



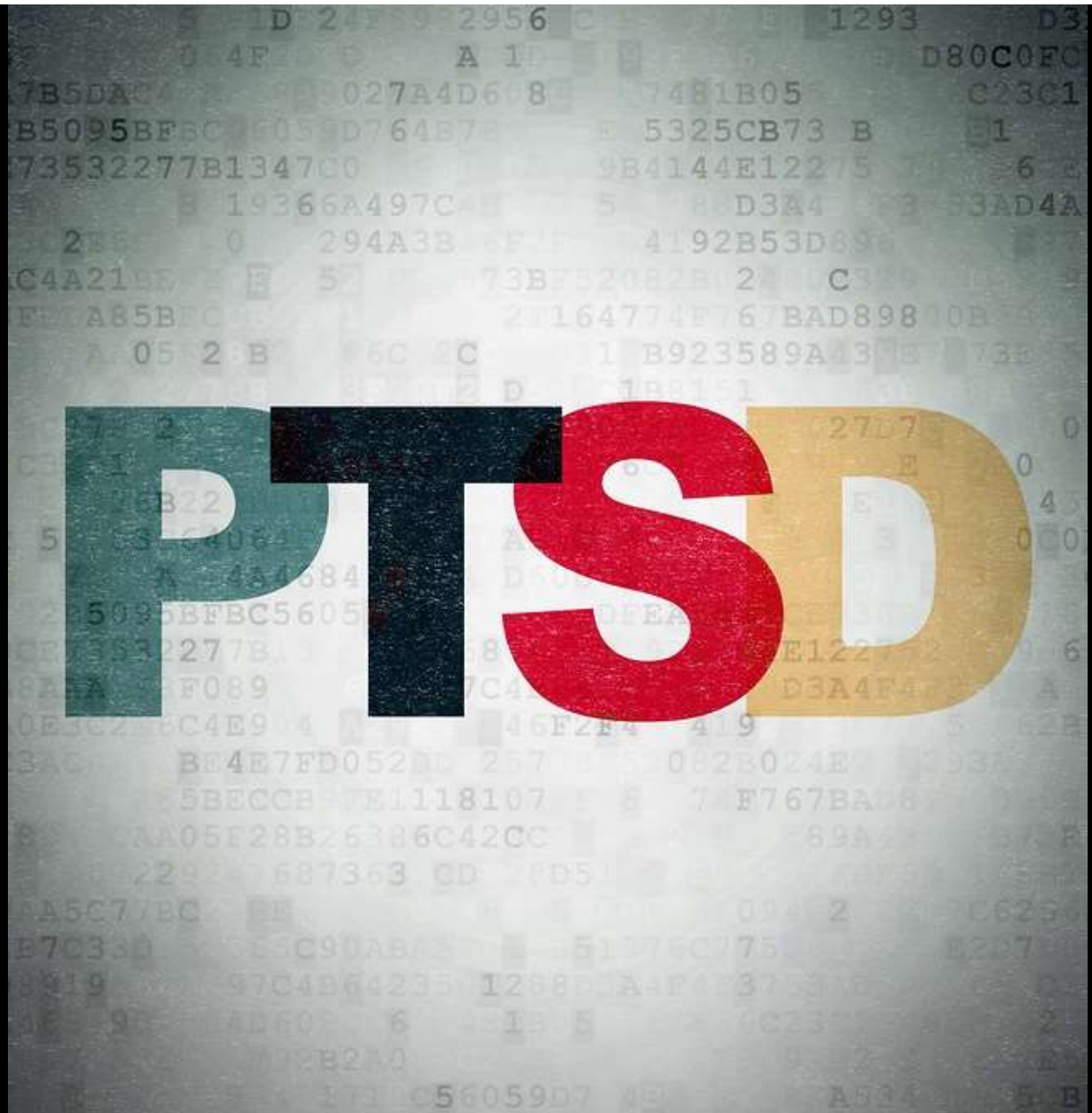
Identifying probable PTSD using machine learning

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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 military personnel, research suggests

Rise in condition mainly seen in veterans who deployed to Iraq and Afghanistan



personnel who deployed to Iraq and Afghanistan were more likely to develop the condition, new research suggests.

furdo MacLeod/The Guardian

Post-traumatic stress disorder (PTSD) rates have increased in the armed forces, new research suggests.

The rate of probable PTSD among current and former personnel was 6% in 2014-16, compared with 4% in 2004-06.

The condition, which can be triggered by a terrifying event involving threat to life or limb, was mainly seen in personnel who deployed to Iraq and Afghanistan, the research suggests.

