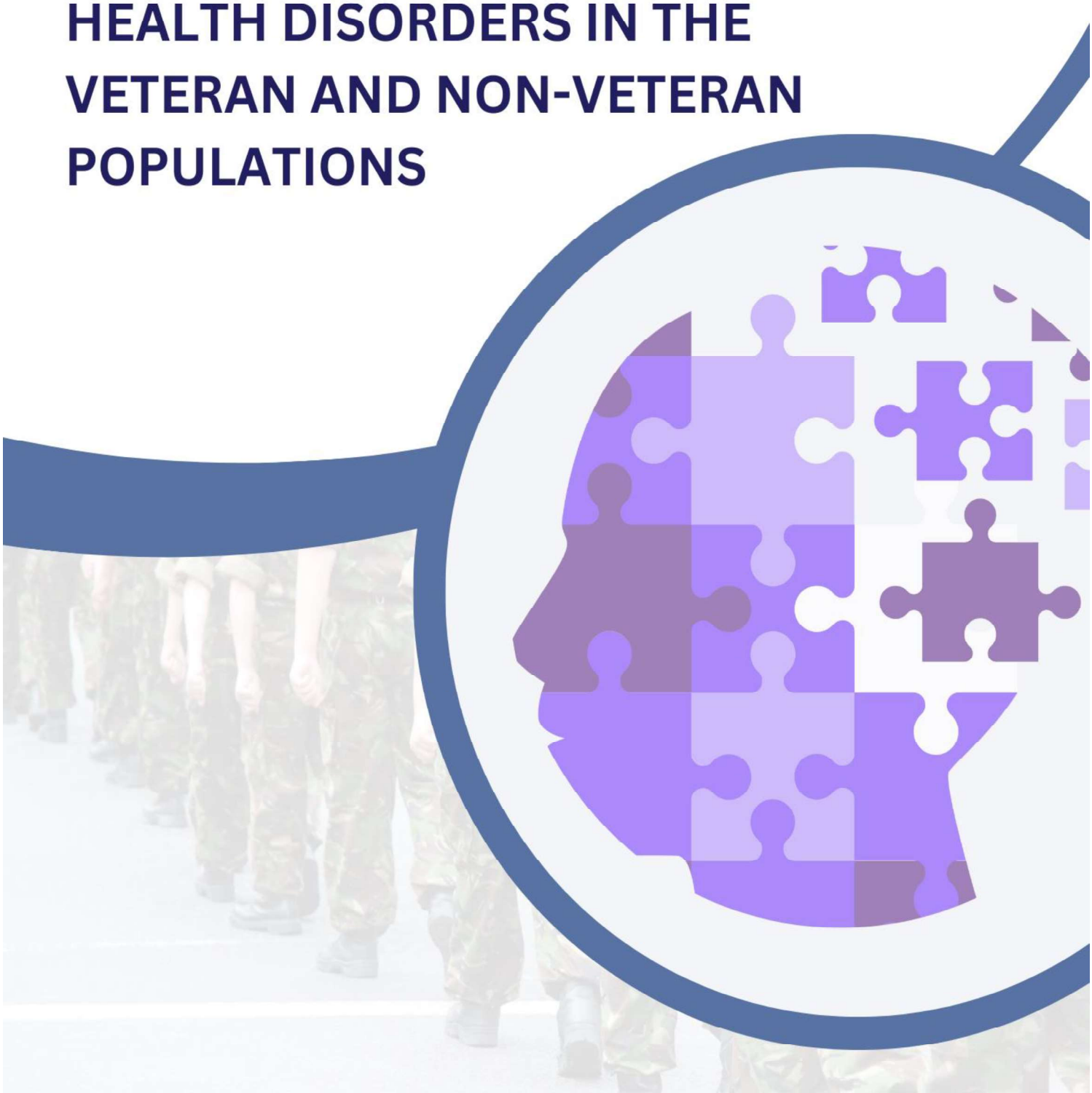
FiMT forces in mind trust

COMMUNITY FUND

Westminster Centre for Research in Veterans | University of Chester

A COMPARATIVE STUDY OF COMMON MENTAL AND PHYSICAL HEALTH DISORDERS IN THE VETERAN AND NON-VETERAN POPULATIONS



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ABBREVIATIONS

Blood Pressure	BP
Defence Medical Services	DMS
Deliberate Self-Harm	DSH
Generalised Anxiety Disorder	GAD
Mental Health	MH
Ministry of Defence	MOD
Non-Suicidal Self-Harm	NSSH
Office for National Statistics	ONS
Primary Healthcare	PHC
Post-Traumatic Stress Disorder	PTSD
Quality and Outcomes Framework	QOF
Royal College of General Practitioners	RCGP
Subthreshold Generalised Anxiety Disorder	SGAD
Systematized Nomenclature of Medicine-Clinical Terms	SNOMED

Foreword

Understanding the unique impacts of Service life on personnel and families is key to ensuring their successful transition to civilian life. Health is a critical element of this – both in terms of determining any key factors in the health conditions of ex-Service personnel but also in ensuring they are able to access effective support and treatment.

Although specific to the North West of England, this first of its kind study is an important foundation in understanding whether some conditions are more prevalent in veterans than non-veterans, providing previously unknown insights into the healthcare needs of former Service personnel.

By better understanding their healthcare needs, this evidence can be used to inform service commissioning, policy and practice, resulting in effective support for former Service personnel and a stronger base for their successful transition. We hope this evidence can also lead to targeted interventions or communications to Service personnel in health areas where this initial evidence highlights a greater prevalence of certain health conditions in veterans who participated in the research.

But the report also provides wider understanding - highlighting the importance of encouraging veterans to register at their local primary healthcare centre; the challenges of identifying and coding former Service personnel within the health system; and the importance of improving data quality, accuracy and consistency, as well as data sharing between the Defence Medical Services and civilian primary healthcare. In addition, it will also help to address challenges with the accurate perception of the health needs of veterans, ensuring their care and support is based on the reality of their health.

Michelle Alston
Chief Executive - Forces in Mind Trust

PHYSICAL HEALTH & SMOKING RESULTS SUMMARY

Percentage of Veterans	Code on medical record	Percentage of Non-Veterans
20.9%	HYPERTENSION 	17.6%
11.8%	SMOKING 	10.6%
8.3%	DIABETES 	6.4%
2.5%	ALCOHOL DEPENDANCE and associated physical conditions such as alcohol cirrhosis 	1.4%
2.1%	DEMENTIA 	2.5%

Figure 1: Physical Health Summary

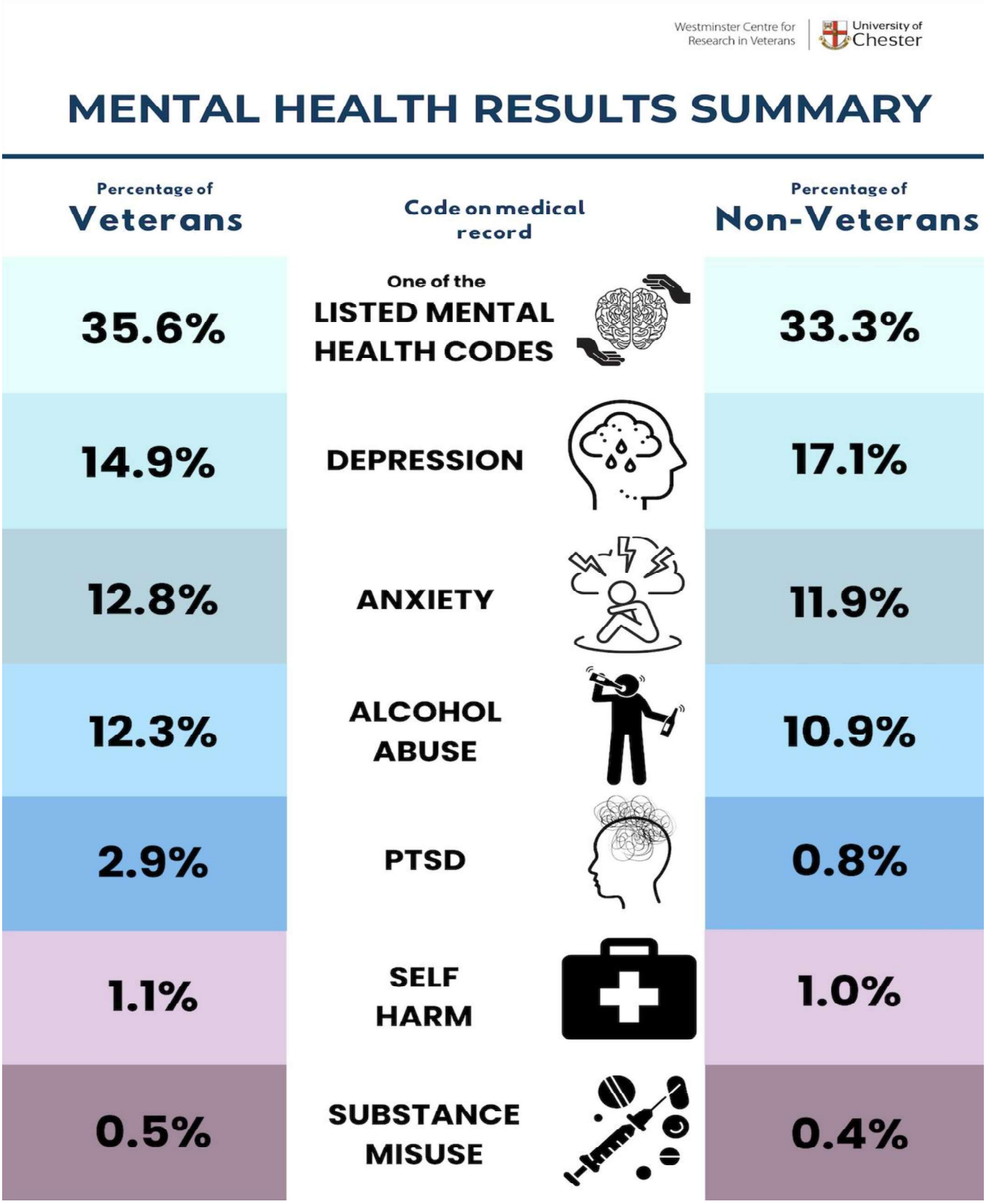


Figure 2: Mental Health Summary

Executive Summary

Introduction

Primary Healthcare (PHC) patient medical records contain Systematized Nomenclature of Medicine-Clinical Terms (SNOMED) that include information regarding diagnosis, demographics and veteran status. FiMT funded the "Where Are All the Veterans" (WAATV) study which was designed to increase veteran registration in PHC and to interrogate PHC records to identify the levels of common mental health (MH) disorders in veterans. WAATV crucially demonstrated the feasibility and effectiveness of utilising PHC medical records to accurately determine veterans MH morbidity although it was unclear whether the prevalence of these disorders is higher than the general non-veteran population.

This study aim was to identify, analyse and compare the prevalence of the MH disorders of depression, anxiety, alcohol misuse, post-traumatic stress disorder (PTSD), self-harm, and substance abuse; the physical health problems of type 2 diabetes, hypertension (high blood pressure) and dementia, and the lifestyle choice of smoking tobacco in veterans and non-veterans including stratification by age and gender. This research was conducted by the University of Chester's Westminster Centre for Research in Veterans (The Centre) (2024).

Methods

The Centre partnered with 13 North-West England PHC practices with a population of 137,410 patients. PHC staff extracted matched veteran and non-veteran SNOMED data from PHC patient medical records; then sent the Centre anonymised data in an amalgamated format between October 2023 and January 2024. Patients were from a local community and therefore social and environmental factors would be similar. Submitted information was inputted into a SPSS database 28 for analysis which included descriptive and inferential statistics to indicate statistical significance of differences between veterans and non-veterans.

Results

In total, 5,458 PHC electronic records were examined comprising of 2,729 veterans and 2,729 demographically matched for age and gender non-veterans. Each group contained 86.4% (N=2,359) men and 13.6% (N=370) women. The mean age was 63.8 years and 98% of the veterans were recorded as White British. More veterans at 54.2% than non-veterans at 50.7%, had one of the listed conditions of depression, anxiety, alcohol misuse, substance misuse, self-harm, PTSD, dementia, type 2 diabetes, and hypertension noted in their medical record. The difference was statistically significant.

Physical Conditions

Rates of hypertension were 20.9% in veterans compared to 17.6% in non-veterans. Type 2 diabetes mellitus were 8.3% in veterans compared to 6.4% in non-veterans. Dementia was 2.1%

in veterans compared to 2.5% in non-veterans. Smoking was 11.8% (N=321) in veterans compared to 10.6% (N=289) of non-veterans.

