



*Suicide in Conscripts*  
*Research from*  
*The Norwegian Armed Forces Health Registry*

Elin Anita Fadum, Ph.D  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology

NORWEGIAN ARMED FORCES

Thank you for having me!

My name is Elin Anita Fadum.

I work as a research coordinator in the Norwegian Armed Forces Health Registry.

And today I am going to present for you some of our published and ongoing work on mental health and suicide in Norwegian conscripts.



Haugaard/Forsvaret

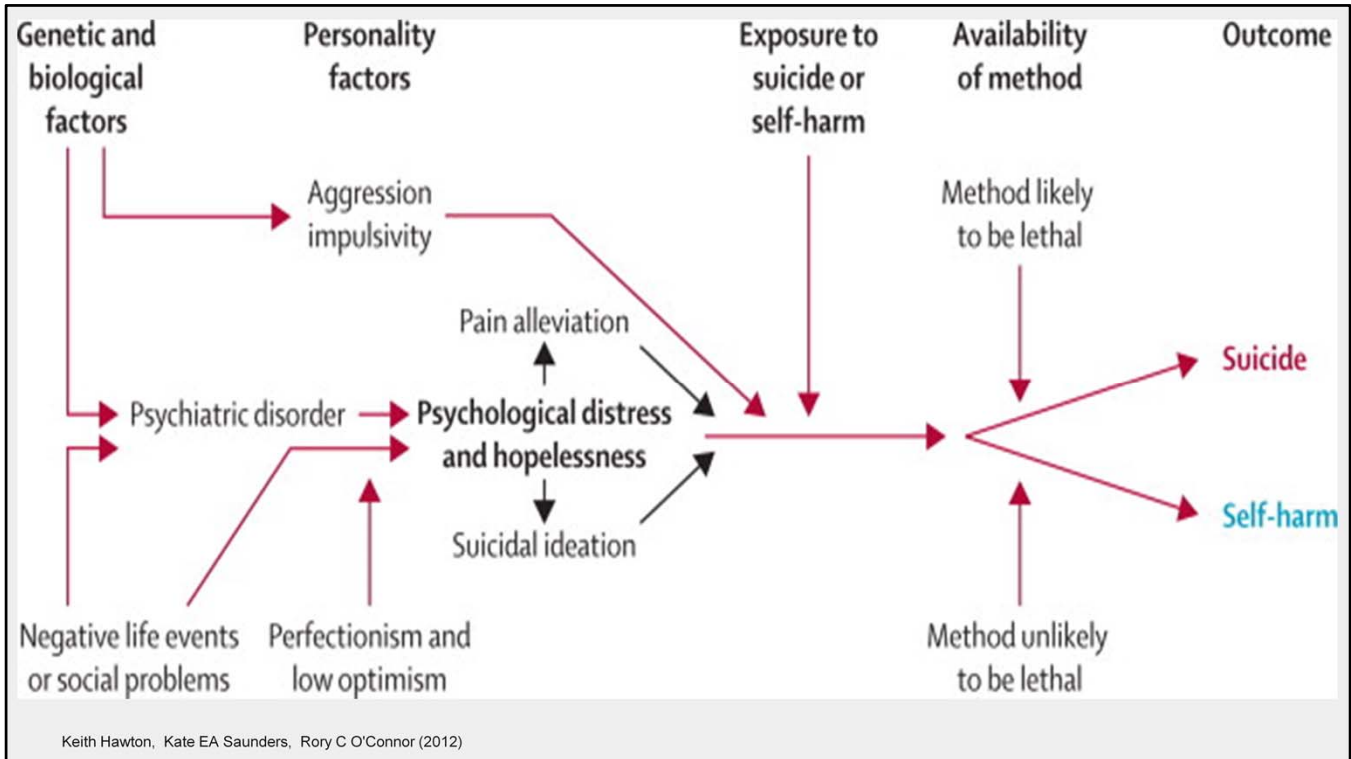
Mathisen/Forsvaret

Bergan/Forsvaret

Karlsen/Forsvaret

In Norway it is optional to do military service, but every Norwegian man and women is obliged to attend military screening.  
 Every year, The Norwegian Conscription Board screen entire birth cohorts.  
 Then about 20000 persons are called for comprehensive pre-military medical examinations.  
 And about 8000 of them carry out military service that usually lasts for about one year.