Health

'Higher levels of PTSD among veterans', says study

By Laurel Ives
BBC Health

8 October 2018

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Rates of PTSD rising, study finds

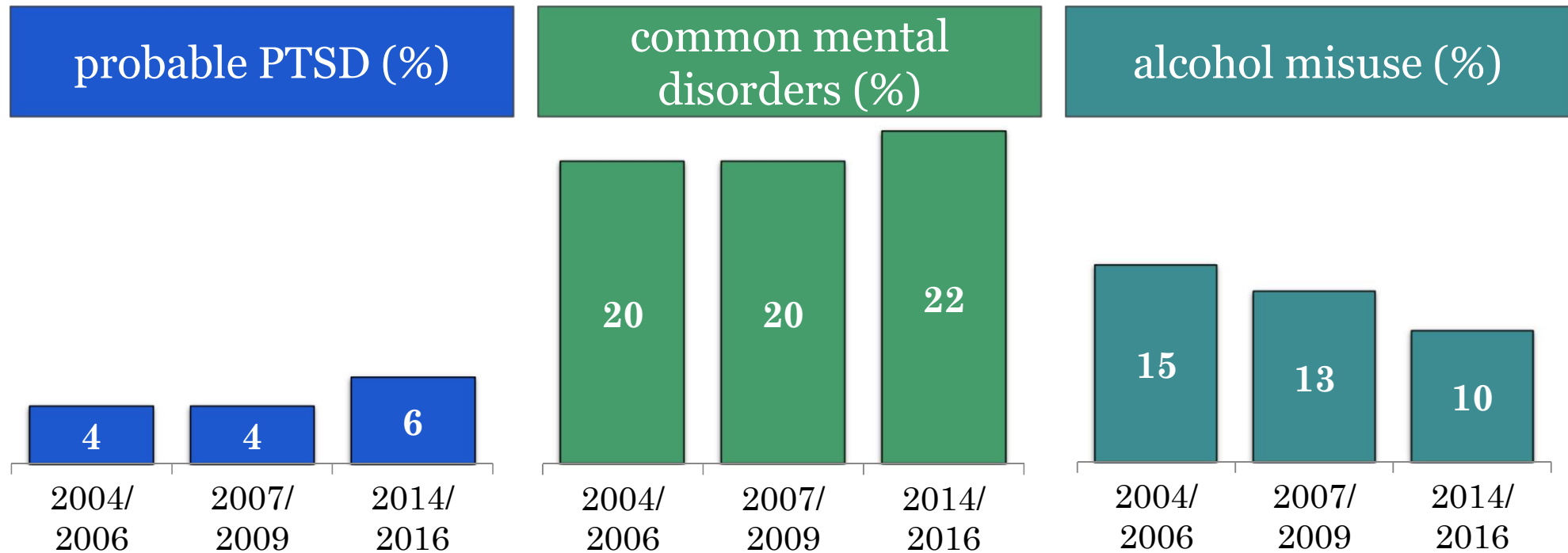
Condition seen in military veterans deployed to Iraq and Afghanistan

Sally Wardle | 6 days ago | 2 comments

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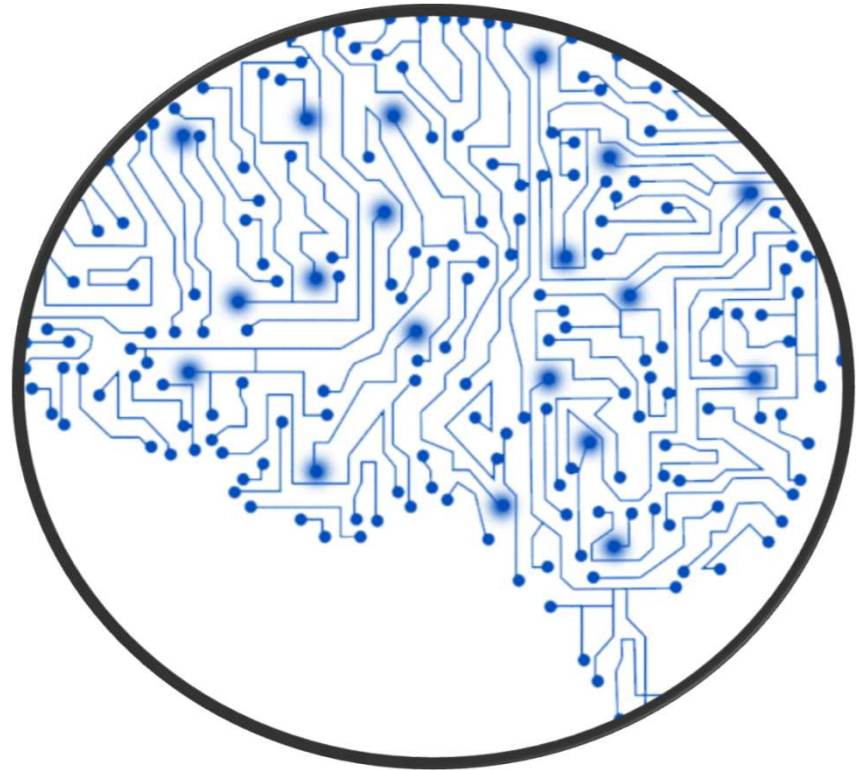
PTSD compared to other disorders