Mental Health Conditions

There were 35.6% (N=971) of veterans with a code on their medical record for depression, anxiety, alcohol misuse, PTSD, substance misuse, or self-harm; this compared with 33.3% (N=909) of non-veterans. Veterans rates of depression were 14.9% (N=407) compared to 17.1% (N=467) in non-veterans; anxiety 12.8% (N=349) in veterans compared to 11.9% (N=325) in non-veterans; alcohol misuse 12.3% (N=337) in veterans compared to 10.9% (N=297) in non-veterans; PTSD was 2.9% (N=78), in veterans compared to 0.8% (N=23) in non-veterans; self-harm 1.1% (N=31) in veterans compared 1% (N=27) in non-veterans; substance misuse 0.5% (N=14) in veterans compared 0.4% (N=10) in non-veterans. Nineteen percent of male veterans (N=450) and 30% of female veterans (N=112) had a code on their record for a common mental disorder (anxiety and depression), compared to 20% (N=475) of non-veteran males and 35% (N=131) non-veteran females. The relationship between gender and presence of a MH disorder in veterans was found to be significant suggesting that female veterans have a higher prevalence of mental disorders than their male counterparts as is consistent with the general population.

Conclusion

These results reveal that veterans were statistically more likely to be diagnosed with the physical health condition of hypertension and type 2 diabetes. Regarding MH, veterans were statistically more likely to be diagnosed with PTSD, and less likely to have depression. This study should assist in a better understanding of the healthcare needs of the veteran population to potentially inform better patient-centred care. However, the effectiveness of utilising PHC patient medical records requires increased efforts to enhance data quality which needs improved PHC staff knowledge, consistency in SNOMED coding, better veteran medical e-record registration and coding, and better transmission of data between the Defence Medical Services (DMS) and PHC.

Key Findings, Recommendations and Limitations

- PHC data provides a valuable insight into veteran morbidity. This comparison study is the first to present UK veteran and non-veteran morbidity by utilising PHC medical records.

- PHC patients belong to a local community where social and environmental factors such as housing, finance and education are similar, which assists in the reliability and validity of the results.

- Morbidity coding can indicate a lifetime prevalence and at times it was difficult to differentiate between enduring or resolved conditions.

- Regarding the assessed MH conditions, apart from PTSD, veterans in this study did not experience statistically significant higher levels of other MH diagnosis. Veterans were less vulnerable to depression. The narrative should indicate that veterans are not a vulnerable population for mental ill health, and should not be treated as such.

- Hypertension was 20.9% in veterans compared to 17.6% in non-veterans, and type 2 diabetes 8.3% in veterans compared to 6.4% in non-veterans. Veterans rates of depression were 14.9% compared to 17.1% in non-veterans; PTSD was 2.9% in veterans compared to 0.8%, and veterans coded with having problems associated with alcohol misuse such as dependence or physical issues including alcoholic cirrhosis of the liver were 2.5% compared to 1.4% of non-veterans. These results were statistically significant.

- Co-morbid hypertension and type 2 diabetes were presented in 27% of male and 23% of female veterans compared to 23% male and 19% of non-veteran females.

- In any follow-up comparison studies, measures should be taken to raise awareness of and engagement with elderly veterans and their families to improve PHC coding of their veteran status.

- Statutory and non-statutory initiatives can tailor interventions to healthier lifestyles, including gym passes and/or connection to health promotion activities with professional sports clubs.

- Effective utilising of PHC data requires knowledgeable PHC staff, consistent SNOMED veteran coding, better veteran medical e-record registration and coding, and improved transmission of data between the DMS and PHC and better clarity in PHC medical records to differentiate between enduring and resolved conditions.

Introduction

There is estimated to be 1.85 million British Armed Forces veterans living in England and Wales, which is approximately 3.8% of the total population (Office for National Statistics (ONS), 2022). The UK Armed Forces veteran population differs substantially to non-veterans in relation to gender and age distributions, with veterans being predominantly male (86%) and older, with those aged 80 years and over (34.8%) in comparison with the non-veterans (5.2%) (ONS, 2022**).** See Figure 3.

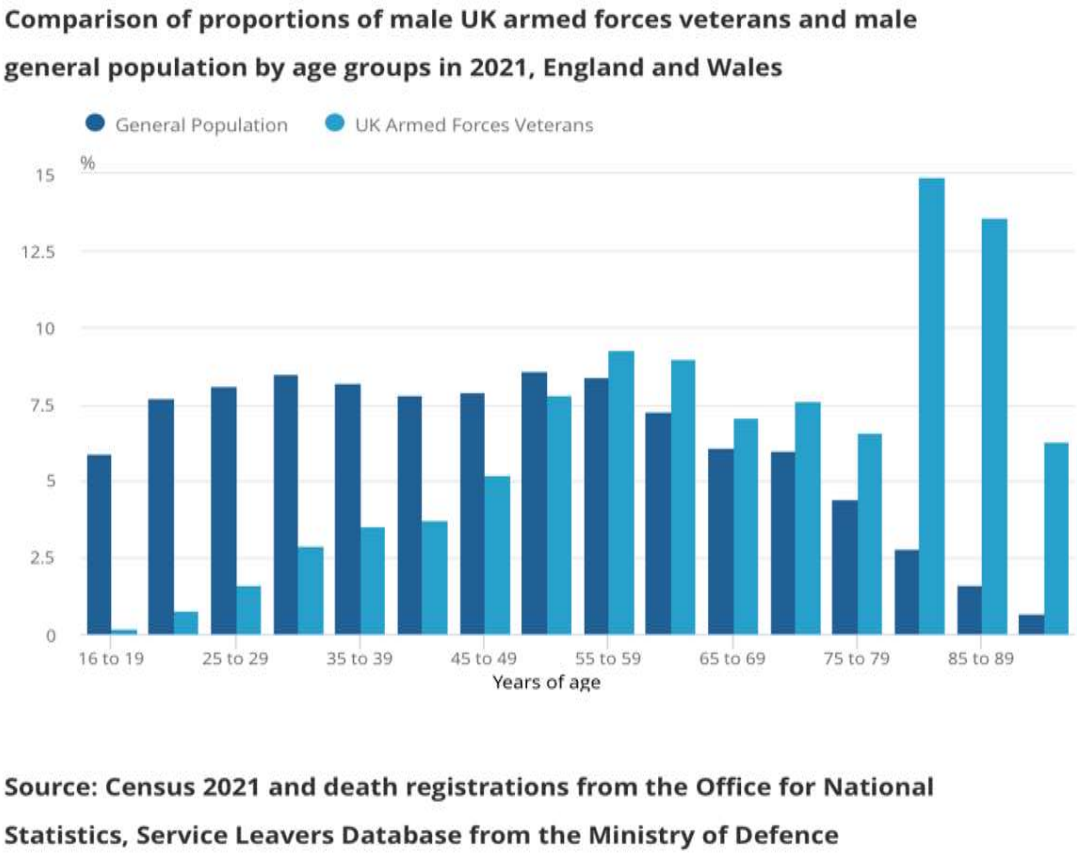


Figure 3: Male Armed Forces Veterans Age Groups

The Armed Forces Covenant (Ministry of Defence (MOD), 2011) was introduced to ensure no disadvantage to serving personnel, veterans and their families, the core principles of which were enshrined in law in the Armed Forces Act 2011 (Legislation.Gov.UK, 2011). This legislation includes healthcare where veterans should receive priority treatment, subject to clinical need, and access to veteran specific services when it relates to a condition aligned to their military service.

Background

Primary Healthcare (PHC) is the portal to the National Health Service (NHS) providing over 300 million consultations each year (NHS England (NHSE), 2024a). PHC patient electronic medical records utilise Systematized Nomenclature of Medicine-Clinical Terms (SNOMED) (NHS Digital, 2021) that contain clinical information related to patient diagnosis, demographics (age, gender, ethnicity), laboratory tests, and medications. SNOMED codes extend to military veterans, and provide a consistent vocabulary for recording patient clinical information. SNOMED codes inform the Quality and Outcomes Framework (QOF) for GP practices in England, Wales and Northern Ireland which is a voluntary annual reward and incentive programme (British Medical Association, 2023, NHSE, 2024b), and provides information to indicate the levels of clinical morbidity. Therefore, a SNOMED search should reveal the healthcare status of the veteran population, although evaluations identified that only 9% were correctly coded as veterans (Finnegan et al, 2018). An initiative to improve registration resulted in 27% being coded correctly (Finnegan & Randles, 2023a), and included accessing PHC records to identify the levels of common/perceived to be common mental health (MH) disorders in military veterans (Finnegan and Randles, 2023b).

The prevalence rate from both studies was that 38% of veterans had a MH disorder included on their PHC medical record. The detail was published in the British Medical Journal Military Health and was the journals most read article since the online publication in January 2022 to November 2024 (Finnegan & Randles, 2023b). These were the first veterans' studies to use this methodology and revealed limitations in PHC SNOMED recording which will have impacted upon the reliability and validity of the results. Crucially, these studies demonstrated the feasibility and effectiveness of utilising PHC medical records to determine veterans MH and physical morbidity. However, it was not yet clear whether prevalence was higher in veterans than in the general non-veteran population.

Common MH Disorders and Help Seeking

Military veterans were cited as having a higher prevalence of common MH disorders including anxiety and depression (Williamson et al, 2023). Research has indicated that alcohol misuse, depressive disorders, anxiety disorders, post-traumatic stress disorder (PTSD) were the most common MH problems within the veteran population (Randles & Finnegan, 2023b; Williamson et al, 2023). Risk factors that increase the likelihood of veterans suffering from a MH disorder including a history of alcohol/substance misuse, operational deployment, and combat exposure as well as a lack of social support/relationships (Finnegan et al, 2024). In the veteran population, females were more likely to be at risk of a lifetime prevalence of depression and suicidal thoughts (Adams et al., 2021), whilst men significantly more likely to suffer from PTSD and to alcohol misuse alcohol (Irizar, 2020). Nevertheless, these gender differences may be due to male and female military veterans presenting MH disorders differently to the non-veteran population and MH difficulties in men not being identified (Finnegan et al., 2014).

It is recognised that males appear to be poor at sourcing support, and that veterans' in particular show inadequate help-seeking behaviour (Randles & Finnegan, 2022). Long waiting times for clinical practice and not wanting to trouble medical staff can leave issues unaddressed and it appears that some veterans need to reach the point of crisis before they consider these MH issues to be worthy of seeking help (Rafferty et al., 2020). Many female veterans adopted the same attitudes but their help-seeking appears to be better (Finnegan et al., 2014; Randles & Finnegan, 2022).

GPs and Veteran Aware Services

In the male dominated veteran population, GPs have a crucial part to play in encouraging men to communicate their MH problems free from the constraints of hegemonic masculinity (Mursa et al, 2022). Equally important is for GPs to be aware that female veterans may adopt the same attitudes as male veterans in not wanting to appear weak (Randles and Finnegan, 2022). A major initiative to engage with veterans and their families is the Royal College of General Practitioners (RCGP) Veteran Friendly GP Practice Accreditation programme in England. This includes correctly registering veteran status, and in May 2024, nearly 3,000 (from approximately 7,000) practices were accredited, (Finnegan et al, 2022; RCGP, 2024) although the number of correctly registered veterans remains unknown. This RCGP initiative should help improve veteran registration and the option to identify veteran morbidity; and it has been bolstered with support from an Office for Veterans' Affairs advertising campaign. See Figure 4.

Figure 4: From: OVA Veteran Registration Campaign (Gov.UK, 2024)

Aim

The aim of this study was to evaluate the prevalence of specified physical and MH disorders, and the levels of smoking in military veterans compared to non-veterans including stratification by age and gender.

Methodology & Method

The methodology was an extension of that developed for a prevalence study to identify the levels of common MH disorders in veterans (Finnegan & Randles 2023a; Finnegan & Randles 2023b). The Centre partnered with 13 Cheshire and Lancashire (England) PHC practices with a population of 137,410 patients. The Centre had worked with the majority of these practices on previous studies, and they were identified as having strong veteran registration and/or being a large PHC practice (>10,000 patients). The PHCs were financially remunerated for their time. Detail from the Census 2021 indicated that the veteran population in North-West England was 3.8%, and this figure was used to estimate the veteran patients expected within each collaborating PHC practice, where the mean was 52% that were correctly coded, ranging from 28% to 92%. See Table 1.

