



Friendly fire, historical analysis, and why database size counts

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Introduction

- ‘Friendly fire’, amicide, amicide or fratricide
 - the problem of attacking one’s own side in battle
- Historically accounted for 10–20% of battle casualties
- Greater impact *per casualty* than those from enemy fire
 - loss of morale
 - loss of operational effectiveness
- Awareness raised by events in Iraq, 1991 onwards
 - solution needed, but problem was not well understood

Examples of incidents

- Firing at returning patrols
 - e.g. death of ‘Stonewall’ Jackson at Chancellorsville in 1863
- Bombarding own troops with artillery
 - many incidents, particularly in WW1
- Mis-directed air attacks on own ground forces
 - St. Lô (1944), Iraq (1991, 2003), Afghanistan (2001, 2007)
- Mis-identification of friends in the contact battle
 - all conflicts ... WW1, WW2, Vietnam, Falklands, Iraq ...
- Also ground-to-air ... in fact, all environments

Vietnam, 3-Aug-1967



Need for a solution

- Three potential solutions:
 - improve training, tactics, techniques and procedures (TTPs)
 - improve situational awareness (SA)
 - improve target identification using technology, e.g. a TID
- Question: which is most cost-effective?
 - depends on frequency of events, causes, impact, environment
- 1990s – attempts to simulate battles with fratricide
 - battle modelling not best suited to problem
 - revealed lack of understanding and dearth of data

[dst1] Implementing the catalogue

Development of catalogue

- 1996: need to understand the phenomenon
 - idea of listing events proposed by Di Wardleworth
 - catalogue started as an ‘unofficial’ project
 - events gathered by those interested, in DERA/Dstl and outside
- First working paper published 2004
 - listed 1318 incidents, including 1238 post-1900
- Compilation of events ongoing ... now around 2600
- DG(S&A) sponsored archiving and validation in 2006–07

Plusses and minuses of HA

- Historical analysis is based on ‘ground truth’
 - albeit a partial and biased sample ...
 - models and simulations are based on our imperfect understanding
- Totally uncontrollable
 - the only analysis tools are retrospective statistics
 - whereas a combat model is a ‘battle in a goldfish bowl’
- Protracted data-gathering phase ... *should* apply to both
- They are complementary techniques
 - e.g. catalogue has informed Dstl’s INCIDER simulation

Sources for catalogue

- Problem: events scattered throughout military literature
 - sources have taken months or years to find ...
- Monographs on fratricide, e.g.:
 - Shrader (1982), other UK and US studies
 - Percin (1921), Kemp (1995), Garrison (1999)
- General books on military history
 - typically yielding 2 to 6 events per book
- Military obituaries and web pages
- Over 300 sources searched



Information recorded per event

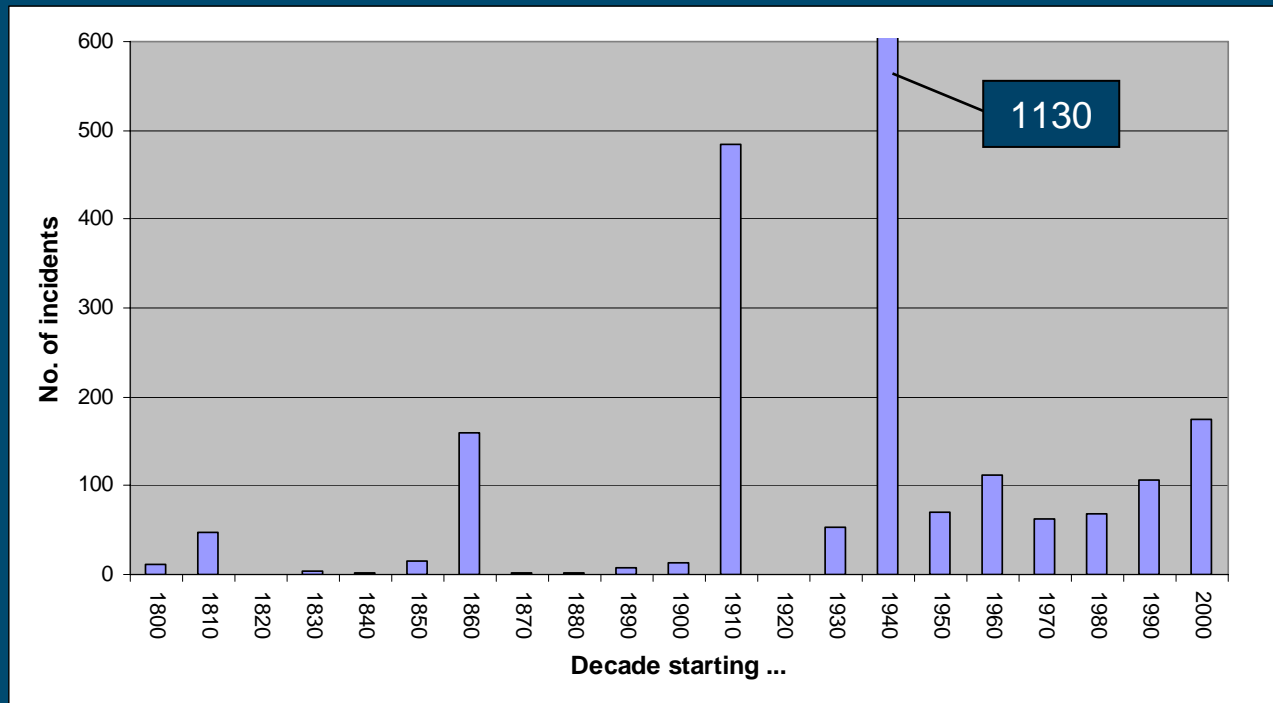
- When? Where? What type of event?
 - environment (L–L, A–L etc.), actual event or a ‘near miss’ etc.
 - circumstances: day or night, in combat or not
- Short factual statement of what happened
- Cause(s) of the incident – 9 categories plus ‘unknown’
- Casualties (K&W) and materiel losses
 - and did the victim return fire on the initiator?
- Full source information, including a ‘confidence rating’

