



**- STATEMENT OF WORK -
Task Authorization (TA) – 34**

FOR SUBCONTRACT WITH CIMVHR

1. NUMBER – TITLE OF TASK AUTHORIZATION

TA 34 – An analytic and predictive risk model to assess dental readiness in the military population

2. VALIDATION OF SCOPE OF CONTRACT

The following task(s), as written in the SOW of the main contract (W7714-145967/001/SV) apply to this Task Authorization (TA):

- a. **Data Analysis** - Perform state of the art analysis of data from experimental studies, clinical trials, field studies or trials, and existing databases.
- b. **Population Statistics** - Derive population statistics and base rates for civilian populations
- c. **Presentations to Government and Health Care System Stakeholders** - Prepare and deliver presentations to government and health care system stakeholders.
- d. **Advice** - Provide recommendations on peer review research proposals, publications, experimental studies, surveys and scientific evidence.

3. ACRONYMS

CFB	Canadian Forces Base
CFDCP	Canadian Forces Dental Care Program
CFHIS	Canadian Forces Health Information System
DFC	Dental Fitness Classification
DRDC	Defence Research Development Canada
PPV	Positive Predictive Value
NPV	Negative Predictive Value
RCDC	Royal Canadian Dental Corps
SA	Scientific Authority
TA	Task Authorization
VAC	Veterans Affairs Canada

4. REQUIREMENT

4.1 The services of a biostatistician are required to provide advice, analyze data and determine data analytic strategies to assess dental readiness in the military population.

5. BACKGROUND

5.1. The most fundamental aspect of the Royal Canadian Dental Corps (RCDC) mission is to establish a high state of dental readiness. For more than five decades, the RCDC has reported dental fitness statistics, as defined in the Canadian Forces Dental Care Program (CFDCP) (and in accordance with NATO Standardization Agreement 2466) as an indicator of CAF dental readiness. Despite being a good triage tool, Dental Fitness Classification (DFC) has been shown to be a poor predictor of dental emergencies in individuals. DFC incorrectly identifies members who are fit as undeployable and members who are unfit as deployable. This, therefore, puts into question the validity of the DFC.

5.2. It is imperative that dental risk classification represents what it is intended to report, as this information provides guidance for the organization's business process and supports efficient and cost-effective resource



**- STATEMENT OF WORK -
Task Authorization (TA) – 34**

management. Additionally, the validity of this classification is the most important dental consideration for military commanders at all levels – it impacts their ability to assess the dental risk when their personnel are deployed on operations. It is intended that this research will lead to the development of an analytic and predictive model that utilizes recent history of CAF population dental trends in order to predict a member's dental risk and need for dental treatment in the future.

6. OBJECTIVES

6.1 The objectives are to develop a dental risk model and assess its predictive validity and diagnostic accuracy. If effective, the model will provide a reliable tool to assess dental readiness in the military population.

7. SCOPE

7.1 The biostatistician will provide advice on the data analytic strategy at the design stage of the predictive dental risk model, and throughout the analysis as population surveillance data are collected in the development of the model. After the population surveillance period has been completed, the biostatistician will assess the dental risk model for predictive validity and diagnostic accuracy and provide conclusions on the limitations and strengths of the model.

7.2 Data collected by the RCDC during Phase 1 dental examinations between May and October 2014 and between April 2016 and March 2017 will establish the baseline data required for the analysis. The SA and Sub Contractor will identify the independent variables to be used for this study. The Independent variables will include patient demographic information (e.g. age, sex) and epidemiologic information (e.g. teeth, tooth surfaces, restorative materials). The SA and Sub Contractor will monitor the cohort prospectively for changes in DFC (dependent variable).

8. APPLICABLE DOCUMENTS & REFERENCES

8.1 None

9. TASKS TO BE PERFORMED

The Sub Contractor must perform the following tasks:

9.1 Develop a data analytic strategy during the design stage of the predictive risk model and throughout the analysis observation period as population surveillance data are collected in the development of the dental risk model. The strategy must include the method to be used for final risk model testing;

9.2 Validate and consolidate CFHIS population surveillance data extracts into a master data set to include all independent variables to be tested as determined by the SA and Sub Contractor;

9.3 Update, verify and consolidate the master data set established in 9.2 throughout the analysis observation period (e.g. subject accrual, subject attrition, censored subjects and hazard rates) and run quarterly progress analysis in accordance with analytic method describe in 9.1;

9.4 At the completion of the analysis surveillance period, determine hazard ratios for all independent variables (as agreed upon by the SA and Sub Contractor) through regression analysis and create a dental risk equation/model; and

9.5 Test the dental risk model established in 9.4 for diagnostic accuracy (PPV, NPV, Sensitivity, Specificity), as determined in 9.1, report findings and results and provide conclusions to include limitations and strengths of the dental risk model.

9.6 Prepare briefing notes, PowerPoint presentations and summary reports that details findings from population surveillance.

