COVID-19 Publications
Summary of Abstracts

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Keywords COVID-19, pandemic, Lessons Learned, workshop, MILMED COE

Abstract *As we emerge from the COVID-19 pandemic, it is necessary to critically reflect on and review the phenomenon that took millions of lives worldwide, overwhelmed medical capabilities, and devastated communities. The negative impacts of the COVID-19 pandemic include an economic downturn, disruption of societal functioning, and degradation of operational readiness. We can see that the destabilizing effects of pandemics pose threats to regional, multinational, and organizational security. Fortunately, pandemics are historically infrequent but with time, memories and clarity fade. We recognize that without a concerted, deliberate effort to preserve the knowledge we have gained, it will be lost. Looking forward, many of the lessons learned from this pandemic might be applied not only in future pandemics but also in combat operations and military operations other than war.*

To capture key lessons from the pandemic relevant to NATO, the NATO Centre of Excellence for Military Medicine (MILMED COE) organized the COVID-19 Lessons Learned Workshop in Budapest, Hungary from 23 to 25 May 2023. The workshop was attended by 60 participants from 17 nations and multiple national and international organizations. The participants of the workshop were predominately from the military medical community, and as such, the scope through which the pandemic was viewed had a decidedly military-medical lens.

The following are some of the abstracts from the plenary session of the workshop.

THE GBR EXPERIENCE

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Keywords COVID-19, pandemic, Great Britain, force health protection, infectious disease, military, testing, disease surveillance, civil-military cooperation

Importance

The COVID-19 pandemic posed unprecedented health and security challenges. A novel disease of uncertain impact required a coordinated response and close collaboration with internal and external defence partners. The pandemic catalysed a lasting change in defence public health delivery, capabilities and inter-service collaboration.

Observations

The GBR defence public health response was agile and rapidly produced defence-specific guidelines for deployments, exercises and an inherently mobile population, which kept up with national vaccination and testing guidance.

The Defence Medical Services led successful changes, which underpinned the GBR pandemic response. Examples include the rapid generation of defence laboratory capabilities facilitating in-house COVID-19 testing, establishment of a single point of contact for COVID-19 information dissemination, normalisation of hybrid working practices, enhanced uses of digital technologies, closer ties with external partners, improved working across the single services and a greater focus on mental wellbeing.

A key observation was the importance of consistency in the public health approach and messaging, despite differences in command structures of the three services. The single services faced different challenges. For example, the Royal Navy experienced 40% higher infection rates compared to land establishments.

Defence infectious disease surveillance was transformed during the pandemic. In May 2020, an innovative real-time surveillance system was introduced delivering reports of COVID-19 read codes from primary care data. GBR subsequently implemented near real-time surveillance for all infectious diseases. Conversely, while GBR has further developed pandemic preparedness for influenza, some lessons revealed a reduced preparedness for a 'novel pandemic'.

The COVID-19 pandemic highlighted the strength of GBR civil-military cooperation taskings. Service personnel offered a variety of assistance, including engineering input to the rapid construction of temporary surge 'Nightingale' hospitals.

Conclusion

It is essential that defence public health lessons learned from the pandemic are embedded in corporate knowledge and utilised to enhance future pandemic preparedness.

LESSONS LEARNED RELATING TO INFECTION PREVENTION AND CONTROL FROM THE CANADIAN ARMED FORCES HEALTH SERVICES' RESPONSE TO THE COVID-19 PANDEMIC

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Keywords Canadian Armed Forces, COVID-19, pandemic, force health protection, infectious disease, military, prevention, civil-military cooperation

The Directorate Force Health Protection (DFHP) provided strategic guidance on public health measures during the COVID-19 pandemic. In particular, guidance on infection prevention and control (IPAC) was developed and/or modified to adjust as the pandemic unfolded and to the fluidity of the situation.

All stakeholders from DFHP were asked to review their work during the COVID-19 pandemic and submit lessons learned for a compilation of qualitative themes.

Common qualitative themes were identified from the submitted compilation. Differences between civilian and military paradigms impacted planning and decision-making. Decisions were often made with incomplete information at all levels. Communication was not always optimal. Collaboration among stakeholders was a force multiplier with different aspects of the pandemic response.