About 80% of the conscripts report that they enjoy military service. They appreciate cohesion, companionship and they talk about exiting new experiences.  
 But, there is also a proportion who say that they feel bored and they really miss their friends and family back home.  
 Some experience sexual harassment, bullying or social exclusion, and some feel that military service did not turn out they way they expected – it actually became worse.



We know that such feelings of hopelessness or despair may grow into depression or suicidal ideation, and then perhaps self-harm and even suicide.

In young people, there is a potential for social transmission of self-harm behaviour – which is of concern in a military setting where people live so close together.

And last, conscripts have access to weapons we know that availability to highly lethal methods is one of the key-components in the etiology for suicide.

The Norwegian Armed Forces has focused on suicide prevention for decades, strategies include psycho-social and mental health action plans and for example conscripts attend a program where they learn how to intervene if one of their comrades seems depressed or suicidal. But, we also know that risk factors for self-harm and suicide may be linked to someone's personality or to social or mental health problems that may originate in childhood or in early adolescence - prior to military service.

We know that psychiatric disorders are among the most common causes to early drop-out from military service in Norway.

But we do not know if these soldiers became ill during military service because they were exposed to too much stress, or if some people actually had mental conditions when they started military service, it is even possible that they had such issues when they attended screening and pre-military medical examinations.

That is why, we have started to look into the Norwegian Armed Forces health data

on conscripts.



NORWEGIAN ARMED FORCES  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology

## *The Norwegian Armed Forces Health Registry*

- a) monitor the health of all personnel in the Armed Forces
- b) identify potential health risks
- c) research and statistics
- d) contribute to the improvement and development of the military health services

(Ministry of Defense 2005)

By “we” I mean the Norwegian Armed Forces Health Registry.  
which was established in 2005, it is run by the Ministry of Defense

And the purpose of this registry is to

a) monitor the health of personnel in the Armed Forces; to identify potential health risks; do research; provide statistics and thereby contribute to the improvement of the military health services.



NORWEGIAN ARMED FORCES  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology

## *The Norwegian Armed Forces Health Registry*

Includes about 2.7 million people

>90% of the male birth cohorts

Dates back to males born in 1950

Personal identifiable

To date it contains data on about 2.7 million Norwegian residents who were enlisted for military service or currently or previously served or had a career in the Armed Forces.

Because military service used to be a male duty, men are in the majority.

The registry includes 90-95% of the Norwegian male birth-cohorts who were born after 1950.

Hvor mange kvinner?

And: it includes the unique personal identifier that every Norwegian citizen has, so it is possible to link the health and service related information about a person to other data sources and retrieve information about hospitalization, prescribed medications, crime, social benefits, education, emigration, cause and date of death etc.

*J Epidemiol Community Health* doi:10.1136/jech-2016-207656

**Research report**

**Presence of minor and major mental health impairment in adolescence and death from suicide and unintentional injuries/accidents in men: a national longitudinal cohort study**

Elin Anita Fadum<sup>1,2</sup>, Vinjar Fennebo<sup>1,2</sup>, Einar Kristian Borud<sup>1,2</sup>

Author Affiliations  
Correspondence to  
Elin Anita Fadum, The Norwegian Armed Forces Medical Services, Institute of Military Epidemiology, 0028A, Sessvollmoen N-2058, Norway; [efadum@forsvarets helseregister.no](mailto:efadum@forsvarets helseregister.no)

Received 15 April 2016  
Accepted 28 June 2016  
Published Online First 14 July 2016

