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Evaluation of Medical Support to Deployed Operations

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Acronyms and Abbreviations

CAF	Canadian Armed Forces
CFHS	Canadian Forces Health Services
CF H Svcs Gp	Canadian Forces Health Services Group
CFRG	Canadian Forces Recruiting Group
CMP	Chief Military Personnel
CRS	Chief Review Services
D H Svcs Pers	Director Health Services Personnel
FG	Force Generation
FY	Fiscal Year
GC	Government of Canada
HSS	Health Services Support
MCRP	Maintenance of Clinical Readiness Program
MOSID	Military Occupational Structure Identifier
MSDO	Medical Support to Deployed Operations
NATO	North Atlantic Treaty Organization
NBI	Non-Battle Injury
NCM	Non-Commissioned Member
NMSO	National Master Standing Offer
O&M	Operations and Maintenance
OP(s)	Operation(s)
PA	Physician's Assistant
PAA	Program Alignment Architecture
PML	Preferred Manning Level
PWGSC	Public Works and Government Services Canada
RTD	Return to Duty
SO	Standing Offer
TACMED	Tactical Medical Training
TCCC	Tactical Combat Casualty Care
TES	Total Effective Strength
TOS	Terms of Service
WIA	Wounded in Action

Executive Summary

Program Description

MSDO includes the deployed medical activities that support the ability of the Canadian Armed Forces (CAF) to conduct both domestic and overseas operations, whether they involve combat, humanitarian or disaster relief missions. These services may be delivered by CFHS personnel, contracted civilian health care providers, locally-procured medical services, and/or through partnerships with other international military health services.

Medical personnel provide all aspects of treatment and care, including surgery, treatment of disease and illness, medical laboratory services, dental and pharmaceutical services, psychology and social services. To deliver these services, approximately 6,400 military and civilian medical personnel and their associated equipment are located across Canada.

Relevance and Performance

The evaluation determined that the need for MSDO is of continuing relevance and is aligned with federal government and departmental roles, responsibilities and priorities. MSDO plays a key function in securing the health of deployed and ready CAF elements, and in the provision of timely and effective treatment for injured CAF members. The risk of injury or illness accompanies any military operation and it is the responsibility of the DND/CAF, and the Government of Canada (GC), to ensure adequate care for CAF personnel.

With respect to performance, from 2007–2012 the MSDO program provided service to 16 humanitarian and disaster relief operations, as well as to 7 combat rotations during Operation (OP) Athena in Afghanistan. During these missions, members of CAF received high-quality, world-class treatment and care during operations; the performance of CFHS

Overall Assessment

- Evidence indicates an ongoing and demonstrable need for Medical Support to Deployed Operations (MSDO), a role that clearly aligns with federal government and Department of National Defence (DND) roles, responsibilities and priorities.
- The program consistently met expectations for support to operations, despite an extremely high operational tempo. During the Afghanistan mission, Canadian Forces Health Services (CFHS) effectively leveraged the support and resources of allies, partners and contracted support to deliver an unprecedented 98 percent survival rate for North Atlantic Treaty Organization (NATO) casualties.
- MSDO still faces challenges in independently sustaining Role 2 and 3 capabilities and in dedicated Forward Aeromedical Evacuation of casualties, which in some operational scenarios is critical to casualty survival and optimal health outcomes.
- During the evaluation period, the program applied efficiencies that increased its effectiveness. Although program expenditures increased, they were not found to have exceeded reasonable amounts.

has been recognized with several national and NATO honours. MSDO was able to meet CAF expectations during this period of high operational tempo. It worked effectively with allies, partners and contracted personnel, although some challenges were noted. For example, CAF had to rely upon contributions of allied forces and contracted civilian medical staff to support and sustain a Role 3 Field Hospital and Forward Aeromedical Evacuation capabilities.

The CFHS has demonstrated sound use of resources and has taken steps to deliver MSDO in a more efficient and cost-effective manner. This includes providing more medical treatments in theatre, so on deployed operations, to reduce the number of repatriations and associated costs, and augmenting medical resources and capabilities with those of allies and partners during operations; these enabled the CFHS to provide treatment and care far beyond its own resources. Overall expenditures on MSDO increased over the evaluation period but these appear to be appropriate to the demand and expectations of deployed forces on high-intensity operations.

Findings and Recommendations

Key Finding 1: The provision of medical support to deployed operations is critical to promote, protect, and restore the health of CAF fighting forces.

Key Findings 2: Deployable medical support capabilities are an essential enabler/element in CAF's ability to meet or sustain the GC's Defence priorities.

Key Finding 3: CAF is legally and morally responsible for delivering medical and dental services to military personnel on deployed operations and at home.

Key Finding 4: MSDO has demonstrated its ability to meet the medical needs and expectations of deployed forces, and to work effectively with its allies, partners and contracted personnel to provide a high standard of health protection and care during operations.

Key Finding 5: Challenges remain in the recruitment, development and retention of certain key medical occupations and categories. Performance data on the number of personnel with current licenses and Total Effective Strength (TES) versus Preferred Manning Level (PML) targets for some officer occupations remains below target.

Key Finding 6: Enhancements to training in recent years, especially during OP Athena, have extended CFHS capabilities and contributed to the successful delivery of medical support and better health outcomes on the battlefield.

Key Finding 7: MSDO has faced several challenges in timely procurement of medical equipment for major operations in recent years.

Key Finding 8: During recent missions in Afghanistan, CAF lacked its own Forward Aeromedical Evacuation capability, which in some operational scenarios is critical to casualty survival and optimal health outcomes.

Key Finding 9: CFHS is limited in scope and specialties that can provide for or sustain a complete Role 3 level of care on its own—although it has addressed this partly through work with allies and by means of enhancements, including expanded use of Role 2 Enhanced and other forward-moving capabilities for MSDO.¹

Key Finding 10: Members of CAF receive high-quality treatment and care wherever and whenever they are deployed.

Key Finding 11: Coordination and use of allied and other-nation medical resources are often critical to effective health care and MSDO, especially on smaller or international missions.

Key Finding 12: The incorporation of the Tactical Combat Casualty Care (TCCC) and Tactical Medical Training (TACMED) programs into pre-deployment training contributed to higher survivability and treatment outcomes.

Key Finding 13: New preventive health measures and activities have been implemented in recent years, including “mental health readiness” programs that require further monitoring and measurement for effectiveness.

Key Finding 14: Medical research conducted by and for CFHS (where CFHS leads or internally conducts the applied research) contributes valuable information towards strategic and tactical medical advice and MSDO.

Key Finding 15: The delivery of effective MSDO contributed to a nearly 50 percent rate of return to duty during a high-tempo operational cycle such as in Afghanistan during OP Athena.

Key Finding 16: Efficiencies and greater clinical effectiveness were achieved through enhanced training techniques such as TCCC and TACMED, which pushed forward and expanded medical capabilities beyond what CFHS could normally provide in battle. Enhancements to Role 2 also enabled specialties such as psychiatry and physiotherapy to be implemented in theatre, reducing further injuries and repatriations.

Key Finding 17: MSDO’s budget is properly aligned with its mandate and mission, with the largest portion of the MSDO Readiness budget (70 percent) supporting Force Generation (FG) and Operations.

Key Finding 18: Although program readiness costs have increased by 30 percent, overall the program has actually become more cost-effective as the majority of the increases have been attributed to adding medical personnel, compared to very slight increases in administration and management costs.

¹ For definitions of terms, please see Annex E.

Recommendation 1: For medical occupations, there is a requirement for continued efforts in recruitment and development programs for retention. In addition, CFHS must use the experience gained on operations to develop an accepted methodology to identify/determine future personnel requirements.

Recommendation 2: Address any shortages or gaps in the current medical supply management process, including a review of existing supply arrangements and standing offers, and adequate levels of procurement personnel.

Recommendation 3: Ensure that pre-deployment medical screening is tracked and reported. Conduct rigorous monitoring and outreach related to medical follow-ups (including mental health follow-up) for both regular forces and reservists post operations.



1.0 Introduction

1.1 Profile of Medical Support to Deployed Operations

1.1.1 Background

In accordance with the Federal Government's Policy on Evaluation, Chief Review Services (CRS) conducted an evaluation of the DND/CAF MSDO program. It began in November 2012 and covered the period of 2006 to 2012. DND last evaluated MSDO over the five-year period from 2001 to 2005, as the CFHS was increasing its role in Afghanistan and OP Athena. The purpose of this evaluation study was to collect and analyze evidence on the relevance, design, implementation and outcomes of activities related to MSDO since the last evaluation up to 2012.

1.1.2 Program Objectives

The specific activities, outputs and outcomes of MSDO are captured in the program logic model in Annex C, which was developed for this evaluation in consultation with the Canadian Forces Health Services Group (CF H Svcs Gp).

The delivery of MSDO by CF H Svcs Gp is designed to achieve the following immediate, intermediate and long-term outcomes:

- Immediate Outcomes
 - Sufficient numbers of qualified personnel, equipment and supplies are available to meet the medical needs of deployed forces
 - The number of medically-deployable personnel in CAF is optimized
- Intermediate Outcomes
 - Treatments and rehabilitation are effective and appropriate
 - Disease and injury prevention is effective and appropriate
 - Strategic medical advice is disseminated and implemented
- Ultimate Outcomes
 - Appropriate and effective medical support is provided, as required, to Canadian Forces conducting domestic and international operations
 - The operational readiness of CAF is sustained

1.1.3 Program Description

Responsibility for health care within CAF is delegated to the Surgeon General, who also serves as Commander CF H Svcs Gp and as Director General Health Services. The Surgeon General is the Medical Officer who is the professional head of the CFHS, controls all clinical/scientific health practices, and senior CAF adviser on all matters related to health (in accordance with Queen's Regulations and Orders 34.011).

Commander CF H Svcs Gp is the commander of the operational military formation (CF H Svcs Gp), while Director General Health Services is the administrative head of the CF

H Svcs Gp. This group provides medical and dental services to approximately 95,000 CAF personnel in-garrison and on deployed operations (including the Primary Reserve), along with public servants and civilian victims during Humanitarian and Disaster Response situations. Medical personnel provide all aspects of treatment and care including surgery, treatment of disease and illness, medical laboratory services, dental and pharmaceutical services, and mental health and psychosocial services. Therefore, the group consists of personnel from approximately 48 health occupations and specialties. Their objective is to promote, protect and restore the health of both in-garrison and deployed forces.

Approximately 6,400 military and civilian health personnel, along with the needed equipment, are located at 77 military installations across Canada. CF H Svcs Gp comprises 43 units consisting of 83 detachments, including clinics, one field hospital, two schools, two Trauma Training Centres, one research establishment, and one medical equipment depot. A wide variety of medical and dental equipment can be deployed as required.