[dst1]

**Some statistics from the
catalogue**

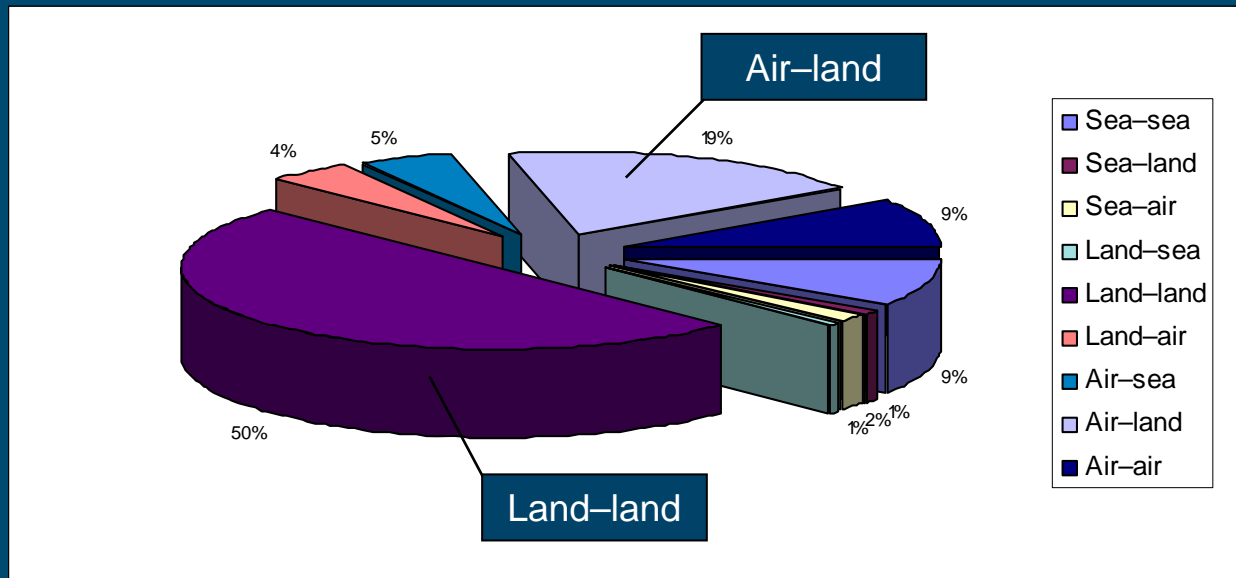
Statistics from catalogue ... 1

- Occurrence of 2526 events post-1800 by decade



Statistics from catalogue ... 2

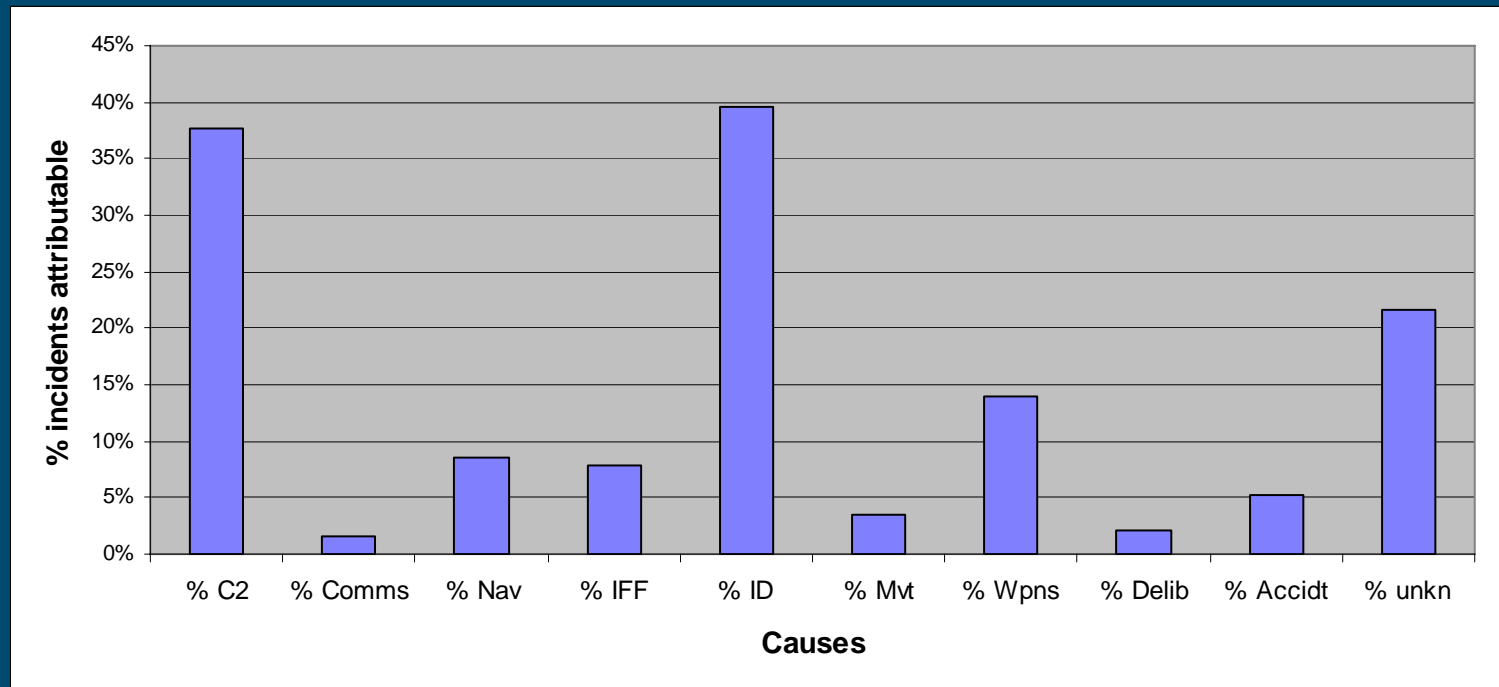
- Breakdown of 20th. century events by environment



