comd Med 1 (UK) Armd Div (see paragraph 151).

144. The Nursing Officer at 205 General Hospital who organised the teams giving the immunisations can recall the trial being undertaken. A small number of volunteers were immunised with the plague vaccine and the effect recorded. The Nursing Officer believes that the study was conducted on personnel who were receiving their second plague immunisation rather than their first. However, the dates of contemporary signals and letters (28/29 January 1991) coincide with 205 General Hospital’s first plague immunisations.

145. The FFT has not been able to establish the precise chain of events behind the decision to undertake this trial. It is not clear whether the 58 plague immunisations given at 205 Gen Hosp (V) over 24 to 25 January, 3 days before the main immunisation programme (see Annex W) constituted the “trial”. The recollections of individuals involved differ. The doctor in charge of the immunisations recollects a larger sample spread over a longer time. However, the evidence of the letters and signals dated 27, 28 and 29 January 1991 show people were interpreting the results earlier. In any case, these immunisations were conducted in accordance with the MOD’s anti-BW immunisation policy. Others in the Middle East and UK were also being immunised against plague as early as 24/25 January 1991, so 205 Gen Hosp (V) was not starting its programme unusually early.

146. One serviceman serving at 205 Gen Hosp (V) has stated that he was involved in the vaccine reaction study and that he was ordered to have the plague immunisation against his will. A review of the 205 Gen Hosp (V) immunisation records suggested that this individual did not receive a plague immunisation. However, his B Med 27 clearly shows that a plague immunisation was administered on 30 January 1991 (two days after the results of the “trial” were reported). The plague immunisation entry was also annotated “Doctors orders”.

147. The FFT contacted the individual who had signed the B Med 27 to establish the provenance of this entry. The Nursing officer concerned confirmed that the handwriting was hers. She was sure that personnel were informed that immunisation was voluntary, but could not recall why she had entered this comment on the B Med 27. No similar entries appear on any of the other 205 General Hospital B Med 27s or F Med 4s seen by the FFT, nor are there any similar entries in the 205 General Hospital immunisation records. Whilst the use of the term “Doctors orders” with reference to a plague immunisation is odd, the FFT is clear that the substantial evidence available for 205 General Hospital clearly shows a policy of voluntary informed consent being implemented in that unit.

Medical advice in-theatre

148. There was considerable debate and concern among medical staff about the BW-immunisation programme. Unit medical officers were concerned whether anthrax could be effective in the short time frame. There was concern about the use of pertussis because of its likely reactogenicity and the lack of published evidence about its efficacy. Some felt that enquiries up the chain of command were not well understood or answered. JHQ on

the other hand was concerned by attitudes in theatre, felt that insufficient pressure was applied down the chain to ensure an adequate uptake of vaccines, and that advice was disregarded or rejected for no good reason. At the time of the second immunisation against anthrax and the first vaccination against plague, the Comd Med of 1(UK) Armoured Division drafted a signal which was sent to the units in 1 (UK) Armoured Division, giving his advice for medical officers on the administration of immunisation. The text of the signal is at Annex EE. In the signal Comd Med stated that he and the General Officer Commanding (GOC) were going to decline the immunisation against plague. Comd Med also stated in the signal:

- That he knew of no reason why pertussis was needed with the second or third dose of anthrax.
- He was advising that no one who had any reactions to the first vaccinations should have pertussis with the second anthrax, unless they were also having a vaccination against plague.
- He recommended the anthrax immunisation and said everyone should be encouraged to have the second dose.
- That “It is regretted that the tone of this signal seems to be contrary to that taken by higher HQ”.

149. An entry dated 24 January 1991 in the 1 Armd Fd Amb commander’s diary (the day before Comd Med’s signal was sent) states:

“The system now intends to “offer” us PLAGUE vaccine but information on its efficacy and side effects is very sparse. Comd Med has briefed GOC who will decline it. I am of the same opinion.”

150. An entry dated 28 January 1991 in the 24 Airmob Fd Amb commander’s diary (three days after Comd Med’s signal was sent) states:

“The unit has now completed preparations for the vaccination programme in the Forward FMA, which will now include the first dose of vaccine against Plague. The news that 1st Armoured Division is not to administer Plague vaccine is a surprise.”

