



# ***Capturing Insights to Reduce Future Warfighter Fatalities***

**Scott Scheff**

Principal Human Factors Engineer

[ScottScheff@HFDesignworks.com](mailto:ScottScheff@HFDesignworks.com)

**Angie Sebok**

Principal Human Factors Engineer

[Asebok@alionscience.com](mailto:Asebok@alionscience.com)

# Key Personnel

- Scott Scheff
  - Principal Human Factors Engineer (HF Designworks)
  - Principal Investigator
- Angie Sebok
  - Principal Human Factors Engineer (Alion Science)
  - Associate Investigator
- Charles Hutchins, PhD.
  - Subject Matter Expert (HF Designworks)
  - Licensed Therapist
- Tyler Herman
  - Subject Matter Expert (HF Designworks)
  - Recent combat tours in Iraq and Afghanistan



# Contents

- Project Overview
- Database
- Interviews
- Critical Findings and Recommendations
- Conclusions

# Project Overview

- Defense Advanced Research Projects Agency (DARPA) Phase I Funded Research
- Information Gathering
  - SME Discussions
  - Fatality Databases
  - Soldier Interviews
- Data Analyses
  - Statistical coding and analyses of databases and interviews
  - Modeling and simulation
    - Integrated Performance Modeling Environment (IPME)
  - Identification of survivability factors
- Identify Current Soldier Issues – Findings and Recommendations
  - Critical fatality time periods
  - Training gaps
  - Information gaps
  - Equipment gaps

# Databases

- **US database** encompasses all publicly available US Military Fatalities in Iraq and Afghanistan from 1 January 2007 to 1 September 2009

- 1,770 total fatalities tracked; Complete data set for 1,654 individuals
- Soldier information (name, age, gender, rank)
- Date and location of fatality
- Unit information & Branch of Military
- Cause of fatality
  - Combat – direct firefight
  - Hostile – IEDs, suicide bombers, car bombs, etc.
  - Non-combat – accidents, suicides, etc.
- Time in tour before fatality
- Miscellaneous
  - Number of tours (when available)

1	Date	Fatal	Name	Age	Gender	Rank	Cause of Fatality
2	2/22/09	2009	Ryan Waltham	21 M	Pvt		
3	12/11/08	2008	Lee Churcher	32 M	Cpl	Army	
4	12/4/08	2008	Daniel Wilson	27 M	LCpl	Army	
5	10/6/08	2008	Nicholas Brown	36 M	Colour Sgt	Army	
6	2/29/08	2008	Duane Barwood	41 M	Sgt	RAF	
7	12/13/07	2007	Stephen Ferguson	31 M	Guardsman	Army	
8	11/20/07	2007	John Bellamy	31 M	Sgt	Army	
9	11/20/07	2007	Lee Fitzsimmons	26 M	Cpl	Army	
10	10/24/07	2007	Sarah Holmes	46 F	LCpl	Army	
11	9/21/07	2007	Mark Stanfield	32 M	Sgt	Army	
12	9/5/07	2007	Eddie Collins	M	Sgt	Army	
13	8/9/07	2007	Kim Redman	32 M	LCpl	Army	
14	8/9/07	2007	Chris Casey	27 M	LCpl	Army	
15	8/7/07	2007	Mark Beard	20 M	Leading Aircraftman	RAF	
16	8/6/07	2007	Kevin Barber	36 M	Pte	Army	
17	7/31/07	2007	Steve Edwards	35 M	Cpl	Army	
18	7/21/07	2007	Timothy Flowers	23 M	LCpl	Army	
19	7/19/07	2007	Reed Milleran	24 M	Senior Aircraftman	RAF	
20	7/19/07	2007	Christopher Dunmore	29 M	Senior Aircraftman	RAF	
21	7/19/07	2007	Matthew Gaskell	22 M	Senior Aircraftman	RAF	
22	7/7/07	2007	Christopher Reed	22 M	Cpl	Army	
23	7/7/07	2007	Ryan Francis	23 M	LCpl	Army	
24	7/6/07	2007	Edward Vlachos	23 M	Rifleman	Army	
25	5/28/07	2007	Paul Jessie	28 M	Cpl	Army	
26	5/28/07	2007	Scott Kennedy	20 M	Pte	Army	
27	5/28/07	2007	James King	20 M	Pte	Army	
28	6/22/07	2007	John Rigby	24 M	Cpl	Army	
29	6/20/07	2007	Paul Harding	48 M	Major	Army	
30	6/16/07	2007	James Cartwright	21 M	LCpl	Army	
31	6/7/07	2007	Robney Wilson	30 M	Cpl	Army	
32	5/22/07	2007	Jeremy Brodie	28 M	Cpl	Army	
33	5/8/07	2007	Kevin Thompson	21 M	Pte	Army	
34	5/1/07	2007	Nick Bateson	48 M	Major	Army	
35	4/29/07	2007	Paul O'Connell	18 M	Private	Army	
36	4/23/07	2007	Alan Jones	20 M	Kingman	Army	
37	4/19/07	2007	Ben Leaning	24 M	Cpl	Army	
38	4/19/07	2007	Kristen Turton	27	Trooper	Army	
39	4/15/07	2007	Mark Powell	37 M	Colour Sgt	Army	
40	4/15/07	2007	Mark McLaren	27 M	Sgt	RAF	
41	4/5/07	2007	Kira O'Neill	27 M	Cpl	Army	
42	4/5/07	2007	Esmer Dugose	19 F	Pte	Army	
43	4/5/07	2007	Adam Smith	19 M	Kingman	Army	
44	4/3/07	2007	Joanna Yorke Dyer	24 F	2nd Lt	Army	
45	4/2/07	2007	Aaron Lincoln	18 M	Rifleman	Army	
46	4/2/07	2007	Danny Wilson	28 M	Kingman	Army	
47	3/4/07	2007	Johnathan Whysocan	21 M	Pte	Army	
48	2/27/07	2007	Daniel Coffey	21 M	Rifleman	Army	
49	2/9/07	2007	Luca Imboden	21 M	Pte	Army	
50	2/9/07	2007	Jonathan Carlos Bracho-C	24 M	2nd Lt	Army	

