Informing Evidence Based Decisions: Usage Statistics for Online Journal Databases

Author
Alexei Botchkarev 1, 2

Author's addresses
1 Ministry of Health and Long-Term Care, Toronto, ON, Canada.
2 Ryerson University, Toronto, ON, Canada.
Email: *alexei.botchkarev@ontario.ca*

Abstract

Objectives - The primary objective was to examine the 2009-2013 usage statistics of the Journal Access Centre (JAC) that is housed and powered by the Ontario Ministry of Health and Long-term Care (MOHLTC) in the context of the evidence based decision making. In addition, the study highlights implementation of JAC and assesses availability and usage of high-quality research evidence to inform health systems' policy making.

Design - Prospective case study.

Setting – A Canadian provincial ministry of health.

Methods - Descriptive analysis of the JAC usage statistics of journal articles from January 2009 to September 2013.

Main Results - MOHLTC's broad area of responsibilities with dynamically changing priorities translates into diverse information needs of its employees: a total of 4,759 journal titles were accessed including 1,675 journals with full-text. Usage statistics indicates that MOHLTC information needs cannot be mapped to a reasonably compact set of "core" journals with a subsequent subscription to those.

Conclusion - JAC usage statistics for 2011 – 2012 calendar years provide evidence of high demand (sessions, searches) for the journals included in the JAC databases and intensive consumption of its content creating a significant value (full-text articles) for the MOHLTC staff. JAC usage statistics for the period 2009-2013 demonstrate availability and usage of high-quality research to inform health systems' decision making. The current paper contributes to the understanding of the information needs and patterns of use of online academic journals within the framework of health system evidence based policy making.

Keywords

Introduction

Use of research results in medical evidence based decision making and healthcare evidence informed policy advice has been recognized essential to improve health outcomes (Sosnowy, 2013; Field, Gauld and Lawrence, 2012; Lomas and Brown, 2009). Despite the agreement on the importance of the issue and general consensus on the approaches, implementation of the evidence based decision making processes leaves much space for advancement. Several barriers have been identified by researchers, including lack of access and limited awareness of research results (Wallace, Nwosu and Clarke, 2012), lack of practical use of systematic reviews (Wallace, Nwosu and Clarke, 2012), lack of organizational culture and/or supports (e.g. behavior of supervisors, front-line staff and other professionals in the organization (Rapp et al, 2010), lack of time (Solomons and Spross, 2011), ambiguous and conflicting research (Madhavji et al, 2011; Ubbink et al, 2011) or research having methodological inadequacies (O'Connor and Pettigrew, 2009), lack of skills, training or tools on how to acquire, assess, synthesize, disseminate and apply research evidence to inform policy related to health systems (Ubbink, Guyatt and Vermeulen, 2013), lack of applicability/relevance of research (Humphries et al, 2014), lack of standard knowledge translation strategies and processes effective in multiple contexts (Humphries et al, 2014), lack of timely research outputs (Oliver et al, 2014; van der Arend, 2014), and lack of interaction and collaboration between researchers and policymakers (Oliver et al, 2014; Wooding et al, 2014).

A significant challenge for health system practitioners (both in a clinical setting and public service) in implementing research evidence is inadequate access to information, which results in doctors' or analysts' unawareness of the (Ubbink et al, 2011; Ubbink, Guyatt and Vermeulen, 2013; Brownson et al, 2014; Oliver et al, 2014; Wallace, Nwosu and Clarke, 2012). Various types of information are required for producing high-quality evidence based policy advice, including journals, books, research reports, professional/trade magazines, etc. Academic journals and professional magazines are the largest component of the potentially applicable information. Arguably, almost all new research is published in journals. That makes access to journals a key pre-requisite for evidence based policy advice.

The Ministry of Health and Long-Term Care (MOHLTC) of Ontario (one of the thirteen provinces and territories of Canada responsible for implementing evidence based health policies and services for the benefit of its population) takes specific measures to encourage evidence based policy making to improve the provincial healthcare system. These measures include, in particular, development and implementation of the policies and procedures of using research evidence, providing financial support to universities in generating new evidence and conducting knowledge transfer, and building and operating information systems to facilitate access to online journals (e.g. the Journal Access Centre).