Region	Medical Centre	Current List	Veterans	Percentage	Census Veterans North West England (3.8%)	% of veterans
Chester	City Walls	15745	408	2.59	598	68%
Chester	Heath Lane	7573	135	1.78	288	47%
Chester	Park	10200	129	1.26	388	33%
Chester	Lache	7374	141	1.91	280	50%
Warrington	Helsby	9789	220	2.25	372	59%
Warrington	Culcheth	12366	131	1.06	470	28%
Warrington	Fearnhead	13808	315	2.28	525	60%
Warrington	Penketh	13069	256	1.96	497	51%
Wirral	Orchard	6150	215	3.50	234	92%
Wirral	Eastham	11404	200	1.75	433	46%
Wirral	The Village	8613	147	1.71	327	45%
Poulton	Queensway	9255	189	2.04	352	54%
Fleetwood	Mountview	12064	243	2.01	458	53%
	Total	**137,410**	**2729**	**1.98**	**5,222**	**52%**

Table 1: Participating PHC Veteran Patients

There are many different SNOMED diagnostic codes available for the same condition, and it is at the discretion of the PHC staff to choose the appropriate code. Measures were taken to ensure consistency, including visits to PHC partners to discuss the requirements and any potential challenges. Then in April 2023, online meetings were offered to the PHC practices which allowed them to discuss their strategies, followed by a final meeting in May 2023. Then the PHCs formed collaborative partnerships in developing and confirming their medical record search criteria, which was bolstered with those PHCs working in the same Primary Care Network. As the PHC registered patients were from a local community then social and environmental factors such as housing, finance and education were likely to be similar which would assist in the reliability and validity of the results.

Being mindful of the considerable pressures on PHC, the search strategy was limited to a small number of physical and MH disorders. Staff extracted matched veteran and non-veteran SNOMED data from PHC patient medical records; then anonymised the data by removing the patient's name and individual NHS identification number, before sending it to the Centre in an amalgamated format. The veteran inclusion criteria was any regular or reservists (including National Service) who had served at least one day in the British Armed Forces. Data was included on whether the chosen disorders were designated as an "Active Problem" in the medical record. The searches were submitted to the Centre between October 2023 and January 2024.

Submitted information was inputted into a SPSS database 28 for analysis which included descriptive statistics of frequencies and percentages, and inferential statistics to indicate statistically significant differences in the prevalence of disorders between the veteran and non-veteran populations.

Ethical Approval

Ethical Approval was received by the University of Chester's Faculty of Health and Social Care Research Ethics Committee (RESC1122-1117 dated 22/12/2022). All ethical guidelines were followed and considered for the project.

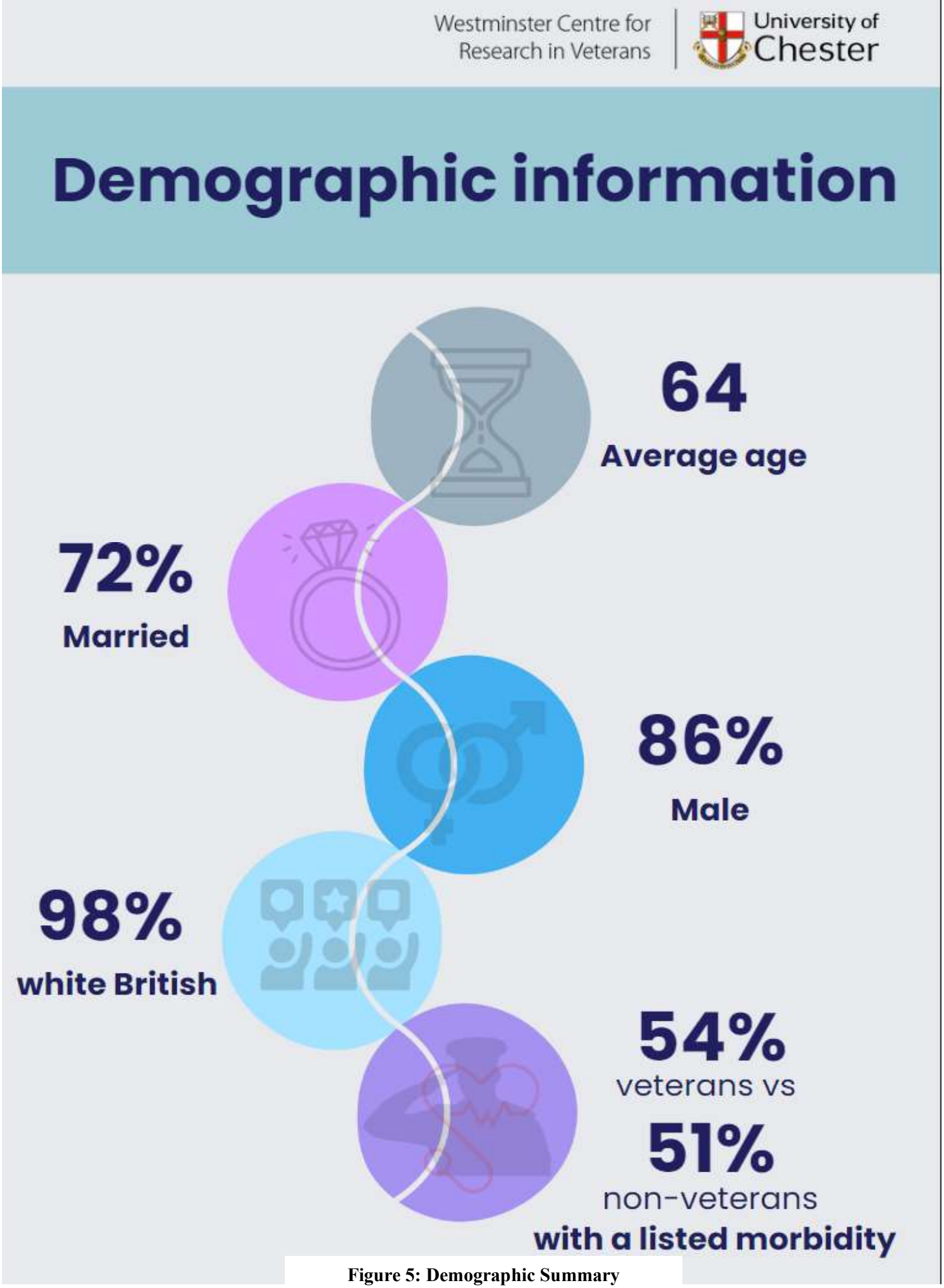


Figure 5: Demographic Summary

Results

Gender and Age

In total, 5,458 PHC electronic records were examined comprising of 2,729 veteran PHC records, matched for age and gender with non-veterans. Each group contained 86.4% (N=2,359) males and 13.6% (N=370) females. These figures match the veteran gender percentages revealed in the Census of 2021. The mean age was 63.8 years, median 64, mode 84 and the standard deviation was 17.7. See Chart 1.

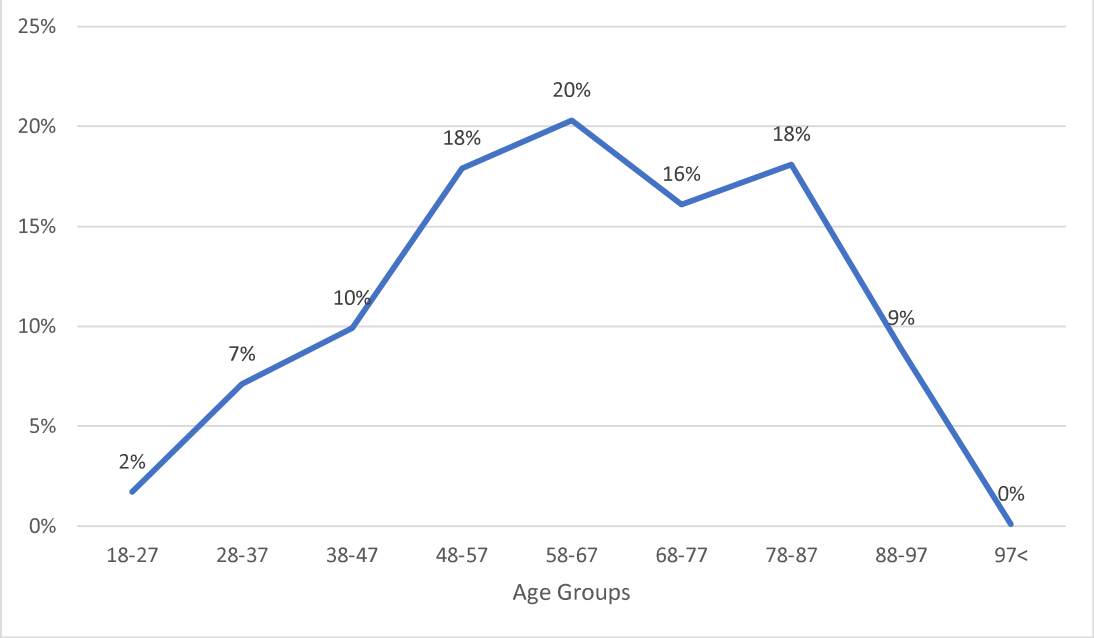


Chart 1: Matched Sample Age of Veterans and Non-Veterans

In 84% (N=2,295) of cases, marital status was unrecorded by the PHC and therefore unknown. Of the 434 patients where marital status was included, 72% (N=314) were married which was higher than the 57% recorded in the Census 2021. This was followed by single at 16% (N=70) which is similar when compared to the Census 2021 of 15%. Ninety-eight percent of veterans were recorded as White British.

Comparisons between Veterans and Non-Veterans

More veterans (54.2%, N=1480) than non-veterans (50.7%, N=1383) had one of the listed conditions of depression, anxiety, alcohol misuse, substance misuse, self-harm, PTSD, dementia, type 2 diabetes, and hypertension noted in their medical record. The difference was statistically significant X^2 (1, N=5484) = 7.2 p=0.007.

PHYSICAL HEALTH

Morbidity Rates

Rates of hypertension were 20.9% (N=570) in veterans compared to 17.6% (N=480) in non-veterans. The difference was statistically significant at $X^2(1,N=5458)=9.5$ $p=0.002$. Rates of type 2 diabetes were 8.3% (N=226) in veterans compared to 6.4% (N=174) in non-veterans. The difference was statistically significant at $X^2(1,N=5458)=7$ $p=0.007$. Rates of dementia were 2.1% (N=58) compared to 2.5% (N=69) in non-veterans. The difference was not statistically significant at $X^2(1,N=5458)=0.975$ p=0.32. Rates of smoking were 11.8% (N=321) in veterans compared to 10.6% (N=289) of non-veterans $X^2(1,N=5458)=2$ $p=0.16$. The difference was not statistically significant at $X^2(1,N=5458)=2$ $p=0.16$. Chart 2.

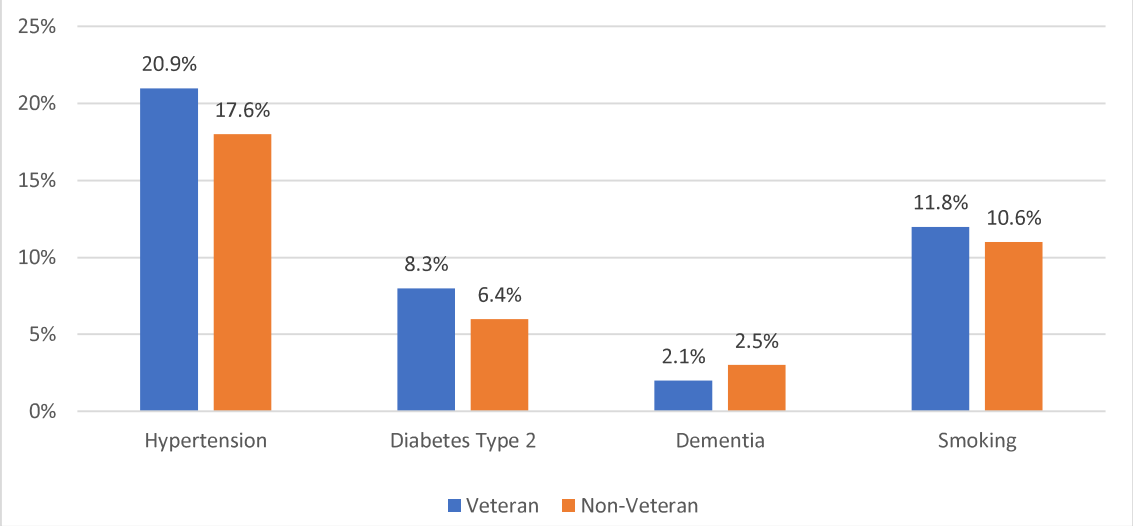


Chart 2: Physical Health and Smoking across Veterans and Non-Veterans

Gender

Amongst male veterans, 21.1% (N=498) were diagnosed with hypertension compared with 18% (N=424) of male non-veterans. A significant association at $X^2(1,N=4718)=7.38$, $p<.05$. Female veterans were 19.5% (N=72) diagnosed with hypertension compared with 15.1% (N=56) of female non-veterans but this was not significant $X^2(1,N=740)=2.42$, $p=.120$. Amongst male veterans, 8.6% (N=203) were diagnosed with type 2 diabetes compared with 6.5% (N=152) of male non-veterans which was statistically significant at $X^2(1,N=4718)=8$ p=0.005. Amongst female veterans 6.2% (N=23) were diagnosed with type 2 diabetes compared with 5.4% (N=20) of female non-veterans $X^2(1,N=740)=0.24$ p<0.637. When combining the diagnosis of hypertension and type 2 diabetes, then 27% of male veterans (N=629) and 23% (N=84) of female veterans had both compared to 23% (N=530) of non-veteran males and 19% (N=69) non-veteran females. The relationship between gender and presence of type 2 diabetes and hypertension in veterans was not significant $X^2(1,N=2729)=2.60$, $p=.107$). Dementia was present in 2.2% (N=53) of male veterans compared to 2.5% (N=59) of non-veteran males. Dementia was present in 1.4% (N=5) of female veterans, and 2.7% (N=10) of non-veteran females. The relationship between dementia

and gender in veterans was not significant $X^2(1, N=2729)=1.23$, $p=.267$). There were 12% of male veterans who smoked tobacco (N=283), compared to 10.6%% (N=251) of non-veteran males which was not significant $X^2(1,N=4718)=2.2$ $p=0.14$. Of females veterans, 10.5% (N=39) were smokers compared to 10.3% (N=38) of female non-veterans $X^2(1,N=740)=0.11$ p=1). Chart 3 shows differences in veteran physical morbidity by gender, and Chart 4, differences in diagnostic levels between veterans and non-veterans by gender.