**Abstract**  
Objective To examine the association between minor and major mental health impairment in late adolescence and death from suicide and unintentional injuries/accidents in men.  
Methods In Norway, all men attend a compulsory military medical and psychological examination. We included 558 949 men aged 17–19 years at the time of military examination in 1980–1999 and followed them up for death from suicide and unintentional injuries/accidents until the end of 2013. We used Cox proportional hazard models to examine the association between the presence of minor and major mental health impairments at examination and death from suicide and unintentional injuries/accidents.  
Results Compared to men with no mental health impairment, those with minor mental health impairment was associated with an increased risk of death from suicide (adjusted HR (HR<sub>adj</sub>)=1.63, 95% CI 1.39 to 1.92), transport accidents (HR<sub>adj</sub>=1.33, 95% CI 1.09 to 1.63), accidental poisoning (HR<sub>adj</sub>=2.27, 95% CI 1.79 to 2.88) and other unintentional injuries/accidents (HR<sub>adj</sub>=1.54, 95% CI 1.17 to 2.02). In men with major mental health impairment, the risk of death from suicide and accidental poisoning was elevated two times (HR<sub>adj</sub>=2.29, 95% CI 1.85 to 2.85) and three times (HR<sub>adj</sub>=3.53, 95% CI 2.61 to 4.70).

**This Article**

- Abstract
- Full text
- PDF

**Services**

- Email this link to a friend
- Alert me when this article is cited
- Alert me if a correction is posted
- Alert me when eletters are published
- Article Usage Statistics
- Similar articles in this journal
- Similar articles in PubMed
- Add article to my folders
- Download to citation manager
- Request permissions
- Add to portfolio

**Responses**

- Submit a response
- No responses published

**Google Scholar**

**PubMed**

**Related Content**

- Suicide (psychiatry)
- Suicide (public health)
- Cohort studies
- Epidemiologic studies
- Occupational and environmental medicine

**Social bookmarking**

Sign in |  Remember me.  
Forgot your sign in details?  
Recommend to your Institution

Register to receive email alerts

Impact Factor 3.865

International Forum on QUALITY & SAFETY in HEALTHCARE  
26-28 April 2017 London  
Call for Papers

I am going to talk about an article that we recently published in journal of epidemiology and community health.

In this paper we used information on mental health that was collected on military medical examinations prior to military service.

We chose a study period when such clinical assessments were mandatory to every man in the country.

So this study included:

men who were mentally healthy and suitable for military service

men who had major mental health conditions – they are usually exempted from military service

And then: a group of men who had minor mental health problems or symptoms– these are men who typically function quite well and they are usually fit for military service.

We linked it to the cause of death registry in Norway.

We wanted to examine the risk of suicide and death from unintentional injuries in these different groups.



NORWEGIAN ARMED FORCES  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology

## *Mental health impairment – classification*



Mental health impairment	Disorders (ICD)
No (ref)	
Minor	Depression, Stress-related Development Behavioral
Major	Mania Phobic anxiety Dissociative Eating Retardation Hyperkinetic Conduct
Unfit for military service	Drug abuse Chronic ?

I assume that you are familiar with military medical classification systems, so you know that

Even though these examinations are performed by military medical examinations who use diagnostic ICD criteria when they work, the purpose of the assessment is not to provide treatment or do research – but to determine whether or not a person is suitable for military training.

This classification is a reflection of a person’s ability to do military service. So, if there are no mental factors about a person that are likely to impair or weaken his social, intellectual or military performance – then he is assessed as mentally healthy and the category no mental health impairment is used. In our study we used these men as the reference group.

The category minor mental health impairment means that a person have symptoms or suffer from a mental health condition but he is still able to do military service. Could be for example minor depression, stress-related disorders or mild behavioral disorders.

“Major mental health impairment” on the other hand is used for conditions that usually do not go along with military service, including for example episodes of



mania, phobic anxiety disorders, eating disorders, or hyperkinetic disorders.

Finally, conscripts are classified unfit for military service due to mental health problems if they suffer from manifest drug abuse or have a chronic psychiatric condition, if they have been admitted to a psychiatric ward or received extensive treatment. Then they are immediately exempted from further examinations and military service.

But, conscripts can be classified to this group because they have some undefined adjustment disorders, or because it is impossible to assess their mental health state at the military medical examinations because they act strange or seem sad, unmotivated, undisciplined: symptoms that do not meet the diagnostic requirements for a major psychiatric disorder, but still most likely they will not function well in a military setting. They are immediately dismissed because of their mental health state.

## *Methods*

- 556,183 men who attended military medical examinations 1980-1999 (17-19 years)
- Follow-up to the end of 2013
- Cox proportional hazard models
- Adjusted Hazard Ratios with 95% confidence interval

In our study we included about young 500 thousand men who attended pre-military medical examinations between 1980 and 1999.