When we could not find the databases we needed, we developed our own

- **UK database** encompasses all publicly available UK Military Fatalities in Iraq and Afghanistan from 1 January 2007 to 1 September 2009

- 215 total fatalities tracked; Complete data set for 206 individuals
- Each entry includes data similar to that found in US database
  - Name, Date of fatality, Age, Gender, Rank, Unit information, Military branch, location of fatality, cause of fatality, time in tour before fatality
- UK database helps to corroborate statistical findings and offer additional useful information

# Databases

All fatality database entries were created from data found through a combination of various public websites

Shown below: screen captures of The Washington Post Faces of the Fallen website and Zeitlangers.com war fatality database

**Most recent casualties | Faces of the Fallen | washingtonpost.com**

http://projects.washingtonpost.com/fallen/

UGV Health Insurance Designworks Google News Facebook BBC Google Hotmail Pandora Wikipedia

**Faces of the Fallen** Comments?

U.S. service members who died in Operation Iraqi Freedom and Operation Enduring Freedom

View Service Members by: Age Year of Death Home State Military Branch

May, 2009

http://www.zeitlangers.com/monthly\_html\_pages/fallen\_May\_2009.html

UGV Health Insurance Designworks Google News Facebook BBC Google Hotmail Pandora Wikipedia

**Most Recent Casualties**

11/8 11/8 11/7 11/5 11/5 11/4 11/4 11/4 11/2 10/31 10/30 10/30 10/28 10/28 10/27 10/27 10/27 10/27 10/26 10/26 10/26 10/26 10/26 10/26 10/26 10/26 10/23 10/23 10/21 10/20 10/19 10/18 10/17 10/16 10/16 10/16 10/15 10/15 10/15 10/15 10/14 10/3 10/3 10/3 10/3 10/3 10/3 10/3 10/3 10/2 10/2 10/2 10/2 10/2 10/1 9/29 9/26 9/26 9/24 9/24 9/24 9/24 9/21 9/20 9/20 9/20 9/19 9/19 9/17 9/16

**Spec. Shawn D. Sykes**  
28, Portsmouth, Virginia  
U.S. Army  
Landsuhl Regional Medical Center  
Hostile - hostile fire - IED attack  
at Landsuhl Regional Medical Center in Landsuhl, Germany, of wounds suffered from an accident that occurred May 8 at Combat Outpost Crazy Horse, Iraq. He was assigned to 215th Brigade Support Battalion, 3rd Brigade Combat Team, 1st Cavalry Division, Fort Hood, Texas.  
Military Times Link  
W.Post Link Link photo

**Pvt. Justin P. Hartford**  
21, Elmira, New York  
U.S. Army  
Balad - Saah Ad Din  
Non-combat  
Died of injuries sustained from a non-combat related incident.  
He was assigned to the 699th Maintenance Company, Corps Support Battalion, 916th Support Brigade, Fort Irwin, Calif.  
Military Times Link  
W.Post Link Link

**Staff Sgt. Randy S. Agno**  
29, Pearl City, Hawaii  
U.S. Army  
Walter Reed Army Medical Center  
Non-combat  
Died at Walter Reed Army Medical Center in Washington of wounds sustained Apr. 27 from a non-combat related incident at Forward Operating Base Oasan in Samarra, Iraq.  
He was assigned to the 225th Brigade Support Battalion, 3rd Brigade Combat Team, 25th Infantry Division, Schofield Barracks, Hawaii.  
Military Times Link  
W.Post Link Link Link photo

**Spec. Omar M. Albrak**  
21, Chicago, Illinois  
U.S. Army Reserve  
Baghdad  
Non-combat - Accident - vehicular  
Died of injuries sustained during a motor vehicle accident.  
He was an Individual Ready Reserve soldier assigned to the Headquarters, Multi-National Forces Iraq.  
Military Times Link  
W.Post Link Link Link photo

**Spec. Lukasz 23 D. Sazcek**  
23, Lake in the Hills, Illinois  
U.S. Army National Guard  
Nangarhar province  
Non-combat  
Died in Nangarhar province, Afghanistan, of injuries sustained from a non-combat related incident.  
He was assigned to the 1st Battalion, 178th Infantry Regiment, Illinois Army National Guard, Woodstock, Ill.  
Military Times Link  
W.Post Link Link

**Maj. Steven Hutchison**  
60, Scottsdale, Arizona  
U.S. Army  
Hostile - hostile fire - IED attack  
Died of wounds suffered when an improvised explosive device detonated near his vehicle in Al Fari, Iraq. He was assigned to the 2nd Battalion, 34th Armor Regiment, 1st Brigade Combat Team, 1st Infantry Division, Fort Riley, Kan.  
Military Times Link  
W.Post Link Link Link photo

**Pfc. Michael E. Yates Jr.**  
19, Federalburg, Maryland  
U.S. Army  
Baghdad  
Non-combat  
Died from injuries sustained from a non-combat related incident at Camp Liberty, Iraq.  
He was assigned to the 3rd Battalion, 66th Armor Regiment, 172nd Infantry Brigade, Grafenwoehr, Germany.  
Military Times Link  
W.Post Link Link Link Link