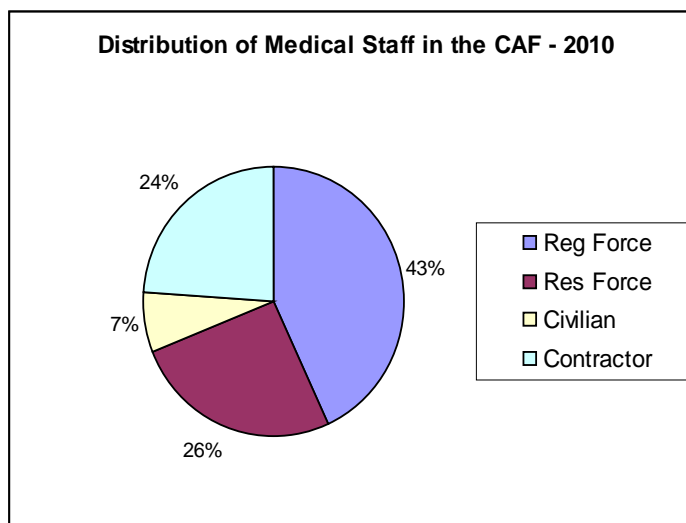


Figure 1. Distribution of Medical Staff in the CAF–2010. The data is summarized in Table 3.

Distribution of Medical Staff in CAF–2010	
Staff	Percentages
Regular Force	43
Reserve Force	26
Civilian	7
Contractor	24
Total	100

Table 1. Distribution of Medical Staff in CAF–2010. This table lists the types of MSDO staff by percentages.

Health services are assigned to support CAF operations by Canadian Joint Operation Command. These services may be delivered by CFHS and/or non-CFHS (e.g., contracted medical specialists) personnel, locally procured services, and/or through partnerships with allied military health services.

Command Structure

The CF H Svcs Gp has a centralized headquarters in the National Capital Region. The headquarters group functions in a similar manner to a “Command”- or “formation”-level headquarters. In addition to providing strategic and operational advice, this hybrid headquarters manages a national-level health care system that poses its own unique set of challenges and requirements. The headquarters has integral centralized “operational level” sections, including Intelligence, Operations, Force Health Protection, Plans and Training, Finance, Human Resources, Health Care Delivery, and Procurement and Supply functions.

Role 1 and 2 medical and dental care in-garrison is provided through more than 120 units and detachments. Role 3 and 4 care in Canada is provided through arrangements with civilian facilities (see Annex E for definitions of Roles/Levels of Care).

1.1.4 Stakeholders

CF H Svcs Gp relies heavily on a wide variety of partners to fulfil its mandate of providing comprehensive health care to CAF personnel on deployed operations. These include civilian health care agencies, provincial/territorial partners, international partners and other federal departments. The degree to which these organizations become key stakeholders depends on the nature and type of the mission (e.g., domestic versus international operations).

The primary (internal) stakeholders for MSDO are:

- Royal Canadian Navy
- Canadian Army
- Royal Canadian Air Force
- Canadian Special Operations Forces Command and Canadian Joint Operation Command

Other external stakeholders who can impact the training, readiness and operations of MSDO include:

Federal government/other departments:

- Health Canada
- Public Health Agency of Canada
- Public Works and Government Services Canada
- Veterans Affairs Canada
- Emergency Preparedness Canada

National:

- Canadian Blood Services
- Associations (Canadian Medical Association, Canadian Dental Association, Canadian Nurses Association, Canadian Dental Association, Canadian

Physiotherapy Association, Royal College of Physicians and Surgeons of Canada, etc.)

International:

- NATO
- Other allied nations
- United Nations
- Host nation
- Non-governmental organizations

1.2 Evaluation Scope

This Evaluation includes all relevant information from 2006 to 2012. It focuses on the relevance and performance of the delivery of:

- pre-deployment health readiness of deploying personnel; and
- medical services support to deployed operations in two main areas:
 - force generation of health services capabilities
 - medical support while on operations.

1.2.1 Coverage and Responsibilities

Under DND's Program Alignment Architecture (PAA) 2010, MSDO is captured primarily under the following Strategic Outcome statement of the PAA: "National Defence is ready to meet Government Defence Expectations." Specifically, MSDO is aligned with 2.4.2.6 Military Health Care (under 2.4 Joint and Common Readiness, 2.4.2 Common Defence Support).²

The following performance indicators are included in the Department's PAA/Performance Measurement Framework. While they apply to all of Health Service Support, and not just MSDO, these indicators are also reflected in the logic model developed and evaluated in this report.

- the professional and personal development of Health Services Staff;
- high-quality health services support (HSS) for Canada's fighting force;
- the CFHS will be manned, trained, and equipped to support CAF operations; and
- trusted health care adviser to the chain of command.

As this evaluation study focused on the medical support (including dental and mental health) given to CAF personnel in the conduct of deployed operations, it did not include an in-depth assessment of the following areas:

² DND, Vice Chief of the Defence Staff, Director Defence Force Planning, PAA—Primer, retrieved September 19, 2013 from <http://vcds.mil.ca/sites/page-eng.asp?page=4769>

- elements of Health Services that are provided in-garrison and longer term, post-deployment;
- HSS delivered to non-CAF members of coalitions forces, alliances or host nations through deployed CAF health capabilities;
- recruitment and enrollment of medical personnel, support to career management, or support to CAF personnel who are not eligible for deployment;
- indirect activities from general HSS services; and
- medical support to civilian populations during disaster relief efforts; this is covered in a 2013 CRS evaluation of Humanitarian and Disaster Relief operations.

1.2.2 Resources

Table 1 presents the portion of CFHS's total budget that is devoted specifically to maintaining the capacity to deploy medical personnel in support of an operation. It represents the cost of maintaining MSDO readiness, as opposed to those expenses related to in-garrison care.

Actuals	2008/09	2009/10	2010/11	2011/12
O&M	135,851,205	148,038,124	148,717,484	155,607,170
Salary	59,418,567	89,732,288	98,778,679	103,674,455
MSDO Total	195,269,772	237,770,412	247,496,163	259,281,625

Table 2. MSDO Budget Amounts Devoted to MSDO, per fiscal year. This table depicts the total budget in dollars devoted to MSDO, including operations and maintenance (O&M) and salaries, over the four fiscal year period.

1.2.3 Issues and Questions

The following evaluation issues and questions are assessed in this report under three sections: relevance; performance; and efficiency and economy.

Relevance

1. Does medical support to deployed operations address an actual and ongoing need?
2. Are the priorities of MSDO consistent with DND's strategic objectives and federal government priorities?
3. Is the delivery of MSDO consistent with the roles and responsibilities of the federal government and, more specifically, the roles and responsibilities of DND/CAF?

Performance (Effectiveness)

1. Were sufficient numbers of qualified personnel, equipment and supplies available to meet the needs of deployed forces?
2. Were treatments and care effective for deployment?
3. Were disease and injury prevention measures effective on deployments?
4. Was strategic medical advice effective during deployments (in supporting the planning and/or implementation of operations)?
5. Was MSDO effective in contributing to the maintenance of a combat-capable, multi-purpose force?

Efficiency and Economy

1. Were the most economical and efficient means of achieving the intended objectives employed?
2. What are the economic costs and benefits of MSDO?

2.0 Findings and Recommendations

2.1 Relevance—Continued Need

Evaluation Question: Does medical support to deployed operations address an actual and ongoing need?

Key Finding 1: The provision of medical support to deployed operations is critical to promote, protect, and restore the health of CAF fighting forces.

The evaluation team found that the delivery of medical support to deployed forces plays a key role in the generation and sustainment of combat power and operational effectiveness. It enables the effective health status of military personnel, contributes to operational readiness, and inspires confidence in deployed CAF members, who know they will receive quality care.³

The risk of injury or illness accompanies any military operation, and it is the responsibility of DND, and the GC, to ensure the adequate preparation of, and care for, CAF personnel. Maintaining an independent, deployable CAF medical capability is necessary because it cannot be guaranteed that local, contracted or allied health services will be available, nor that they will have the capability, capacity, or mandate to support CAF deployed operations. In addition, deploying uniformed medical personnel who are subject to the chain of command and the principle of unlimited liability is often a necessity in high-risk operational environments.⁴

2.2 Relevance—Alignment with Government Priorities

Evaluation Question: Are the priorities of MSDO consistent with DND's strategic objectives and federal government priorities?

Key Finding 2: Deployable medical support capabilities are an essential enabler/element in the CAF's ability to meet or sustain the GC's Defence priorities.

The Surgeon General's 2010 report identifies the health needs of military personnel as being a top priority for DND and the GC. This sentiment is echoed in a number of high-level policy documents and ministerial statements, including DND's Corporate Risk Profile and the Canada First Defence Strategy, reflecting an understanding that healthy soldiers, sailors, airmen and airwomen are necessary to generate, deploy and sustain a combat-capable military force.⁵ Since the provision of medical support to deployed operations is directly linked to the sustainment of force levels, it is unlikely that the CAF

³ DND, Joint Doctrine: Health Services Support to Operations, December 2007, pages 1–3.

⁴ "The regular force, all units and other elements thereof and all officers and non-commissioned members thereof are at all times liable to perform any lawful duty." DND, Act 33, (1), page 24.

⁵ DND, CF H Svcs Gp TES, Surgeon General's Report 2010: Building on our Strategy, page 2.

would be able to achieve national objectives in its absence. This program is therefore deemed to be a high priority for DND and the GC.

2.3 Relevance—Alignment with Federal Roles and Responsibilities

Evaluation Question: Is the delivery of MSDO consistent with the roles and responsibilities of the federal government and, more specifically, the roles and responsibilities of DND/CAF?

Key Finding 3: The CAF is legally and morally responsible for delivering medical and dental services to military personnel on deployed operations and at home.

The provision of health services to Canadian military personnel is a long-standing responsibility of the GC. It is entrenched in the 1867 *Constitution Act*, which defines health care for Canada's military personnel as a federal responsibility, and is reinforced in the *National Defence Act*, the *Canada Health Act* and the Queen's Regulations and Orders. Members of CAF are excluded from provincial health care under the *Canada Health Act*, so it is therefore a requirement that DND provide CAF personnel with adequate coverage and care both at home and abroad.

The GC is also a signatory to the Geneva Conventions and the Additional Protocols. Its obligations under these conventions, as set out in the *Geneva Conventions Act*, include the responsibility to collect and care for the wounded and sick during wartime.⁶ Failure to fulfil these obligations, which also include the need to provide an acceptable level of care to enemy prisoners of war and detainees, could result in a violation of the Law of Armed Conflict.