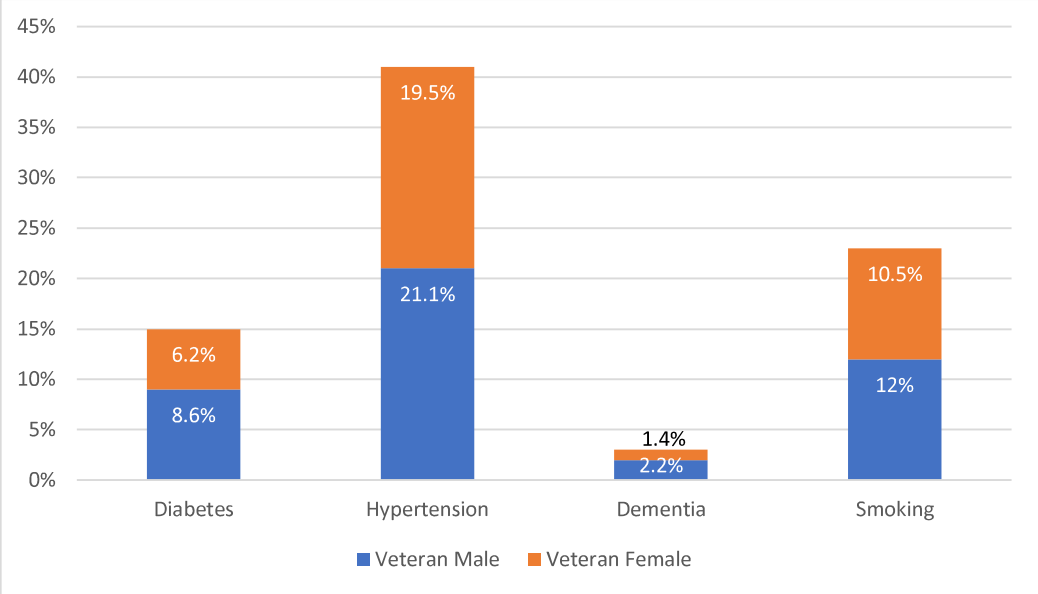


Chart 3: Veterans Physical Health by Gender

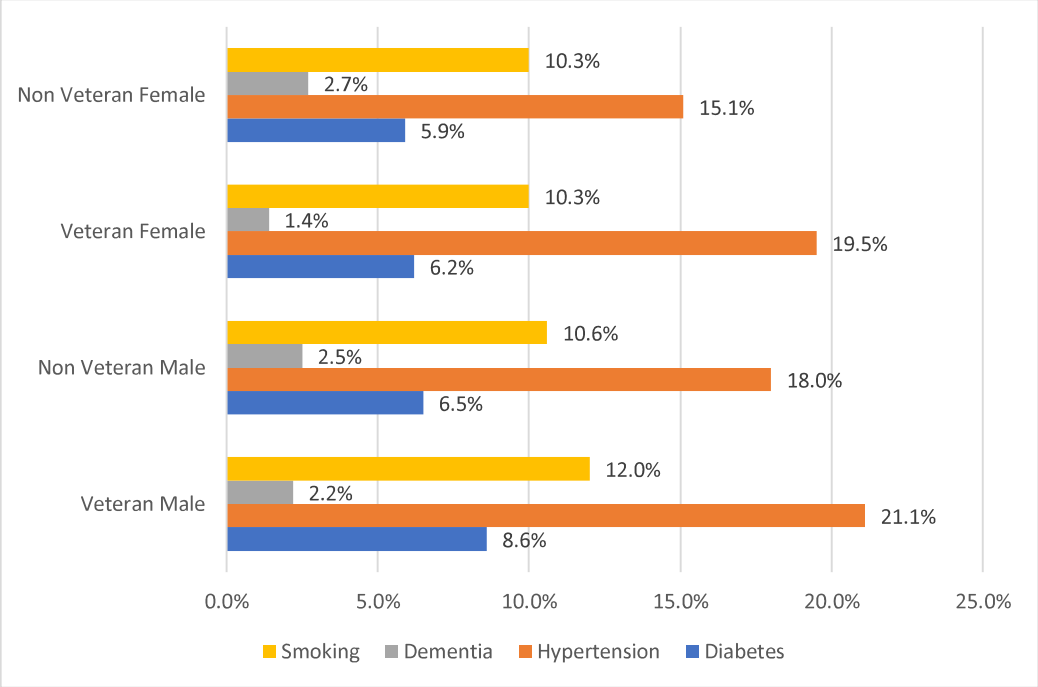
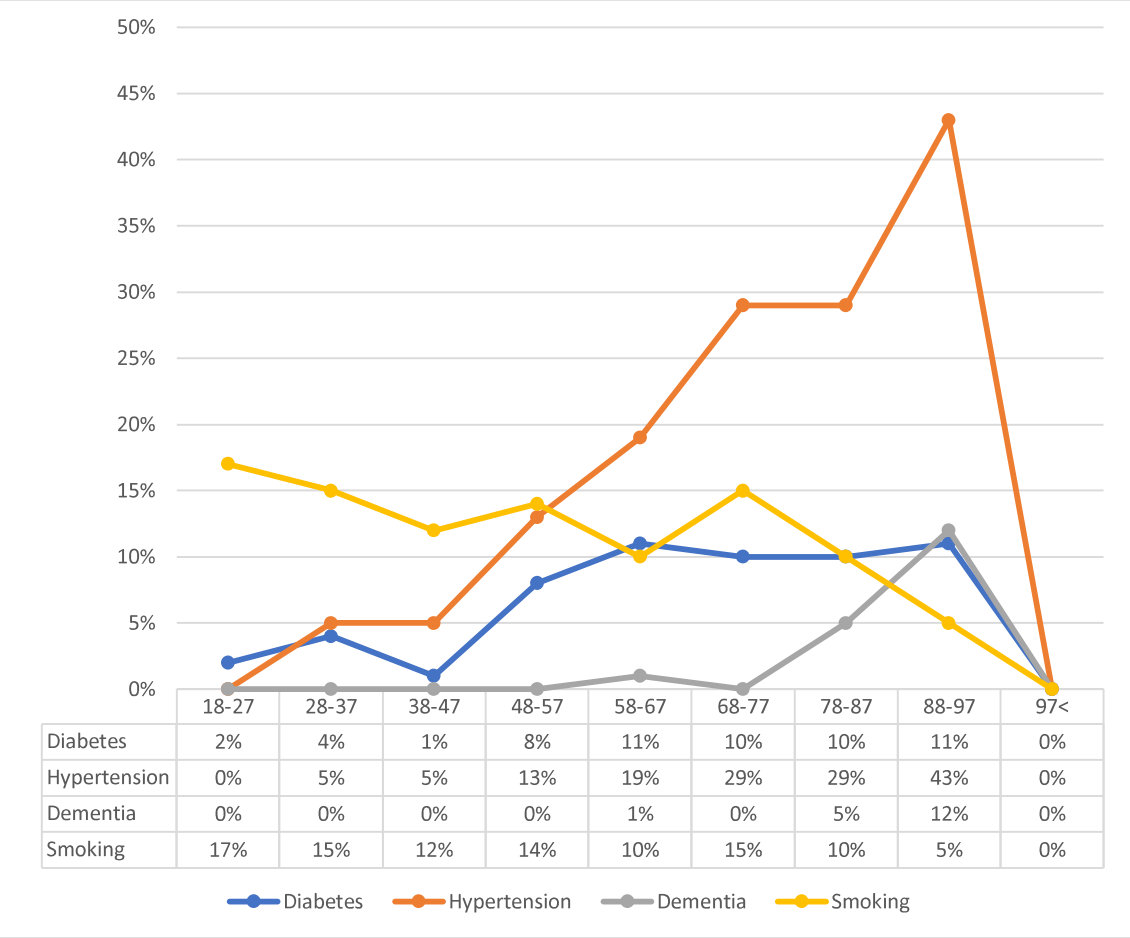


Chart 4: Physical Health and Smoking in Veteran and Non-Veterans by Gender

Age

In veterans, hypertension was most prevalent in the 88 to 96 age group (43.4%, N=105), followed by the 78 to 87 age group (29.4%, N=145). Differences across age groups and hypertension were significant $X^2(8,N=2729)=228.8$, $p< .01$). Type 2 diabetes was most prevalent in the 58 to 67 (10.7%, N=59) and 88 to 96 (10.7%, N=26) age groups. Differences across age groups and type 2 diabetes were significant $X^2(8,N=2729)=38.01$, $p<.01$). Dementia was most prevalent in the 88 to 96 age group (12%, N=29) with differences across age groups being significant $X^2(8,N=2729) =161.6$, $p< .01$). Smoking was most prevalent in the 18 to 27 age group (17%, N=8). Differences across age groups and smoking was significant $X^2(8,N=2729)=22.3$, $p< .01$). See Chart 5.



	18-27	28-37	38-47	48-57	58-67	68-77	78-87	88-97	97<
Diabetes	2%	4%	1%	8%	11%	10%	10%	11%	0%
Hypertension	0%	5%	5%	13%	19%	29%	29%	43%	0%
Dementia	0%	0%	0%	0%	1%	0%	5%	12%	0%
Smoking	17%	15%	12%	14%	10%	15%	10%	5%	0%

Chart 5: Percentage of Physical Health Disorder in Veterans by Age Groups

Smoking, Hypertension and Type 2 Diabetes

There were significant differences between veterans and non-veterans who were coded for both smoking and hypertension (F(1,5458)=5.490, $p<.05$), with non-veterans at 12.1% (N=231) and veterans at 9.5% (N=268). Also, non-veterans (14.3%, N=264) were more likely than veterans (10.2%, N=299) to be coded for both smoking and type 2 diabetes but this difference was not significant (F(1,5458)=.4.082, $p=.084$). Table 2.

Smoking & Hypertension								
Veteran or Non-Veteran			Hypertension				Total	
			No		Yes			
			N	%	N	%	N	%
Veteran	Smoker	No	1891	87.6%	516	90.5%	2407	88.2%
		Yes	268	12.4%	54	9.5%	322	11.8%
	Total		2159	100.0%	570	100.0%	2729	100.0%
Non-Veteran	Smoker	No	2018	89.7%	422	87.9%	2440	89.4%
		Yes	231	10.3%	58	12.1%	289	10.6%
	Total		2249	100.0%	480	100.0%	2729	100.0%
Smoking & Type 2 Diabetes								
Veteran or Non-Veteran			Diabetes				Total	
			No		Yes			
			N	%	N	%	N	%
Veteran	Smoker	No	2204	88.1%	203	89.8%	2407	88.2%
		Yes	299	11.9%	23	10.2%	322	11.8%
	Total		2503	100.0%	226	100.0%	2729	100.0%
Non-Veteran	Smoker	No	2291	89.7%	149	85.6%	2440	89.4%
		Yes	264	10.3%	25	14.3%	289	10.6%
	Total		2555	100.0%	174	100.0%	2729	100.0%

Table 2: Smoking Association with Hypertension and Diabetes in Veterans and Non-Veterans

MENTAL HEALTH

Morbidity Rates

There were 35.5% (N=971) of veterans with a code on their medical record for depression, anxiety, alcohol misuse, PTSD, substance misuse, or self-harm compared with 33.3% (N=909) of non-veterans. Furthermore, there was some comorbidity noted in veterans (ie having more than one disorder).

Nineteen percent of male veterans (N=450) and 30% of female veterans (N=112) had a code on their medical record for a common MH disorder (anxiety and depression), compared to 20% (N=475) of non-veteran males and 35% (N=131) non-veteran females. The relationship between gender and presence of a mental disorder in veterans was found to be significant (X^2 (1, N=2729) = 24.5, p< .05) suggesting that female veterans have a higher prevalence of mental disorders than their male counterparts.