**Spec. Jacob D. Barton**  
20, Lenox, Missouri  
U.S. Army  
Baghdad  
Non-combat  
Died from injuries sustained from a non-combat related incident at Camp Liberty, Iraq.  
He was assigned to the 277th Engineer Company, 420th Engineer Brigade, Waco, Texas.  
Military Times Link  
W.Post Link Link Link Link

**Staff Sgt. Christian E. Bueno-Galdos**  
25, Paterson, New Jersey  
U.S. Army  
Baghdad  
Non-combat  
Died from injuries sustained from a non-combat related incident at Camp Liberty, Iraq.  
He was assigned to the 3rd Battalion, 66th Armor Regiment, 172nd Infantry Brigade, Grafenwoehr, Germany.  
Military Times Link  
W.Post Link Link Link Link Link photo

**Maj. Matthew P. Housel**  
54, Amarillo, Texas  
U.S. Army  
Baghdad  
Non-combat  
Died from injuries sustained from a non-combat related incident at Camp Liberty, Iraq.  
He was assigned to the 55th Medical Company, Indianapolis, Ind.  
Military Times Link  
W.Post Link Link Link Link

© 2009 The

SEARCH: go News Web results by

NEWS | OPINIONS | SPORTS | ARTS & LIVING Discussions | Photos & Vide



# Overall Database Findings

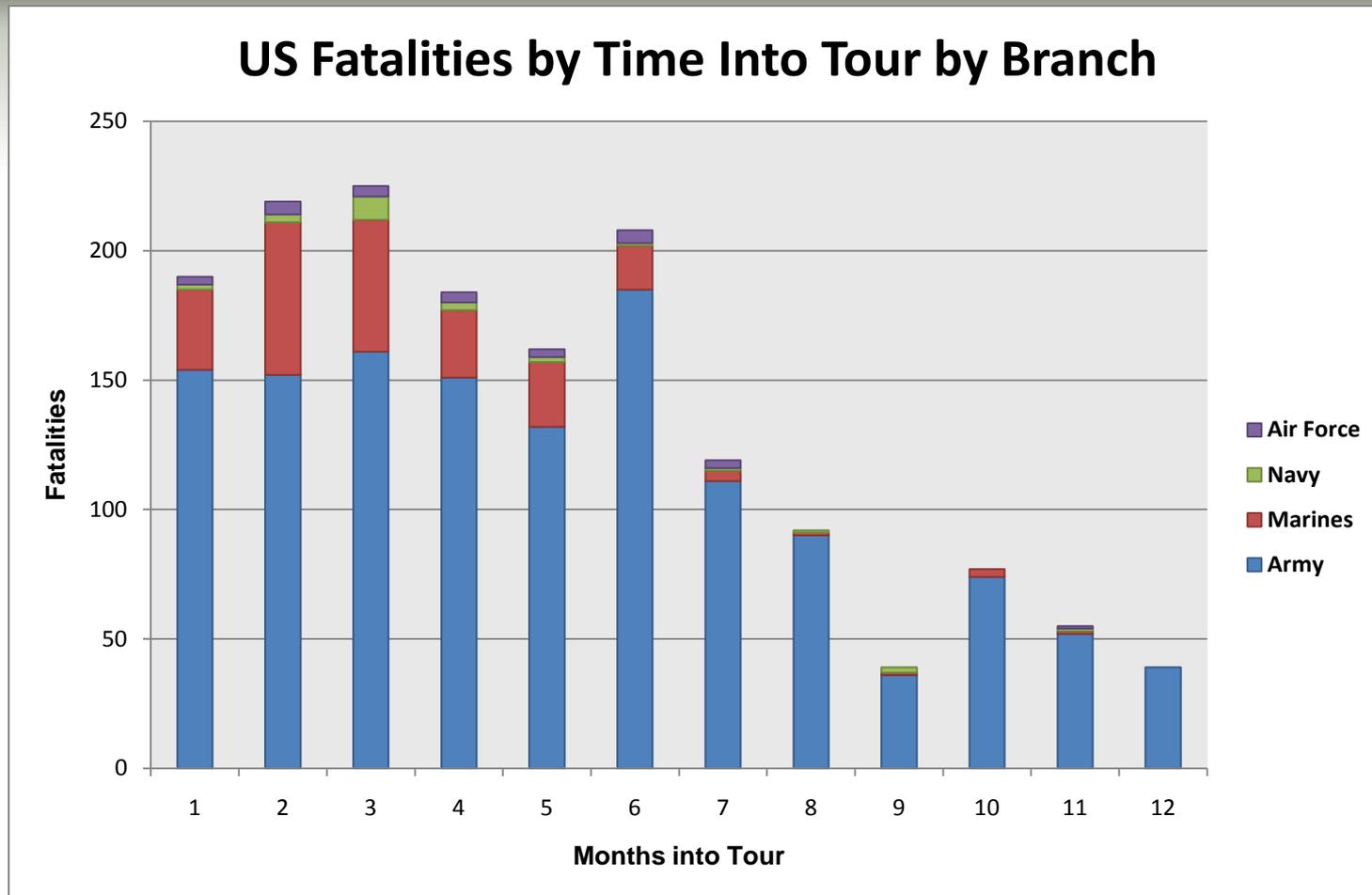
- Analyses explored for both US and UK forces:
  - Number and percent of fatalities by **time in tour**
  - Number and percent of fatality by **service branch**
  - Number and percent of fatalities by **season**
  - Number of fatalities by time in tour by **branch**
  - Mean **ages** of fatalities by **branch**
  - Number of fatalities by **rank**
  - Cause of fatalities
  - Cause of fatalities by time in tour
  - Fatality **by country** of occurrence
  - Trend analysis** - top causes of US Soldier fatalities from 2004 data and HFDW 2007-2009 data