2.4 Performance—Achievement of Expected Outcomes (Effectiveness)

Immediate Outcome 1: Were there sufficient numbers of qualified, properly equipped and supplied personnel available to meet the medical needs of deployed forces?

Key Finding 4: MSDO has demonstrated its ability to meet the medical needs and expectations of deployed forces, and to work effectively with its allies, partners and contracted personnel to provide a high standard of health protection and care during operations.

To support the needs of deployed forces, CFHS is expected to provide sufficient numbers of medical personnel with appropriate training, certifications, equipment and supplies. Moreover, they must be organized and supported to carry out their duties. The evaluation assessed a number of elements to determine the availability of MSDO resources and assets to meet expectations, including: medical occupation levels, training and

⁶ *Geneva Conventions Act*, 1984 Chapter 2 (Wounded and Sick), Article 12, page 9, and Article 15, page 10.

certification, medical supplies and equipment, and organization. Based upon an assessment of recent operations (through Lessons Learned), interviews with primary stakeholders and program managers, and performance measurement data, the evaluation team found that, while the needs of deployed forces were met over the past five years, challenges existed.

During the evaluation period (2007–2012), CFHS participated in 16 humanitarian and disaster relief operations, as well as seven combat rotations in Afghanistan for OP Athena. It was found that sufficient numbers of qualified personnel to support these operations were not always available from within CFHS. Sustained support to combat operations at the Role 3 level required the medical assistance of allied forces, contracted Canadian civilian specialists, and by significantly increasing numbers of uniformed CAF specialists above PML. Reservist medical support personnel composed, on average, about 10 percent during these rotations. As a result of the implementation of these mitigating measures, neither the success of the operation nor the ability to provide needed care were impacted.

Other issues that have impacted on the ability to meet the medical needs of deployed forces are noted below under the sub-headings for key elements that were reviewed.

Staffing of Medical Personnel

Key Finding 5: Challenges remain in the recruitment, development and retention of certain key medical occupations and categories. Performance data on personnel with current licenses and TES versus PML targets for some officer occupations remain below target.

CF H Svcs Gp has approximately 6,400 regular force, reserve and civilian personnel from over 45 health occupations and specialties in 126 units and detachments in Canada and abroad. Included in these occupations and specialties are: medical technicians, physician's assistants (PAs), nurses, specialists, and medical officers.

Historically, key CFHS positions—such as medical officers, nursing officers, social workers, physiotherapists and pharmacists—have been difficult to fill. For example, positions for physicians and surgeons (medical officers) have historically been as low as 45 percent of desired levels. During the evaluation period, these levels actually hit historic highs of 98 percent, largely due to the attraction of working in Afghanistan, where conditions offered unique and valuable medical experience. Some categories remain under strength even though shortfalls were mitigated through medical education and outreach programs, and partnerships with the Royal College of Physicians and Surgeons of Canada, the Canadian Medical Association, and other medical professional organizations. There are indications, however, that the end of the mission in Afghanistan and the effects of fiscal constraints are contributing once again to shortfalls in medical officer recruitment and retention difficulties.

Figure 2 presents performance measurement data for TES versus PML for both the officer and non-commissioned officer positions. Challenges remain in recruitment and

retention of key occupations, such as physiotherapists and medical laboratory technicians. The sub-occupation of PAs is also critical for MSDO, and is a few percentage points below PML as shown in Figure 3 under the category of Medical Technician.⁷

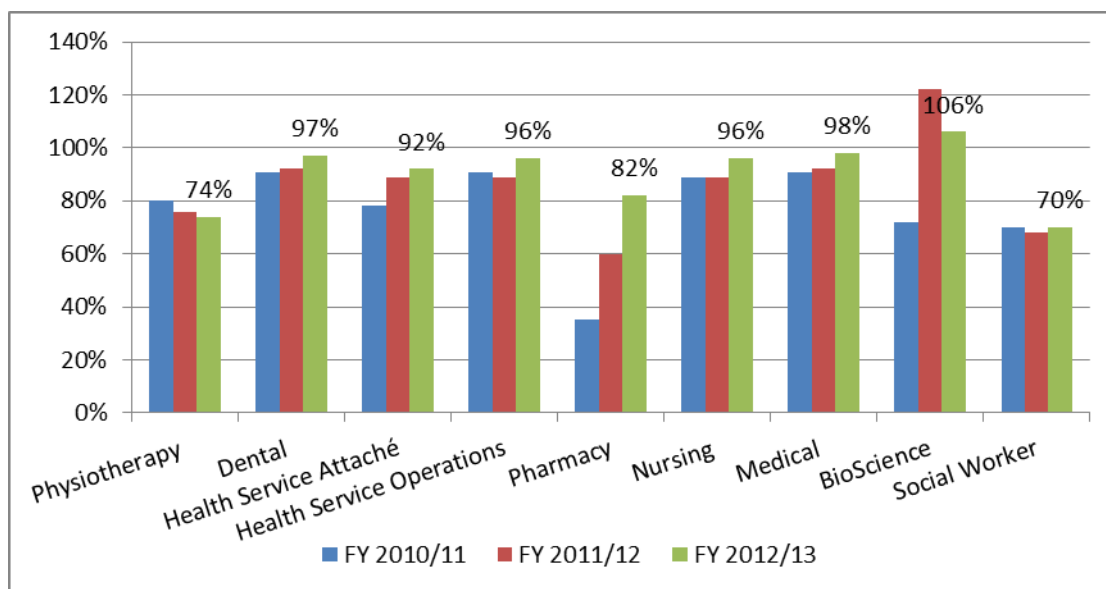


Figure 2. Percentage TES versus PML—Officer Occupations. The data is summarized in Table 3.

The projected target of 95 percent was met by FY 2012/13 for all occupations except physiotherapists, pharmacists and social workers.

FY	2010/11	2011/12	2012/13
Physiotherapy Officer	80	76	74
Dental Officer	91	92	97
Health Service Attaché	78	89	92
Health Service Operations	91	89	96
Pharmacist	35	60	82
Nursing Officer	89	89	96
Medical Officer	91	92	98
Bio-Science Officer	72	122	106
Social Worker Officer	70	68	70

Table 3. Percentage TES versus PML—Officer Occupations. This table depicts the TES percentage for each of the medical officer occupations listed as a total of the PML over a three-year period.

⁷ Data extraction issues with the Human Resource Management System prevented breaking down the Medical Technician data into its constituent parts to reflect Physician Assistants, Operating Room Technicians, Preventive Medicine Technicians, and Aero-Medical Technicians.

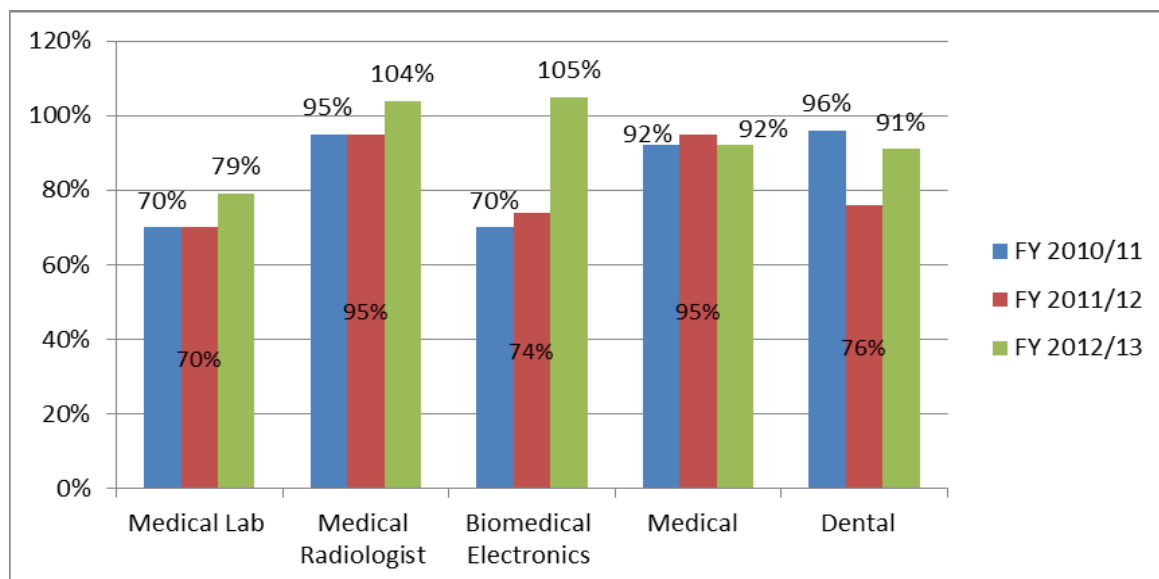


Figure 3. Non-Commissioned Member (NCM) Technician Occupations. The data is summarized in Table 4.

NCM Occupation	2010/11	2011/12	2012/13
Medical Lab Technician	70	70	79
Medical Radiologist Technician	95	95	104
Biomedical Electronics Technician	70	74	105
Medical Technician	92	95	92
Dental Technician	96	76	91

Table 4. Percentage of NCM Technician Occupations: TES versus PML. This table depicts the TES percentage for each of the NCM technician occupations listed as a total of the PML over a three-year period.

The projected target of 95 percent was met for all occupations except medical laboratory technician.

Interviews and lessons learned also indicated that CFHS has had difficulties in developing and ‘force generating’ personnel in the PA and Medical Technologist categories on past missions, which continue to be a challenge as reflected in the performance measurement data. While the TES versus PML data demonstrates some of the challenges of reaching personnel targets, additional personnel data, such as numbers of those who are actually ready and fit to deploy, are needed for a more complete and accurate picture.

Another key concern is the high operational tempo for the medical occupations. As these members are required for almost every deployed operation, there is a high demand and frequency of requests for deployment. This compounds the pressure on lower staffing

levels and may lead to higher attrition rates, particularly since medical occupations are also sought after outside of the CAF.

CRS Recommendation

1. For medical occupations, there is a requirement for continued efforts in recruitment and development programs for retention. In addition, CFHS must use the experience gained on operations to develop an accepted methodology to identify/determine future personnel requirements.

Training of Personnel

Key Finding 6: Enhancements to training in recent years, especially during OP Athena, have extended CFHS capabilities and contributed to the successful delivery of medical support and better health outcomes on the battlefield.

CFHS personnel participate in a number of individual and collective training programs that are vital to MSDO's readiness and performance. A majority of this training takes place at CFB Borden, Ontario, and includes training for medical technicians, dental technicians, preventative medicine technicians, PAs, nurses and others. CFHS also partners with civilian health care facilities throughout Canada to provide clinical education and training for its students.