The prevalence of alcohol misuse has decreased from 2004/06, whereas the prevalence of PTSD has increased from 4% to 6%

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

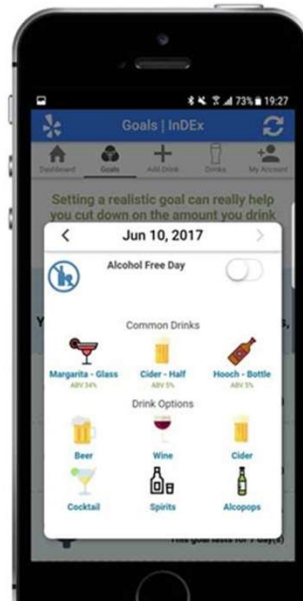
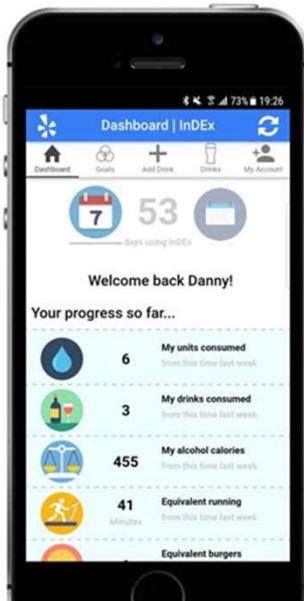
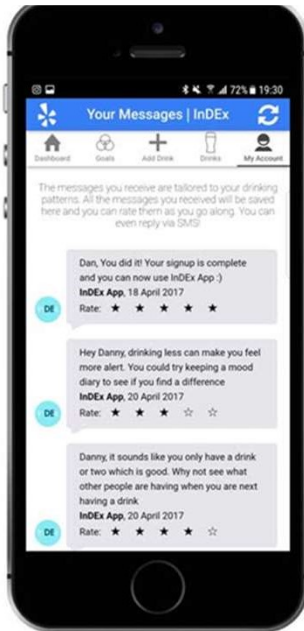