	2004 Data	HFDW Data
Improvised Explosive Device	22.9%	45.96% 
Small-Arms Fire	23.3%	14.06%
Helicopter Downed	4.4%	4.23%
Grenade/ Rocket Propelled Grenade	4.2%	2.65%
Rocket/Mortar	1.2%	1.30% 
Sniper	1.4%	0.51%

2004 Data Source: <http://www.centcom.mil/CENTCOMNews> & <http://casualties.org/oif/stats.aspx>, 5 OCT 04

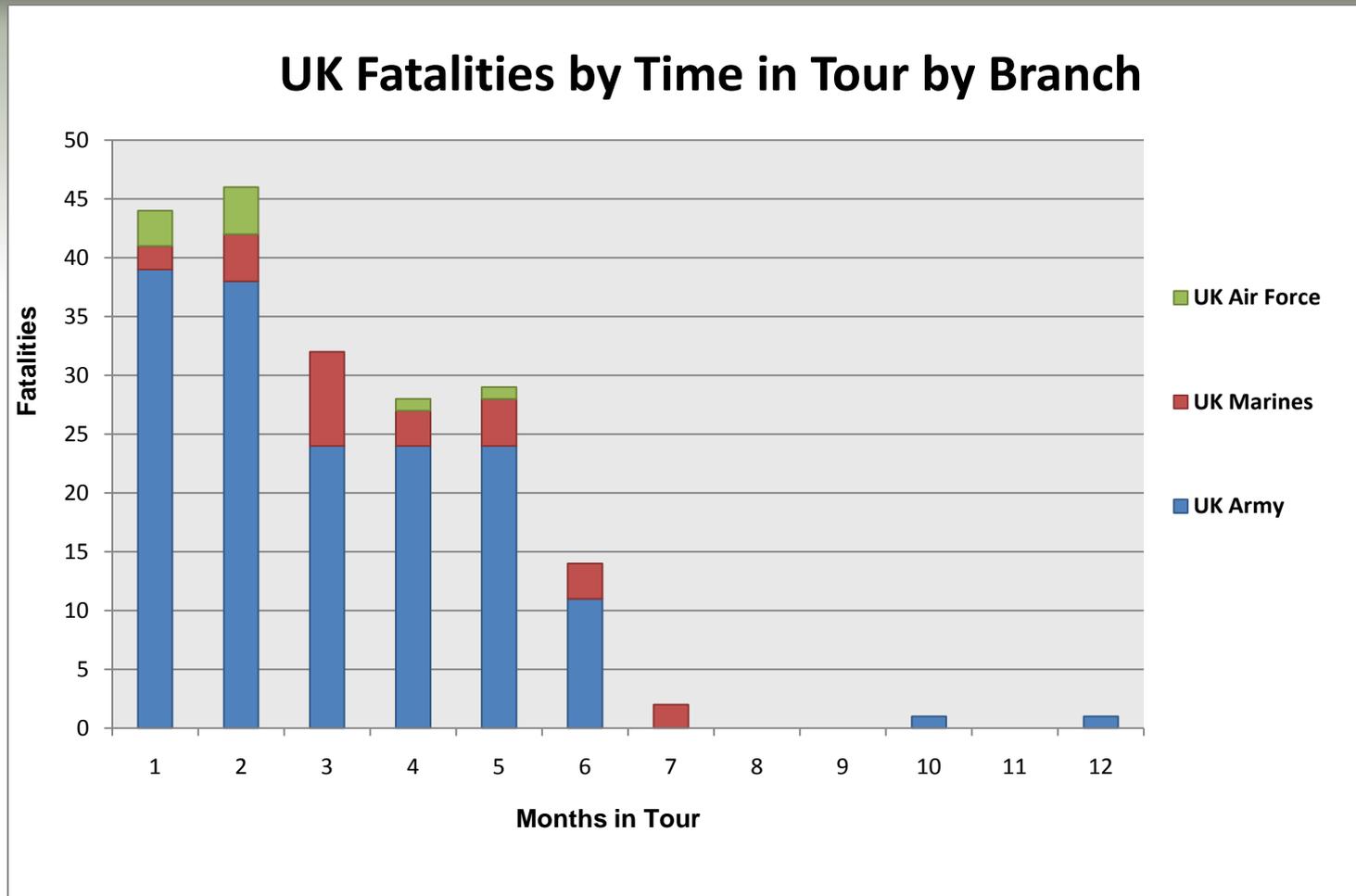
HFDW Data Sources: <http://www.globalsecurity.org/> & <http://antiwar.com/casualties/list.php> & <http://iraq.pigstye.net> & [www.zeitlangers.com](http://www.zeitlangers.com) & <http://projects.washingtonpost.com/fallen/> & <http://www.defenselink.mil>, 1 MAY 09

# Final Statistical Findings: US Database



Fatality by Time into tour by Branch of Military

# Final Statistical Findings: UK Database



## Fatality by Time into tour by Branch of Military

\*Note that the majority of British deployments are approximately six months long

