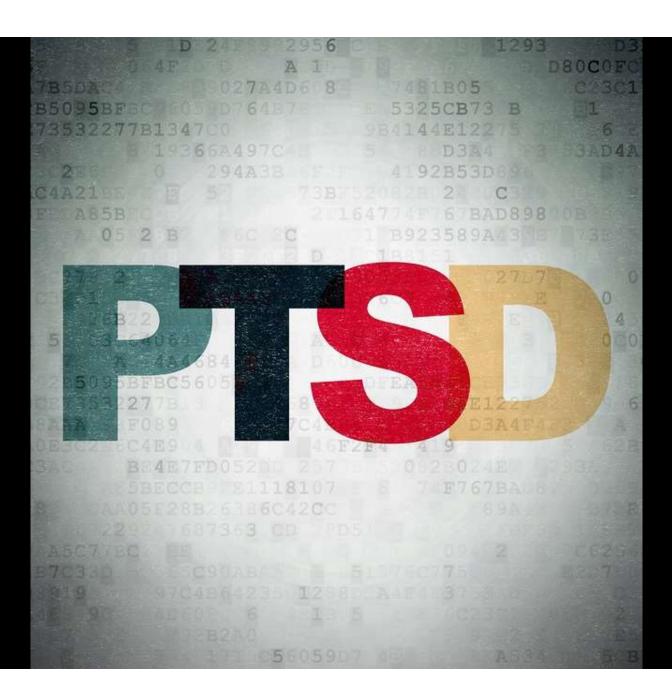
K C M H R

Identifying probable PTSD using machine learning

Dan Leightley PhD King's Centre for Military Health Research King's College London



@_Dr_Daniel | @kcmhr



PTSD: the focus of the media...



UK TOP NEWS OCTOBER 8, 2018 / 12:20 AM / 7 DAYS AGO

Rates of post-trauma stress rise in British military veterans

Kate Kelland

3 MIN READ

LONDON Oct 8 (Reuters) - Conflicts in Iraq and Afghanistan may have led to an increase in rates of post-traumatic stress disorder (PTSD), according to new research looking at the mental health of Britain's soldiers.

PTSD rates increase in UK milita Health personnel, research suggests

Rise in condition mainly seen in veterans who deployed to Ira Afghanistan



personnel who deployed to Iraq and Afghanistan were more News > UK > Home N Jurdo MacLeod/The Guardian

matic stress disorder (PTSD) rates have ir armed forces, new research suggests.

Ill rate of probable PTSD among current a l was 6% in 2014-16, compared with 4% i

n the condition, which can be triggered b volving threat to life or limb, was mainly eployed to Iraq and Afghanistan, the researc 'Higher levels of PTSD among veterans', says study

By Laurel Ives BBC Health





TV dramas like the BBC's Bodyquard have helped increase awareness of PTSD

Post-traumatic stress disorder of serving Army personnel and military Rates veterans has increased in the last 10 years, a new study suggests. rising, study mus

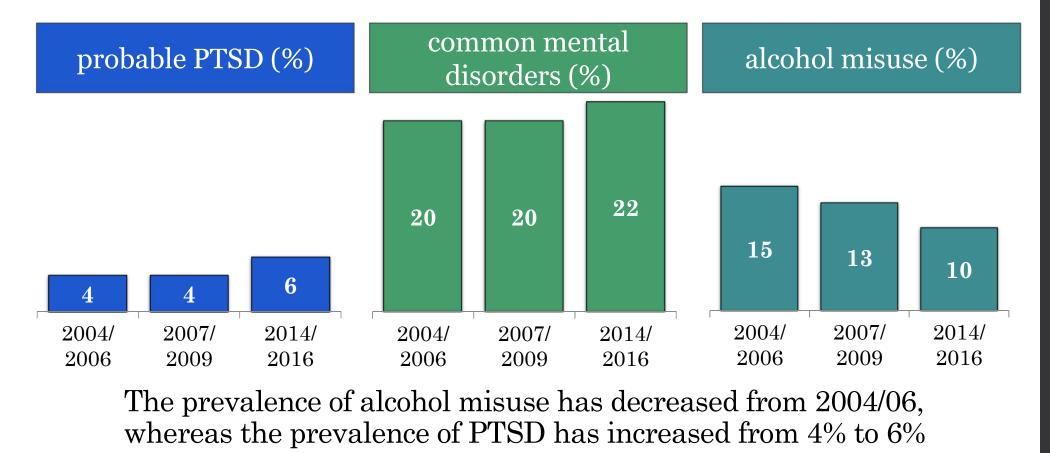
Condition seen in military veterans deployed to Iraq and Afghanistan