In veterans, rates of depression were 14.9% (N=407) compared to 17.1% (N=467) in non-veterans; anxiety 12.8% (N=349) in veterans compared to 11.9% (N=325); alcohol misuse 12.3% (N=337) in veterans compared to 10.9% (N=297); PTSD 2.9% (N=78) in veterans compared to 0.8% (N=23); self-harm 1.1% (N=31) in veterans compared to 1% (N=27); and substance misuse 0.5% (N=14) in veterans compared to 0.4% (N=10). Veterans were significantly more likely to have PTSD and less likely to have depression. See Chart 6.

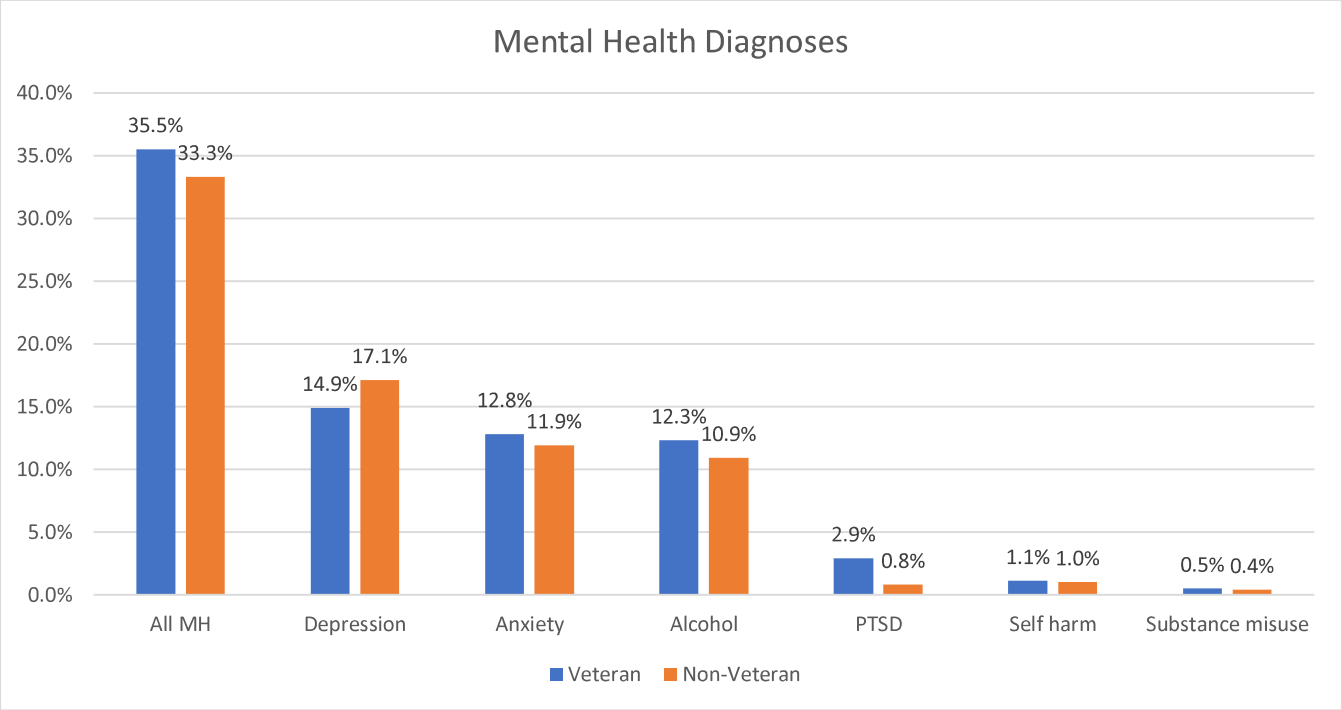


Chart 6: Percentage of Each Disorder Present within the Veteran Population

In the veteran group, 2.5% (N=67) were coded as having problems associated with alcohol misuse such as dependence or physical issues including alcoholic cirrhosis of the liver compared with 1.4% (N=38) in the non-veteran group. The difference is statistically significant X^2 (1, N=5484) = 8 p=0.004.

Gender

The rates of depression in male veterans was 13.9% (N=329) compared to male non-veterans at 15.6% (N=367). The rates of anxiety amongst male veterans and male non-veterans were comparable, with 11.4% (N=270) of male veterans having a diagnosis compared with 10.6% (N=250) of non-veterans. The rates of depression in female veterans was 21.1% (N=78) compared to female non-veterans at 27% (N=100). The rates of anxiety between female veterans 21.4% (N=79) and female non-veterans (20.3% (N=75) were also similar. Both veteran and non-veteran females therefore had a higher prevalence than male veterans for both anxiety and depression. The relationship between anxiety and gender in veterans was found to be significant (X^2 (1, N=2729) = 28.1, $p< .01$), as was the relationship between depression and gender in veterans (X^2 (1, N=2729) = 12.8, $p< .01$).

Alcohol misuse was similar between veterans and non-veterans and also genders. PTSD was diagnosed in 2.9% (N=68) of male veterans compared with 0.8% (N=18) of male non-veterans. The difference was statistically significant X^2 (1, N=4718) = 29.6 p<0.001. Intentional self-harm was noted in 1.2% (N=29) of male veterans compared with 1.1% (N=25) of male non-veterans. The female numbers were low with N=2 in both veteran and non-veteran samples, making any comparison unreliable. A similar pattern was seen in diagnosed substance misuse with male veterans at 0.5% (N=13) compared with 0.3% (N=8) of male non-veterans and again female numbers were too low to compare. See Chart 7.

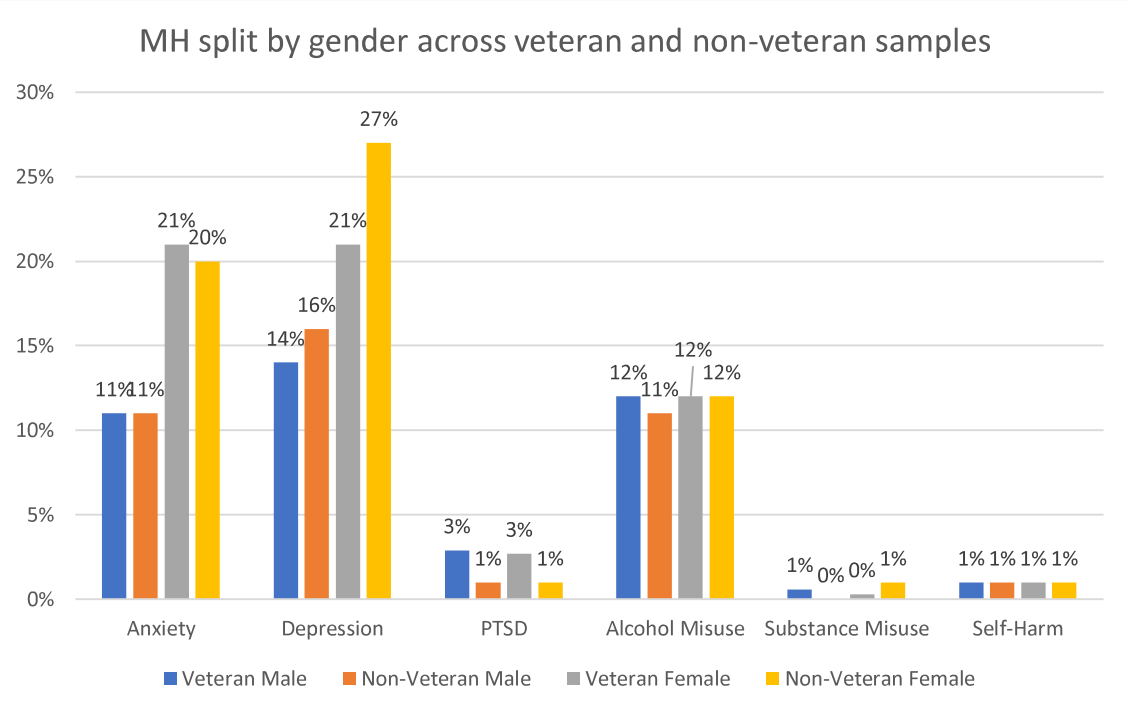


Chart 7: Mental Health Split by Gender

Age

The age group with the highest percentage of MH disorders was the 18 to 27 group (34%, N=16), followed relatively closely by the 28 to 37 group (29.5%, N=215), and continued to decrease throughout the older age groups. The differences between the age groups on having a MH diagnosis present was found to be significant (X^2 (8, N=2729) =62.6, p< .01). See Chart 8.

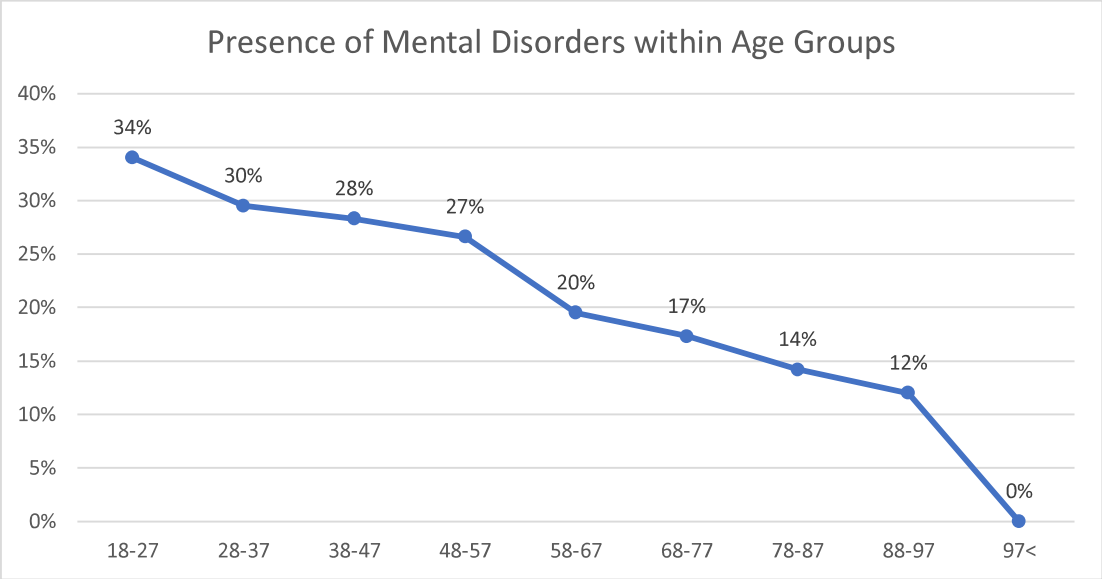
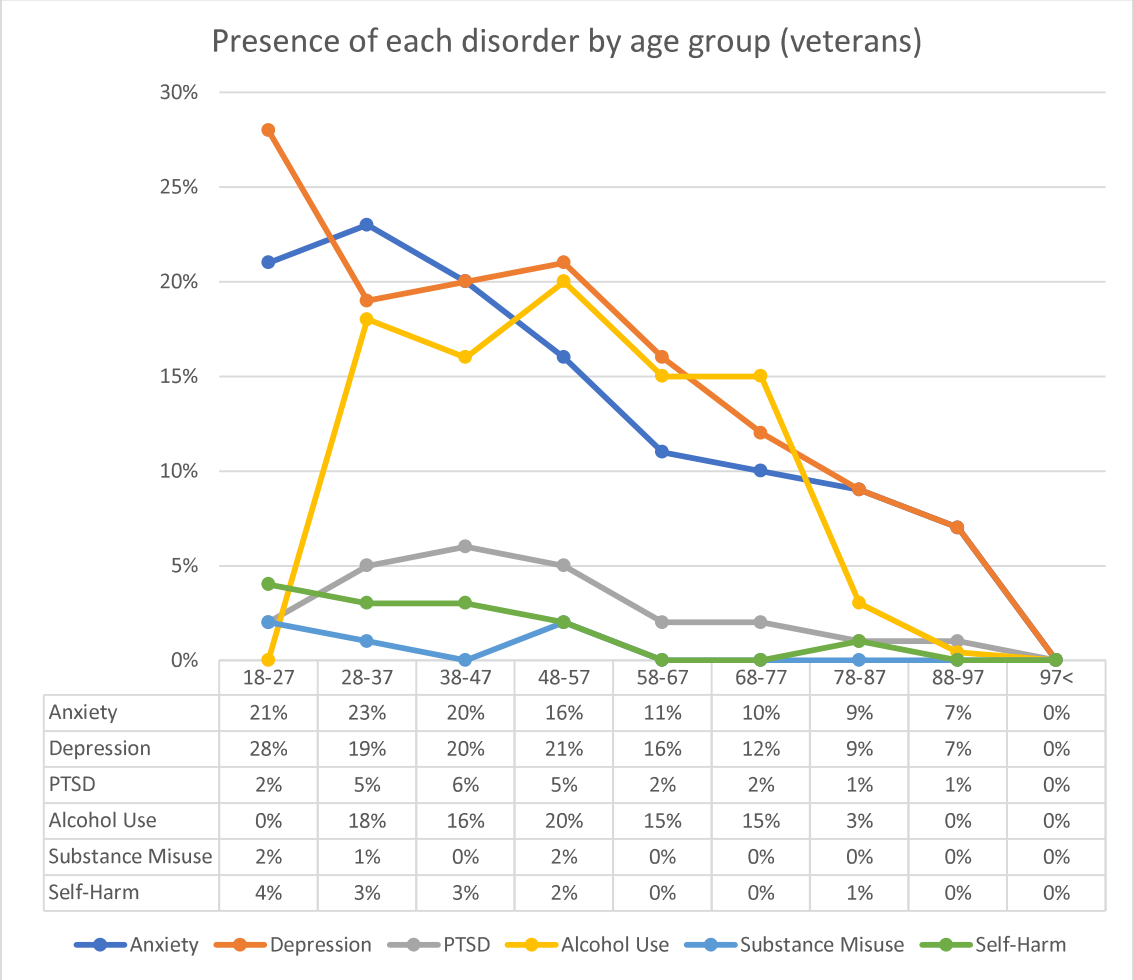