Machine learning as an aid...*for now*

- 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

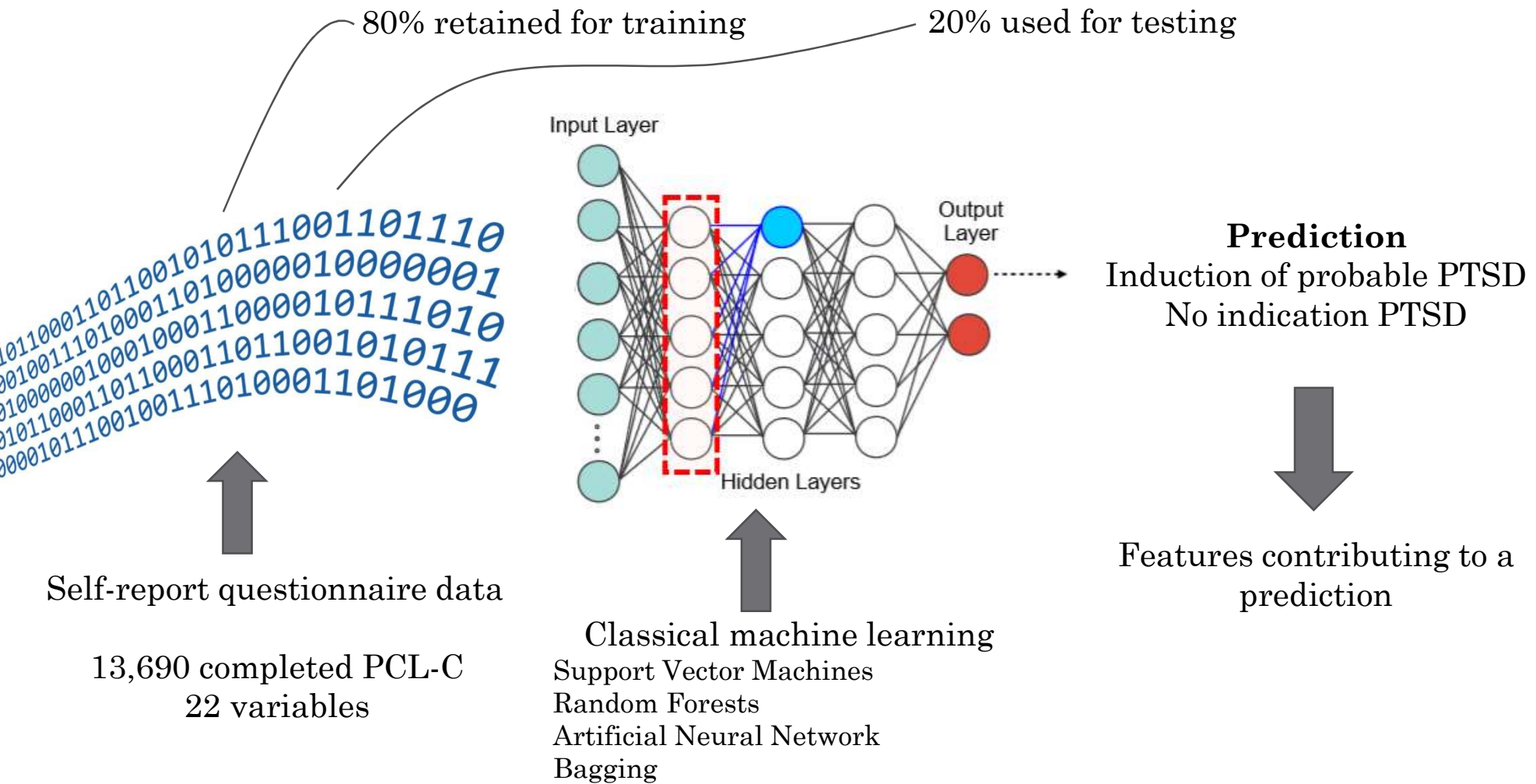


Other work...

- 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

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.



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.

80% retained for training

20% used for testing

Classifier	Accuracy	Sensitivity	Specificity	MCC
Support Vector Machines	0.91	0.70	0.92	0.74
Random Forests	0.97	0.60	0.98	0.64
Artificial Neural Networks	0.89	0.61	0.92	0.45
Bagging	0.95	0.69	0.96	0.55

13,690 completed PCL-C

Support Vector Machines
Random Forests
Artificial Neural Network
Bagging

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.

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

Classifier	Rank 1	Rank 2	Rank 3	Rank 4
Support Vector Machines	AUDIT Score	GHQ-12 score	Age (years)	Consumes alcohol (y/n)
Random Forests	Gender	AUDIT Score	GHQ-12 score	Service type
Artificial Neural Networks	GHQ-12 score	AUDIT case (y/n)	AUDIT Score	Consumes alcohol (y/n)
Bagging	Age	Consumes alcohol (y/n)	Smoking	GHQ-12 score

Guyon, I., & Elisseeff, A. (2003). An Introduction to Variable and Feature Selection. *Journal of Machine Learning Research*, 3, 1157–1182