The lessons learned from the COVID-19 pandemic were notable. Differences between the civilian and military paradigms can be leveraged to be to the benefit of the Canadian Armed Forces in attaining common goals and avoiding divisiveness. Both paradigms, civilian and military, have known advantages and disadvantages that can be harnessed to multiply and manage force, respectively. Recognizing that there will be information gaps, decision-making is most appropriate when sufficient available options are outlined and should continually evolve as updated scientific knowledge becomes available. When informed of the various risks and benefits of multiple courses of action, decisions can be formulated while minimizing micromanagement and/or ineffective instructions from vague messaging. Communication was paramount during the pandemic, which may require paradigm shifts to allow for improved execution and message effectiveness. The established lines of communication were bureaucratic and slow to disseminate information, which overly emphasized the standardization of messages. Newly introduced methods of communication allowed for quicker and wider distribution, which increased transparency and collaboration.

Learning Objectives for Infection Prevention and Control:

1. To understand the concepts of how the benefits and limitations between the civilian and military paradigms can influence decision-making relating to infection prevention and control topics.

2. To understand how to leverage strategic guidance to increase operational capabilities and effectiveness relating to infection prevention and control processes.
3. To understand how the concept of contingency planning can optimize decision-making for infection prevention and control issues.

SUMMATIVE EVALUATION OF THE CANADIAN FORCES HEALTH SERVICES' RESPONSE TO THE COVID-19 EMERGENCY

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Keywords Canadian Armed Forces, COVID-19, pandemic, force health protection, infectious disease, military

Introduction

Given the pandemic's unprecedented scope and complexity, the Canadian Forces Health Services (CFHS) evaluated its role in supporting the Canadian Armed Forces' (CAF) Operation LASER response. This evaluation captured lessons learned, assessed success, and identified areas for improvement. The report addressed questions regarding in-garrison care, deployments, and civil authority responses.

Methods

This evaluation used a mixed method with standardized data collection techniques to address key questions. The main body of evidence was gathered through desk reviews (n=175 documents), 31 focus groups (n=204 people), interviews with key stakeholders (n=118 people), on-site facility observations (n=11 locations), and a review of the Canadian Forces Health and Dental Information Systems.

Results

The evaluation yielded 28 findings, leading to 22 comprehensive recommendations. Notable outcomes include:

1. CFHS achieved Operation LASER objectives, including CAF operational effectiveness, healthcare for members, supporting the government, and successfully delivering on its mandate throughout all phases of the COVID-19 pandemic.

2. Medical and dental experiences in the initial six months of the pandemic exhibited significant variations.
3. No systematic or systemic failures were evident.

Conclusions

CFHS successfully delivered mission-critical health services, protected CAF personnel's health, and maintained operational readiness during the COVID-19 pandemic by rapidly implementing infection control measures.

CFHS's COVID-19 response efficiency was impacted by planning gaps, pre-existing resource challenges, and governance structures and processes.

Despite initial obstacles, CFHS personnel innovated and adapted but it came at a cost, including staff fatigue, attrition, burnout, and a disruption of the "Defence Team" ethos, particularly at the tactical level. CFHS may face recovery challenges from this extended surge posture.

SARS-COV-2 EXPERIENCES: HUN INTEGRATED COVID LABORATORY

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Keywords Hungarian Defence Forces, COVID-19, pandemic, force health protection, infectious disease, military, testing, PCR, civil-military cooperation

The Integrated COVID Laboratory was created within the Medical Centre, Epidemiological and Scientific Research Institute of the Hungarian Defence Forces by the fusion of three separate PCR laboratories to carry out diagnostic tests for COVID-19.

The diagnostic work was based on the SARS-CoV-2 RT PCR protocol of the WHO/Pasteur Institute.

The first PCR-positive case of the laboratory was a 24-year-old civilian man from Budapest on 15 March 2020. The nasopharyngeal, oropharyngeal and stool samples were positive. The isolation and sequencing of the virus was carried out by the National Laboratory of Virology of the University of Pécs.

The total number of PCR tests conducted by the Integrated COVID Laboratory between March 2020 and April 2023 was 230,824.

In addition to the diagnostic work, the laboratory has also performed subtyping of 338 viral strains, using Sanger and next-generation sequencing.

Prediction of the number of cases using mathematical modelling and daily analysis of domestic and international data has also been provided and reported to the Ministry of Defence and

the Prime Minister's Cabinet Office on a daily basis.

At the beginning of the pandemic, the laboratory equipment was limited, making the whole process labour- and time-consuming. After about one year, it became possible to use automated and higher capacity machines, with which the efficiency improved significantly.