Chart 8: Percentage of Each Age Group with a Mental Disorder Code

The results indicated the presence of each disorder within the different age groups. In veterans at 22.8% (N=44) and non-veterans 21.8% (N=42), anxiety was most prevalent among the 28 to 37 age group. The differences in anxiety prevalence between veterans and non-veterans were not statistically significant in any of the age groups. Within the veteran group alone, the differences in anxiety prevalence between the age groups was significant (X^2(8,N=2729)=54.6, p<.01). Depression was highest amongst the 18 to 27 age group (27.7%, N=13). However, the second highest prevalence was within the 48 to 57 group (20.7% N=101) and 38 to 47 group (20.4%, N=55). These differences were also found to be significant (X^2 (8, N=2729) = 58.3, p< .01).

For PTSD, the highest prevalence in veterans was amongst the 38 to 47 age group (5.9%, N=16), closely followed by those 28 to 37 years old (5.2%, N=10), with significant differences between the groups (X^2 (8, N=2729) = 34.7, p< .01). Alcohol misuse was highest in the 48 to 57 years old age group at 19.7% (N=96). Alcohol dependency, though at lower prevalence than for alcohol misuse, had the highest prevalence amongst the 38 to 47 age group (5.6%, N=15), then 48 to 57 age group (5%, N=25); these differences were also significant (X^2(8, N=2729)=44.8, p< .01). For substance misuse, the highest prevalence was amongst the 18 to 27 age group (2.1%, N=1), closely followed by the 48 to 57 age group (1.8%, N=8). These

differences were significant (X^2 (8,N=2449)=19.4, p>.05). Self-harm was most prevalent in the 18 to 27 age group (4%, N=2), followed by 28 to 37 age group (2.6%, N=5) and the 38 to 47 age group (2.6%, N=7), illustrating greater prevalence of self-harm risk in younger veterans. Differences in self-harm across age groups were significant (X^2 (8, N=2729) = 28.7, p< .01). See Chart 9.



	18-27	28-37	38-47	48-57	58-67	68-77	78-87	88-97	97<
Anxiety	21%	23%	20%	16%	11%	10%	9%	7%	0%
Depression	28%	19%	20%	21%	16%	12%	9%	7%	0%
PTSD	2%	5%	6%	5%	2%	2%	1%	1%	0%
Alcohol Use	0%	18%	16%	20%	15%	15%	3%	0%	0%
Substance Misuse	2%	1%	0%	2%	0%	0%	0%	0%	0%
Self-Harm	4%	3%	3%	2%	0%	0%	1%	0%	0%

Chart 9: Percentage of Each Mental Health Disorder Present Split by Age Group

Discussion

There were 5,458 electronic records examined in this comparison study, with 2,729 veterans and 2,729 demographically matched for age and gender non-veterans. There were 86.4% men and 13.6% women, which match the England and Wales veteran gender percentages presented in the Census of 2021. The mean age was 63.8 years with a range of 18 years to 100 years. The median age was 64, the mode 84 years and the standard deviation was 17.7. The Census 2021 does not include a mean age for veterans, but as the gender status is the same, that provides substance to affirm this age should be correct. However, there is the potential that many elderly ex-services patients were not registered with their PHC practice. Reasons for this include veterans being unaware of the one-day inclusion criteria and therefore unaware of their veteran status and never declaring as such. This could extend to the more vulnerable members of the population in care and residential homes, or with dementia, who may be reliant on others to communicate with PHC.

Of the 434 patients where marital status was included, there were 72% married which was higher than the 57% recorded for veterans in the Census 2021. This was followed by single at 16% which was similar to the Census 2021 figure of 15%. Ninety eight percent of veterans were recorded as White British, which is higher than the Census 2021 which recorded those who had previously served in the British Armed Forces at 96.4%. This difference is also higher to regional ethnicity composition, for example Cheshire West and Chester (which provided GP data for this study) recorded 92% of veterans who classed themselves as White British. It may be that ethnic minority ex-services patients were not recorded as a veteran.

Comparisons between Veterans and Non-Veterans

Of the medical diagnoses examined in this study, more veterans at 54.2% than non-veterans 50.7% had one of the listed conditions of depression, anxiety, alcohol misuse, substance misuse, self-harm, PTSD, dementia, type 2 diabetes, and hypertension noted in their medical records. The difference was statistically significant. There were 35.6% of veterans who had a code on their medical record for PTSD, depression, anxiety, alcohol misuse, substance misuse, or self harm. Furthermore, there was some co-morbidity with veterans having more than one disorder. The highest prevalence was depression 14.9%, followed by anxiety 12.8% and alcohol misuse 12.3%. PTSD remained relatively low at 2.9%. This compared with 33.3% (N=909) of non-veterans.

Looking at gender differences, 19% of male veterans and 30% of female veterans had a code on their record for a common MH disorder (depression and anxiety), compared to 20% (N=475) of non-veteran males and 35% (N=131) non-veteran females. The relationship between gender and presence of a MH disorder in veterans was found to be significant, suggesting that female veterans have a higher prevalence of MH disorders than their male counterparts as is consistent with the general population (Boyd et al, 2015). In comparison with the original prevalence paper (Finnegan & Randles, 2023b), the percentage of veterans with common MH problems

has fallen. This may be accounted for by more "healthy" veterans notifying PHC practices of their veteran status rather than seeking MH support or more accurate record keeping.

PHYSICAL HEALTH

Hypertension

It was estimated that 11.8 million adults aged 16 years or older in England had hypertension, which is mainly detected and managed in general practice (NHSE, 2024b). Primary hypertension occurs in about 90% of these people and has no identifiable cause, leaving about 10% of people with an underlying cause, such as renal, endocrine, or vascular disorder. Generally, there are no symptoms, but early diagnosis and effective management can curtail the long-term effects of hypertension including the most common risk factor of cardiovascular disease (Yamada et al, 2023). The prevalence of hypertension increases with age, and is more common in deprived areas (NHSE, 2024b).

The National Institute for Health and Care Excellence (NICE) (2023) hypertension guidelines has diagnosis aligned to a clinic recorded blood pressure (BP) of 140/90mmHg or higher, and either a subsequent ambulatory BP monitoring daytime average or home BP monitoring average of 135/85mmHg or higher. Other organisations have different thresholds such as the American College of Cardiology/American Heart Association of at least 130/80mmHg (Reboussin, 2018) and US primary care ≥130 mmHg or DBP ≥90 mmHg (US Department of Veterans Affairs, 2020). However, lowering the BP diagnostic and treatment cut-offs significantly increase the burden on healthcare systems (Yamada et al, 2023) and may in part explain why our partnering Cheshire practices use 150/90mmHg. This clearly impacts on reporting incidence levels.

USA research reveals combat exposure and/or combat injury may increase the risk of hypertension through changes in inflammatory responses, psychological stress, and health behaviours (Egan, 2020). Howard et al's (2020) analysis of the Department of Defence Trauma Registry data indicated that PTSD, being overweight and obesity were associated with higher odds of hypertension, and reaffirmed that combat exposure and/or combat injury exacerbates increased hypertension risk. In our study, rates of hypertension were 20.9% in veterans compared to 17.6% in non-veterans. This was statistically significant; equating to 480,700 veterans with hypertension. Male veterans at 21.1% were higher when compared with 18% of male non-veterans; and female veterans were 19.5% compared with 15.1% of female non-veterans. As expected, percentages rose incrementally with age.

Military Lifestyle

Veterans are at high risk for uncontrolled BP and its complications (Yamada et al, 2023), and there is a complex interplay of certain comorbid conditions such as type 2 diabetes mellitus that suggest the need for multifaceted interventions to prevent cardiovascular events (Acharya et al, 2024). Military personnel experience significant occupational demands of high physical

exercise regimens, often supplemented with heavy manual work for the combat and front-line career employment groups. To maintain this level of physical endeavour service-personnel habitually have a high calorific intake, but without fear of being overweight. That level of fitness is maintained and monitored with annual mandatory personal fitness tests, which when failed results in remedial training. However, on leaving the armed forces, for many the physically demanding regime disintegrates, yet their calorific consumption may remain the same whilst they may progress into more sedentary employment. Combined with getting older, weight gain is inevitable unless preventative measures are introduced. Statutory and non-statutory initiatives can tailor a specific course of interventions to healthy lifestyles. A proactive measure is to provide veterans with gym passes and/or connection to health promotion activities with iconic organisations such as professional sports clubs (Hunt et al, 2014). As 150,000 veterans access over 500 Armed Forces Breakfast Clubs, then aligned public health notices or initiatives could help. Unfortunately, poor diet is associated with poor finances, and working age veterans need an adequate level of paid employment.

Type 2 Diabetes

QOF (2024) data indicates that 7.5% of adults were recorded as having type 2 diabetes and the percentage was higher in deprived areas (Office for Health Improvements and Disparities, 2024). In this study, rates of type 2 diabetes were 8.3% in veterans compared to 6.4% in non-veterans, with the difference being statistically significant. This equates to 190,900 UK veterans with type 2 diabetes. Amongst male veterans, 8.6% were diagnosed with type 2 diabetes compared with 6.5% of male non-veterans which was again statistically significant.

Prevalence of doctor-diagnosed type 2 diabetes increased with age, from 1% of adults aged under 35 to 16% of those aged 75 and over (NHSE, 2024b). In our study, type 2 diabetes was most prevalent in the 58 to 67 and 88 to 96 year old veterans at 10.7% in each. Type 2 diabetes in military veterans was higher in all age groups except for the 38 to 47 age group, and notably higher from the age of 48 years onwards.

A retrospective cohort study of a large sample in Scotland of veterans and non-veterans (matched for age, gender and area of residence) involved up to 37 years follow-up. The results indicated that 7.2% of veterans were diagnosed with type 2 diabetes and were at slightly increased risk compared with 6.4% of non-veterans. The increased risk was confined to men, and to veterans born prior to 1960. There was a positive association between type 2 diabetes and PTSD, especially in the presence of comorbid mood disorder (Bergman et al, 2022a).

Stefanovics et al (2020) researched a nationally representative sample of U.S. veterans to assess PTSD and obesity prevalence, co-occurrence, and relationships with mental and physical health measures. A total of 16.4% of veterans screened positive for current PTSD, 32.7% for obesity, and 5.8% for co-occurring PTSD and obesity. Relative to obesity-only veterans, veterans with co-occurring PTSD and obesity had elevated likelihoods of mental and physical health concerns (most notably major depressive and generalized anxiety disorders), suicidality, and migraine headaches, and higher body mass indices. Relative to veterans with PTSD alone, individuals with comorbid PTSD and obesity had elevated likelihood of suicidal ideation, nicotine dependence, MH treatment, migraine headaches, type 2 diabetes, hypertension, and insomnia.

Dementia

In the UK, there are an estimated 1 in 11 people over the age of 65 years who have dementia, which is the leading cause of death with a population estimate of 7.1% (NHS, 2024a). USA research highlighted an increased prevalence of dementia in veterans, particularly when associated with PTSD (Qureshi et al, 2010), whilst Scottish research indicated that rates in the veteran population were no higher than non-veterans (Bergman et al, 2021). Our study identified 2.1% of veterans recorded as having dementia compared to 2.5% of non-veterans; equating to 48,300 UK veterans living with dementia. As expected, dementia was most prevalent in the 88 to 97 years old group and above at 11%; however, given that the Census 2021 indicated that nearly a third of veterans (31.8%) were aged 80 years or older (ONS, 2022) this figure remains lower than the Centre expected to find.