# Soldier Interviews

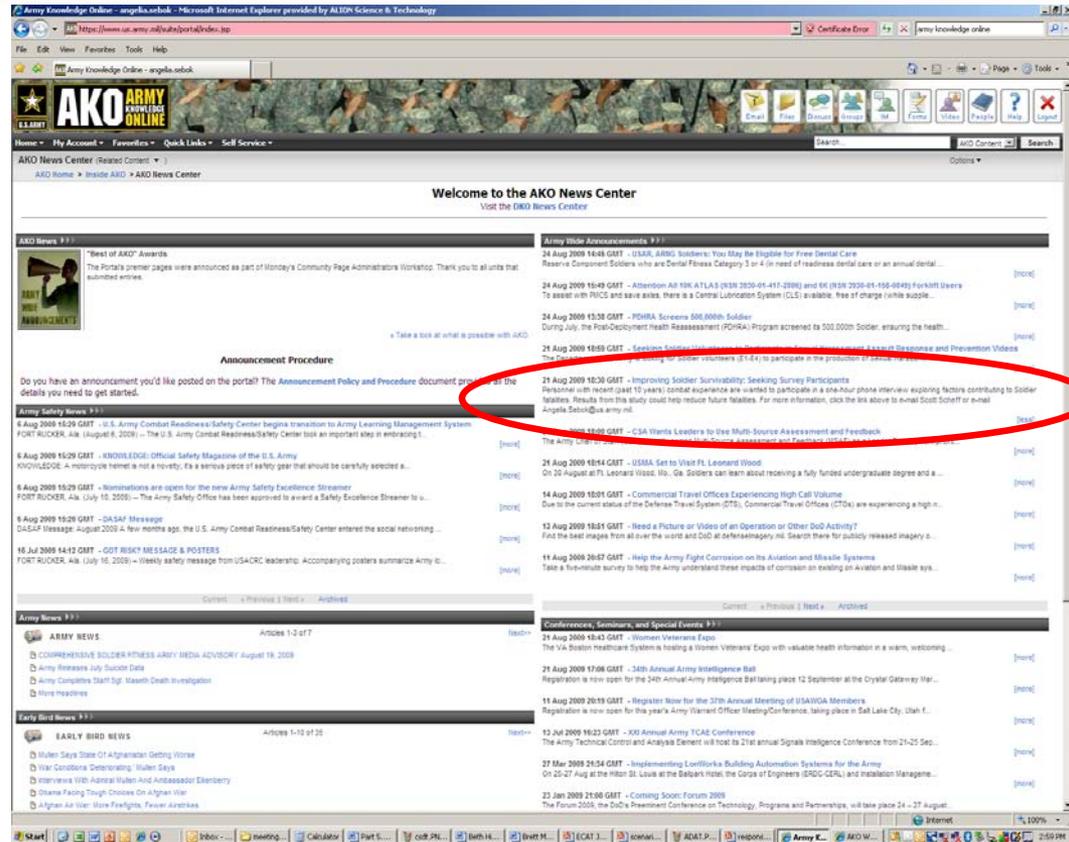
- Individual and group interviews with US combat veterans
  - 25 total participants
    - Representing Army, Marines, and Navy
    - All with small arms combat experience
  - 18 individual interviews with combat veterans
  - Group interview with 7 combat veterans
  - 54 tours of duty total combined experience of participants

	A	B	C	D	E	F
5	Q1b: Do you think more Soldiers die early on in their tour then mid way through?	Yes	Yes	Yes		
6	Q1c: What about the thought that Soldiers become fatalities towards the end of their tour?	Complacency, enemy moves in as you don't want to go to certain places towards the end of your tour because you know its bad there. Adrenaline can cause you to lose concentration.	Perhaps, maybe due to complacency, units operating in same area go for days without any incident. The enemy watches them and learns. Terrain analysis works both ways. We are not trained on how to deal with complacency. Going back to same village over and over again. Have to go in during daylight sometimes which means we lose our advantage.	It happens, but a lot less often. When it does happen it could be because you start to get complacent. "Complacency Kills" is put into our heads to help us stay aware.		
7	Q2: Do you feel there is any truth to the statement that the highest chance of becoming a fatality is towards the beginning of one's tour?				Yes	Yes
8	Q3: Do you feel there is any truth to the statement that a Soldier's chance of becoming a fatality increases towards the end of a tour?	Yes, there is complacency, enemy moves in as you don't want to go to certain places towards the end of your tour because you know its bad there. Adrenaline can cause you to lose concentration.	Yes, there is complacency, fatigue (we have a very tired army, performing 24/7 ops for 12-15 months), and the enemy gets smarter.	Yes, there is complacency (the only factor <u>we</u> have control of). Another factor is an increase in enemy activity.	No	No, first few months are roughest.
9	Q4: How many firefights do you think it takes before a Soldier's chance of surviving the next firefight is the best it is going to be? Or, in other words, how many firefights do you think it takes before you're in the "safe" zone meaning you'll likely live through each successive combat?	7 or 8 firefights before you get into a comfort zone. Adrenaline subsides then, but for some, they never adjust	Never felt like I was in a safe zone.	Depends on the severity of the firefight. When in a long firefight (like in Afghanistan) your brain starts learning. You "Never get total comfort."	A month, for us, the first firefight happened in the first day in Iraq. It was two weeks before we had a total of five firefights.	2-3 firefights, then you learn not to panic. By 5th or 6th firefight things get less muddled.