151. At interview, the Comd Med stated that in formulating these views, he was aware that 205 Gen Hosp (V) had had 3% of its staff bedded down for 48 hours after having their second anthrax and pertussis and first plague immunisations. He had calculated that this would be equivalent to 540 personnel across the Division. This was at a time when the weather had turned unusually wet and cold for Saudi Arabia: the weather was so bad that Comd Med felt that if people needed to be bedded down in those conditions, then they would have had to have been admitted to hospital until they were fit again.

152. The Comd Med also stated that the GOC sent a similar signal down the command chain to his units stating that he, the Chief of Staff and the Comd Med were not going to have the plague immunisation. However, the signal did encourage personnel to have the second vaccination against anthrax. A copy of the GOC’s signal to units of the Division was located and is at Annex EE. This stated that the GOC did not intend to take up the plague immunisation, which is what the GOC recalled at interview. The Comd Med’s recollection was that before GOC’s signal was sent, a draft was sent to BFME and JHQ, advising that the formal signal would be sent in 24 hours, unless the 1 (UK) Armoured Division concerns about the need for plague immunisation and the second pertussis

immunisation were addressed. The FFT could not find evidence to confirm such an exchange.

153. The Commander's diary of 1st Armoured Field Ambulance (1AFA) corroborates Comd Med's view. On 24 January 1991 he recorded that information on efficacy and side effects of plague vaccine was very sparse. He agreed with the GOC and Comd Med decision to decline plague. On 26 January he briefed Commander 7 Brigade on anthrax and plague, and he agreed that anthrax (2nd) be given without pertussis and that we "do not offer plague". If plague was, literally, not offered to 7 Brigade, this suggests that GOC's wishes at para 3 of Annex EE were not carried out. Although Table Four shows no records of 7 Armd Bde getting plague 1, Table 4 suggests there must have been some uptake, including, ironically, a high proportion amongst 1 AFA staff.

154. At Annex FF is a signal from JHQ to HQ BFME confirming that those in theatre often felt there was a lack of medical information on biological warfare, and asking the HQ to ensure material was properly disseminated. This is confirmed by The HQ 1 Armd Div Preventative Medicine Post Operation Report dated 18 March 1991 which states that information was not readily available for the administration of the second anthrax/pertussis when the use of pertussis was questioned. It also states that similar information was not available for the plague immunisation and that decisions in theatre were based on textbooks brought from BAOR which were out of date. The lack of information on anthrax/pertussis 2 and plague 1 was said to have contributed to the lower uptake of these immunisations (see paragraphs 165 to 170).

155. The FFT concluded that these signals, which contained different advice from that in the BW Directives, would have caused uncertainty at unit level as to which immunisation personnel should receive. On the whole, however, they would have supported unit medical and commanding officers views doubting the need for, efficacy, and side effects of particularly plague and pertussis. On the basis of the interviews and the tables (paragraph 154) there does seem to have been a lower and more patchy uptake of pertussis 2 and plague 1 in HQ 1 UK Div and its Brigades, than in RN or RAF units, HQ BFME, or the FMA/FFMA, and it would seem logical to attribute this to the GOC's position and the view of his medical staff.

Commanding Officers' operational decisions

156. The FFT established at interview that in the later stages of the anti-BW immunisation programme, some Commanding Officers decided that, based on their experience of the side effects of the first set or second set of anti-BW immunisations, their units should not have the next set of planned immunisations due to their potential effects on unit operational efficiency prior to the commencement of ground operations. They were not prepared to risk possible side effects putting a significant percentage of their formation out of action for up to 48 hours at a critical time. This stance was taken from about 20 February 1991 in some forward units, expecting to go into action very shortly thereafter (see paragraph 114).

CHAPTER 5 - UPTAKE OF IMMUNISATIONS

157. A key task of the FFT was to investigate the extent of immunisation. This Chapter gives an analysis of those findings, followed by the data presented in tabular form. The FFT specifically examined the uptake of anthrax, pertussis and plague. It also enquired about the routine immunisations, Nerve Agent Pre-treatment Sets (NAPS) and anti-malarial tablets.

Interviews

158. The estimates given for the uptake of vaccines and prophylactics shown in the Tables below are based on those made for their respective units by interviewees. It was not practical to interview large numbers of personnel from the same unit. Therefore, although 200 personnel were interviewed, the estimate uptake of vaccines and prophylactics for each unit is based on interviews with a small number of personnel from that unit (up to 11 with a median of 4). The estimates of uptake made by the interviewees are subject to the limitation of recall after seven to eight years (see paragraphs 33 to 35). Some of those interviewed may have already discussed the issues involved with former colleagues, which may have led to an artificial convergence of view about past events.