Chung et al (2023) conducted a UK longitudinal cohort analysis of linked electronic health records from 4.3 million people regarding dementia incidence, comorbidities, reasons for health-care visits, mortality, causes of death, and examined dementia patterns by relative deprivation in the UK. Reasons for hospitalization and causes of death were compared in individuals with and without dementia. From 1998 to 2016, 145,319 (3.1%) of individuals were observed with incident dementia. Repeated hospitalizations among senior adults for infection, unknown morbidity, and multiple PHC visits for chronic pain were observed prior to dementia diagnosis, and multiple long-term conditions were present in half of the individuals at the time of diagnosis. Individuals living in high deprivation areas had higher dementia incidence and high fatality. They concluded that there was considerable disparity of dementia that informs priorities of prevention and provision of patient care.

There are multiple reasons why elderly veterans PHC e-medical records were not correctly coded. These include veterans being unaware of the one-day inclusion criteria and therefore ignorant of their veteran status and never declaring as such. This study's PHC staff suggested that dementia diagnosis is often only confirmed after a long and insidious presentation, frequently with family and other support being in place. Large numbers of vulnerable veterans may be residing in care/residential homes, and they may be reliant on others for communication with PHC. This has important ramifications for non-statutory and third sector organisations who have considerable resources to assist all of the armed forces community. The Centre have previously highlighted that women on average live to an older age than men (UK - 83 compared to 79 years), and veterans' spouses may be socially isolated with financial difficulties (Finnegan and Randles, 2023b).

Smoking

Rates of smoking tobacco were higher in veterans (11.8%) than non-veterans (10.6%), being more so in males, and most prevalent in the 18 to 27 age group at 17%. This equates to 271,400 veterans who smoke tobacco. In smokers, the results indicated that the association with diabetes and hypertension were higher in non-veterans although the numbers were low. Smoking tobacco carries a high public health risk (Bergman et al, 2022a) and often commences or is maintained whilst serving in the armed forces, and efforts should be continued to address and offer early support.

MENTAL HEALTH

Depression

In 2022/23, 13% of adults in England had a diagnosis of depression on their PHC medical record (Office for Health Improvements and Disparities, 2024). This study revealed 14.9% (N=407) of veterans diagnosed with depression, which was significantly fewer than non-veterans (17.1%, N=467). This would equate to 342,700 UK veterans having depression. Our higher rates may result from a more liberal interpretation by PHC staff of the data which often includes depression recorded with anxiety. However, there was consistency of coding across both veterans and non-veterans.

Causative Factors

Depression is associated with major life events and predominately caused by multi-factorial reasons. Stressors include social isolation or lack of support (Leslie et al, 2020); financial hardship related to poverty, unemployment, (Lund et al., 2010), family breakdown and relationship problems (Finnegan et al., 2014; Royal British Legion, 2014). With women there can be depression during and after pregnancy (Ayers & Shakespeare, 2015) and stressors associated with the menopause (Alblooshi et al, 2023). Additionally, lifestyle factors unique to military life and deployments including exposure to military traumatic events can be stressors (Finnegan et al., 2014). On leaving the armed forces, some find the initial transition difficult, and MH problems were noted in those misusing alcohol, homeless and unemployed (Murphy et al., 2016).

Gender and Age

Depression diagnosis is twice as common in females (Mental Health Foundation, 2016; WHO, 2018), and more common in female soldiers than male (Finnegan, 2011). In this study, 13.9% (N=329) of male veterans diagnosed with depression compared to 15.6% (N=367) male non-veterans; and 21.1% (N=78) of female veterans compared to 27% (100) of female non-veterans. Neither result reached statistical significance.

Depression affects all age groups, and in this study the highest levels of veterans diagnosed with depression were within the 18 to 57 age groups. The mode being 18 to 27 at 27%. This mirrors the national English statistics from 2022, where the prevalence of depressive symptoms was highest among those aged 16 to 29 years old (28%) (Baker & Kirk-Wade, 2024). Whilst depression is a common MH problem for older people, with a late-onset presentation typically occurring around 65 years old impairing their quality of life (Mental Health Foundation, 2016). In this study, levels of depression (and anxiety) reduced notably as the veteran got older. This group may be retired, and for those veterans who served a full career then the military pension is competitive. That extra financial allocation may act as a protective factor.

Depression in PHC

NICE guidelines are available to help GPs assess, treat and manage depressed patients and include an overview of somatic presentations, advice on screening and comorbid conditions (NICE 2013, 2022), and GPs receive a financial incentive for screening depression (DoH, 2014). In the UK armed forces, Rona et al's (2004) PHC study concluded that the validity of a prospective screening programme based on military PHC doctors is unsatisfactory, which may be due to soldiers' narratives, and when faced with a GP may over or under report their symptoms. This behaviour may have transferred to NHS practices where there is less time available with a GP. The under recognition of depression in PHC has indicated that only 47% of cases were correctly identified (Mitchell et al., 2009), with GPs only documenting their findings in 34% of cases (Mitchell et al., 2009). Stigma may play a part in accessing services (Randles & Finnegan, 2022), and in the fearless world that is associated with veterans, this may play a part in why veterans were significantly less likely to be diagnosed with depression in this study.

Anxiety

Generalised anxiety disorder (GAD) is a MH disorder characterized by excessive anxiety and worries that impair daily functioning. In 2021, younger people were more likely to have some form of anxiety with those aged 16 to 29 years most likely at 28%. This decreased steadily through the age groups, and the least likely group was those aged 70 and over (5% likely) (Mental Health Foundation, 2024). While prior work has documented the prevalence and correlates of GAD and subthreshold GAD (SGAD) in clinical samples, data on the epidemiology of anxiety symptoms are lacking, particularly in higher-risk populations such as military veterans (Macdonald-Gagnon et al., 2024).

Macdonald-Gagnon et al (2024) evaluated data from a large, nationally representative sample of U.S. veterans to examine the prevalence of probable GAD and mild anxiety symptoms. Their measurements included a brief screener; sociodemographic and military characteristics associated with anxiety symptoms; and psychiatric and functional correlates of anxiety symptoms. Results revealed that a total of 7.9% (95% confidence interval [CI] = 6.7-9.3%) and 22.1% (95% CI = 20.5-23.9%) of veterans screened positive for probable GAD and mild anxiety symptoms, respectively. Relative to veterans without anxiety symptoms, those with probable GAD and mild anxiety symptoms were younger, more likely to be female and racial/ethnic minorities, and more likely to have served 2+ deployments. Further, a "dose-response" association was observed between anxiety symptom severity and clinical correlates, with robust associations observed between probable GAD and poorer MH, suicidal thoughts and behaviours, and functional impairment. Their results suggested that 3-of-10 U.S. veterans report anxiety symptoms.

In this FiMT comparison study, 12.8% (N=349) of veterans were diagnosed with anxiety compared with 11.9% (N=325) of non-veterans. The difference was not statistically significant. This would equate to 294,400 UK veterans having anxiety. The rates of anxiety amongst male veterans (11.4%) and male non-veterans (10.6%) were comparable. Rates of anxiety in women were higher, but were again similar, being 21.4% (N=79) in veterans and 20.3% (N=75) in

non-veterans. In 2022/23, an average of 37.1% of women and 29.9% of men reported high levels of anxiety compared to data drawn from 2012 to 2015, and this has increased significantly from 21.8% of women and 18.3% of men reporting high levels of anxiety (Mental Health Foundation, 2024). In our comparison, veterans had higher rates of anxiety than non-veterans within all age groups except for 48 to 57 and 68 to 77 year olds. Notable higher rates for veterans were in the 18 to 27 year old age group where the study revealed that anxiety accounted for 21% of cases, although the numbers are small (Veterans N=10; non-veterans N=7). By their very essence, this age group will include young service leavers, but as the last major deployments were over 10 years ago then their anxiety may be due to their current living situations and potentially not related to their military service. However, anxiety was highest in the 28 to 37 years old (23%) and also high in those aged 38 to 47 (20%). A possible reason is that veterans who served longer may have had greater difficulties in transitioning from the armed forces in relation to accommodation, finance, housing and employment. There may have been adjustment issues for their spouse and children including schooling, but the coding of the veterans' medical records did not capture this information. Anxiety declined in older age groups, and the differences between veterans and non-veterans were not statistically significant in any of the age groups.

A UK military MH programme identified anxiety as a commonly reported condition, featuring in 53% (N=267) of self-reported cases in the Armed Forces Covenant Fund Trust's *One Is Too Many* programme, where 79% (N=396) also reported feeling anxious as a symptom on entering the programme (Finnegan et al, 2024). The programme was based on the premise that if veterans and their families were provided with appropriate interventions, within an environment that values leadership and tackles stigma, then stress can be effectively managed. The evaluation included psychometric questionnaires that indicated significant declining levels of depression and anxiety, and improvements in wellbeing (Finnegan et al., 2021; Finnegan et al., 2023; Finnegan et al., 2024).

Alcohol Misuse

Alcohol consumption is viewed as part of military culture and seen as a way to bond a military unit together (Kiernan et al., 2016). For armed forces personnel and veterans, alcohol misuse is identified as a coping mechanism for those suffering from MH disorders (Finnegan et al., 2014, 2024); in particularly those diagnosed with PTSD (Goodwin et al., 2015). Veterans may fail to acknowledge that they have a problem and not access support until they are older and admitted to a hospital due to alcohol related medical complications (Kiernan et al., 2016; Murphy et al., 2016).

Thompson et al (2017) investigated the incidence and annual presentation rates of alcohol dependence in UK PHCs for each year between 1990 and 2013. The directly standardized annual incidence rates were 8.3 and 3.7 per 10,000 male and female patients. The estimated annual rates of presentation per 10,000 were 17.1 for males and 7.6 for females. For both measures and across genders, the highest rates were in those aged 35 to 54 years old. Lowest rates were in those aged over 75 years. Northern Ireland and Scotland had significantly higher rates across both genders, and patients from the most deprived areas had the highest incidence

and annual presentation rates. Non-officer veterans were historically recruited from low socio-economic groups (Parliament.UK, 2005) and may return to these areas after leaving the armed forces. This has important indicators for informing future public health initiatives.

In our study, 12% of veterans were recorded as having moderate to high alcohol consumption compared to 10.9% of non-veterans. This was not statistically significant and would equate to 276,000 veterans with moderate to high alcohol consumption. There were marginal gender differences, with male veterans at 12.4% compared to 10.7% of non-veterans, and female veterans at 12.2% compared with 11.9%. Highest rates for veterans were in the 48 to 57 age group at almost 20% compared to 18% in non-veterans. The levels of alcohol misuse found in this study were less than those often associated with the military, and with the initial prevalence study finding a rate of 17% (Finnegan et al., 2023), it may be that the number of available SNOMED codes are affecting the consistency of coding.

Veterans may be consuming more than the recommended weekly average; but they are functioning very well, have no concerns about their behaviour, and are therefore not raising it as an issue with their GP. Many of these veterans would perceive the low rates of UK acceptable alcohol drinking at an upper limit of 14 units per week (NHS, 2024b) as nonsense. In this study, none of the 18 to 27 year old group were coded with alcohol misuse although these young people often consume the highest levels of alcohol. Others decline to inform their GP of high levels of alcohol consumption, as they perceive that the classification of alcohol misuse would lead to challenges such as increased travel insurance. These factors impact on the validity of our study's alcohol results.

The Annual Psychiatric Morbidity Study indicates that 6.6% of adults in England report drinking to hazardous levels, while 1.2% report levels which indicate probable alcohol dependence (Drummond et al., 2016). The UK Health Security Agency (2020) state the rate of possible alcohol dependence is 1.4% in the general population. In our veteran group, 2.5% were coded with alcohol dependence or alcohol related physical issues such as alcoholic cirrhosis of the liver compared with 1.4% in the non-veteran group. The difference is statistically significant. Male veterans were 2.6% compared to 1.4% of non-veterans; and female veterans were 1.4% compared to 1.3% of female non-veterans, although these are based on very small numbers.

PTSD

The prevalence of probable PTSD in serving personnel has been reported to be 7% and in veterans 11% (Sharp et al, 2024). In this study, PHC PTSD levels for veterans was 2.9% which was significantly higher than the non-veteran comparison group of 0.8%. There is the potential that these results include patients who have received successful treatment, but unless the date of the last positive assessment or treatment is recorded then the diagnosis may remain in the patient's medical record despite being concluded. Ideally, inclusion criteria such as a positive assessment and affirmation of the condition being resolved would help rectify this issue.

Research indicates that PTSD was more likely to be prevalent in lower military ranks, those unmarried, and those with a history of childhood adversity (Iversen et al, 2008; Burdett et al,

2014). Therefore, socio-demographical differences may also contribute to MH difficulties in veterans, with those suffering from PTSD tending to be younger and having lower educational attainment (Iversen et al., 2008).