- 32% were 'cross-environment' events

Statistics from catalogue ... 3

- Breakdown of 20th. century events by causes

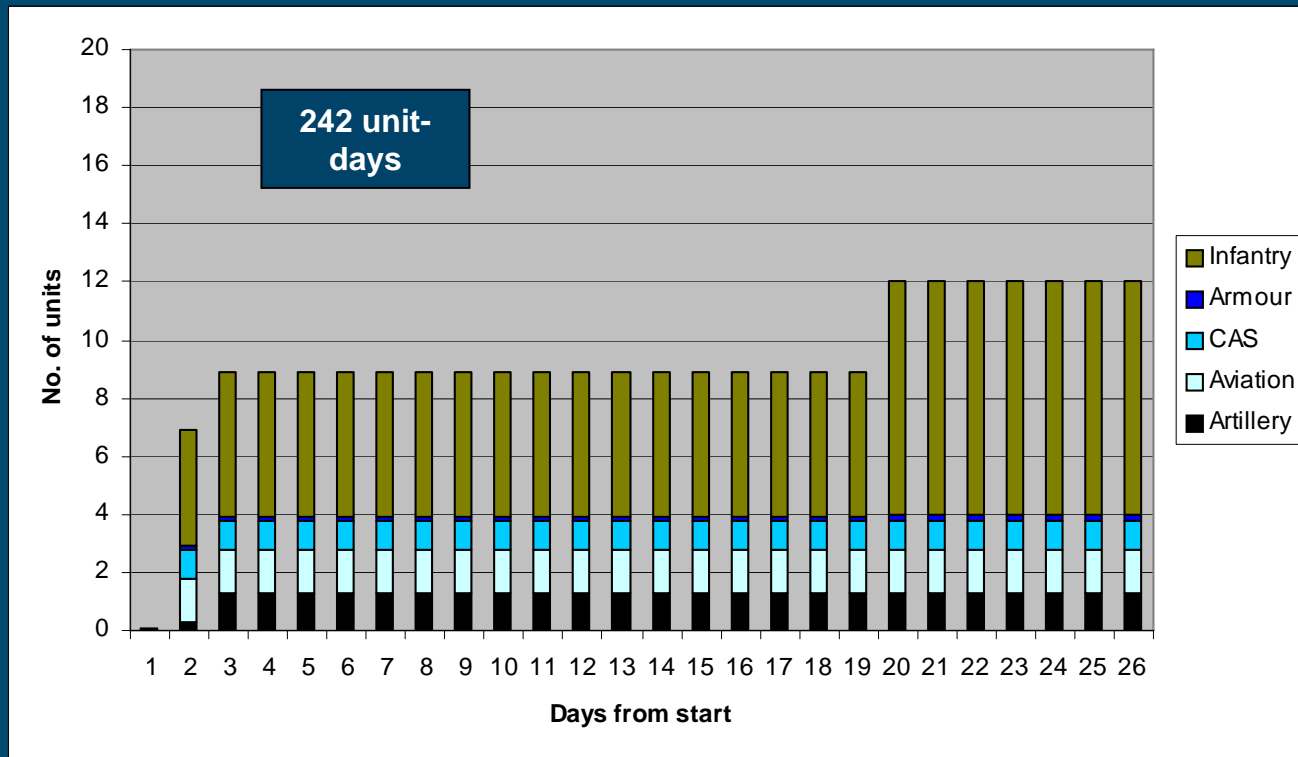