Documentation

159. The information in the vaccination record tables is based on four sources:

- i) Medical documents checked by the FFT at interviews.
- ii) Medical documents checked for the FFT as part of the random search of medical records (see paragraphs 184 to 190 below).
- iii) Immunisation records passed to the FFT.
- iv) Information contained in Commanders Diaries, Unit Logs, immunisation books, Unit Part One Orders and other Service contemporary documentation including one nominal roll.

160. Dates given in the tables for vaccines having been administered, are considered to be typical for that particular unit. In many cases records show several personnel in a unit had the same immunisations on the same day, which is strong evidence for a single vaccination parade and conformity within a unit. However, in large units, the vaccines could have been given over a number of days because of time constraints or because immunisation teams would often have been visiting different parts of the unit in various locations widely dispersed across the desert.

161. Overall, the FFT believes these tables help to show a pattern of uptake in general terms. However, it must be stressed that this data is neither exhaustive nor definitive, and the sources from which it is derived are limited and subjective.

Reading the tables of estimated uptake

162. Tables showing the estimated uptake by unit in each of the three Services are set out below. There are two sets of Tables for the Army. For the first set, units have been classified in seven groups, generating Tables for each group. Groups One to Seven (Tables Three to Eleven) are based on the Order of Battle for 1 (UK) Armoured Division. (Note: this is a snapshot of the organisation of units deployed to the Gulf around the end of January/early February 1991 under the command of 1 (UK) Armoured Division, not a definitive roster for the entire period.) Details of which units are in each of these groups appear on pages 40-41. The best way to use the Tables is to start at the list of groups that appear on pages 40-41; find the unit you want to check (or the parent unit) and then go to the group Table indicated. Once at the correct Table, just look for the unit you wish to check on in the left-hand column.

163. For the second set of Tables for the Army, units have been classified by Corps and Regiments (Tables Twelve and Thirteen). A further breakdown of these units can be found on the page following Table Thirteen.

164. The tables are organised as follows:

Table One	Royal Navy and RFA (data from computer record)
Table Two	Royal Navy and RFA (data from documentary records and interviews)
Table Three	Army – HQ 1 (UK) Armoured Division & Divisional Troops (data from interviews and documentary records)
Table Four	Army - 7 Armoured Brigade (data from interviews and documentary records)
Table Five	Army - 4 Armoured Brigade (data from interviews and documentary records)
Table Six	Army – Divisional Rear Troops (data from interviews)
Table Seven	Army – Divisional Rear Troops (data from documentary records)
Table Eight	Army – Forward Maintenance Area /Forward Force Maintenance Area (data from interviews)
Table Nine	Army – Forward Maintenance Area/ Forward Force Maintenance Area (data from documentary records)
Table Ten	Army – HQ British Forces Middle East (data from interviews and documentary records)

Table Eleven	Army – Post January 1991 units (data from interviews and documentary records)
Table Twelve	Army – By Corps (data from interviews)
Table Thirteen	Army – By Corps (data from documentary records)
Table Fourteen	RAF (data from interviews and documentary records)

What the estimated uptake shows

General points

165. In general, personnel of all three Services were brought up to date with their routine public health vaccinations prior to or in the early part of their deployment. The data indicated a high uptake - over 75% generally and closer to 100% in some units - across all three Services of the first doses of anthrax and pertussis, but thereafter the uptake is reduced and the overall pattern changes. From the documentary evidence that was seen, it would also appear that the second anthrax and pertussis immunisations were normally accompanied by the first plague immunisation, as was envisaged in the directive which ordered the start of immunisation against plague (see Annex Q).

Royal Navy

166. The uptake of the first anthrax/pertussis, second anthrax/pertussis and the first plague was high (greater than 75%). Interviews with RN and RFA personnel indicated an uptake for the first anthrax/pertussis of greater than 75%, in line with the computer record. These personnel also estimated that the uptake for the second anthrax /pertussis and first plague vaccinations was about 75%. From the evidence the second dose of plague vaccine was given to very few RN personnel. A signal sent by CINCFLEET on 5 March states "In light of much reduced BW threat assessment, V1, V2 and cutter vaccination requirements for movement of personnel to theatre are reduced to first injection plus hold period of 48 hours. This policy applies to all personnel approved to move into theatre".