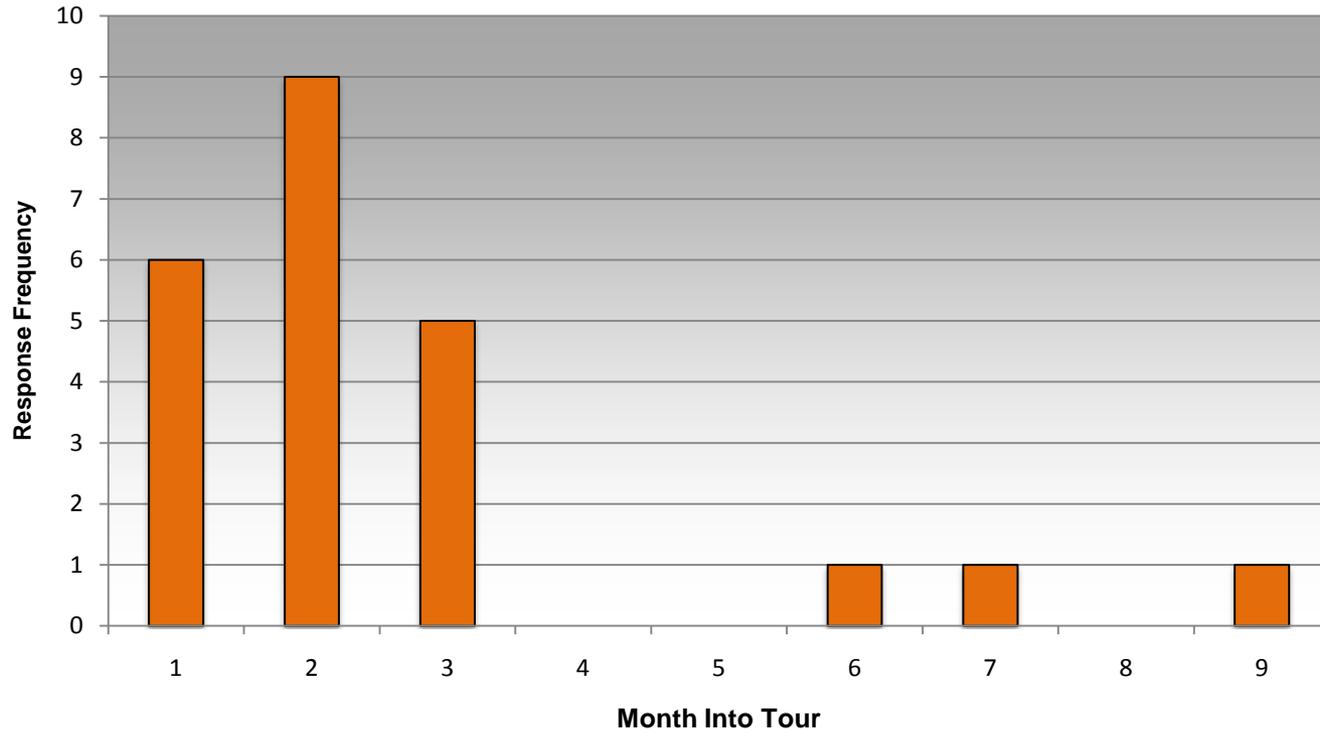
# Soldier Interviews

- Offered a first-hand account of the conditions and needs on the ground
- Interviews gave insight into possible fatality causes and methods of improving warfighter survivability
- Allowed those who have seen combat to voice their opinions and concerns about current issues such as training, equipment, and practices
- Participants were recruited from several sources, such as Army Knowledge Online (AKO), Soldier centric websites, Walter Reed Medical Center, and HF Designworks SMEs



# Soldier Interviews

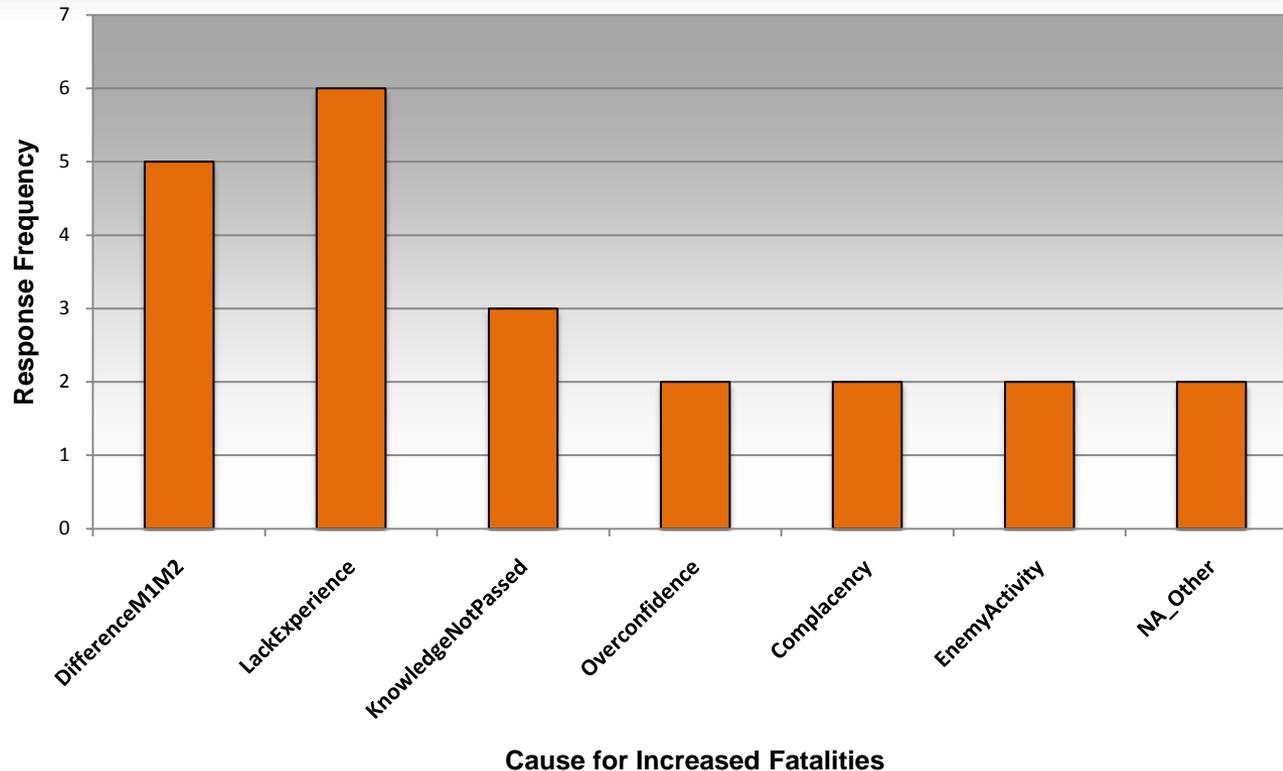
## Months in Which Soldiers Feel the Most Firefight Related Fatalities Occur



Of the 23 Soldier responses, 20 felt that the months at which the most firefight related casualties occur was either month one, two, or three. Month two was the most frequent response, with nine Soldiers responding with this month.