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**Incident frequency on
recent operations**

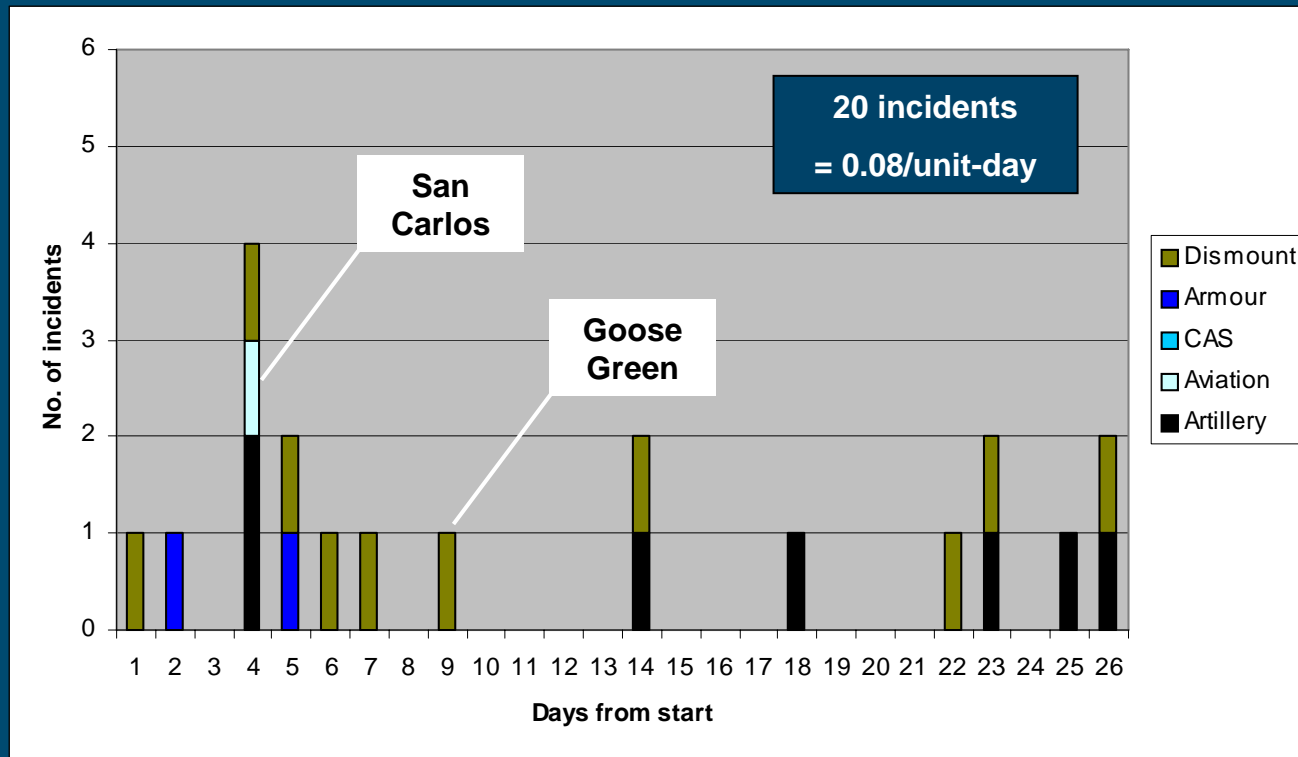
Falklands, 1982 ... 1

- UK land units involved in Operation Corporate:



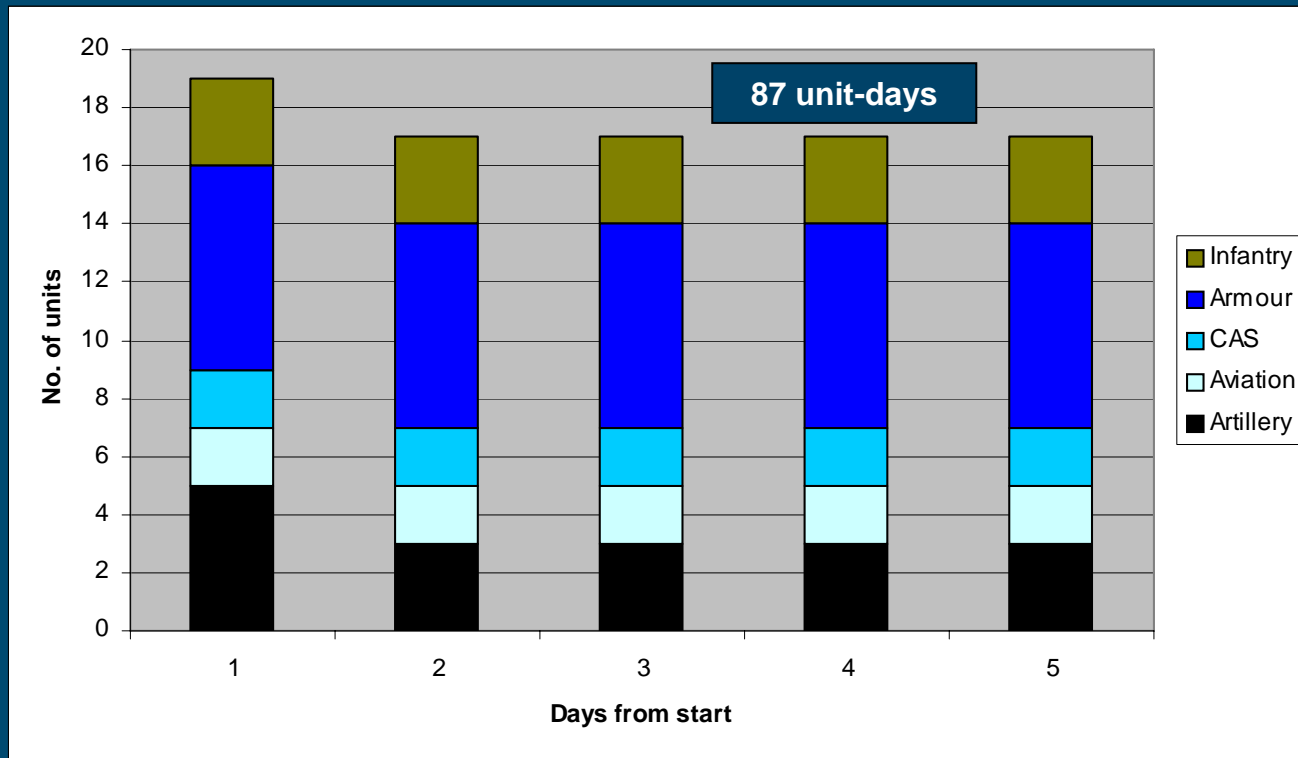
Falklands, 1982 ... 2

- Land amicides on Op. Corporate – including near-misses:



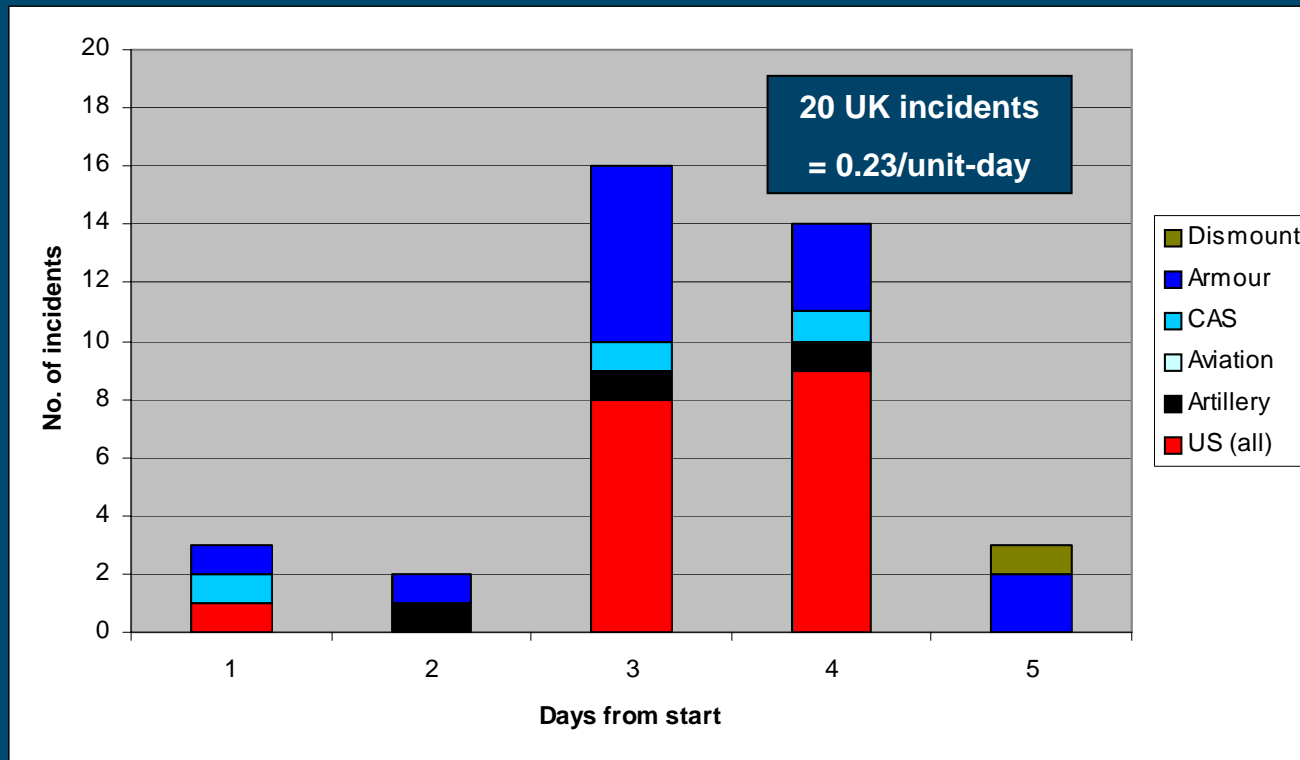
Iraq, 1991 ... 1

- UK land units involved in Operation Granby:



