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Testing Armed Forces recruits for COVID-19

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Good infection prevention and control plans, including extensive testing, is one of several measures to reduce the risk of the mass spread of infection in the Norwegian Armed Forces' induction training programme.

The Norwegian Armed Forces are based on national conscription, and in April 2020, a new cohort of recruits presented for duty. Hundreds of young people were gathered together in close proximity, which is obviously contrary to the health authorities' general recommendation for social distancing and not to gather in large groups.

The induction process involving hundreds of new recruits may justify extensive testing to identify potential asymptomatic or pre-symptomatic carriers of COVID-19, even though no such recommendation has been given for wider society. Such testing can also generate knowledge that is useful to civilian society.

The supply of new soldiers is vital to our defence capabilities, and thus for the security of the nation. However, the fact that a significant proportion of carriers of SARS-CoV-2 have few or no symptoms is a challenge (1, 2).

Infection prevention and control in the Armed Forces

The induction training consists of an eight-week programme where healthy young men and women learn about the transition from civilian to military life. The recruits normally sleep in dormitories with between five and ten beds. During the pandemic, the recruits are divided into 'Forces families' where close contact is limited to those they share a dormitory with. Messing, practical hygiene measures, basic soldier training and field exercises have been adapted to reduce the risk of infection with SARS-CoV-2.

An important part of basic soldier training consists of the individual soldier acting on orders as part of a team, platoon, or company. Being ordered to adhere to measures such as handwashing, disinfecting door handles or not to shake hands in order to prevent the spread of infection does not therefore present a problem.

However, the way that young people socialise can compromise the recruits' own infection prevention and control judgements. Many young soldiers may also allow their own performance to undermine the national collective effort to prevent the spread of the disease. The men and women of the Armed Forces are therefore facing major challenges.

Extended systematic infection screening

The latest induction of Armed Forces' recruits has coincided with a situation in which the infection status and spread of SARS-CoV-2 in Norway in both civilian society and the Armed Forces is unclear. Special infection prevention and control measures have therefore been implemented in addition to well-established and proven principles for the induction of new recruits. The extended systematic infection screening is carried out as part of the Armed Forces' health service. All data collected is recorded in the Armed Forces' electronic patient record system and transferred to the Armed Forces Health Registry (Figure 1).

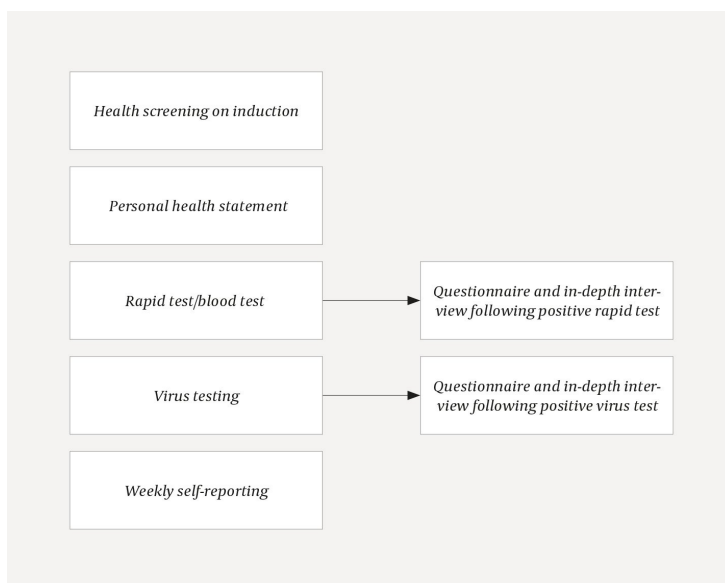


Figure 1 Extended systematic infection screening in the Norwegian Armed Forces

When recruits arrive for testing on the first day of induction, they are asked about respiratory symptoms before being tested, and their temperature is taken. All recruits then complete a personal health statement, which is based on the Norwegian Institute of Public Health's NorFlu questionnaire and adapted for the Armed Forces. The questions concern respiratory symptoms, contact with the health service and infection prevention. To allow us to store their data, recruits also need to sign an informed consent form.

The testing of recruits entails several different types of investigations: capillary tests/rapid tests for the detection of antibodies to SARS-CoV-2; blood tests for serological antibody analysis and to validate the results of rapid tests; deep nose/throat tests for virus detection. Serological and nasal/throat tests are repeated after three and six weeks.

Using tests for SARS-CoV-2

There are several commercially available serological rapid tests that detect IgM and IgG antibodies. After the onset of symptoms, it takes several days for antibodies to form and be detectable in rapid tests. The Norwegian Armed Forces Joint Medical Service and the Armed Forces' health service do not therefore regard a negative rapid test as conclusive. The Norwegian Institute of Public Health is currently conducting clinical trials of rapid tests, and the test used by the Armed Forces is considered to be one of the most accurate tests that has been validated (3).

It is important that the Armed Forces place a strong emphasis on infection prevention and control when weighing this against operational activity in the form of teaching, education, exercise and training

Serological tests that detect antibodies to SARS-CoV-2 are analysed in collaboration with Oslo University Hospital. The purpose is to generate knowledge on the infection situation among recruits. Prevalence analyses performed using serological tests in the Armed Forces will be useful for future inductions of new recruits and of interest to national health authorities. However, the seroconversion rate and period vary widely in published studies. So far, there is no evidence of a link between the measured antibody response and a protective immune response.

Infection screening in the Armed Forces will also generate more knowledge on cross-reactivity with antibodies to other respiratory viruses (primarily other coronaviruses), and whether such antibodies are also picked up in the various tests.

Good test properties and extensive work on validation means that polymerase chain reaction analysis (gene detection test) of deep nose or throat tests in this project is the preferred test method in the Armed Forces' extended systematic infection screening for

determining how to manage infection prevention and control among recruits.

The way forward

It is important that the Armed Forces place a strong emphasis on infection prevention and control when weighing this against operational activity in the form of teaching, education, exercise and training. However, in the ongoing work of the Armed Forces, the consumption of testing kits and infection control equipment must be carefully balanced against the benefits of extensive testing.

The knowledge generated from extended systematic infection screening in the Armed Forces represents a valuable contribution to the collective effort needed by society to learn how to manage COVID-19. The Norwegian Institute of Public Health and Oslo University Hospital are providing expertise and test analysis capability, and are acting as advisors in the follow-up of new recruits to the Armed Forces.

The induction of new recruits and soldier training represents a particular challenge for infection prevention and control, and an optimum framework must be established in which testing for SARS-CoV-2 can be used as a means to ensure a safer induction process for new recruits.

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