Support Vector Machines
Random Forests
Artificial Neural Network
Bagging

umns

AVAILABLE COLUMNS

All Types ▼

search columns



PTSDever
ptsdlong
PTSDmem

1. Publicly available dataset
downloaded from UK
Data Achieve

2. Upload to Microsoft
Machine Learning Studio

3. Training ML classifier

4. Define training and
testing set

5. Evaluate



Clean Missing Data

SELECTED COLUMNS

All Types

pserial
gor06
newsha
d
ints1
Num
Sex
Age
MarDF
10yr
20yr
Yng
Old
lsize

columns

Experiment created on 2/23/2018

Experiment created on 2/23/2018 > APMS 2007 > dataset

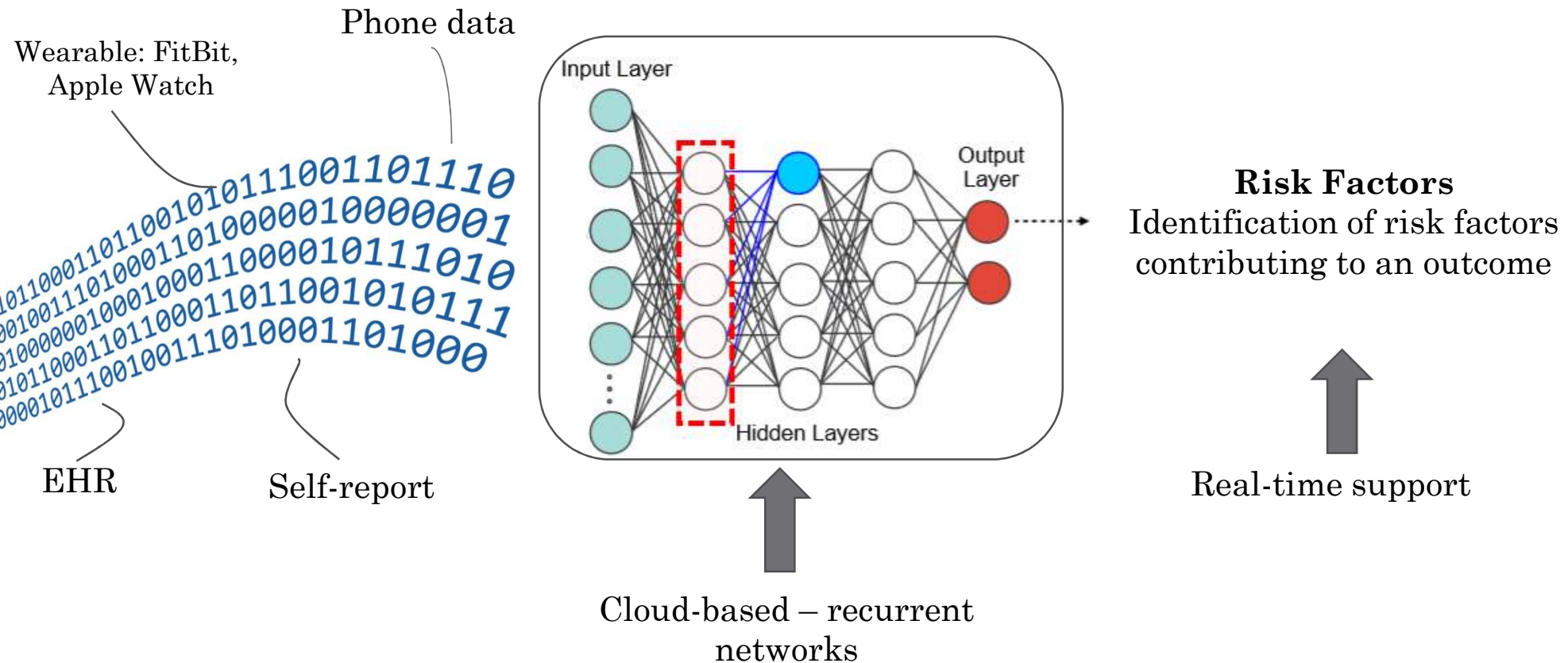
	gor06	newsha	qind	wt_ints1	area	ResNum	ResSex	ResAge	ResMarDF	Age10yr	Age20yr	AgeYng	AgeOld
1072	7	7	2	1.203129	103	1	2	53	2	4	2	4	1
1102	7	7	3	0.778035	103	1	2	78	5	7	4	4	4
1112	7	7	3	0.601564	103	1	2	52	3	4	2	4	1
1132	7	7	2	1.086081	103	1	2	58	1	5	3	4	2
1162	7	7	3	0.659169	103	1	1	66	5	6	3	4	3
1172	7	7	1	1.125239	103	1	1	86	1	7	4	4	5
1192	7	7	3	0.778035	103	1	2	88	4	7	4	4	5
1202	7	7	3	0.767071	103	1	1	41	5	3	2	4	1
1212	7	7	3	1.204665	103	1	2	68	5	6	3	4	3
1222	7	7	3	1.086081	103	1	2	56	1	5	3	4	2
1232	7	7	1	1.844655	103	1	1	30	1	2	1	4	1
1242	7	7	3	1.534142	103	1	1	36	1	3	2	4	1
1262	7	7	2	1.687858	103	1	1	77	1	7	4	4	4
1282	7	7	1	0.660861	103	1	2	79	4	7	4	4	1
1302	6	6	3	0.883658	109	1	2	52	1	4	2	4	1
1322	6	6	3	0.473141	109	1	1	67	5	6	3	4	3
1332	6	6	2	1.128457	109	1	1	54	1	4	2	4	1
1342	6	6	2	0.485381	109	1	2	75	4	7	4	4	1

UK • DATA
ARCHIVE

You can use machine learning too...

Example <https://tinyurl.com/y9xlrll0>

Next steps



Thank You

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