Among the problems can be mentioned the resupplying of consumables and reagents, the low number of personnel, the resulting frequent night shifts, the different nucleic acid isolation protocols and the slow pace of changes in international/national and civil-military regulations.

DATA-DRIVEN SOLUTIONS DURING A HEALTH SECURITY EVENT

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Keywords Hungarian, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation, national security, digital transformation

Importance

The COVID-19 pandemic has highlighted the need to prioritize health and healthcare as critical aspects of national security. To address health security risks effectively, we must develop resilient health systems through innovative advancements in health data science.

Observations

Our research presents two case studies to underscore this argument, both within epidemic management. The first example summarizes our earlier publication on utilizing mobile phone Call Detail Records (CDRs) to track population movements. This method assesses the efficacy of movement restrictions, such as the lockdown implemented in Hungary during the initial phase of the COVID-19 pandemic. Our findings indicate that gathering and analyzing CDRs is a cost-effective and efficient way to monitor large-scale population movements. This approach effectively complements GPS-based smartphone

tracking, which is more apt for contact tracing and managing individual home quarantines. Our CDR-based technique could be adopted by other nations or for monitoring cross-border movements in Europe or globally, requiring minimal adjustments. Our methodology is well suited to investigate patient pathways using innovative methods, a priority objective of our TKP2021-NVA-11 project, part of the National Defence and National Security sub-program of the Thematic Research. The second case study examines the influence of anti-vaccination social media activism on Hungary's human papillomavirus (HPV) vaccination campaign in 2014. Through network analysis of Facebook posts and comments opposing vaccination, we found that during this period, these activists failed to reach a broader audience and did not disrupt the expansion of Hungary's effective public vaccination program. However, the situation differs with the ongoing COVID-19 vaccination campaign, indicating that anti-vaccination activism poses a real and significant security threat that needs addressing.

Conclusions

In conclusion, this paper contends that the digital transformation of healthcare, propelled by the rapid advancement of information and communication technologies, is crucial for creating resilient health systems. These systems are essential to effectively address the challenges brought about by the swift environmental and societal changes characteristic of the 21st century.

MASS TESTING FOR SARS-COV-2 IN SLOVAKIA

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Keywords Slovak Armed Forces, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation, testing

Observations

In late September 2020, Slovakia started to see a second wave of COVID-19, eventually reaching a seven-day median of 2,500 cases, with 458 cases per 1,000,000 people. This came as a surprise because Slovakia hardly saw any cases in the first wave. Thanks to an early lockdown and border closures, Slovakia performed the best in Europe, with the fewest cases and the lowest number of deaths. Slovakia faced a familiar trade-off: either a lockdown with punitive costs to an already hard-hit economy or a continued spike in cases with a collapse of the healthcare system.

In total, 87, 83 and 84 percent of the age-eligible population were tested in the rounds. The proportion of positive tests

was 3.91 percent (range across counties: 3.12 to 4.84%) in the pilot, 1.01 percent (range: 0.13-3.22%) in round 1 and 0.62 percent (range: 0.28-1.65%) in round 2.

The medical team of the Office of the Surgeon General was closely cooperating not only with all relevant organizations within the structure of the Ministry of Defence but also with the Ministry of Health and the Ministry of Interior throughout all four phases of this operation. As the mass testing program for COVID-19 of such a scale was never carried out in Europe, our planning team encountered a number of unexpected situations that had to be solved under severe time pressure.

Importance

The aim of the paper is to address challenges to maximize effectiveness and pathways to create an effective collaborative environment during the planning and execution of mass testing.

Operation "Shared Responsibility" was the most extensive/intensive CIV-MIL cooperation with the most demanding logistic support in the history of the Slovak Republic, under the direct command and control of the armed forces.

Conclusions

The Slovak Armed Forces led the operation "Shared Responsibility", which focused on several rounds of the mass testing program across all regions in Slovakia from October to November 2020. Our military medical team was responsible for planning the mass testing for SARS-CoV-2 in the entire area of Slovakia.

PHASES OF THE SLOVAK COUNTER COVID-19 PANDEMIC OPERATIONS AND MEDICAL MATERIAL

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Keywords Slovak Armed Forces, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation, logistics

Introduction

During the COVID-19 pandemic, the Slovak Armed Forces participated in various types of anti-pandemic operations. All operations required the provision of medical supplies.

From a medical logistics point of view, we can attribute certain characteristics to the phases of providing supplies from consumable medical material during the first year of the pandemic.