Army

167. There appear to be differences between Army formations, as represented by the seven groups in the Tables. Fewer personnel in HQ 1 (UK) Armoured Division appear to have had the second anthrax or first plague immunisation. The contents of the signal at Annex EE will have been an important influence on this observed trend.

168. Although several units in 7 Armoured Brigade had the second anthrax immunisation, few of the units had the plague immunisation. In 4 Armoured Brigade the uptake of the plague immunisation was much more widespread, although the actual uptake between individual units seems to have varied.

169. In the FMA/FFMA medical units, such as the hospitals, there was a much greater uptake of the first plague immunisation. In many of these units there was also a considerable uptake of the third anthrax and the second plague vaccinations, which few other units seem to have received.

Royal Air Force

170. The reported uptake of immunisations and prophylactics in the RAF is almost identical for all locations in the Gulf and seems to indicate that there was a high uptake (greater than 75%) of the first and second anthrax/pertussis and the first plague. The Station Diary for Dhahran records that commencing on 2 January 1991 a total of 1,390 personnel received the first anthrax and pertussis immunisations. The FFT found no evidence to indicate that any RAF personnel, except some in Army units, had the third anthrax/pertussis or second plague vaccinations.

Collateral evidence for overall uptake

171. Very substantial quantities of Gulf era anti-BW vaccines still exist at MSA Ludgershall having been returned from the Gulf and were counted by the FFT: 42,895 doses of anthrax from the relevant batches, 31,949 of pertussis, and 40,510 of plague. Comparing these figures with deliveries (paragraph 72 to 77) we can deduce the maximum number of doses given to UK Forces. The actual number of doses will be fewer because some certainly went to Allied Forces operating with our own (e.g. around 460 doses of anthrax to 1 Canadian Field Hospital); some to civilians; and some would certainly have been wasted or destroyed, either on withdrawal from the Gulf, or in the eight intervening years. Interviewees recalled units in the Gulf deciding to destroy surplus vaccines locally by burning them with other rubbish. This is logical since at unit level the vaccines could not be kept stored at the required temperatures for long. However, destruction may not have been widespread practice, and there is extensive documentary evidence that anthrax stocks in particular were carefully husbanded during the programme and accounted for in detail, both in the UK and the Gulf.

Anthrax

172. CAMR records show 142,720 doses despatched to MOD before the end of the anti-BW immunisation programme. However, there is a discrepancy in Batch E346 where MOD is only recorded as having 600, yet 2,960 still exist at Ludgershall. This suggests MOD also got a consignment of 2,800 originally intended for British Aerospace but annotated "not taken" on CAMR records. Adding these 2,800 we get 145,520. 42,895 doses have survived, meaning that the likely¹ number of doses available to the MOD programme was 102,625.

Pertussis

173. MOD ordered a total of 130,400 doses from Merieux and Wellcome. 31,949 survive, meaning the maximum available was 98,451.

Plague

174. MOD purchased 80,000 x 1 ml doses from Cutter Biological. 40,510 survive, meaning the maximum available was 39,490 ml, or 32,910 x 1.2 ml first dose plus booster for two immunisations.

¹ Likely, not maximum because some doses from CAMR which went to other customers might conceivably have become available to MOD.

175. The table below compares these figures with an estimated range of uptake for each injection, assuming approximately 53,500 Service personnel were deployed to the Gulf theatre in all.

Immunisation	Uptake %	Estimated No. of doses used	Total doses used (low estimate)	Total doses used (high estimate)	Available doses
Anthrax 1	80-90	42,800 – 48,150	} 80,150	96,200	102,625
Anthrax 2	60-70	32,000 – 37,350			
Anthrax 3	10-20	5,350 – 10,700			
Pertussis 1	80-90	42,800 – 48,150	} 74,800	85,500	98,451
Pertussis 2	60-70	32,000 – 37,350			
Plague 1	60-70	32,000 – 37,350	} 32,530	37,880	39,490 ml
Plague 2	5	2,675 x 0.2 = 530			

176. The number of remaining vaccines therefore allows us to draw very broad conclusions about likely overall uptake of vaccines across UK veterans of the Gulf conflict which substantiate the oral testimony given to the FFT. In particular it is likely that only a small percentage of the Force had the third anthrax immunisation. It is certain that initial uptake of plague must have been well below 100% and that only a small fraction of the Force could have had the second plague immunisation.