# Soldier Interviews

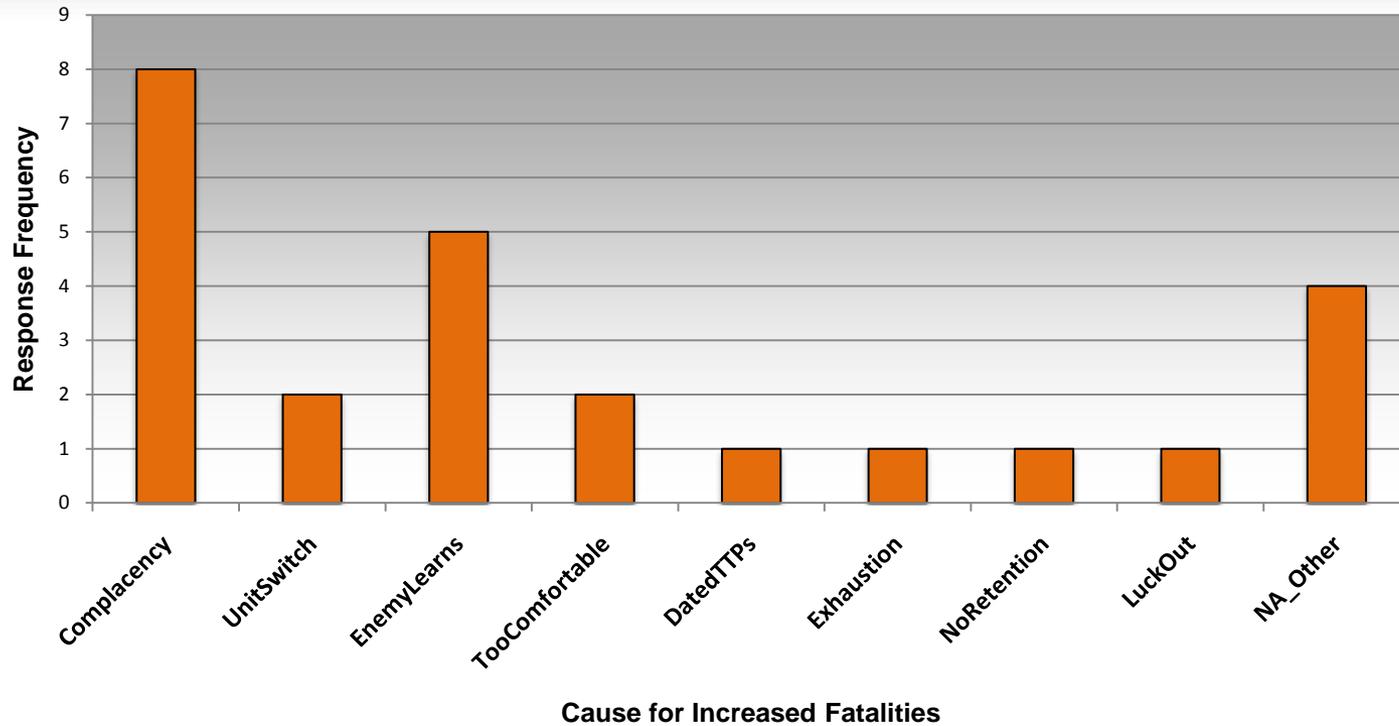
## Cause for Increased Fatalities at 2nd Month of Tour



Lack of experience was most often cited as the cause for an increase in fatalities (six Soldiers felt this way). Five Soldiers attributed this increase in fatalities to a change between months one and two in combat, such as Soldiers becoming more comfortable in their second month of deployment and more likely to push boundaries; also that the old unit returns home in the new unit's second month, leaving the new unit more vulnerable

# Soldier Interviews

## Cause for Increased Fatalities at 6th Month of Tour



The most common cause mentioned for the six-month spike in fatalities was complacency. Eight Soldiers felt that there is high amount of complacency at this time. The next most common response was that the enemy observes and learns about tactics and adapts to them.

# Summary of Findings and Recommendations

Finding #	Finding	Source	Recommendations
<a href="#">1</a>	US Soldiers have the highest likelihood of becoming a combat fatality during their second and third month of a tour.	FD, II, GI	Consider greater overlap or consider keeping key individuals in theater longer to better transition new unit personnel and to reinforce the relationship with locals (local intelligence).
<a href="#">2</a>	In addition to the second and third month of a tour, US Soldiers also have an increased likelihood of becoming a fatality mid-way through their tour, and near the end of their tour.	FD, II, GI	Consider in-deployment training to reduce complacency, break up monotony, and maintain focus. Add variety, change up troop movements and everyday activities to break up monotony and avoid insurgent adaptability.
<a href="#">3</a>	Fatalities most commonly due to IEDs and Small-arms fire.	FD	Ensure that Soldiers know the most common/likely causes of fatalities in their area of operations and how to best avoid these types of fatalities. Ensure latest information regarding enemy tactics is flowed down to Soldiers.
<a href="#">4</a>	US tactics might not change fast enough, allowing enemy to adapt.	II, GI	Push changes in tactics and latest reports [Tactics, Techniques, Procedures (TTPs), lessons learned, After Action Reviews (AARs)] out to troops in the field as <i>frequently and quickly as possible</i> . Update and change TTPs frequently to avoid predictability/enemy adaptability.
<a href="#">5</a>	Soldiers are unhappy with current Rules of Engagement (ROEs).	II, GI	Re-examine ROEs, allow fielded troops to have input. Allow ROEs to be updated by combat veterans and those in the field. 25% of Soldiers interviewed expressed concern with Rules of Engagement.
<a href="#">6</a>	Communication structure and communication equipment is in need of revision.	II, GI	Update communication structure in order to get the most recent and useful information and tactics to the Soldiers heading into combat. Review the communication equipment in the field to replace outdated and ineffective equipment.
<a href="#">7</a>	Soldiers feel that leadership selection needs altering.	II, GI	Examine leader selection process. 33% of Soldiers that were interviewed expressed displeasure with leadership. Soldiers were concerned that some leaders' priorities lie in their career, not their unit. Perhaps allow some leaders to stay in theater even after their unit rotates out to keep up with local Intel and provide a support network for Soldiers rotating in.

