Article details: 2015-0045	
Title	Health Services and Policy Research in the First Decade at the Canadian Institutes of Health Research
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Reviewer 1	Shamara Baidoobonso
Institution	Health Quality Ontario, Evidence Development & Standards
General comments (author response in bold)	1. Other predictors of funding success that are captured in applicants[1]. CVs and other materials should have been included in the analyses. These include: educational background/ training, previous research awards, publication record, university (to assess the presence of a "halo" effect), and whether or not one of the applicant[1]s colleagues was part of the review committee. **We agree that these additional training and research characteristics would be nice to add. Unfortunately, this information cannot be extracted from the CIHR database. Data within the CV module is not "extractable" (it is like an unstructured PDF). Moreover there is no way to link reviewers to applicants within the current data structure. Indeed the questions raised by this study have led to a re-design of future data systems to allow more useful analytic capacity.** 2. In addition to the term to assess the combined effect of age and sex, the regression models should include age and sex as individual variables. **We initially fit the main effects of age and sex as well as the interaction term (age*sex) in the model based on prior literature that suggested that male researchers appear to have an academic and research advantage particularly by mid to late career. The interaction was statistically significant. This means that there is no pure age or sex effect. The effect of sex is a function of age. To represent either effect alone would lead to bias. Thus, to facilitate interpretation by the reader we simplified the representation of the interaction term, creating 4 dummy variables to represent the effect of sex in those under and over the age of 45 years.** MINOR CONCERNS: 1. Page 3, Line 51: The odds ratio is interpreted incorrectly. **This sentence has been re-phrased.** 2. Given recent U.S. findings on the impact of race on funding success, the omission of race analyses should be included as a limitation (I am aware that the CIHR does not collect data on race). Furthermore, the U.S. study found that nationality impacts funding success, and the CIHR collects data on nationality/citizenship, so this variable should have, and could have, been included in the analyses. **Thanks for bringing our attention to these papers. As outlined previously, data within the CIHR CV module is not accessible for extraction and analysis.** 3. In the analyses, how did the authors account for loss to follow-up due to researchers leaving the profession or country? **We acknowledge, in the DISCUSSION, last paragraph, that we have no data on retirement or out-migration.** RESULTS 4. The authors use very large age groupings in the analyses. Why weren't smaller age groupings used, even groupings of 5 or 10 years? There's a big difference between a 30 year old investigator and a 45 year old investigator (e.g., number of publications, number of applications submitted, type of research position occupied, etc.). **As outlined in response to a previous comment, there was an interaction between age (modeled initially continuously) and sex. By modeling multiple age categories by sex, we would end up having small number of observations per cell and instability in the estimates, thus we elected to categorize by the median age.** 5. Page 12, Line 18: When the authors write (OR: 1.73, 1.81), they are presenting the point estimates for the odds ratios, but this fact is not apparent unless the reader reviews the information in the table. The authors can revise the statement to make it clearer. **Thank-you for pointing this out. The sentence has been revised to improve clarity.** 6. Page 12, Lines 21-23 and 28-36: The authors interpret the odds ratio incorrectly, as though it is a relative risk. I recommend revising. Page 14, Line 11: The statement but only for all applicants' is unclear. Please revise. **When the event rate is below 20% the odds ratio is a good approximation of the relative risk. In this study, it modestly over-estimates the relative risk by**

	0.01. To be conservative we have modified out interpretation to be technically correct. **We simplified the sentence on page 14, line 11.** 7. Figure 1: The years axis is not labelled. **This was fixed.** 8. Figure 2: The years axis is not labelled. **This was fixed.** 9. Figure 3: The vertical axis is not labelled, and the grey "Biomedical" bar should be blue. **This was fixed.**
Reviewer 2	Don Husereau
Institution	University of Ottawa, Epidemiology and Community Medicine