Uptake of other medical countermeasures

NAPS

177. There were no detailed records kept of taking NAPS other than references in some unit records. However, the FFT concluded from interviews that the uptake was extensive. Almost all those interviewed said they took NAPS at some time. However, many also said that compliance in their unit was erratic and tailed off as the campaign progressed. The three main reasons given for this were:

- Personnel often forgot to take them every 8 hours.
- Some people found that it was inconvenient to take them every eight hours when they were working 12-hour shifts, so they eventually stopped taking them.
- Some personnel stopped taking them because of the side effects they were experiencing².

Antimalarials

178. Many units started taking antimalarials, namely Paludrine and chloroquine tablets. The official advice from UK that antimalarials were necessary conflicted with advice obtained locally and the difference was not resolved immediately. However, most of those questioned said that they stopped taking the tablets very shortly after arriving in the Gulf because they realised or were told that the areas in Saudi Arabia where they were serving were free of malaria.

² See "Background to the Use of Medical Countermeasures to Protect British Forces During the Gulf War (Operation GRANBY)", MOD, October 1997.

Number of immunisations

179. If a regular Service person's routine immunisations were in-date and if there was no requirement to update or administer additional occupational immunisations when they were assigned to Operation GRANBY, then he or she is likely to have only received immunisation against cholera, a regional immunisation requiring two doses of vaccine within a period of up to a month. In addition, he or she could have received up to the full set of the anti-BW immunisations against anthrax, pertussis and plague, a total of seven doses of vaccine (three / two / two respectively) over a period of approximately seven weeks. That said, most personnel serving on Operation GRANBY did not receive the third anthrax or second plague immunisations. Two cholera, two anthrax, two pertussis and one plague is likely to represent the experience of many of those who deployed on Op GRANBY.

180. TA personnel and Reservists were less likely to have been up to date with their standard Service immunisations (poliomyelitis, tetanus, typhoid and yellow fever). Some Reservists and TA personnel would have needed to be brought up to date with some of these immunisations. TA and Reservist medical personnel may also have needed occupational immunisations (hepatitis B and possibly meningococcal meningitis) as would food and water handlers (hepatitis A in the form of Gamma Globulin). In addition, they would also have been immunised against cholera and received the anti-BW immunisations.

181. From the set of immunisation records kept by 205 Gen Hosp (V), (see Annex W), it is clear that personnel joining that unit in late December or early January could have received up to nine immunisations against poliomyelitis (orally), tetanus and typhoid (as one combined injection if under 35 years of age), yellow fever, cholera, hepatitis B, meningococcal meningitis A and C, anthrax and pertussis. One individual also received an immunisation against hepatitis A in the form of a Gamma Globulin injection. In theory, a Reservist joining a unit for the first time after 21 January 1991 could have received these nine immunisations plus plague vaccine as well. The FFT concluded that a maximum of ten immunisations could have been given to an individual on any one day during the Gulf conflict - one oral immunisation for polio and nine injections (typhoid and tetanus being one combined immunisation). The FFT found no examples of such a high number of immunisations being administered and most records where a number of routine, regional or occupational immunisations were recorded show them being administered over two days. The highest recorded number of immunisations on one day was seven (see Annex HH).

182. The full regime for all these vaccines over a period of about seven weeks would have been 17 immunisations in total. For those that were deployed in the Gulf for a period of six months or over, a further cholera immunisation would have been required (given local policy it is unlikely that this would have been given). Those immunised against hepatitis B would have received the third of a course of three immunisations and those immunised against hepatitis A would require a further injection of Gamma Globulin. This would make a possible total of 20 immunisations over a six month period³. However, this represents the maximum possible number of immunisations and is not representative of the vast majority of those that were deployed to the Gulf. The FFT found no evidence of

³ Calculation: 1 polio + 1 tetanus + 1 typhoid + 1 yellow fever + 2 cholera + 1 hep A + 2 hep B (over 7 weeks) + 1 meningococcal meningitis A and C + 3 anthrax + 2 pertussis + 2 plague = 17. After six months in theatre: 17 + 1 further hep B + 1 further cholera + 1 further hep A = 20 immunisations or 18 injections (remembering tetanus and typhoid are combined) and one oral immunisation.

any individual receiving this number. Reservists represented only 2% of the troops who deployed on Operation GRANBY, most of whom did not deploy for 6 months.

CHAPTER 6 - RECORDING THE VACCINATIONS

183. The warning order for anthrax stated that the immunisations were to be entered on "B Med 27 and where possible on F Med 4" (see Annex L). Many Gulf veterans have asked why their medical records do not show details of the anti-BW immunisations which they recall receiving as part of the programme. The FFT set out to establish what record was made of the vaccinations and, where this was not done, to investigate possible reasons why this recording was deficient.