During OP Athena a number of enhancements to medical training were implemented that contributed to the success of CFHS medics on the battlefield and to positive health outcomes during the war. For example, the TCCC's two-week course given to select combat troops (one of every eight soldiers received this training), as an enhancement to the regular 2-day combat care course, enabled soldiers to provide quick care on the battlefield and act as a medical "extension" to CFHS capabilities and resources. The TCCC taught medical techniques to regular forces, such as applying tourniquets and hemostatic dressings, and performing needle decompression under the direction of a medic.⁸

CFHS personnel also implemented an extension of their regular medical training through the TACMED course. This additional two-week course, introduced by CFHS in 2007, provided "realistic training" and represented "the highest level of care provided by CAF members in the pre-hospital battlefield setting."⁹ This enhanced training contributed greatly to the success of CFHS on the battlefield and lowered the loss of life during OP ATHENA. "Medics frequently state that this training was crucial to their effectiveness on the battlefield."¹⁰

⁸ Lieutenant-Colonel Savage, E. et al., Tactical Combat Casualty Care in the Canadian Forces: Lessons Learned From the Afghan War, Canadian Journal of Surgery, Volume 54, Supplement, December 2011, page S120.

⁹ Ibid.

¹⁰ Ibid.

Equipment and Supplies

Key Finding 7: MSDO has faced challenges in timely procurement of medical equipment for major operations in recent years.

CFHS has faced challenges in the past related to timely procurement of medical supplies during large, multiple-rotation operations such as OP Athena in Afghanistan. Medical supplies for DND/CAF are managed by the Central Medical Equipment Depot, which provides health care supplies, equipment maintenance and repair support to all entitled units and elements of the CAF. This Depot provides a supply service apart from general supplies due to the unique nature and time-sensitivity of medical supplies.

Contracting issues were seen as one cause for delays in supplies. Often, the value of the procurement and the urgency of the need during military operations necessitated the use of pre-established contracting instruments such as supply arrangements or standing offers that were not in place prior to 2006.¹¹ Interviews with CFHS staff and review of Office of the Auditor General reports found that this was a persistent and continued problem during the time period covered in this Evaluation. Lessons learned from OP Athena noted challenges in supply management, which were in part due to shortages of qualified procurement personnel in the supply chain.

CRS Recommendation

2. Address any shortages or gaps in the current medical supply management process, including a review of existing supply arrangements and standing offers, and adequate levels of procurement personnel.

Key Finding 8: During recent missions in Afghanistan, the CAF lacked its own Forward Aeromedical Evacuation capability, which in some operational scenarios is critical to casualty survival and optimal health outcomes.

Another significant limitation that arose during the evaluation study was the CAF's lack of its own "Forward Aeromedivac" capability to extract injured and wounded from the battlefield during OP Athena. To mitigate this, the CAF relied on allies, including the United States, for support, in part because they already had this capability up and running, and because the CAF was still developing this capability through training and the use of Griffon helicopters acquired in 2009.

¹¹ Office of the Auditor General of Canada, Chapter 2: Support for Overseas Deployments—National Defence, Report of the Auditor General of Canada, May 2008, pages 15-16.

Organization Structure

Key Finding 9: CFHS is limited in scope and specialties that can provide for or sustain a complete Role 3 level of care on its own—although it has addressed this partly through work with allies and by means of enhancements, including expanded use of Role 2 Enhanced and other forward-moving capabilities for MSDO.

In 2000, CFHS undertook a large-scale reorganization as part of a ten-year, multifaceted DND/CAF reform project called Rx2000. The renewal initiatives, along with a reduction of resources earlier in the mid-1990s, led to a more integrated model of care delivery between in-garrison support and MSDO. The key component of this integration was the movement of all HSS personnel under the umbrella of the CF H Svcs Gp. This primarily affected unit level medical personnel, as they were removed from their previous unit establishments and placed in the HSS units (currently 43).

Today, CF H Svcs Gp includes these forty-three units, eighty-three detachments including clinics, three field ambulances (mobile medical units), one field hospital, two schools, one research establishment, and one medical equipment depot. Through increased integration of CFHS, in-garrison health care directly supports deployed medical capabilities by promoting and maintaining the health of CAF personnel and providing pre-deployment screening, while also training and maintaining the core medical skills of CFHS staff to deploy themselves.

In this integrated organizational model, all CFHS units are force generators—from the field ambulances to the CF H Svcs clinics. Limitations do exist for CFHS in delivering full Role 3 care, which can only be done in partnership with allies. CFHS has won recognition for its contribution and leadership at the joint international Role 3 hospital in Afghanistan during OP Athena. Recent NATO expansion of the definition and capabilities of Role 2 Enhanced¹² has also greatly enhanced CFHS capabilities to deliver broader care and specialties on the battlefield that were previously only available at the Role 3 level.

Lessons learned from recent operations, including earthquake relief efforts in Haiti during OP Hestia, have also led CFHS to develop more modular and forward-generating medical capabilities that offset past reliance on only Role 3 specialties and capabilities; this has enhanced and increased effectiveness of medical support to deployed operations. A recent peer-reviewed article on OP Hestia in the Canadian Journal of Surgery also recommended a more rapid and mobile implementation surgical capabilities in the future, which could be useful in both disaster relief efforts and MSDO.¹³ Since this article was published, in 2012, and as a result of the lessons learned, a new modular Acute Medical Surgical Capability has been developed that increases timely response.

¹² DND, Joint Doctrine: Health Services Support to Operations, Issued on authority of the Chief of Defence Staff, February 2007, page 6.

¹³ Talbot, M. et al., 1 Canadian Field Hospital in Haiti: Surgical Experience in Earthquake Relief, Canadian Journal of Surgery, Vol. 55, No. 4, August 2012, page 274.

Intermediate Outcome 1: Was treatment and care effective on deployment?

Key Finding 10: Members of the CAF receive high-quality treatment and care wherever and whenever they are deployed.

The evaluation study found strong evidence that the delivery of medical support to deployed operations has been a resounding success over the past five years. Members of the CAF have received high quality, world-class treatment and care across all three environmental commands (i.e., Canadian Army, Royal Canadian Navy and Royal Canadian Air Force). This is also demonstrated by numerous awards and commendations received by CFHS personnel in recent years, including a unit commendation to one Canadian Field Hospital for its support to CAF operations in the Persian Gulf, the Balkans, Afghanistan and Haiti.¹⁴

A large part of CFHS's recent success has come from its leadership and performance in OP Athena in Afghanistan, including its leadership of the Role 3 Multinational Medical Unit at Kandahar Airfield, Afghanistan, from 2006 to 2009. While operating in support of the International Security Assistance Force's peace-enforcement mandate in Afghanistan, Canadian and international Role 3 Multinational Medical Unit staff performed a total of 6,735 procedures on 4,134 patients.¹⁵ Survival rates for these procedures were exceptionally high, with approximately 98 percent of CAF and International Security Assistance Force personnel leaving the hospital alive; these rates were similar to or exceeded those experienced in civilian trauma centres in Canada.¹⁶ The fact that many of these wounds were quite extensive, such as improvised explosive device blasts requiring multiple amputations, is a further demonstration of the skill and effectiveness of MSDO provided by CFHS personnel.

In recognition of "its extraordinary clinical success under austere conditions," Canada was awarded the Dominique-Jean Larry Award by the NATO Committee of the Chiefs of Military Medical Services in November 2012.¹⁷ This award is the highest honour for military medical support and medical interoperability that NATO bestows.

Table 5 outlines the number of casualties, wounded in action (WIA) and non-battle injuries (NBI) that occurred during eleven rotations in Afghanistan. The low number of deaths can be attributed to the high record of success of MSDO.

¹⁴ DND, CAF H Svcs Gp, Surgeon General's Report 2010: Building on our Strategy, page 23

¹⁵ Col Brisebois, R. et al., The Role 3 Multinational Medical Unit at Kandahar Airfield 2005-2010, Canadian Journal of Surgery, Vol. 54, No. 6 (Suppl.), December 2011, page S126.

¹⁶ Ibid.

¹⁷ NATO, General Bartels opens the 38th Committee of the Chiefs of Military Medical Services plenary session", http://www.nato.int/cps/en/natolive/news_91452.htm?selectedLocale=en, last retrieved November 21, 2012.

Dates	Rotation	Deaths	WIA	NBI	Total
August 2005–January 2008	1–4	78	298	441	817
January 2008–August 2008	5	19	63	112	194
August 2008–February 2009	6	19	70	122	211
March 2009–October 2010	7	15	78	173	266
November 2009–May 2010	8	13	28	184	225
May 2010–November 2010	9	9	74	184	267
November 2010–July 2011	10	4	9	175	188
July 11–December 2011	11	0	2	17	19
	Total	157	622	1408	2187
	Mean	13.1	51.8	117.3	182.3

Table 5. Casualty Registry Data for OP Athena. This table outlines the number of casualties, WIA and NBI that occurred during eleven rotations in Afghanistan.

The evaluation study noted that CFHS has improved the effectiveness of MSDO by implementing various initiatives during the past five years. Interviews and reports of lessons learned mentioned the effectiveness and efficiency of “forward deploying” some medical services that are traditionally provided at the Role 3 or static hospital level. Medical services, such as psychiatry and physiotherapy in particular in Afghanistan, were considered effective in the early treatment of injuries and prevention of greater repatriation of CAF personnel. It allowed CFHS to address the health needs of soldiers in theatre and helped to get them back to their duties as quickly as possible. It should be noted, however, that this was only made possible by exceeding PML for specialists, hiring civilian medical personnel, and through significant reliance on allied medical resources.

Other innovations included:

- improving training for medical technicians to provide earlier care at point of injury;
- the procurement of portable ultrasonography machines; and
- based on knowledge that those wounded in combat often die from exsanguinations, CFHS greatly enhanced training for combat soldiers to provide greater “self care and buddy aid,” improving the survivability of the wounded.¹⁸

Key Finding 11: Coordination and use of allied and other-nation medical resources are often critical to effective health care and MSDO, especially on smaller or international missions.

Operations in Afghanistan were enhanced through the effective use of allied partnerships, particularly with regard to the United States’ assistance with performing Aeromedical Evacuations. Since the threat posed by improvised explosive devices and enemy

¹⁸ Commander Jung, H., Lessons Learned From the War in Afghanistan: A Commander’s Perspective, Canadian Journal of Surgery, Vol. 54, No. 6 (Suppl.), December 2011, p. S111.

ambushes often made it difficult for CF H Svcs Gp's land-based ambulances to reach combat casualties in a timely manner, access to this ally's Aeromedical Evacuations capabilities offered a safer and more rapid evacuation to the Role 3 facility, and was a crucial enabling factor in the delivery of effective treatment and care. It also allowed the evacuation of critically-wounded personnel to Landstuhl Regional Medical Centre, a Role 4 facility in Germany, where treatment beyond capabilities of Role 3 could be delivered.