General comments (author response in bold)	1. Firstly, the report uses subjective and hyperbolic language throughout, and particularly in the introduction. Although the authors are clearly poised to promote the work of their own institution, they should remove language or phrases that are subjective, not supported by references, or neologisms that are not suitable for a scientific journal. The following are examples that I identified: a. P5 line 9 – the first line of the first paragraph is unsubstantiated. I'm sure HSPR is perceived (by some) as something that can foster needed innovation which in turn can help health systems achieve their goals. But "innovation engine" is an undefined neologism and "effective" system requires definition. b. P5 line 26 – "farsightnedness" is hyperbolic and requires substantiation. The sentence suggesting chronic disease and lifestyle determinants are being dealt with today does not follow from the previous sentence ("a variety of factors" – are these the factors?). c. P5 – Line 41 "exciting and ambitious" is subjective language and needs to be removed. d. P5 line 42 "that were key to improved health for Canadians" – assume these were perceived by some as key. But this is unsubstantiated. e. P6 Line 16 "best science" is subjective (and hyperbole). f. P6 Line 19 "excellence" is subjective (and hyperbole). g. P 6 Line 21 "ambitious" is subjective (and hyperbole). h. P 14 Line 28 "world class talent" is subjective (and hyperbole). i. P 14 Line 41 "excellent projects" is subjective (and hyperbole). j. P16 Line 10 "disappointing" is subjective. k. P16 Line 18 ³high revolution grant treadmill² is a neologism and subjective for example, we could equally believe the increased rate is tolerable by researchers and necessary. **The comments that are cited as being excessive have either been modified or have been substantiated with references. It is not that surprising that expectations (and perhaps hyperbole) are high when a new organization is being launched. Our introduction reflects this enthusiasm. The manuscript follows the guidelines set out by CMAJ for the Introduction, Methods and Discussion** • **Introduction. This section should explain the topic being studied and provide the context that led to the research question. The objective of the study should be clearly stated. This section should be no more than 1.5 pages.** • **Methods. Use a narrative style in the active voice and avoid the passive voice. We also encourage authors to include a complete study protocol, which may appear as an online appendix to their manuscript if accepted for publication. Include the following 4 elements: setting; patients; study type or design; and the main or primary measurements or outcomes.** • **Results. Provide results for the main outcome using absolute and relative terms where possible. Give confidence intervals where appropriate, or other measures of statistical significance. Quantitative results should be displayed in a table. Avoid redundant presentation of results in tables and in the text of the manuscript.** • **Interpretation. This section should include 4 parts and be limited to 2 pages:** • **A brief conceptual summary of the main results of the study (1 paragraph).** • **An explanation of the findings; a comparison and contrast of the findings with other related studies in the literature, avoiding claims of precedence (1 or 2 paragraphs).** • **The limitations and strengths of the study (1 paragraph each).** **The conclusion and implications for practice, policy or future research (1 paragraph). This is a direct quote from government documentation of the CRC program. This based on rating by peers who have rated a project as excellent (rating of 4.0 or above) in the peer review process but the project is not funded. Word changed to "poor". The use of the term neologism to comment on the phrase "high revolution grant treadmill" is absurd. Neologism:**

	1: a new word, usage, or expression **2: *psychology* : a new word that is coined especially by a person affected with schizophrenia and is meaningless except to the coiner** **http://www.merriam-webster.com/dictionary/neologism** **A *neologism* is used to describe the use of words that have meaning only to the person who uses them, independent of their common meaning.[8] This tendency is a symptom of psychopathy[9] or a thought disorder (indicative of a psychotic mental illness, such as schizophrenia).[10] It may also be acquired after brain damage resulting from a stroke or head injury.[12]** **https://en.wikipedia.org/wiki/Neologism** **Both terms –"high revolution" and "grant treadmill" are in common parlance.** 2. Secondly, the report is that of a multivariable logistic regression, but lacks adequate scientific reporting to allow for credible review and interpretation of its findings. In particular, the authors should report more information regarding coding of variables, events per variable, tests for interactions, model validation, collinearity, goodness-of-fit statistics and other important components of MLR to allow an adequate assessment and interpretation of results. (See:, for e.g., Bagley SC, White H, Golomb BA. Logistic regression in the medical literature: standards for use and reporting, with particular attention to one medical domain. J Clin Epidemiol. 2001 Oct;54(10):979–85.; Tetrault JM, Sauler M, Wells CK, Concato J. Reporting of multivariable methods in the medical literature. J Investig Med. 2008 Oct;56(7):954–7.; Ottenbacher KJ, Ottenbacher HR, Tooth L, Ostir GV. A review of two journals found that articles using multivariable logistic regression frequently did not report commonly recommended assumptions. J Clin Epidemiol. 