To what extent were the anti-BW immunisations recorded ?

184. In order to determine how many Gulf veterans' medical records contain details of anti-BW immunisations, the FFT undertook a series of document surveys. The results show that the number of medical records showing anti-BW immunisations is low.

Royal Navy

185. The RN manning authority at HMS Centurion selected, at random, the F Med 4s of 363 Officers and Ratings who had served in the Gulf conflict. Of the 363 records selected, only 131 or 36% showed details of anti-BW immunisations. In comparison with the apparent level of uptake on RN ships (see Tables One and Two), this figure is surprisingly low since most of the immunisations were received in ships' sick bays, where F Med 4s should have been immediately available. However, after this exercise it was found that some RN ships recorded anti-BW immunisations on a specially designed form held inside the F Med 4. A transcript of this form is at Annex GG. It is possible, therefore, that while HMS Centurion checked the outside of F Med 4s, records of immunisations were actually held within them and that the figure of 36% may be understated.

Army

186. The FFT gave the Army Personnel Centre (APC), Glasgow, 298 randomly selected names of retired Officers/Soldiers who had served in the Gulf. Their medical documents were then checked for anti-BW immunisation entries. For the 298 names selected, only 233 F Med 4s were present for inspection. Of these, only 22 or 9.4% showed details of anti-BW immunisations. All those which showed anti-BW immunisations also indicated that these had been given in either UK or Germany prior to deployment.

187. The FFT also randomly selected 300 serving soldiers who had served in the Gulf conflict and their current unit medical centres were asked to check their B Med 27s for anti-BW immunisation details. There were 226 responses, in which only 30% of B Med 27s had any anti-BW immunisations entered on them. These findings are much lower than would be expected for the estimated uptake of anti-BW vaccines amongst Army units (see Tables Three -Thirteen).

188. As with the RN, it was found that a number of specially designed vaccination records were created to record anti-BW immunisations (see transcripts at Annex GG). These records were held by individuals interviewed by the FFT rather than inside their F Med 4s. It is possible, therefore, that some records may still have been retained by individuals while others may have been held within the F Med 4. However, this is unlikely to explain why so many records did not hold information on anti-BW immunisations.

Royal Air Force

189. The RAF manning authority at RAF Innsworth checked the medical records of 305 retired Officers and Airmen who had served in the Gulf, selected at random. Only 242 F Med 4s were available at Innsworth for inspection, of which only 11 or 3.6% showed details of anti-BW vaccinations. Although during interviews senior commanders said they believed that F Med 4s were completed at the time, when staff responsible for administering the medical records were interviewed, they stated that vaccination details were not being entered onto F Med 4s at that time. The FFT survey supports the latter view.

190. Many RAF medical centres maintain immunisation record books that show, on a daily basis, all personnel who have been vaccinated and the vaccine(s) they received. These record books are unofficial documents and there is no requirement for units to keep them. The FFT found the immunisation record books from RAF Coltishall, RAF Finningley, RAF Innsworth and RAF Leeming covering the period 1990/91. These contain records of anti-BW immunisations for some personnel. It has also been established that record books still exist for RAF Stations Benson, Bentley Priory, Bracknell, Digby, High Wycombe, Linton-on-Ouse, Locking, Lyneham, Valley and Wyton which do not contain anti-BW immunisation details.

Why do some personal medical records not show the anti-BW immunisations ?

191. During interviews, it became clear that most units, in accordance with normal procedures and explicit instructions, did not take F Med 4s to the Gulf. Where they did, often the records were not readily available because they were stored miles away with non-essential (for battle) items of equipment and documentation in rear areas. It also became apparent that some units, particularly those in 7 Armoured Brigade, having initially taken their medical records out to Saudi Arabia, sent them back to Germany. Commander Medical, 1 (UK) Armoured Division, stated that MOD issued instructions for F Med 4s to be sent back, but no copies of this instruction have been located.

192. Nevertheless, individual Service personnel should have been carrying their B Med 27s with them during Operation GRANBY and any anti-BW vaccinations given should therefore have been entered on that form. This does not always appear to have been the case in practice. However, some units produced their own certificates of vaccination in lieu of or in addition to the B Med 27. In some cases these were inserted inside the F Med 4 (such as on some RN ships), on other occasions they were retained by the individual. Examples of these certificates are at Annex GG. Even if B Med 27s were completed, the FFT was told that in some instances, on leaving the Gulf, personnel handed in their B Med 27s to central collection points. No documentary evidence was found to confirm this.