The ability to leverage allied health resources also allowed CFHS to ensure the delivery of an appropriate level of care to Canadian soldiers participating in United Nations operations. The number of CAF personnel deployed on these operations is usually quite small, so it can be difficult to justify sending them with anything beyond a Role 1 level of care. Instead, CFHS often works through its United Nations partners to secure appropriate and effective HSS arrangements for CAF personnel. In 2011, for example, the health needs of Canada's eleven-person contribution to the United Nations Organization Stability Mission in the Democratic Republic of Congo were addressed through a combination of Indian, Jordanian, United Nations and South African capabilities.

Key Finding 12: The incorporation of the TCCC and TACMED programs into pre-deployment training contributed to higher survivability and treatment outcomes.

Interviews with senior CFHS staff and clinicians indicated that the implementation of TCCC and Combat First Aid training to combat troops and enhanced TACMED training for CFHS medics contributed greatly to enhancing medical capabilities, and to successful health outcomes on the battlefield.¹⁹ The simultaneous introduction of new medical consumables, particularly improved tourniquets and haemostatic dressings, contributed to this success by enabling deployed medical technologies to provide more effective battlefield care. TCCC is now offered to select deployed military personnel and has been embraced across all three branches of the Canadian military. In addition, standard first aid training is also mandatory for all deploying personnel.

Intermediate Outcome 2: Effective Disease and Injury Prevention

Key Finding 13: New prevention measures and activities have been implemented in recent years including "mental health readiness" programs, that require further monitoring and measurement for effectiveness.

¹⁹ For a detailed overview of the concepts underlying TCCC, see Lieutenant Colonel Savage, E. et al., Tactical Combat Casualty Care in the Canadian Forces: Lessons Learned From the Afghan War, Canadian Journal of Surgery, Vol. 54 (Supplement), December 2011, page. S118-S123; and Butler, F. K. Jr. and Blackburne, L. H., Battlefield Trauma Care Then and now: A Decade of Tactical Combat Casualty Care, The Journal of Trauma and Acute Care Surgery, Volume 73, Number 6, December 2012, pages S395-S402.

Based upon stakeholder interviews, program data, and lessons learned from OP Athena the evaluation team found that the MDSO was effective in preventing most non-battle injuries (accidents and disease) during deployed operations. It was also noted that Director Force Health Protection contributed significantly on both OPs Athena and Hestia with Force Health Protection guidelines (e.g., the CAF was able to minimize anti-malarial use, compared to United States military personnel, yet still prevent illness). CAF medical personnel were also able to conduct in-theatre health threat assessments to reassure the chain of command regarding air quality issues. Casualty registry data shows that the rate of NBI during the time period covered in the Evaluation remained relatively constant and did not increase, despite the high operational tempo of major operations such as OP Athena.²⁰

A key area of concern for CFHS has been the possibility of mental injuries during battle and operational stress injuries occurring later in the post-deployment phase of duty. To prepare CAF personnel (including medical personnel) to prevent this type of mental injury more effectively, CFHS developed a number of programs and psychological resilience training, such as The Road to Mental Readiness. The Road to Mental Readiness is a pre-deployment training program that has four learning objectives:

- understanding stress reactions;
- identifying challenges of deployment and their impact,
- learning and applying strategies to mitigate the impact of stress; and
- recognizing when and where to seek support.²¹

Other mental injury prevention programs include the CAF Expert Panel on Suicide Prevention, CAF Expert Panel on Mild Traumatic Brain Injury, and the Enhanced Addiction Treatment Program.

In addition to these prevention programs, pre-deployment screening also plays a critical role in identifying injury and disease prevention, including mental injuries. Several interviews and lessons learned reports raised efficiency issues with pre-deployment screening and questions about the level and quality of the checklist approach to screening. Reservists in particular were identified as a key group who could not always ensure that they had a basic medical screening prior to deployment. Interviews with CFHS staff noted that reservists do not have consistent military pre-deployment medical checkups or follow-ups post-deployment.

CRS Recommendation

3. Ensure that pre-deployment medical screening is tracked and reported. Conduct rigorous monitoring and outreach related to medical follow-ups (including mental health follow-up) for both regular forces and reservists post operations.

²⁰ See Table 5 in this report for NBI and Return to Duty (RTD) rates for OP Athena.

²¹ DND, CAF H Svcs Gp, Surgeon General's Report 2010: Building on our Strategy, page 13.

Intermediate Outcome 3: Was medical advice and research effective in supporting the planning, policies and/or implementation of MSDO?

Key Finding 14: Medical research conducted by and for CFHS (where CFHS leads or internally conducts the applied research) contributes valuable information towards strategic and tactical medical advice and MSDO.

In 2010, the Surgeon General created a Health Research Strategy that coordinates science and technology research efforts around eight key research areas: Operational Medicine, Trauma Care, Public and Occupational Health, Mental Health, Healthcare Resources, Primary Care, Epidemiology and Population Health, and Health Personnel. Some of the benefits from this research include: “better forward casualty triage; advances in trauma management and analysis; better knowledge of mental health status and the effectiveness of current screening and preventive measures; the development and implementation of resiliency, and TBI management.”²²

The Surgeon General’s Research Strategy also includes the creation of a Health Research Board tracking system and Military and Veteran Health Research Forum, all of which have helped to inform the strategic and operational advice and guidance the Surgeon General must give to DND/CAF. Operationally, the Surgeon General must provide advice and guidance to the CAF, develop policies, standards and procedures. Relevant and timely data, information, and research are crucial to providing this advice.

Another tool that supports the Surgeon General in providing medical advice is the Standing Committee on Operational Medicine Review and the Clinical Council. Both of these formal bodies provide medical advice to the Surgeon General. The Standing Committee on Operational Medicine Review includes expert military clinicians, and has provided a number of tactical medical recommendations in past operations, such as “providing for forward surgical support to combat operations, improved training for medical technicians to allow them to provide better care at point of injury [and on] ...the procurement of new equipment, such as portable ultrasonography machines.”²³

Ultimate Outcome: Was MSDO effective in contributing to the maintenance of a combat capable, multipurpose force?

Key Finding 15: The delivery of effective MSDO contributed to a nearly 50 percent rate of return to duty during a high-tempo operational cycle such as in Afghanistan during OP Athena.

Data from CAF’s “casualty register” strongly indicates that MSDO is effective at contributing to the maintenance of a combat-capable, multipurpose force. MSDO does

²² Surgeon General, Building on our Strategy Report (2010), page 46.

²³ Commander Jung, H., Lessons Learned From the War in Afghanistan: a Commander’s Perspective, Canadian Journal of Surgery, Vol. 54, No. 6 (Suppl.), December 2011, page S111.

this by saving the lives of Canadian soldiers when they are injured and helping to get them back to their duties as quickly as possible. During eleven rotations of Op Athena, for example, a total of 1,009 soldiers were able to return to active duty as a result of medical support delivered in theatre; this is nearly 50 percent of the total who were injured across the eleven rotations of OP Athena. This helped to preserve the personnel strength of Canada's Battle Group Task Force in Afghanistan, and directly contributed to its ability to sustain combat operations.

Data from the casualty registry in Table 6 presents the total number of non-fatal injuries experienced by CAF personnel during OP Athena. It divides this total into two distinct categories: WIA and Non-Battle Injury (NBI). Each category is further broken down according to the six-month operational rotation in which the injuries occurred. The total amount of soldiers who were able to RTD following treatment is then listed according to injury category and the rotation in which they were injured.²⁴ The numbers demonstrate that a high rate of return to duty was achieved through the efforts and skills of CFHS in providing MSDO.

OP Athena Rotation Number		1–4	5	6	7	8	9	10	11	Total
Injuries	WIA	298	63	70	78	28	74	9	2	622
	NBI	441	112	122	173	184	184	175	17	1408
	Total	739	175	192	251	212	258	184	19	2030
RTD	WIA	190	39	42	43	9	33	3	2	361
	NBI	246	25	39	87	87	82	79	3	648
	Total	436	64	81	130	96	115	82	5	1009
RTD Ratio (percent)	WIA	64	62	60	55	32	45	33	100	58
	NBI	56	22	32	50	47	45	45	18	46
Total (percent)		60	37	42	52	45	45	45	26	50

Table 6. RTD Data for OP Athena by Rotation. Data obtained from CAF's Casualty Register demonstrates overall injury and return to duty numbers for all eleven rotations of OP Athena. The rate of RTD was nearly 50 percent.

Another way to demonstrate MSDO's contribution to the maintenance of a combat-capable, multipurpose force was through development and implementation of TCCC and TACMED training that was provided to CAF members during deployment on OP Athena, and has since been expanded to other members of the forces. This additional training enables forces to provide a higher level of medical self-care and assistance to their unit members, thereby improving survival and injury prevention rates and further enabling the forces through expanded medical tools and capabilities.

²⁴ These numbers capture all injured military personnel who were treated in theatre (i.e., at Role I, II or III levels of care) and who were not subsequently repatriated to Canada. They exclude all personnel who received treatment in Afghanistan prior to being repatriated to Canada or evacuated to the Role IV facility near Landstuhl, Germany.

2.5 Performance—Demonstration of Efficiency and Economy

Evaluation Question: Were the most economical and efficient means of achieving the intended objectives employed?

To assess the efficiency and economy of the MSDO program, the evaluation considered the following:

- use of best practices to drive efficiencies;
- resource allocation; and
- overall program cost.

Key Finding 16: Efficiencies and greater clinical effectiveness were achieved through enhanced training techniques such as TCCC and TACMED, which pushed forward and expanded medical capabilities beyond what CFHS could normally provide in battle. Enhancements to Role 2 also enabled specialties such as psychiatry and physiotherapy to be implemented in theatre, reducing further injuries and repatriations.

Best Practices

Enhanced training such as TCCC and TACMED enabled earlier lifesaving procedures and extended CFHS capabilities on the battlefield, which provided an efficiency as well. The training acted as a force multiplier for medical support in battle. In addition, the expanded definition and capabilities of Role 2 Enhanced has moved forward a number of specialties that were previously found later at the Role 3 level. This has had positive health benefits, with troops receiving certain specialized care sooner. It also contributed to efficiencies and potential cost savings, since later care in Role 3, or even repatriation for sustained injuries, can be more costly than treating injuries earlier, on or near the battlefield.