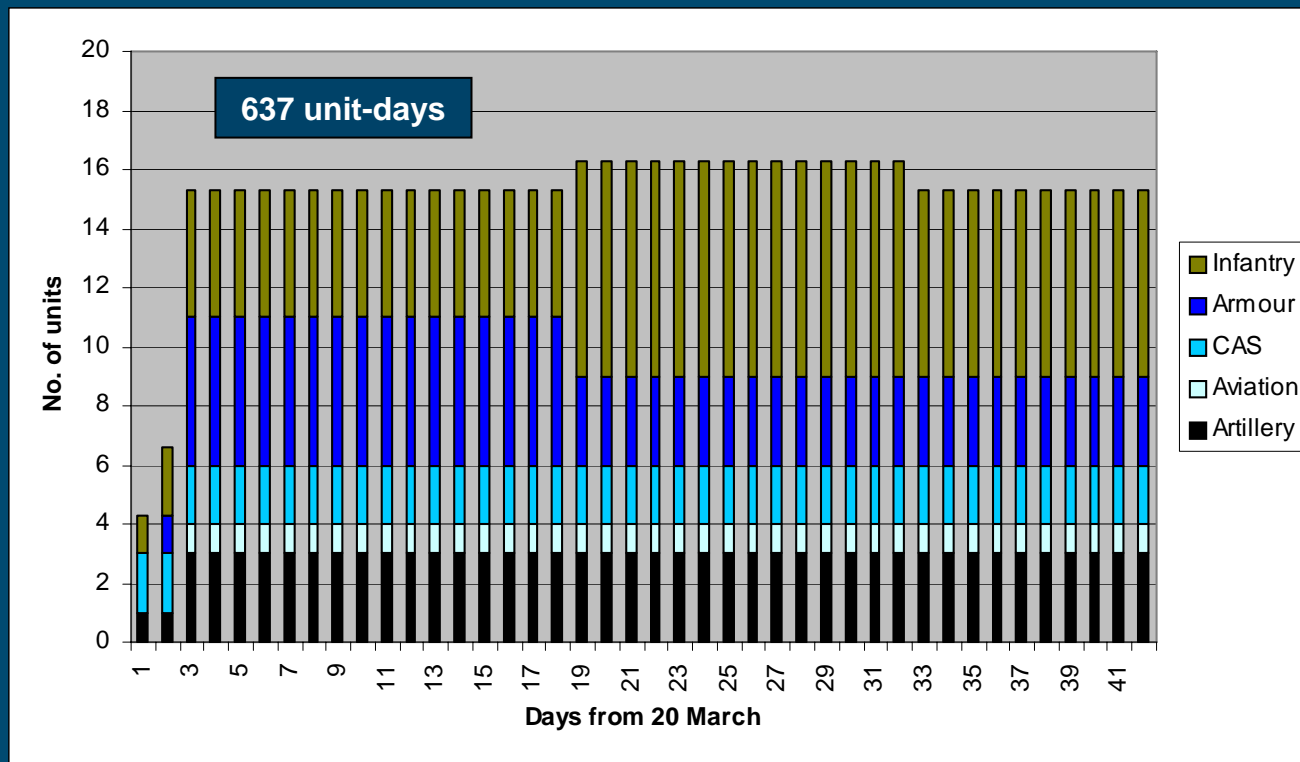
Iraq, 1991 ... 2

- Land amicides on Op. Granby – including near-misses:



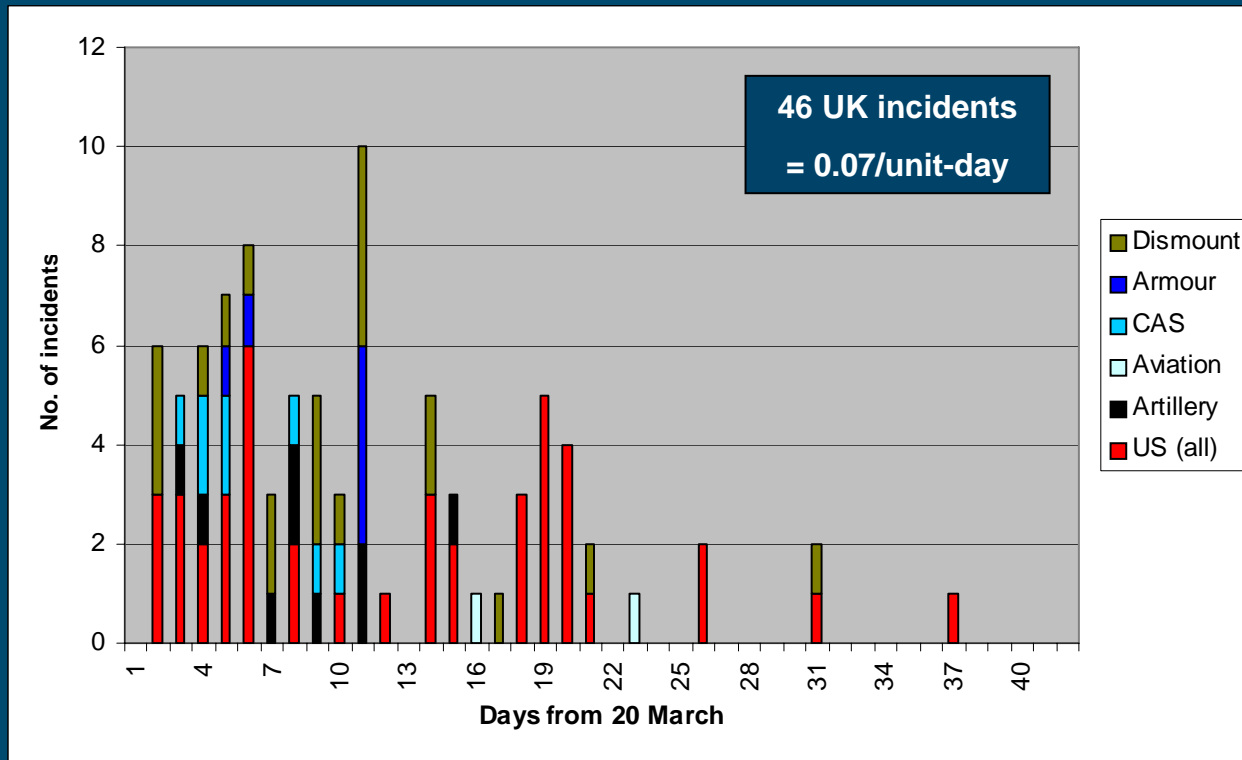
Iraq, 2003 ... 1

- UK land units involved in Operation Telic 1:



Iraq, 2003 ... 2

- Land amicides on Op. Telic 1 – including near-misses:



Conclusions on incident frequency

- Incident rates are similar when normalized
 - from 0.05 to 0.25 per unit-day
 - marked effects of operational tempo
- Normalized rates very similar to Normandy, 1944
 - at around 0.1 incidents per unit-day
- Thus more dependent on ‘human factors’ than technology
 - reinforces validity of HA for these research purposes

[dst1]

**What value has HA added
to friendly fire studies?**

Value of catalogue

- Has compiled a representative sample of events
 - statistically robust for analysis purposes
- Has provided understanding of patterns in incidents
 - e.g. commonly poor C3 followed by poor physical ID
 - emphasizing multiple causes per event
 - Reason's (2000) 'Swiss cheese' model of civil accidents
- Highlighted frequency of 'cross-environment' events
 - alerted procurement to need for cross-boundary solutions

Impact of project

- Better understanding of event frequency and causality
- Informed building of INCIDER* decision-making model
- Input to BoI studies for CID procurement
 - quantifying relative importance of each environment
 - in terms of casualties and maintaining operational effectiveness
- Input to NAO and PAC reports on CID
 - 2002, 2006 and 2007
- Ongoing input to Parliamentary Questions on CID

* Integrative Combat Identification Entity Relationship model; see Dean *et al.* (2005)

[dst1]

**Database size, and HA
project management**

Database size

- Can it ever be definitive?
 - in very limited areas, maybe; in general, no ...
 - but it *can* provide a representative sample of events
 - large enough to be statistically robust
- Does it *need* to be this large?
- Yes ... projects always require a subset of the data ...
 - but *which* subset cannot be predicted
 - selection can quickly reduce from 2600 to (say) 35 events ...

Database size

- Projects must select data from ‘one I prepared earlier’
- *“Quantity has a quality all of its own.”*
 - Josef Stalin
- Is this requirement compatible with modern PM practice?

HA and project management

- HA database compilation is a ‘slow-burn’ activity
 - has taken 12 years to compile 2600 amicide events
 - not particularly intensive, thus low cost per year
- Issue: no overall ‘problem owner’ ...
 - it is a resource that has been used by about 20 projects to date
 - hard to assign to any one budget
 - should HA databases be treated as facilities?
- Data usually required at short notice
 - insufficient elapsed time for bespoke data gathering by projects

What HA databases are needed?

- Potentially, one for each OA study area
 - with content guided by past study questions
 - e.g. for AFV vulnerability, a database of losses, by cause etc. ...
- They rely on analysts interested in history
 - should OA organizations recruit more history graduates?
- OA culture must value *data* as much as it values *models*
 - *or more so ... good data may feed many different models!*

Some sources

DAVIS P.K. & BLUMENTHAL D. (1991) *'The Base of Sand Problem: A White Paper on the State of Military Combat Modeling'* RAND Note N-3148-OSD/DARPA

DEAN D.F., HYND K., MISTRY B., VINCENT A. & SYMS P.R. (2005) *'A new technique to address CID and IFF studies'* Paper for 22 ISMOR, Southampton, September 2005; Dstl/CP16723

GADSDEN J.A. & OUTERIDGE C.C. (2006) *'What Value Analysis? The Historical Record of Fratricide'* Paper for 23 ISMOR, Southampton, August 2006; Dstl/CP21027

GARRISON W.B. (1999) *'Friendly Fire in the Civil War'* Rutledge Hill Press, Nashville TN: 229 pp.

KEMP P. (1995) *'Friend or Foe: Friendly Fire at Sea 1939-1945'* Leo Cooper, London: 198 pp.

NAO (2002) *'Combat Identification'* Comptroller and Auditor General's Report HC 661, 7 March 2002

NAO (2006) *'Progress in Combat Identification'* Comptroller and Auditor General's Report HC 936, 3 March 2006

PAC (2007) *'Progress in Combat Identification'* House of Commons Public Accounts Committee Report HC 486, 23 April 2007

PERCIN Gén. A. (1921) *'Le Massacre de Notre Infanterie 1914-1918'* Michel Albin, Paris: 301 pp.

REASON J. (2000) *'Human error: models and management'* British Medical J. **320**: 768–770

SHRADER C.R. (1982) *'Amicide: The Problem of Friendly Fire in Modern War'* US Command & General Staff College Fort Leavenworth KS Combat Studies Institute Research Survey No. 1

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* Co-author of 2004 paper

** Proposed catalogue in 1996

Questions?

Always keen to hear of amicide events for catalogue – compilation of V2.0 is ongoing

– *please e-mail me on prsyms@dstl.gov.uk*