193. As shown in Annex A, Vol. 2, Ch 66 of AGAls requires commanding officers to maintain a vaccination record for all ranks so that the vaccination state may be readily available at any time. There is strong evidence that many units kept nominal rolls and many personnel remembered nominal rolls being maintained. In contemporary unit records there are references to nominal rolls being kept. In particular, the unit log for 24 Airmob Fd Amb (which helped run the anti-BW immunisation programme in the Gulf) contains the following reference dated 8 February 1991:

“Time: 1130 To: 24 From: CO 10 Regt [RCT]

Event: Requested the return of the master list of injections given by H Sect. Lists belonged to RHQ and is their only record.

Action: Sgt [name deleted] tasked to find it.”

When contacted, personnel from the Fd Amb units recalled that unit nominal rolls were used to record personnel attending immunisation parades. In addition, many other personnel contacted could recall that nominal rolls were kept, others with prompting considered that it was inconceivable that they would not have kept some type of a record, and that a nominal roll seemed the most likely. However, whatever form these records took, the FFT could only locate one nominal roll. This was for British liaison personnel serving with 7 US Corps. FFT also located a number of incomplete lists of names with anti-BW immunisation data but their provenance and reliability as a record of immunisations is doubtful.

194. The instructions issued concerning the recording of immunisations (Annex L) seem therefore to have been interpreted in different ways and in some instances no contemporary vaccination documentation appears to have survived.

195. What is also clear from extant documents is that details of immunisations were not always transferred from B Med 27s or temporary records to F Med 4s once personnel returned to their home base. The FFT found no indication that this shortcoming was ever commented upon during unit document inspections in the years immediately after the Gulf conflict.

196. It appears that record keeping was inadequate from the start. It is certain that there was a significant failure to transfer what immunisation data was available onto permanent medical records after the Gulf conflict and that much of that data is probably now irrecoverable. The FFT concluded that, since at interview both individuals who were vaccinated and those administering the programme assessed the initial uptake of the anti-BW vaccines as high, whereas the incidence of Gulf veterans' medical records holding any information on the receipt of these vaccines is low, the receipt of the anti-BW vaccines by individual service personnel in 1991 is significantly under-recorded. However, the FFT established that the initial uptake of anti-BW immunisations was high and close to 100% in many units.

Codewords, symbols and names

197. In contemporary signals, documents and medical records various names and codes were used for the anti-BW vaccines. Those seen by the FFT with their assessed meaning are listed below:

Word, Symbol or Name	Meaning
Victor 1 or V1	Anthrax
Victor 2 or V2	Pertussis/whooping cough
Victor 3 or V3	Needles and syringes (for giving vaccines)
Victor 4 or V4	Plague
Cutter ¹	Plague
Yersinia pestis ²	Plague
PV	Plague Vaccine
BIO or BIO II	Anthrax or anthrax and pertussis
B123	Anthrax, pertussis and plague
Biological	Anthrax or anthrax and pertussis
BIO 01/90	Anthrax batch number

“Victor” and “Cutter”

198. Many of the people who were interviewed referred to the vaccines by what they assumed were the assigned codewords, e.g. “Victor” and “Cutter”. Although none of these terms used was an official codeword issued by the MOD, signals sent from JHQ High Wycombe and HQ UKLF show that these establishments were using “V1”, “V2” and “V3” and “Cutter” (see Annex R and DD). It seems probable JHQ devised such terminology influenced by the level of secrecy with which the programme was being treated. These terms were then used commonly by units³. Plague was generally referred to as “Cutter”. Generally, only RN records used the term “Victor 4” or “V4”. However, a vaccination record for one member of 205 General Hospital uses the term “V4” for a plague immunisation.

‘BIO/B123’

199. On some B Med 27s and F Med 4s the terms “BIO”; “BIO, B123” and “BIO 123” were seen. The FFT saw some B Med 27s, which had “BIO 01/90” entered on them. The number “01/90” is an anthrax batch number for a composite batch of anthrax vaccine which was produced by combining two small batches, 338 and 339⁴.

¹ “Cutter” was used because Cutter Biological was the supplier in the USA from which the vaccine was purchased by the US Department of Defense.

² Yersinia pestis is the medical term for plague bacteria.