A recent peer-reviewed journal article assessing the costs of providing medical care in combat, by Tien, Acharya and Pannell (2009), found that it is often less expensive to care for injured soldiers on site than at home (taking into account methodological limitations). Having the necessary equipment (and specialties) on site is cost-beneficial in most cases. The article found that, on average for soldiers with the same level and severity of injury, it costs approximately \$20,000 to care for a soldier at a field hospital before returning to duty; \$42,000 for one treated at an out-of-theatre regional referral hospital before returning to duty; and \$113,000 to care for one repatriated and finally treated in Canada.²⁵

CFHS interviews, document reviews and lessons learned noted these efficiencies created by this “forward movement” or deployment of key medical resources and specialties,

²⁵ Tien, H. C. N., The Cost of Providing Health Care to Injured Soldiers in War, The Journal of Trauma, Injury, Infection, and Critical Care, Volume 67, Number 2, August 2009, page 379.

such as physiotherapy and psychiatry in theatre. All of them may have further reduced the number of potential repatriations during recent operations such as OP Athena.

Employing a multinational model for the Role 3 in Afghanistan also enabled the CAF to leverage several resources and capabilities not available or developed by CFHS, but existent in other military medical services, such as neurosurgery (provided by United Kingdom). By implementing these measures CFHS has been able to leverage the resources and capabilities of other countries and achieve cost savings (to the CAF) by avoiding duplication of resources or for developing and training CFHS personnel for what might be limited-use capabilities. It should be noted, however, that without access to allied capabilities these efficiencies would not be realized.

Resource Allocation

Key Finding 17: MSDO's budget is properly aligned with its mandate and mission, with the largest portion of the MSDO readiness budget (70 percent) supporting FG and Operations.

Costs associated with MSDO were on average \$240 million each year over the past four fiscal years, as reflected in Table 7.²⁶ As demonstrated by the allocation of resources, the largest area of expenditures (70 percent) was in support of FG (the ability to deploy fully equipped, qualified, and supported medical personnel) or in the conduct of an actual operation itself. One area of note is the rise in expenditures over the evaluation period. Almost all categories have increased by approximately 30 percent from FYs 2008/09 to 2011/12.

FG and OPs	2008/09	2009/10	2010/11	2011/12	Budget Multiplier (%)
Training and Education	22,182,646	27,010,719	28,115,564	29,454,393	11.36
Support FG and OPs	137,196,542	167,057,491	173,890,804	182,171,269	70.26
RX 2000	9,080,044	11,056,324	11,508,572	12,056,596	4.65
Research	23,198,049	28,247,125	29,402,544	30,802,657	11.88
Occupational Health	2,265,129	2,758,137	2,870,955	3,007,667	1.16
Command and Control/Overhead	1,347,361	1,640,616	1,707,724	1,789,043	0.69
Totals	195,269,772	237,770,412	247,496,163	259,281,625	100

²⁶ Note that the costs listed in Table 7 do not include military pay for regular forces. Pay amounts for contract and reservists are included under O&M or, in this table, as "support FG and Ops."

Table 7. MSDO Breakdown of CFHS Readiness Costs (in Dollars) From FYs 2008/09 to 2011/12. The table shows MSDO CFHS expenditures by category over these four fiscal years.

Cost of Program

Key Finding 18: Although program readiness costs have increased by 30 percent, overall the program has actually become more cost-effective as the majority of the increases have been attributed to adding medical personnel, compared to very slight increases in administration and management costs.

The average cost of the MSDO program over the evaluation period was approximately \$240 million. Although program costs have increased by 30 percent, overall the program has actually become more cost-effective as it appears that the majority of the increases have been attributed to adding medical personnel, as opposed to very slight increases in administration and management costs. It could be said that the program delivers 60 percent more medical delivery personnel, compared to FY 2008/09, for just a 30 percent increase in cost.

Cost Comparison with Other Countries

In the past CFHS has considered doing comparisons with other nations' medical support. Difficulties arose due to differences in accounting and data availability. Each nation is not only funded differently but provides different levels of care to different patient groups, and in different ways. As an example, the United States health care mix is different for each branch—Army, Navy and Air Force—which have their own hospital system providing care to serving members (i.e., Regular and Reserve), dependants, retirees and, in specialized cases such as burns, to civilians. Even a model similar to ours, e.g., Australia's, has major differences—they rely on reservists for specialists, its Surgeon General has no central health care budget, and deals with a different patient mix. In the end, the evaluation team ruled out this measure for not comparing like products.

Annex A— Management Action Plan²⁷

CRS Recommendation

1. For medical occupations, continued effort toward recruitment and development programs for retention is required. In addition, CFHS must use the experience gained on operations to develop an accepted methodology to identify/determine future personnel requirements.

Management Action

Canadian Forces Recruiting Group (CFRG) lost two dedicated Health Services Recruiters and CFHS (Director Health Services Personnel (D H Svcs Pers)) lost one dedicated full-time recruiter position, which had been very active and successful in increasing the recruitment of difficult to recruit occupations. To offset these actions, D H Svcs Pers employed two CFHS Reserve Class A members one day per week to collaborate with CFRG in responding to potential recruit questions and to develop and execute recruiting activities in universities and highly attended national conferences across Canada. Local CFHS personnel are also tasked where available and applicable to accompany CFRG recruiters on local recruiting activities. While this strategy incurred minimal or no cost, intake results have been unacceptably low for the past FY 2013/2014. This low intake has increased the risk of under-manning several occupations that are essential for the provision of health care on operations and in garrison, prompting D H Svcs Pers to request the re-establishment of a full-time recruiter position within both CFHS and CFRG.

There are a host of other factors that have contributed to the significant challenges associated with health care practitioner attraction and recruiting, particularly in our stressed occupations. They include:

- The loss of the draw of an Afghanistan deployment where clinicians get highly clinical and beneficial occupational training and experience;
- Restraints that have impacted negatively on a host of various programs /opportunities (Continuing Professional Education, Maintenance of Clinical Readiness Program (MCRP), interesting and exciting courses, depth and number of field exercise deployments, Temporary Duty entitlements, etc.);
- Canadian demographic changes and the United States' Health Care Reform are leading civilian jurisdictions to compete heavily with CAF for the attraction and retention of medical officers;
- Provincial trends to employ and rely more on physician assistants;
- The cessation of the automatic Lieutenant Colonel promotion trial for qualified medical specialists upon completion of obligatory service;
- Costing of foreign courses (in particular in the United States) has and will continue to increase substantially. These courses are required to maintain clinical and operational capabilities, and are at times not available in Canada. And

²⁷ CF H Svcs Gp revised this MAP in September 2014.

- In some of our medical occupations (pharmacists are an example) there is a significant discrepancy in pay scales and bonuses compared to their civilian counterparts. A recent study completed by a third party shows this discrepancy to be as high as 19 percent in some cases, adding to attraction (and retention) challenges.

RECRUITING

Action Plan:

In order to meet the above challenges, D H Svcs Pers will set up a Recruiting and Retention Cell. This initiative will put a strain on other programs within the directorate, but the priority must be supporting operations in-garrison care and operational readiness by means of trained and effective health services personnel.

Goal:

To meet the Annual Strategic Intake Plan for each occupation by focusing on specific high-concentration areas of the target population. The main target population is physicians, social workers, pharmacists and medical technologists, as their Strategic Intake Plan is the most difficult of all CFHS occupations to achieve.

Timelines

April 2014–March 2015: Attend a minimum of eight recruiting activities.

June 2014: Briefing Note identifying the need for dedicated recruiters for Health Services and CFRG. (Completed)

July 2014: Set up and staff a Recruiting and Retention cell. (Completed)

Maintain close coordination links with external agencies (particularly CFRG staff, Director Personnel Generation Requirements, colleges and universities, Military Occupational Structure Identifier (MOSID) advisors, Civil Military Cooperation, Director General Public Affairs Marketing).

August to October 2014: Orientate to the Analysis and Reporting issues by gathering available data and analyzing current problems and issues.

September 30, 2014: Briefing Note on the potential use of Recruiting Allowances. Intent is to submit authority requests so as to activate allowances as soon as it is confirmed that a certain medical occupation is going to be below the PML or experience a shortfall in recruiting personnel to meet the requirements for future years, since it takes at least 5 years to train a number of our shortfall occupations.

October to November 2014: Confirmation of lines of Operation and delivery points, including: review of the OP Design's lines of operation (Analysis and Reporting) with specific attention to the decisive points and provide additions/amendments to the program as situations present themselves.

October 30, 2014: Set up plan with CFRG for the recruitment of direct entry officer critical care nursing officers, medical officers, medical specialists and for primary care paramedic medical technologists who are already licensed.

November 30, 2014: Creation of a communications plan aimed at attraction/retention—create strategic messages:

- develop/update handouts that can be used at job fairs, conventions and universities, as an important and needed attraction tool;
- update websites, as required, with attraction and retention messages; and
- develop other new and innovative ideas for attraction/retention.

Evaluation:

Report to be produced by D H Svcs Pers outlining outcome of activity (i.e., number of potential candidates, general interest, appropriate venue, etc.).

Updated OP Design.

Production of a Communication Plan.

RETENTION

Action Plan:

D H Svcs Pers has provided funding for each CFHS occupation to organize/participate in training and education opportunities/activities related to their occupation. These activities may be existing activities in the civilian sector or they may be initiatives within each CFHS occupation designed specifically for their occupation. Each MOSID advisor submits a proposal with substantiation as a retention tool, along with the cost. Upon approval, the MOSID advisor organizes and executes the activity and feedback is provided on the overall outcome.

Staffing action will be taken to continue the Retention Strategy for Medical Specialists which is aimed at correcting the attrition problem associated with Medical Specialists with a view to meeting operational requirements and rewarding clinical excellence. A request for official changes to the promotion pattern for Medical Specialist based on a trial run has been submitted for Chief Military Personnel (CMP) consideration. It must be noted that non-continuation of this strategy is likely to aggravate the attraction/retention challenge for physicians and will affect CAF operational needs.

All CFHS occupations have been identified as reaching a critical staffing point in FYs 2014/15, 2015/16 and 2016/17, where a large percentage of initial Variable Intermediate Engagement Terms of Service (TOS) will come to completion and many qualified personnel will have the option of renewing a TOS or leaving the CAF. The time at which a new TOS is offered is critical. It has been observed that a number of CFHS personnel are not receiving a TOS offer until their current TOS has almost expired or already has, thus making it difficult for personnel to plan their career. This practice has led to personnel opting to accept offers from the civilian sector, and may effect an increase in the attrition rate. In the near future, the CFHS chain of command will direct unit Commanding Officers to offer TOS Offers earlier.