Source Key:  
 FD: Fatality Databases  
 LV: Lit Review  
 II: Individual Interview  
 GI: Group Interview

# Summary of Findings and Recommendations

Finding #	Finding	Source	Recommendations
<a href="#">8</a>	Field manuals can be outdated and oftentimes might not be applicable to current combat situations.	II, GI	Ensure that the latest and most crucial lessons and tactics are being integrated into field manuals and that these manuals get to the field quickly so they are relevant to the current environment. "Takes about 10 years to update Army manuals" (Group Participant).
<a href="#">9</a>	Training needs to be more current and should more closely reflect the environments and situations in which Soldiers are being deployed.	II, GI	Increase the amount of immersion training done before a tour, and include recent combat veterans in the training process so they can interact with and share lessons learned with novices.
<a href="#">10</a>	Soldiers would like in-theater training to help stay focused and remain current on latest TTPs.	II, GI	Perform current, applicable in-theater training that includes current TTPs and incorporates the most recent experiences from Soldiers in the field.
<a href="#">11</a>	Many useful technologies are not being pushed to troops in the field, and training on current technology is lacking.	II, GI	Supply troops with better technology and equipment and the training to use it. For instance, 21% of Soldiers interviewed specifically requested more IED and chemical detection technology.
<a href="#">12</a>	Soldiers feel that there is a current cookie cutter approach to equipment selection and fielding.	II, GI	Ensure that equipment and weapons that are fielded are specific and customized to the environment for where troops are deployed. Allow more flexibility in equipment selection-allowing units to make decisions on what to carry.
<a href="#">13</a>	Complacency kills.	FD, II, GI	96% of Soldiers interviewed stated that complacency is a factor in Soldier survivability. Implement training and routines to help Soldiers stay focused and reduce complacency.
<a href="#">14</a>	Too much equipment, weighs too much, and is not necessarily needed.	II, GI	Eliminate unnecessary equipment that will be a burden to troops on the ground. Ensure that all equipment and weapons are specific and useful for area of deployment.
<a href="#">15</a>	Desire for sharing of Soldier survival strategies.	II, GI	Share experiences of veterans with Soldiers going to combat zones and give them an outlet to discuss their strategies for coping. Ensure Soldiers know the importance of keeping focus, staying determined, etc.
<a href="#">16</a>	Some Soldiers experienced "non-traditional, out-of-the-box" training styles that they appreciated.	II	To avoid a cookie-cutter approach to training, allow units to customize their training and utilize non-traditional training programs that are appropriate to the area to which they are being deployed. Units desired some flexibility in training programs based on their area of deployment.

Source Key:  
 FD: Fatality Databases  
 LV: Lit Review  
 II: Individual Interview  
 GI: Group Interview

# Conclusions

- “First Five” concept
  - Many fatalities occur early in tour, however “First Five” is not explicitly supported by data
  - Limited traceability for number of firefights before a fatality
    - First 100 days better gauge
    - Still, many fatalities occur during middle of tour (six month mark for Army personnel)
  - Firefights are not the largest cause of fatalities: IEDs currently cause most fatalities
- Multiple vulnerable periods
  - 2-3 Month point
  - Middle point of tour is critical for all branches
  - Although databases do not reflect this, interviewed Soldiers consistently stated there is vulnerability in the months leading up to the end of their tour
    - Complacency
  - Far fewer fatalities second half of tour compared with first half of tour
    - Possible explanation for this is that TTPs are often updated by second half of tour, based on fatalities and lessons learned during first half of tour
    - Currently may take a fatality before TTPs are updated
- Training *needs* updating
  - Must be current and realistic
  - Include in-deployment training to reduce complacency
  - Just-in-time training and more up-to-date information to combat ever-changing enemy tactics
- Soldiers *recommend improvements* to non-training elements as well
  - Communication structure
  - Leadership selection
  - Equipment and technology dispersal



# Conclusions, Continued

- IED fatalities on the rise
  - IED training might not be keeping up with IED development and execution
  - IED scenario model suggests considerations for improved/different training
- Likely factors contributing to combat fatalities include:
  - Insufficient experience
  - Loss of local intelligence due to old units rotating out
  - Limited capabilities due to strict Rules Of Engagement (ROE)
  - Failure to change tactics in a timely manner
  - Lack of familiarity with the enemy and the environment
  - Complacency
- There exists a need for Soldiers to discuss their experiences, emotions, and needs in an anonymous manner (so as not to fear command backlash)



Scott Scheff

Principal Human Factors Engineer

[ScottScheff@HFDesignworks.com](mailto:ScottScheff@HFDesignworks.com)

PO Box 19911 Boulder, CO 80308

Tel: 303.415.9518

[www.HFDesignworks.com](http://www.HFDesignworks.com)



Angie Sebok

Principal Human Factors Engineer

[Asebok@alionscience.com](mailto:Asebok@alionscience.com)

4949 Pearl E Cir Boulder, CO 80301

Tel: 303.442.6947

[www.alionscience.com](http://www.alionscience.com)