They were 17, 18 or 19 years old when they were examined.

We followed these men for suicide to the end of 2013.

We used cox proportional hazard models to estimate the suicide risks.

We included measures for physical health, intellectual performance, age, and decade for examination in our models.

## *Results*

Risk of suicide HRadj (95% CI) compared to those who had no mental health impairment:

Minor: 1.63 (1.39 to 1.92)

Major: 2.27 (1.79 to 2.88)

Unfit: 3.18 (2.37 to 4.26)

We found that both minor and major mental health impairment were associated with elevated risk of suicide:

In those with minor mental health impairment, suicide risk was elevated by 63% and in those with major mental health impairment; suicide risk was twice as high as in those who were assessed to be mentally healthy.

In those who were classified as unfit for military service due to a variety of mental health states; suicide risk was three times higher than in the reference group.

## *Strengths and Limitations*

- Longitudinal cohort design
- High power
- Unselected population
- 90% of Norwegian men
- Physician assessed mental health measurement
- Misclassifications?
- Women
- Lack of information (socioeconomics, clinical data and **military training**)

By using the data in the Norwegian Armed Forces Health Registry we were able to conduct a study with a unique design:

It was a longitudinal cohort design with high power.

And we had a physician assessed measure on minor as well as major mental health conditions on almost 90% of the entire male population.

However, the mental health classification that we used may have been inaccurate.

We did not include those who refused to show up for military medical examinations

We did not include the women.

Finally, the study lacked information on a range of potential confounders, as for example socioeconomic status.

More importantly – we did not include any information on military training or military service in this study.



## *Suicide in Conscripts who did Military Service*

- Number of suicides
- Timing of suicides in relation to military service (discharge)
- Methods

We need to monitor suicide incidence in conscripts who do military service – this is a priority that is assigned to the Norwegian Armed Forces Health Registry.

We need to know

How often does it happen?

When does it happen in relation to military service and discharge?

Which methods was used?

We also need to describe important characteristics of those who died.



NORWEGIAN ARMED FORCES  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology

## *Suicide in Conscripts who did Military Service*

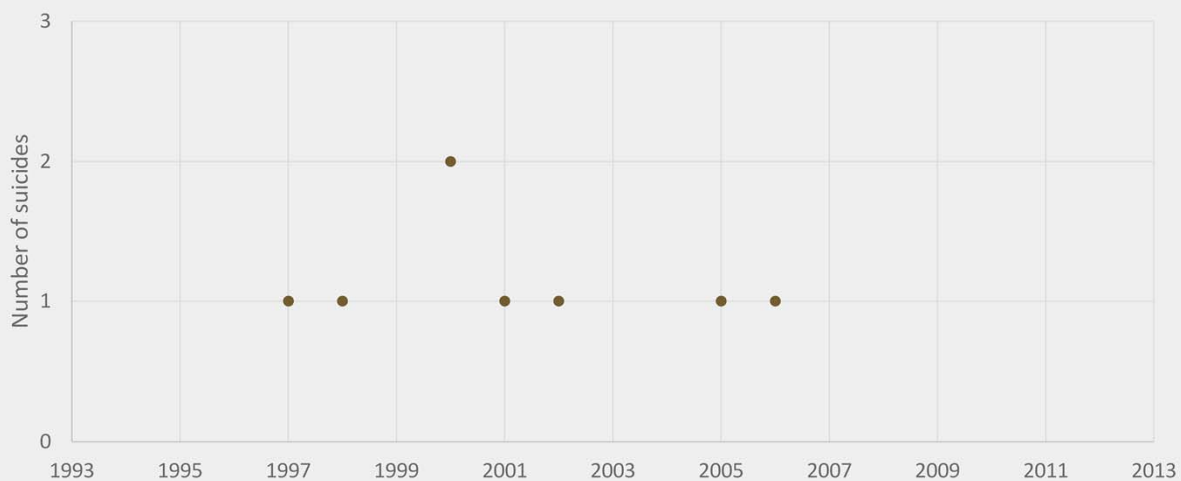
- N= 236,488 conscripts who started military service between 1993 and 2011
- Follow-up two years

We have counted the number of suicides in conscripts who started their military service sometime between 1993 and 2011.