10. DELIVERABLES (DESCRIPTION AND SCHEDULES)



**- STATEMENT OF WORK -
Task Authorization (TA) – 34**

The Sub Contractor must create and submit the following deliverables by March of 2019:

Deliverable Number	Task reference	Description (Quantity and Format) and Schedule
10.1	9.1	A brief Draft Report (electronic, MS Word document format) describing the data analytic strategy, statistical method and validation no later than 6 weeks after the authorization to begin work. The report must also include the method to be used for final risk model testing. The Scientific Authority (SA) will provide feedback to the Sub Contractor within 15 business days of receiving the Draft Report.
10.2	9.1	A Final Report (electronic, MS Word document format) addressing issues and feedback from the SA on the Draft Report (Deliverable 10.1) to be submitted within 2 weeks of receipt of feedback from the SA.
10.3	9.2	CFHIS population surveillance data extracts consolidated into a master data set including all independent variables to be tested (electronic, MS Excel format) no later than 16 weeks after the authorization to begin work. All data and information must be presented in publication quality tables, which meet scientific publishing guidelines.
10.4	9.3	Quarterly consolidated master data set including all independent variables tested (electronic, MS Excel format). All data and information must be presented in publication quality tables, which meet scientific publishing guidelines. The due date for the first Quarterly Update will be determined by the SA after acceptance of Deliverable 10.3.
10.5	9.4	A Draft Dental Risk Equation/Model Report (electronic, MS Word and/or MS Excel format) describing the regression analysis method and statistical formula used to develop the model and presenting results obtained during the analysis surveillance period to include hazard ratios for all statistically significant independent variables and other independent variables determined to be highly relevant, no later than December 2018. The SA will provide feedback to the Sub Contractor within 15 business days of receiving the Draft Report.
10.6	9.4	A Final Dental Risk Equation/Model Report (electronic, MS Word and/or MS Excel format) addressing issues and feedback from the SA on the Draft Report (deliverable 10.5) to be submitted within 4 weeks of receipt of feedback from the SA.
10.7	9.5	Draft Model Diagnostic Accuracy Report (electronic, MS Word and/or MS Excel format) describing PPV, NPV, Sensitivity and Specificity results obtained and offering conclusions on the limitations, strengths and predictive validity of the Dental Risk Equation/Model no later than February 2019. The SA will provide feedback to the Sub Contractor within 10 business days of receiving the Draft Report.
10.8	9.5	Final Model Diagnostic Accuracy Report (electronic, MS Word and/or MS Excel format) addressing issues and feedback from the SA on the Draft Report (deliverable 10.7) to be submitted within 3 weeks of receipt of feedback from the SA.

11. MANDATORY SELECTION CRITERIA

11.1 The biostatistician must:

- a. have a Master’s level or above in statistics or biostatistics (PhD Preferred) (evidenced by Curriculum Vita (CV) or Resume);
- b. have taken academic courses in analytics (preferably healthcare analytics); and
- c. have significant experience analyzing complex data (must show evidence of having worked on several projects with different investigators and submit a reference letter from previous supervisor/academic advisor/department chair etc).



**- STATEMENT OF WORK -
Task Authorization (TA) – 34**

12. LANGUAGE OF WORK

12.1 Documentation and deliverables must be submitted in the English language.

13. LOCATION OF WORK

13.1 The work must be performed on the Sub Contractor's site.

14. TRAVEL

14.1 The Sub Contractor will be required to travel CFB St-Jean to attend progress meetings with the SA. The Sub Contractor may also be required to travel to present research findings at scientific conference(s). Sub Contractor travel must have the prior written authorization of the Scientific Authority and the Technical Authority, and must be undertaken in accordance with the National Joint Council Travel Directive and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

15. MEETINGS

15.1 The Sub Contractor will meet the SA at the CFB St-Jean dental clinic at a frequency no greater than once every two weeks in order to consolidate population surveillance data and monitor progress.

16. GOVERNMENT SUPPLIED MATERIAL (GSM)

16.1 The SA will provide the Sub Contractor with the following:

- a. baseline data required for the analysis, which consists of data collected by the RCDC during the Phase 1 dental examinations between May and October 2014 and between April 2016 and March 2017.
- b. CFHIS population surveillance data extracts.

17. GOVERNMENT FURNISHED EQUIPMENT (GFE)

17.1 None

18. SPECIAL CONSIDERATIONS OR CONSTRAINTS

18.1 All personal identifiers will be scrubbed from the baseline data required for the analysis prior to its release to the Sub Contractor. Source extracted data, that includes personal identifiers will be kept by the SA.

18.2 The Sub Contractor must be based in or near Montreal, Quebec to facilitate the regular visits to CFB St-Jean dental clinic.

19. SECURITY

19.1 The Sub Contractor will not require access to PROTECTED and/or CLASSIFIED information or asset, nor to restricted access areas.

X Not applicable RELIABILITY STATUS PROTECTED A PROTECTED B

20. INTELLECTUAL PROPERTY (IP) OWNERSHIP



**- STATEMENT OF WORK -
Task Authorization (TA) – 34**

20.1 The Sub Contractor will be invited to participate in the writing of peer reviewed publications related to the Work by the SA and be listed as a co-author on the final manuscript(s). The Sub Contractor may also collaborate with the SA on Sub Contractor-led publications related to the Work where the SA is listed as a co-author. The Crown also reserves the right to publish copies of all materials (reports, papers, presentations etc.) on Government websites (e.g., DND, Surgeon General, DRDC, VAC).

21. CONTROLLED GOODS

Not applicable

Applicable

22. BUDGET The Sub Contractor will be paid by CIMVHR as per the terms of Contract # W7714-145967 between Defence Research and Development Canada and CIMVHR. The amount of funding available is allocated by fiscal year (April 1 - March 31st) and is approximately \$36,500 for FY 2017-2018 and \$36,500 for FY 2018-2019. Details TBD upon award.

A draft budget must be submitted with the proposal along with a budget justification. A detailed budget will be developed post award in consultation with CIMVHR. Interested parties should request budget documents and information on creating their budget from Jocelyne Halladay.