2004 Nov;57(11):1147–52. **The standards of reporting with respect to the approach to statistical analysis vary by both the textbook that outlines best practices as well as the accepted, expected and pragmatic standards of what is possible to report within the word length that is expected in current high impact journals. The approach outlined by the reviewer is the standard we teach in our graduate programs. Table 1 and 2 both provide information about a) the coding structure by indicating the reference category and dummy variables employed, and b) the number of events per category can be calculated by multiplying the funding rate by the number of applications in each category. The hypothesized interaction that was tested had already been outlined in the analysis. We added the statistical test of this interaction to the analysis section. We also added the approach to assessing collinearity, although there is no method to account for underestimation of the variance in clustered models using standard approaches. We are using GEE models to account for clustering of applications within applicants. There are no accepted methods yet for assessing the adequacy of the fit for GEE models; the main challenge being that no likelihood exists and residuals are correlated. (Evans S, Li L; Statistics in Medicine, 2005; 24: 1245-1261).** MINOR 1. Related to 2) above is the misinterpretation of odds ratios throughout the paper. For example, an Odds ratio of 1.67 (p.12, line 11) does not mean that investigators were 67% more likely to be funded. It does mean the odds of funding were 1.67 the odds of not being funded for those investigators during that period. The researchers should carefully revise these according to conventions for interpreting odds ratios (See: Grimes DA, Schulz KF. Making sense of odds and odds ratios. Obstet Gynecol. 2008 Feb;111(2 Pt 1):423–6. or Bland JM, Altman DG. The odds ratio. BMJ. 2000 May 27;320(7247):1468. **When the event rate is below 20% the odds ratio is a good approximation of the relative risk. In this study, the odds ratio modestly over-estimates the relative risk by 0.01. To be conservative we have modified out interpretation to be technically correct.** 2. Other examples of inappropriate language can be found: P 12 Line 21 "21% less likely" P12 Line 32 "16% reduction" P12 Line 33 "51% reduction" P12 Line 56 "45% more likely" P 13 Line 21 "66% reduction on the odds" (also syntax error here) P13 Line 26 "Four fold difference" P 13 Line 41 says "more likely" but reports odds ratios < 0 P1 3 Line 48 "two fold increase" **These issues have been addressed in the revised sections.** 3. P5 Line 46 Sentence beginning "CIHR aimed to foster a new generation of interdisciplinary collaborative research through the influences on health" requires reference. **Reference now included.** 4. P6 Line 21 "it is possible to assess the impact² – this report does not seek to assess the impact per se so this sentence is a bit incoherent with the rest of report. **The sentence has been modified to improve clarity.** 5. P7 Line 23 – the "pillar" concept is here but is not defined. It is defined later in the paper and could have been defined earlier when the "pillars" were mentioned.

	The definition was moved to the first mention of pillar. 6. P7 Line 26 "submitted previously" (presumably to CIHR – the term could be better defined) P 9 Line 6 "< 10 colleagues, 10-20, 20-35, 35-50, and > 50 HSPR colleagues." Some justification for this variable categorization should be given. **"to CIHR" was added to this sentence** **Based on the data, the classification cut-points were established to provide approximately equivalent number of applications particularly at the lower end of the scale where lack of critical mass is deemed to be an important predictor of funding success and research productivity.** 7. P 14 Line 33 – "Combined, these programs likely boosted the number and quality of applications to CIHR."– I don't think the authors have provided enough evidence in their analysis or the discussion to substantiate this claim **We have substituted likely to may have.** 8. P 17 Line 6 "$10.75 billion should be invested in HSPR to meet the goals of health system adaptation.." this is based on the previous sentence but the authors should indicate this (e.g., "Based on this assumption"). **We have edited to sentence in accordance with the suggested changes.** 9. P17 Line 16 "one initiative that will boost" – SPOR is intended to boost but whether it "will" is a matter of debate. Suggest adding "intent" or other language. **Sentence changed as per suggestion.** 10. Authors may want to comment why they did not attempt to address cronyism bias as it appears to be of interest in science policy. **To address cronyism bias, we need to have complete information on the ratings provided by each peer review committee member or their indication of conflict of interest. These data were only available through ResearchNet in 2012, and were not "linkable" to the application. In the most recent year it may be possible to make this linkage and thus do this analysis, but this is far beyond the scope of this paper.**