We followed them for two years from their first day in service to the date of their death, emigration or end of follow-up.



## *Suicide – the day of discharge*



In this period, there were eight conscripts who ended their military service in suicide.

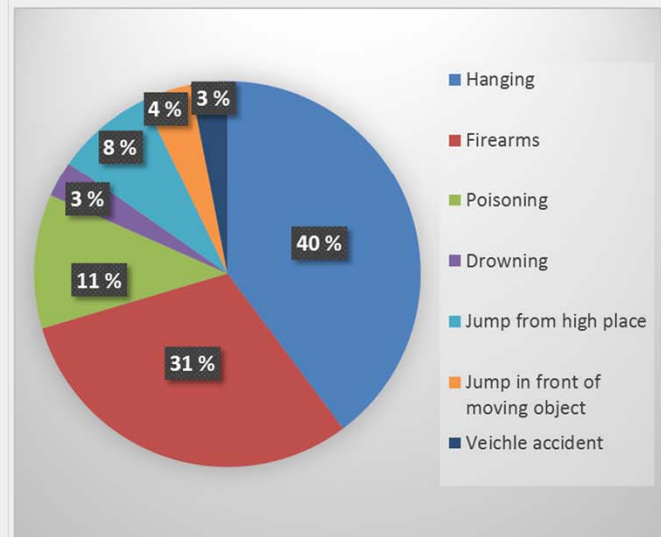
You can see that it happens occasionally from time to time.

If we do a rough calculation the suicide rate among serving conscripts is 2.7 per 100.000 person year.

In the same period we found 16 persons who died in suicide between one week and three months after discharge from military service.

## *Suicide – two years follow up*

N= 98 in the first two  
years after service  
start



When we expanded the follow-up period to two years from the first day in military service we found 98 suicides – one female.

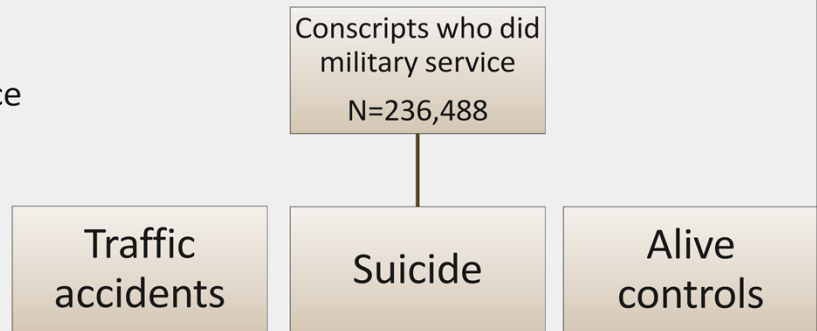
The methods they most commonly used was hanging, firearms and poisoning – which is the common picture described in many research publications.





## *Suicide and accidental death in conscripts two years after military service*

- Self-reported and physician assessed health prior to service
- Health during military service
- Physical and mental disability at discharge
- Military career
- Post-discharge psychopathology



The next step now is to describe the characteristics of those who died and try to identify the factors that could be relevant for selection, suicide prevention, and follow-up.

So we recently got the permission to collect detailed health and service related information from medical journals.

We plan to do a case-control where we compare those who died in suicide to conscripts who died in a traffic accident and to a group of controls.

Then we will include self-reported and physician assessed information prior to military service, recorded health contacts and problems during military service, and of course information about their military career and performance.

Based on our first analyses we suspect that those who drop out from service early and those who are dismissed from military service because of physical or mental disability is a defined high-risk group for suicide.

So we will collect information from the registry of work and social benefits in Norway on things like unemployment, education, sick-leaves, and social benefits after discharge from military service.

Then we can learn something about these guys' doings in the period between military service and death.

Hopefully this work can aid in follow-up procedures when conscripts are discharged from military service too early.