Methods

Analysis of available medical logistics data and description of the individual phases of goods supply according to selected criteria.

Results

The analysis provides a rough description of the course of the specific pandemic-related medical logistics operation in context – demand, logistics capabilities, and behaviour of the market.

Some lessons learned:

- irreplaceability of keeping own stocks;
- stockpiles of state reserves – a reliable source of material;
- unreliability of future contracts concluded with importers;
- the importance of coordinating the management of the use of resources at the national level;
- the need to simplify procurement processes in times of crisis;
- reliability of the NATO Support and Procurement Agency (NSPA);
- to consider infrastructure and personnel resilience/cost;
- the necessity of checking the quality of the material.

Conclusions

Crisis parameters appear in the description of the process, which is advisable to know about to find possible solutions and adopt proposals for measures to eliminate these parameters.

VACCINATION EFFECTIVENESS AND ITS IMPACT ON DEFENCE READINESS IN THE ESTONIAN DEFENCE FORCES IN 2021

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Keywords Estonian Defence Forces, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation, vaccination

Since the beginning of the pandemic in 2020, the Estonian Defence Forces, as an organization, have not isolated themselves. We monitored the situation and acted following the decisions made by the National Health Board. At the beginning of 2021, the morbidity rate of the republic in the last 14 days was slightly over 600 per 100,000 people (30/12/2020). Vaccination of the employees of the Defence Forces (active employees, officials, contract workers, conscripts) was a continuous theme in 2021.

The aim was to ensure maximum vaccination among EDF personnel so that

the Defence Forces could fulfill their main task, protecting the Estonian state. It also included reducing the number of isolated people and carrying out exercises close to the planned volume. Many of the isolations were due to the infection spreading among service members and conscripts. The isolation lasted 14 days, which meant many people's long-term absence from exercises. The main exercise of the Defence Forces, Kevadtorm 2021, took place on a smaller scale than planned, without allies and with some restrictions. An essential part of the plan to prevent the spread of the virus was the situational risk analysis of the work environment, which found that the risk level is higher in the fields of active military personnel, security personnel, medical workers, and conscripts compared to fields that support training. In the risk analysis updated in August, the activities of the Defence Forces were looked at in the context of the tasks set by law and based on townships and buildings. The activities of the Defence Forces take place and function to a large extent as joint activities (training, exercises, teamwork processes), which require constant contact among different service members.

The first coronavirus vaccines arrived in February, which enabled the vaccination of medics and soldiers going on foreign missions in the first place. At the same time, active mapping of risk groups took place in order to identify priority groups. By the end of April, 1,187 members of the Defence Forces have been vaccinated. More active vaccination started in May. By July 2021, 3,672 people (i.e., 73.4%) from the Defence Forces have been vaccinated with at least the first dose, out of the nearly five thousand servants and employees of the EDF. In addition, some received a protective injection with the support of civilian medicine. By the beginning of August, the percentage of those vaccinated with at least one dose rose to 87.3 percent. While the percentage of vaccinations for the January conscripts remained at 85, as mentioned above, a 95 percent vaccination was quickly achieved for the July conscripts. In the case of the October conscripts, who had already been fully vaccinated or had started vaccinations, full training could be started. In connection with the widespread coronavirus, the government of the republic established by decree the obligation for employers to ensure the infection safety of personnel in the work environment on 13 August. The obligation imposed by the regulation enabled the organization to require a certificate from its personnel and to introduce mandatory vaccination for the Estonian Defence Forces. The relevant directive was issued on 31/08/2021. The Republic of Estonia set a precedent, which other authorities began to follow. Fifty-two people were dismissed from service for not complying with the order. Forty people approached the court in 36 cases.

COVID-19 PANDEMIC LESSONS IN THE PORTUGUESE ARMED FORCES

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Keywords Portuguese Armed Forces, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation, disease surveillance

Importance

In Portugal, the COVID-19 pandemic arrived on March 8, 2020 and determined the declaration of 218 days of State of Emergency. During this period, the Portuguese Armed Forces (PAF) had to adjust to maintain their primary mission while collaborating with the national effort against the COVID-19 pandemic. The General Staff of the PAF launched a plan that determined the levels of responsibility and, as the situation evolved, the level of commitment that the PAF could endure with or without compromising other activities (prioritization). This plan also established a communication chain with "near real-time" surveillance of confirmed cases of COVID-19 in the PAF and how that was affecting the mission.