Many studies show men have higher levels of PTSD but that was not the case in this study although the numbers for female veterans were very low at 10 women. In the UK, veterans who had served in a combat role had PTSD rates of 17% compared to 6% amongst those who had deployed in a service support role and were not front-line troops. This may be attributed to their role in the military and the increased likelihood that they have been in contact (combat) situations (Kings Centre for Military Health Research, 2023). The average age and highest prevalence of those recorded in GPs practices in this study were 38 to 47 years old which include those who had deployed to Afghanistan (2004 to 2014) and Iraq (2001 to 2012).

Substance Misuse

'From Harm to Hope' (Gov UK, 2022) is the UK governments 10-year drugs strategy. This is underpinned by investment of over £3 billion, pledging long-term commitment to reducing drug-related crime, harms, deaths, and use. See Figure 6.

In the UK, in the year ending March 2023, there was an estimated 9.5% of people aged 16 to 59 years (approximately 3.1 million people) reported using an illegal drug in the last 12 months; 7.6% reported using cannabis (around 2.5 million people) and 3.3% reported using a Class A drug (around 1.1 million people). Overall, 2.3% (approximately 777,000) of people were frequent illegal drug users (they had taken a drug more than once a month in the last year (ONS, 2023). Robert et al (2016) provided further data indicating that 3.1% of adults in England show signs of drug dependence, and men (4.3%) are more likely to be dependent on illegal drugs than women (1.9%).

The ONS (2023) reported that the prevalence of drug use was highest in people aged 16 to 24 years old, with 17.6% (around one million people) reporting any illegal drug use, a decrease compared with the year ending March 2020 (21.0%); this was largely a result of falls in cannabis use (from 18.7% to 15.4%) in this age group. The estimates were based on the Crime Survey for England and Wales (ONS, 2023) for the year ending March 2023 and the ONS recommend caution because of the potential impact of lower response rates on data quality.

The military's regular random drug tests are a deterrent to using banned substances, and this may have positively impacted on the temptation to use illegal drugs whilst in the forces, which has then transitioned into veteran behaviour. It could also be due to under-reporting and that veterans are a more elderly population. Substance misuse was most prevalent in the 18 to 27 year old age group, so again the early service leavers. These figures may be even higher in this age group, but there may be a sense of shame from those who were discharged due to substance abuse and therefore they may not want to declare their veteran status. It may also be the case that PHC patients do not want to declare that they are taking illegal drugs.

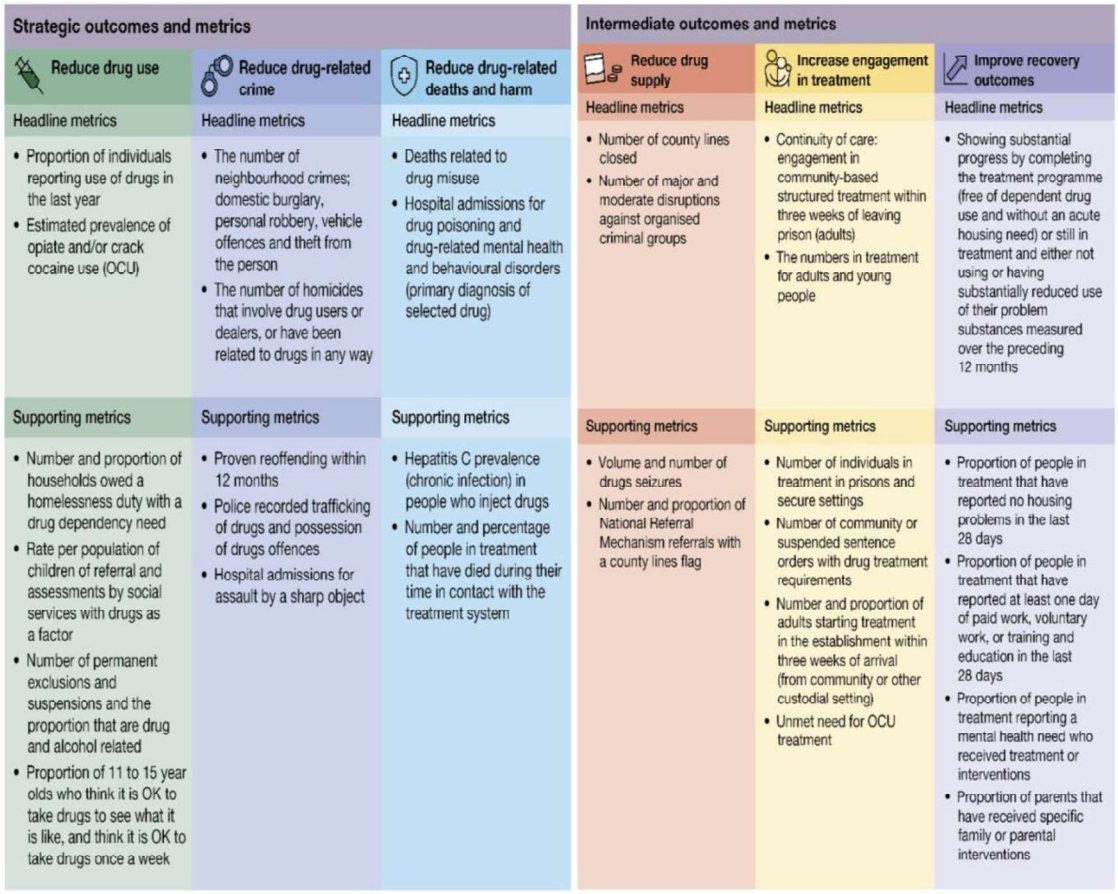


Figure 6: Full National Combatting Drugs Outcomes Framework (His Majesty's Government, 2023)

Self-Harm

McManus et al (2019) revealed the prevalence of service contact for people attending English hospital Accident and Emergency departments for non-suicidal self-harm (NSSH), which between 2000-14 had nearly tripled from 2.4% in 2000 to 7.6% in 2014. Whilst increases in NSSH were noted across both genders and age groups, the most notable increase was in women and girls aged 16 to 24 years. However, where this increase was not reciprocated was in access to health, social or other support services where in 2014 nearly 60% reported no medical or psychological services, most notably in men and those aged 16 to 34 years old. One of the factors cited was that men and the young were self-harming to cope with stressful life incidents (McManus et al., 2019).

An MOD (2019) report indicated that rates of deliberate self-harm (DSH) among UK armed forces personnel remains low at 3.1 per 1,000 personnel (0.3% of all UK military personnel) in 2017/18, rising from a rate of 2.2 per 1,000 in 2010/11. This equates to an increase of 1 person per 1,000 personnel over the eight year period. The risk groups for DSH in the UK armed forces were similar to the general population, where females and younger age groups were found to be at greatest risk of presentation at a hospital with a self-harm episode. It is not known if this is a true rise in DSH or improved reporting. Whilst suicide is infrequent, there appears to be a paucity of research concerning NSSH in the British Armed Forces and the

veteran community. Jones et al (2019) compared lifetime self-harm rates estimates on three occasions between 2004 and 2016 and explored the associates of lifetime self-harm. They found that self-harm increased significantly ($p < .001$) from 1.8% among serving personnel and 3.8% among veterans in 2004/06 to 1.9% and 4.5% in 2007/09 and to 4.2% and 6.6% in 2014/16. Veterans were significantly more likely to report lifetime self-harm than serving personnel. Important determinants of lifetime self-harm included current MH disorder symptoms, stigmatization, poor social support, suicidal ideation, and seeking help from formal medical sources. Other research has highlighted that there may be little gender differences for suicidal ideation in veterans (Bergman et al., 2022b).

Rates of self-harm in this comparison study were low with 1.1% of veterans recorded as having self-harmed compared to 1.0% of non-veterans. No significant differences were observed between genders. There remains the possibility of a failure to inform PHC of self-harm events and those accessing an Accident and Emergency department may not declare an armed forces connection. Overall, the PHC findings from this study should be viewed with some caution, and the requirement may be better reflected in the level of support for self-harming and suicidal intent sought from the support services offered by UK charities such as the Royal Marines Association (Finnegan et al., 2024).

LIMITATIONS

Classification as a UK "veteran" requires an individual to serve for only 1 day in the armed forces, and the results include those unlikely to be affected by their military service. Furthermore, the coding of a disorder can indicate a lifetime prevalence and at times it was difficult to differentiate between enduring or resolved conditions. Therefore, the results could be inflated with people who were successfully treated being categorised as an active case. Multiple SNOMED codes for the same condition impacts on consistency of reporting, and Defence Medical Services (DMS) patient records are not always added to PHC records. The study was in North-West England which included variance across social scales of deprivation, but there may be wider differences for veterans living in other English areas and Celtic countries. In certain groups the sample numbers were small.

CONCLUSION

This comparison study is the first of its kind to present UK veteran and non-veterans morbidity by utilising PHC medical records, and provides information to inform health organisations and other relevant stakeholders to identify gaps in service provision. This should assist in understanding the healthcare needs of the veteran population, and potentially provide better patient-centred care within all healthcare sectors including NHSE's Op COURAGE and RESTORE. The results should also be considered in developing veterans specific educational syllabus, and policy.

Military medical screening would have restricted enlistment with conditions including diabetes, and as the study does not reveal the causes then it is unclear if the medical conditions were aligned to military service. A study that assesses written PHC patient notes would prove enlightening to specifically identify what situational factors are impacting on the veteran population.

The effectiveness of exploiting PHC patient medical records requires increased efforts to improve the four areas that will lead to better quality data, that being better PHC staff knowledge of veterans, consistency in PHC SNOMED coding, better veteran medical e-record registration and coding, with better transmission of data between the DMS and NHS PHC services. The results from a sizable UK population provides information to be considered in developing veterans specific clinical provision, educational syllabus, and policy.

Recommendations

1. The effectiveness of utilising PHC patient medical records requires increased efforts to improve data quality which needs improved PHC staff knowledge, consistency in SNOMED coding, better veteran medical e-record registration and coding, and better transmission of data between the DMS and PHC.

2. Efforts should be prolonged to maintain the momentum of the Royal College of General Practitioners (RCGP) "Veteran Friendly Practice" accreditation programme. This would be enhanced with the support of other clinical professional bodies such as the Royal College of Nursing. In addition, the continued promotion and utilisation of the *Where Are All The Veterans* guidance on how to improve veteran registration in PHC - https://vimeo.com/730934667

3. Primary health care staff are benefitting from a structured armed forces community educational module. The Centre's free online educational videos are available on the NHS Learning Hub and the Centre website - https://www.chester.ac.uk/research/research-and-knowledge-exchange-institutes-rkeis/research-centres/westminster-centre-for-research-in-veterans/introduction-to-the-armed-forces-community/

4. Consideration to extending this comparison study to other parts of England and to Wales, Northern Ireland and Scotland. This can also be expanded to other morbidities such as musculoskeletal conditions. Involve greater numbers of PHCs to identify the clinical morbidity in ethnic minority veterans.

5. In any follow-up comparison studies, measures are required to raise awareness and engagement with elderly veterans and their families to improve PHC coding of their veteran status.

6. Encourage PHCs to improve morbidity diagnostic coding to clearly differentiate between lifetime prevalence and resolved conditions.

7. To address high levels of hypertension, type 2 diabetes and improve MH, then statutory and non-statutory initiatives can tailor interventions for veterans to live healthier lifestyles, and support them by including gym passes and/or connection to health promotion activities with professional sports clubs.

8. Utilise the methodology from this study within the DMS to examine morbidity between serving personnel and non-serving veterans and between service branches. Extend the methodology in PHC to examine partners of serving personnel and/or veterans against a matched non-serving personnel and/or veterans.

9. These results indicate that in MH terms, apart from PTSD, that veterans do not experience higher degrees of MH diagnosis. In terms of depression, veterans were less vulnerable to depression. The narrative should indicate that veterans are not a vulnerable population, and should not be treated as such.

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Acknowledgements

The Centre are grateful to the Forces in Mind Trust for funding this research and for Kirsteen Waller for supporting the Centre during this project. A thank you to all the PHC Centres who participated in this research.

About the Centre

The Westminster Centre for Research in Veterans are part of the University of Chester. Our mission is to support the military community through innovative and high-quality research, educational provision, and community engagement. Our vision is to provide subject matter expertise and a focal point of consultation to our partners within the Northwest of England for the betterment of military veterans and their family's wellbeing. We hope to support a vibrant, inspirational, and innovative learning environment to provide a rewarding academic experience to University of Chester personnel and academic partners; Clinical, welfare and military staff who provide care or services to the military community; local authority partners engaged in the care and support of veterans; as well as the veteran population.

We aim to grow a robust research profile that will have a positive impact on veteran's health and healthcare at regional, national, and international level. This profile will embrace new technologies and creative methodologies to address issues that negatively affect the wellbeing of the military population.

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