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M Share

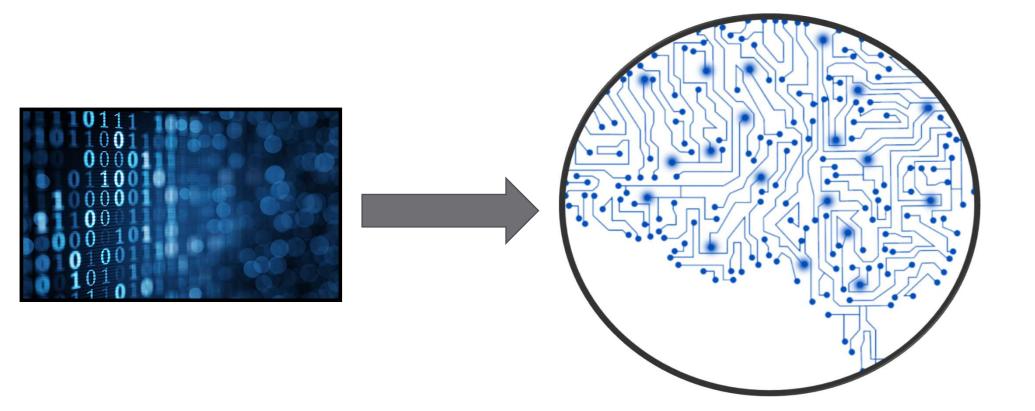


PTSD compared to other disorders



See Stevelink et.al. Mental health outcomes at the end of the British involvement in the Iraq and Afghanistan conflicts: a cohort study: The British Journal of Psychiatry (2018) 213, 690–697. doi: 10.1192/bjp.2018.175

The ultimate goal





Machine learning as an aid...for now

- The risks:
 - **Perception**: Deep Mind and Greenwich hospital
 - Understanding: 'Black box'
 - Accountability: 'Blame'
 - Human factor: 'Loss of jobs'

Work on-going to mitigate these risks



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Other work...

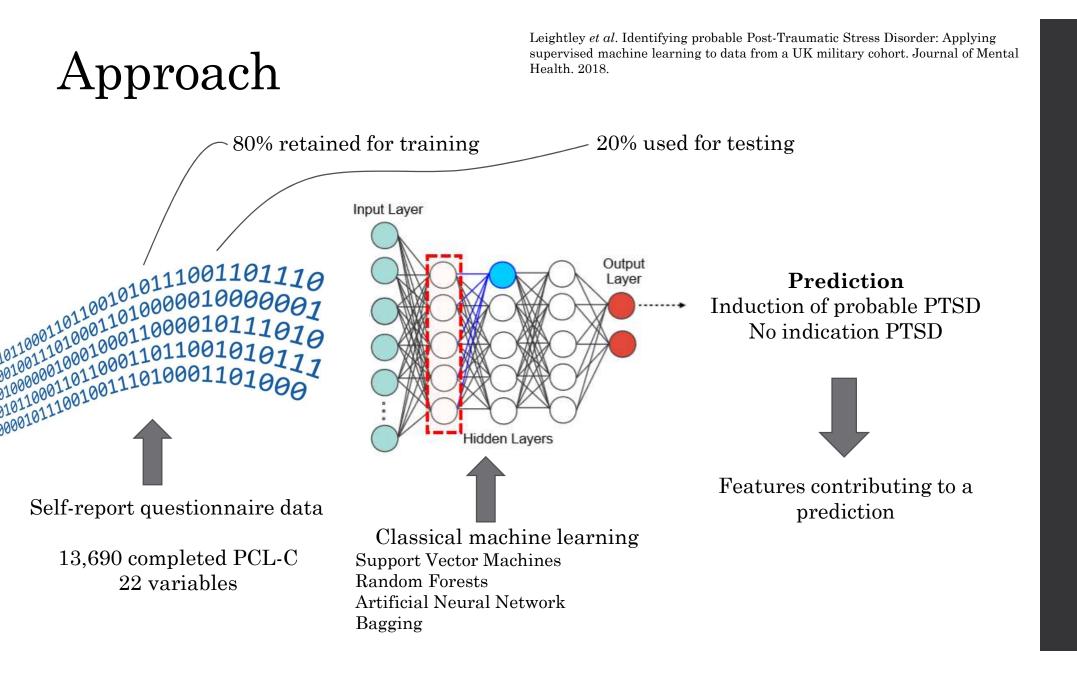
- Alcohol misuse (*InDEx*) •
 - Personalised messaging and content
- Improving physical activity (*HeadSmart*) •
 - User insights and early detection
- Detecting veterans in clinical records •
 - To provide further care and support