Observations

The Portuguese Armed Forces supported the National Health System and the military personnel in different ways: testing capacity, outbreak control, care of patients, vaccination, prevention and education and formation.

- Lectures about Sars-CoV-2 virus transmission and protection measures were prepared and provided by the PAF to healthcare and other professionals in nursing homes and schools;
- Epidemiologic inquiries into COVID-19 patients were performed by several military teams;
- Several military health facilities in Oporto, Lisbon, Coimbra and Évora received patients who needed immediate care for COVID-19, increasing their capacities.

Conclusions

The military culture and hierarchical structure were positively identified as helpful in extreme situations. Calling to arms military personnel out of duty for different reasons (reserve, leave) and readjusting personnel from other areas (musicians, marines) were considered highly efficient in resource management.

COVID-19 LESSONS LEARNED: BUNDESWEHRZENTRALKRANKENHAUS KOBLENZ

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Keywords Bundeswehr, COVID-19, pandemic, force health protection, infectious disease, military, civil-military cooperation

Introduction

The COVID-19 pandemic has presented the global healthcare system with an unknown challenge. As one of the five military hospitals in Germany, the Bundeswehrzentralkrankenhaus Koblenz, with its resources, skills and the intensification of civil-military cooperation, was able to make a decisive contribution to supporting the civilian healthcare system and coping with the pandemic.

Method

The experiences of the Bundeswehrzentralkrankenhaus Koblenz during the COVID-19 pandemic from March 2020 to March 2023 were considered and evaluated retrospectively.

Experiences/Results

The Bundeswehrzentralkrankenhaus Koblenz provided around 400 normal care beds, 30 high care beds and treatment capacities for COVID-19 patients during the pandemic. A total of around 1000 COVID-19 patients were treated from March 2020 to March 2023 in the Bundeswehrzentralkrankenhaus, around 20 percent of them were intensive care patients. 90 percent of the patients were civilians and the other 10 percent were military ones. The Bundeswehrzentralkrankenhaus also treated patients from other nations. The medical staff's experience in coordination, (airborne and ground-based) transport and treatment of intensive care patients was valued expertise in the civilian

healthcare sector. They brought their expertise in the treatment and coordination of intensive care COVID-19 and non-COVID patients, to national committees and also to international assignments (Lisbon, Portugal). The hospitals within the supply region joined forces, and the Bundeswehrzentralkrankenhaus Koblenz and two other hospitals in Koblenz were in charge of the coordination. A total of around 40 clinics in the region were coordinated concerning COVID-19 issues and tasks. Through the close cooperation and establishment of early warning systems and regular joint video conferences, it was possible to react to the constantly changing pandemic situation together and at especially short notice. At the same time, new forms of communication and reporting obligations to the federal and state governments were required. Adaption and expansion of the IT equipment in a military property is still a challenge. With the support of the Bundeswehrzentralkrankenhaus staff, a short-term reaction was taken right at the beginning of the pandemic, and facilities such as COVID outpatient clinics and vaccination centers were set up together with the city of Koblenz. During the entire pandemic, the Bundeswehrzentralkrankenhaus provided regional and national support with medical staff and material in the context of requests for administrative assistance and contributed to the progress of the immunization of the population. A sustainable network was established from the local clinics, the city of Koblenz, the fire brigade and the office for civil protection, the structures of which are solid and continue to this day. The establishment of additional structures in order to be able to implement the regulations associated with COVID-19 also required support from an enormously high and flexible body of staff at the Bundeswehrzentralkrankenhaus. The willingness to provide support within the Bundeswehr was very high, so it was able to partially absorb the additional burden.

Lessons Learned

The experience from deployments abroad and the provision and training of personnel who can be deployed anytime and anywhere in the world contribute significantly to the fact that the medical service represents valuable and important support for the civilian health system both nationally and internationally. The integration of the military medical service into the civil health sector and the mutual training and further education in the medical field, as well as in the field of civil protection, was strengthened in the long term by the pandemic and can be a stable basis for further cooperation in non-COVID fields. In the future, these structures can be reactivated at short notice and make a positive contribution to even faster responsiveness. At the same time, the coronavirus pandemic has shed light on the slow progress in digitization and also forced it to advance. New digital meeting formats and ways of using mobile working for staff in non-patient care areas are positive examples that the results of the COVID-19 pandemic have taken the digitization of the medical service one step further. In conclusion, one can say that we learned from both the strengths and the weaknesses the pandemic revealed.