Since 2007, D H Svcs Pers has been providing opportunities for maintenance of clinical skills through the Maintenance of Clinical Readiness Program (CFHS Instruction found at <http://cmp-cpm.forces.mil.ca/health-sante/pd/pol/3100-22-eng.asp>), as well as through Continuing Professional Education opportunities for CFHS clinical personnel (CFHS instruction found at <http://cmp-cpm.forces.mil.ca/health-sante/pd/pol/3110-14-eng.asp>). Each CAF clinician has access to these programs, and participation in each one is measured at the end of each fiscal year. D H Svcs Pers has instituted a review of this program to ensure that it reflects and measures knowledge and professional competencies. We are also going to improve our tracking systems to ensure that we capture the information we needed to report on these measures.

D H Svcs Pers has embarked on the occupational restructuring of the medical technician and PA occupation. This process is expected to take two years to complete. It is anticipated that this restructuring should reduce the PA attrition rate by opening up a separate clinical occupation with a structure that is competitive with civilian PA employment opportunities.

Goals:

To retain experienced and highly qualified personnel to provide the best care to CAF personnel both in-garrison and on operations.

Timelines:

July 30, 2014: Complete briefing note to Assistant CMP on reimbursement of License/Membership for Health Care Practitioners and Other Health Care Professionals (still being staffed through the chain of command).

September 30–November 30, 2014: In order to improve the MCRP program, we are now starting a program review to make it more knowledge- and competency-based with a view to addressing the findings of the CRS report such as to include:

- defined data points;



- developed reports for the individual, supervisor, commander and program manager;
- mapping of all processes;
- a developed decision-making matrix to assess possible software platforms;
- a review of all MCRP documentation and provision of suggested amendments;
- a DL learning package to implement new systems that are developed and delivered;
- provision of Quality Assurance and process improvements 2 months post implementation; and
- a program staff member trained to maintain MCRP tracking system and produce reports.

October 30, 2014: Contract for services to perform civilian-military analysis of pay and benefits for medical officers, dentists, pharmacists and PAs.

October 30, 2014: Address TOS offers by commanding officers and Director Military Careers Administration no later than one year prior to expiry of current TOS.

November 30, 2014: Retention activities per occupation to be determined for FY 2014/15.

November 30, 2014: Development of Exit Surveys—Create a tool to analyze why DND medical staff are leaving. MOSID advisors will conduct personal interviews with all clinicians who have submitted their release.

November 30, 2014: Re-establish Medical retention working group to develop strategies and plans to reduce Medical attrition.

December 31, 2014: Contingent on approval from CMP of the proposed changes to medical specialist promotions and PML, promotion be granted to Lieutenant Colonel in keeping with the performance review process, of medical specialist majors who have served for a period of 5 years after completion of post-graduate specialty training with certification, or after enrolment as Direct Entry Officer and completion of the period of obligatory service incurred either as a result of specialty training or receipt of a DEO enrolment bonus.

April 30, 2016: Anticipated completion of the occupational restructure of the Medical Technician and Physician Assistant occupation.

OPI: CMP – CF H Svcs Gp/Director Health Services Personnel

Target Date: Various intermediate target dates (see above)

Final Target Date: April 30, 2016



CRS Recommendation

2. Address any shortages or gaps in the current medical supply management process, including a review of existing supply arrangements and standing offers, and adequate levels of procurement personnel.

Management Action

The supply management process is deemed adequate to meet the current needs of medical re-supply. Shortages or gaps observed in the supply chain in recent years were, for the most part, outside of DND's control and were namely: the \$5,000 Local Purchase Order ceiling, contracting issues and back-orders from suppliers.

Local Purchase Order limit

The increase from \$5,000 to \$25,000 allows for a more efficient procurement process for items not available on existing Standing Offers (SOs). The previous \$5,000 limit was inadequate for expensive medical supplies and very often required assistance from the procurement cell of the Assistant Deputy Minister (Materiel) and Public Works and Government Services Canada (PWGSC), resulting in unwanted delays. The new Local Purchase Order limit enables the Central Medical Equipment Depot to contract directly from the trade for larger buys, with a more streamlined procurement process and quicker delivery timelines.

OPI: CMP – CF H Svcs Gp/Director Health Services Delivery

Target Date: Completed—Already in place

Supply Arrangements and Standing Offers**National Master Standing Offer**

PWGSC is in the process of renewing the Prime Vendor National Master Standing Offer (NMSO) on medical supplies—for which DND is, by far, the largest client. The contract was expected to be awarded in April 2014. PWGSC has also decreased the number of items on current NMSOs from 4,200 to 300, based on consumption rates over the past few years. This drop is a direct consequence of the no-longer-existing requirement for specific medical supplies, the vast majority of which were added to the NMSOs during the support of the Role 3 Hospital in Afghanistan. Although it would be ideal to have /maintain all critical/expensive medical items required for surgical capabilities on SOs, it is simply unachievable based on non-existent requirements. PWGSC will not set up SOs for items that have very low/no usage. Should the need rise again, the Local Purchase Order will be the initial method of procurement. Repeated requirements will then dictate the need to have items added to existing SOs or the establishment of new ones. Of note, SOs on medical equipment are of limited use since the \$40,000 limit call-up is too low, given the cost of such equipment. Contracting through PWGSC remains the only choice. The current Prime Vendor NMSOs have been extended to June 30, 2014 (with no impact

to DND users). This is needed to allow PWGSC to complete the review of bids, which is extremely time-consuming. As such, the NMSO target date has been adjusted to June 30, 2014.

Specialty SOs

PWGSC is in the process of establishing SOs for medical products for which certain companies have exclusive rights of acquisition and distribution in Canada. These products cannot be added to the Prime Vendors NMSOs. As an example, certain combat medical supplies would fall into this category. These commodities are required to conduct actual medical training.

OPI: PWGSC

OCI: CMP – CF H Svcs Gp/D HS Del

Target Date: June 30, 2014–new NMSOs (completed); December 2014 (Specialty SOs).

Warehousing and back orders from suppliers

Another major cause of procurement issues was linked to the inability of the civilian providers and Central Medical Equipment Depot, which latter orders from the former, to meet the surge of medical consumables generated by the Role 3 hospital. The providers and this Depot had to adjust their minimum/maximum inventory levels in order to re-supply the operation accordingly. Towards the end, minimum/maximum inventory levels had to be dropped to avoid excessive loss of dated medical consumables. To keep the inventories at the elevated levels would be far too expensive for the benefit of the action. In addition, ever-changing trends in medical treatment and technology would add to the cost over an extended period of time.

OPI: CMP – CF H Svcs Gp/D HS Del

Target Date: N/A

CRS Recommendation

3. Ensure pre-deployment medical screening is tracked and reported. Conduct rigorous monitoring and outreach related to medical follow ups (including mental health follow up) for both regular forces and reservists post operations.

Management Action

The responsibility and authority to ensure that CAF personnel, both regular and reserve force, report to their respective CAF medical clinics for post-deployment medical follow-ups (including mental health follow up) falls solely to the CAF chain of command. The CF H Svcs Gp has no authority in this regard, other than for the CF H Svcs Gp units directly under its command. A letter outlining this requirement will be sent to the 3 Services.

The CF H Svcs Gp, through CAF medical clinics, already rigorously tracks these encounters and will further increase outreach efforts to provide progress reports to local CAF chains-of-command to assist them as they strive to ensure that all of their personnel complete post-deployment medical follow-ups (including mental health follow-ups). CF H Svcs Gp/Director Medical Policy/Medical Policy and Standards will review extant policies with respect to pre-deployment screening and post-deployment screening, and revise them to facilitate compliance with this recommendation.

OPI: CF H Svcs Gp/D Med Pol/Medical Policy and Standards

OCI: CMP – CF H Svcs Gp/Director Mental Health

Target Date: March 30, 2015



Annex B—Evaluation Methodology and Limitations

1. Methodology

1.1.1 Overview of Data Collection Methods

The evaluation findings and conclusions have been based on the objective analysis and triangulation of multiple lines of evidence (both quantitative and qualitative) using the following research methods:

- a) Document and database review (including lessons learned).
- b) Literature review (including academic journals).
- c) Key informant interviews.
- d) Performance measurement data review.
- e) Financial analyses.

Each of these methods is described in more detail in the following sections.

1.1.2 Document Review and Literature Review

The document review included over 65 program and stakeholder documentation specific to MSDO, and identified key issues, trends and requirements that related to the relevance, performance, efficiency and economy of the program. In addition to program documents, the lessons learned database (Knowledge Management System), and reports for the five most recent years of operations (especially OP Athena in Afghanistan) were reviewed and incorporated in the analysis of several evaluation questions.

A literature review of academic and research studies was also conducted and used to identify broader trends, issues and challenges related to medical support to deployed operations, as well as best practices and lessons learned. The review included an examination of external documents, reports and academic research on topics related to MSDO from a Canadian, North American and NATO perspective.

1.1.3 Key Informant Interviews

Preliminary interviews were conducted during the initial scoping phase of the Evaluation with key members of CF H Svcs Gp, including senior leadership. These interviews provided information on the scope and key issues for the Evaluation and the logic model for MSDO.

Further interviews were conducted as part of the formal evaluation conduct phase. These interviewees were drawn from 5 main groups described in more detail in what follows.

- CFHS senior leadership—including those at CF H Svcs Gp headquarters;
- CFHS medical providers—who provide care delivery, such as medical technicians, PAs, nurses, medical officers, etc.;



- CFHS administrative staff—who provide planning, administration, governance, management of MSDO;
- post-deployment care—Integrated Personnel Support Centre/Joint Personal Support Unit staff;
- internal military stakeholders—this group includes force generators/force employers, such as operational commanders; and
- external partners and stakeholders—such as other NATO allies, and medical units from other countries such as the United States and United Kingdom.

Interview Group	Number of Interviews Conducted
1 CFHS senior leadership	5
2 CFHS medical providers	20
3 CFHS administrative staff	14
4 Post deployment care	3
5 Internal military stakeholders	5
6 External partners	3
Total	50

Table B-1. Interviews Conducted. This table lists the number of interviews identified for each of the interview groups.

1.1.4 Performance Measurement data review

Performance measurement data was provided by CF H Svcs Grp headquarters for indicators related to departmental/PAA reporting requirements and internal CFHS tracking. Most of the performance data provided were for the past three years only, and were analyzed in the performance section of this evaluation report.