*Thank You!*

---

Elin Anita Fadum, Ph.D  
Norwegian Armed Forces Medical Services  
Institute of Military Medicine and Epidemiology  
fadumelin@forsvarets helseregister.no

NORWEGIAN ARMED FORCES

## Mental health impairment at military medical screening and suicide

	<b>Hanging (n=1221)</b>	<b>Firearms (n=991)</b>	<b>Poisoning (n=615)</b>	<b>Total (n=3291)</b>
	HR (95% CI)	HR (95% CI)	HR (95% CI)	HR (95% CI)
No	Ref.	Ref.	Ref.	Ref.
Minor	1.86 (1.43-2.42)	1.56 (1.14-2.14)	2.49 (1.80-3.44)	1.86 (1.59-2.19)
Major	2.37 (1.64-3.43)	2.33 (1.54-3.53)	3.30 (2.11-5.16)	2.61 (2.11-3.24)
<b>Unfit</b>	5.25 (3.69-7.46)	<b>1.33 (0.63-2.80)</b>	3.97 (2.24-7.04)	3.84 (3.00-4.92)

Out of curiosity we broke down the material to suicide by different methods and we found similar associations with increased risk of suicide by hanging and self-poisoning in those who had minor and major mental health impairment and we found the highest risks in those who were classified as unfit for military service. These are the crude hazards by the way,

But it was no increased risk for suicide by firearms in those who were classified as unfit for military service, which I think was quite interesting and perhaps we should investigate these preliminary findings further.

We haven't published this – I just show it to you

## *Results*

Risk of suicide HRadj (95% CI) compared to those who performed “average” on the IQ-test (score 5):

Below: 1.25 (1.14-1.36)

Above: 0.72 (0.66-0.79)

The other factor that was associated with increased risk of suicide was low score on the intellectual performance test, while those who had the highest scores had the lowest risk of suicide. This is in line with other research.

## Information collected at military medical examinations in Sweden

Author (year)	Birth cohort	Measures	Outcome
Stenbacka (2015)	1949-1951	Mental health problems↑	Suicide attempt↑
Sörberg (2014)	1949-1951	BMI↓	Suicide attempt↑
Åberg (2014)	1950-1987	Cardiovascular fitness↓	Suicide attempt Suicide↑
Sörberg (2013)	1949-1951	Cognitive ability↓	Suicide↑ Suicide attempt↑
Lundin (2011)	1949-1951	Psychiatric diagnoses	Suicide attempt↑ Suicide↑
Batty (2010)	1950-1976	Cognitive ability↓, BMI↓	Suicide attempt↑
Månsdotter (2009)	1949-1951	Masculinity rank↓	Suicide↑
Magnusson (2006)	1950-1981	BMI↑	Suicide↓
Gunnel (2005)	1950-1976	Cognitive ability↑	Suicide↓
Hemmingson (2003)	1949-1951	Smoking↑	Suicide↑
Jiang (1999)	1973-1975	Body height↑, Cognitive ability↑ Military performance↑	Suicide attempt↓
Allebeck (1990)	1949-1951	Psychiatric diagnosis	Suicide↑
Allebeck (1990)	1949-1951	Deviant behaviour and substance abuse	Suicide↑
Andreassen (1988)	1949-1951	Alcohol↑	Suicide↑

## *Military Medical Examinations*

- General physics
- Digestives
- Eyes & Ears
- Arms & Hands
- Walking
- Back
- Skin
- Mental Health



Up to the year 2009, all Norwegian males were obligated to attend military medical examinations. Females could voluntarily attend.

Only about 1.5% of the Norwegian male birth cohorts were exempted because they were registered in the National Health Insurance Office as permanently disabled before the age of 18 years. Another 3% of the Norwegian male birth cohort died or emigrated before conscription, and 6-7 % did not meet for medical examinations at age 18 years because they at that time were abroad, ill, imprisoned, or for some other reason could not be traced by the Norwegian Conscription Board (Oyen, Vollset et al. 2007). From 2010, only a proportion of the conscripts are called for military screening, the numbers depends on the Armed Forces military staff requirements (each year about 20,000 are called for military screening and 8000 selected for military service).

These examinations are usually conducted around age 18 years and are performed by military medical doctors.

The aim of these examinations are to select and classify an individual as able or unable to perform military service. An assessment of stress tolerance and mental health is of course crucial and recorded in every individuals medical profile. Meaning that

There is a handful of studies that have included variants of these mental health assessments in their analyses. But these studies included only men who were born in the beginning of the 50s or used a dichotomized version of the mental health assessment that did not differ between those who had minor symptoms of mental health illness and those who had severe psychiatric disorders.