³ In Annex EE an error has been made and the codewords for anthrax and pertussis have been transposed.

⁴ See “Background to the Use of Medical Countermeasures to Protect British Forces During the Gulf War (Operation GRANBY)”, MOD, October 1997.

200. The FFT is also aware that many of the records (B Med 27s) of the 1st Battalion Royal Highland Fusiliers (1 RHF) show “BIO, B123” or “BIO, BIO123” being given prior to deployment on or about 26 January 1991 at their barracks’ medical centre at Oakington, Cambridgeshire. The vaccine issue vouchers from Ludgershall shows that 600 doses each of anthrax, pertussis and plague vaccines were issued to the Medical Reception Station Colchester on 23 January 1991, 3 days prior to the administration of immunisations to 1 RHF. The FFT therefore concluded that a single line entry of “BIO, B123” or “BIO, BIO123” was used to indicate the simultaneous administration of anthrax, pertussis and plague vaccines.

‘Biological’

201. The FFT was made aware that one unit that had taken part in Operation GRANBY, 205 General Hospital (Volunteer), had generated a special form to record immunisations for staff members which were given under its auspices and that copies included a line entitled “Biological” (see Annex HH for examples of this form).

202. From the annotation of the forms, the timing of immunisations and the limited number of batch numbers given, the FFT concluded that an entry against “Biological” indicated an anthrax or an anthrax and a pertussis immunisation. In view of the care taken to make and preserve such records, the use of the word “Biological” in this way suggests careful and conscious thought had been given to its use. However, the FFT was not able to reconstruct the reasoning behind it.

Conclusion

203. The FFT found no widespread or consistent use of the terms “BIO”, “BIO II”, “B123”, “Biological”, “Yersinia pestis”, “YP” and “PV”; it is therefore assessed, in contrast to the sanctioned use of “V1”, “V2”, “V3” and “Cutter”, that these were local measures intended to give some security to the nature of the vaccines being administered. This was not a requirement of the policy as promulgated to those implementing the immunisation programme and it is not clear how the idea that the vaccines should not be entered on individual records using their proper names on vaccinations records came about.

Allegations of additional, as yet undisclosed, immunisations

204. There have also been suggestions by some Gulf veterans that during the Gulf conflict UK forces were immunised with vaccines as yet undisclosed by the MOD such as smallpox and tularaemia (rabbit fever) or that experimental vaccines were used. These allegations have been thoroughly investigated as part of the Fact Finding Team's work. During the course of this investigation, the FFT found no evidence that UK personnel were immunised except under the anti-BW immunisation programme as detailed in this paper or with routine immunisations as listed at Annex E. In particular, the FFT saw no evidence of the issue of smallpox, tularaemia or any other vaccine not already declared by the MOD.

205. The MOD is aware of two Gulf veterans who, prior to service in the Gulf, received particular vaccines, apparently uniquely:

- a. one individual received a smallpox vaccination by private arrangement from a non-MOD source; and

b. one individual received a Japanese equine encephalitis immunisation. This was because he was originally scheduled to go to the Far East, for which this immunisation is sometimes recommended, but was subsequently posted to the Gulf instead.

206. MOD is also aware of one F Med 4 that appears to show that an immunisation for smallpox was given to another Gulf veteran from 205 Gen Hosp (V) on 3 January 1991 at Saughton Camp in Cheshire. The medical officer concerned confirmed that the entry in the smallpox section of the F Med 4 is in his handwriting. However, he stated that he did not at any time during 1990 and 1991 give a smallpox vaccination to any members of the Armed Forces. He is also confident that smallpox vaccine was not administered to any of those who attended Saughton Camp and that no smallpox vaccine was available for use at the Camp. The extant immunisation records from 205 Gen Hosp (Volunteer) include a sheet for the veteran referred to above, which does not include an entry for smallpox.

207. This particular record is an error. MOD considers it likely that this arose because of the two different F Med 4 forms in use at the time (see Annexes B and C). In the earlier version, the smallpox inoculations box is at the top of the right hand column. In the new version it is not there, but the cholera box has moved up to replace it. It is quite possible that the Medical Officer may have initialled the wrong box on the older version of the form.

208. The position on immunisation of UK Service personnel against smallpox prior to and during the Gulf conflict was set out in an answer to a Parliamentary Question on 21 April 1998 (see Annex II - House of Lords Official Report (Hansard), 21 April 1998, A200)⁵.

⁵ Parliamentary Copyright, House of Lords 1998