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Approach

Leightley *et al.* Identifying probable Post-Traumatic Stress Disorder: Applying supervised machine learning to data from a UK military cohort. Journal of Mental Health. 2018.

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0011001	Random Forests	0.97	0.60	0.98	0.64	
01011	Artificial Neural Networks	0.89	0.61	0.92	0.45	
Sel	Bagging	0.95	0.69	0.96	0.55	
-	13,690 completed F	Random	l Neural Network	0		

Leightley *et al.* Identifying probable Post-Traumatic Stress Disorder: Applying supervised machine learning to data from a UK military cohort. Journal of Mental Health. 2018.

Approach

Machine learning analysis is helping us to determine WHICH variables are most important

	Classifier	Rank 1	Rank 2	Rank 3	Rank 4	
100011	Support Vector Machines	AUDIT Score	GHQ-12 score	Age (years)	Consumes alcohol (y/n))
001101 000001 110001	Random Forests	Gender	AUDIT Score	GHQ-12 score	Service type	
010113	Artificial Neural Networks	GHQ-12 score	AUDIT case (y/n)	AUDIT Score	Consumes alcohol (y/n)	
Sel	Bagging	Age	Consumes alcohol (y/n)	Smoking	GHQ-12 score	
	Guyon, I., & Elisseeff, Learning Research, <i>3</i> ,	A. (2003). An Introduc 1157–1182		eature Selection. Journ	nal of Machine	

Artificial Neural Network

Bagging

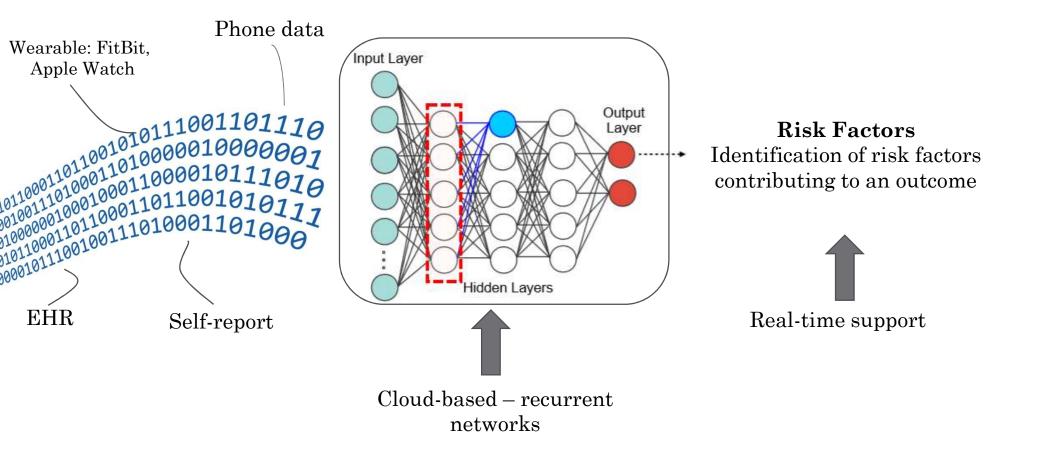
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	testing set																	
5.	Evaluate				•	~											nine	

Clean Missing Data

You can use machine learning too...

Example<u>https://tinyurl.com/y9xlrllo</u>

Next steps



Thank You

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