1.1.5 Financial analysis

The financial analysis for the MSDO evaluation study contributed to the efficiency and economy questions indicated in the evaluation matrix. Estimates of costs (i.e., planned and actual) for MSDO have been included in the final report. A comparison of financial data for medical support to deployed operations from other countries was not included in this Evaluation, as activities and costs related to medical support to deployed operations of other allied countries were considered to be too different for the purposes of this evaluation study.

2. Limitations

The following constraints and limitations were found during the evaluation study and the listed potential mitigation strategies were considered.

Limitation	Mitigation Strategy
Performance measurement information and indicators were limited to only 3 years of data on average.	Used other data gathered from documents and databases.
Available logic model was for broader scope of HSS not MSDO.	Developed a logic model for MSDO with the support and advice of CFHS for the purposes of the Evaluation.
Comparison of financial data for medical support to deployed operations from other countries.	A review of medical support activities and costs for other allied nations resulted in differences that would not support a clear comparability. This methodology was not pursued further for this study.

Table B-2. Potential Mitigation Strategies. This table shows the limitations of the evaluation methodology and the mitigation strategy used to manage the bias.

Annex C—Logic Model

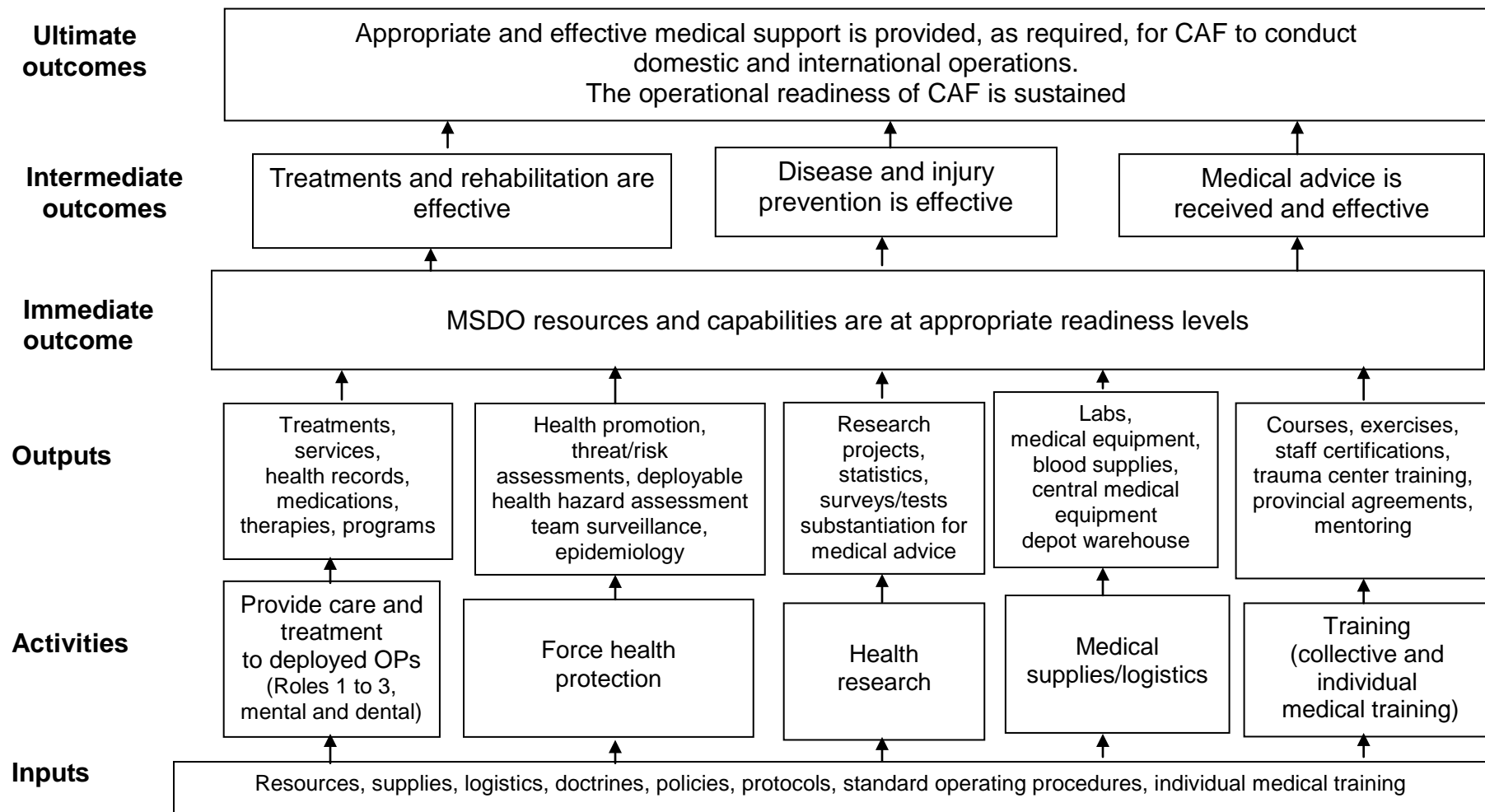


Figure C-1. MSDO Logic Model. This flowchart depicts the link between MSDO inputs, activities and outputs, and the immediate, intermediate and ultimate outcomes.

Annex D—Evaluation Matrix

Evaluation Matrix—Relevance						
Evaluation Issues/Questions		Indicators	Performance Measurement Data	Document Review and Lessons Learned	Interviews	Literature Review
1.1	Does medical support to deployed operations address an actual and ongoing need?	1.1.1 Description of (unique) needs for MSDO (based on levels of threats, risks, hazards of a mission)	No	Yes	Yes	Yes
		1.1.2 Risk of not having HS to support deployed ops?	No	Yes	Yes	Yes
1.2	Are the priorities of MSDO consistent with DND's strategic objectives and federal government priorities?	1.2.1 Alignment between MSDO and GOC priorities	No	Yes	No	No
		1.2.2 Alignment between MSDO and DND/CAF priorities	No	Yes	No	No
1.3	Is the delivery of MSDO consistent with the roles and responsibilities of the federal government and, more specifically, the roles and responsibilities of DND/CAF?	1.3.1 Legal obligations for health services to deployed OPs	No	Yes	No	Yes
		1.3.2 Alignment with agreements, MOUs with partner nations and allies (e.g., NATO agreements, North American Aerospace Defense Command, Geneva Convention, etc.)	No	Yes	No	No
		1.3.3 How well-defined are the roles and responsibilities for MSDO in relation to partners/allies?	No	Yes	Yes	Yes

Table D-1. Evaluation Matrix—Relevance. This table indicates the data collection methods used to assess the evaluation issues/questions for determining the program's relevance.



Evaluation Matrix—Performance: Achievement of Expected Outcomes (Effectiveness)						
Evaluation Issues/Questions		Indicators	Performance Measurement Data	Document Review and Lessons Learned	Interviews	Literature Review
2.1	Were sufficient numbers of qualified personnel, equipment and supplies available to meet the needs of deployed forces?	2.1.1 Levels assessed based on training, staffing levels, organization and equipment	Yes	Yes	Yes	No
2.2	Were treatments and care effective on deployments? - Dental - Trauma / Injury - Mental health programs	2.2.1 Were treatments and rehabilitation effective and adequate for support on deployments? Sub indicators: - quality of care/treatments - survival rates - rate of return to active duty - number and type of injuries sustained in past 5 years of operations	Yes	Yes	Yes	Yes
		2.2.2 Effectiveness of partnerships in delivery of treatments and rehabilitations, including interoperability with other nations, allies	Yes	Yes	Yes	No
2.3	Were disease and injury prevention measures effective on deployments?	2.3.1 New and enhanced preventions/prevention programs	Yes	Yes	Yes	Yes
		2.3.2 NBI rates, RTD rates	Yes	Yes	Yes	No



Evaluation Matrix—Performance: Achievement of Expected Outcomes (Effectiveness)						
2.4	Was strategic medical advice effective during deployments (in supporting the planning and/or implementation of operations)?	2.4.1 Effective use of health research for treatments	Yes	Yes	Yes	Yes
		2.4.2 Effective advice (quality/timeliness /usefulness) to support planning and implementation of operations	Yes	Yes	Yes	No
2.5	Was MSDO effective in contributing to the maintenance of a combat-capable, multi-purpose force?	2.5.1 Rate of return to active duty	Yes	Yes	Yes	Yes
		2.5.2 Effective training and pre-deployment readiness programs	No	Yes	Yes	No

D-2. Evaluation Matrix—Performance: Achievement of Expected Outcomes (Effectiveness). This table indicates the data collection methods used to assess the issues/questions for determining the program's performance effectiveness.



Evaluation Matrix—Performance: Demonstration of Efficiency and Economy						
Evaluation Issues/Questions		Indicators	Financial Data	Document Review and Lessons Learned	Interviews	Literature Review
3.1	Were the most economical and efficient means of achieving the intended objectives employed?	3.1.1 Use of best practices to drive efficiencies	No	Yes	Yes	Yes
		3.1.2 Resource allocation by program activity area	Yes	Yes	No	No
		3.1.3 Overall Program cost	Yes	Yes	No	No
3.2	What are the economic costs and benefits of MSDO?	3.2.1 Cost of specific research projects, treatments and programs	Yes	Yes	No	Yes
		3.2.2 Cost of providing MSDO	Yes	Yes	No	Yes
		3.2.3 Cost of providing trained medical support	Yes	Yes	No	No
		3.2.4 Cost of providing health promotion and prevention	Yes	Yes	No	No
		3.2.5 Cost of providing rehabilitation and treatments in order for CAF members to return to active duty	Yes	Yes	No	Yes
		3.2.6 Cost to Canadian society and health care system of long-term injuries not treated or prevented by MSDO	Yes	Yes	No	Yes

D-3. Evaluation Matrix—Performance: Demonstration of Efficiency and Economy. This table indicates the data collection methods used to assess issues/questions for determining the program's performance efficiency and economy.



Annex E—CAF Definitions of Roles of Medical Support

Role 1—medical support that provides for routine primary health care, specialized first aid, triage, resuscitation and stabilization.

Role 2 (Basic)—provides surgical capability including damage control surgery and surgical procedures for emergency surgical cases to deliver life, limb and function saving medical treatment. The surgical capability should be provided within medical timelines.

Role 2 (Enhanced)—provides all the capabilities of the Role 2 Basic but has enhanced capabilities as a result of additional diagnostic facilities and greater resources including the capability of stabilizing and preparing patients and casualties for strategic aero medical evacuation.

Role 3 Medical Treatment Facility—must provide all the capabilities of the Role 2 (Enhanced) and be able to conduct specialized surgery, care and those additional services as dictated by mission and theatre requirements

Note: Most of the care capabilities of each Role are intrinsic to the next-higher Role.