Objectives

The primary objective was to examine the 2009-2013 usage statistics of the Journal Access Centre (JAC) that is housed and powered by the Ontario Ministry of Health and Long-term Care in the context of the evidence based decision making. In

addition, the study highlights implementation of JAC and assesses availability and usage of high-quality research evidence to inform health systems' policy making.

Methods

Design: Prospective case study.

Setting: Ministry of Health and Long-Term Care, Ontario, Canada.

Materials: JAC usage statistics from January 2009 to September 2013

Type of analysis: descriptive analysis of JAC usage statistics.

A descriptive analysis of the usage of journal articles was conducted through the JAC access tool from January 2009 to September 2013. Journal usage statistics for MOHLTC users were downloaded from the EBSCOhost administrative reporting site (EBSCOhost n.d.). Journal usage is characterized by the following indicators: i) number of sessions, ii) number of searches, iii) number of full-text articles accessed (in PDF or HTML format), iv) number of abstracts accessed, and v) number of rejected sessions (turnaways). These indicators were selected based on the recommendations of the internationally recognized standard: COUNTER-2008, Counting Online Usage of NeTworked Electronic Resources (Counting Online, n.d.). Definitions of the indicators and related terms are available in (Counting Online, n.d.). Numbers of sessions and searches characterize overall intensity of the JAC use and demand for this service. Number of full-text articles characterizes the desired output of the solution and can be linked to the value provided by the service.

Journal Access Centre Implementation

To support evidence based decisions, MOHLTC of Ontario, Canada, built the Journal Access Centre (JAC). JAC - an online access tool supported by journal content selection, acquisition and consultation services – has been in operation with the MOHLTC since 2008, making the ministry one of the Canadian healthcare pioneers of online access to academic journals. It was conceived and developed to facilitate online access to journals and serve as an enabling factor for enhanced evidence-informed policymaking. JAC's logic model is presented on Figure 1.
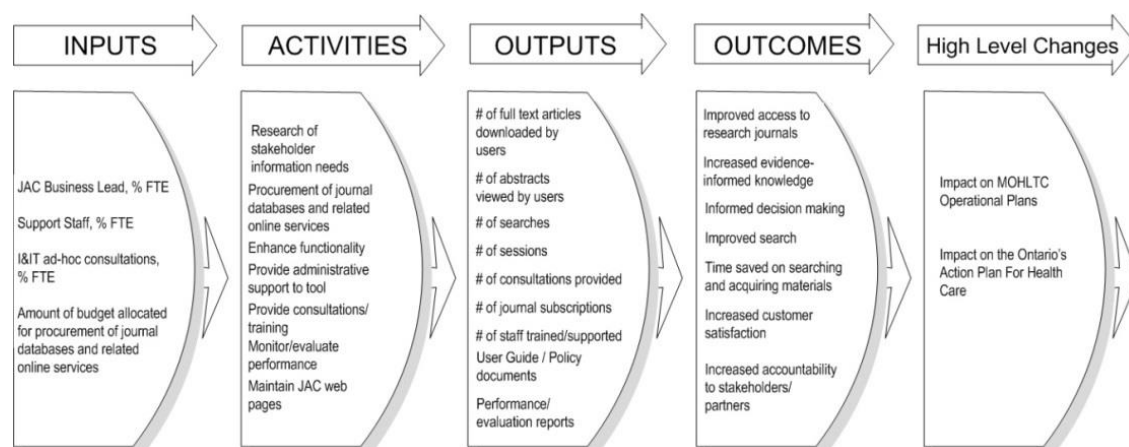

Figure 1
JAC logic model

System's view of JAC is presented in Figure 2. MOHLTC acquire access to journals based on the annual subscriptions procured from various vendors including journal aggregators and individual publishers. The content is discussed and suggested for acquisition by the JAC Content Selection Advisory Network – a permanent working group with representation from each of the ministry's divisions.

Mostly, the access to the content is acquired by journal databases (a collection of journal titles representing a certain subject area). Examples could be such well-known databases as MEDLINE, CINAHL from EBSCO company (EBSCO, n.d.) or Academic OneFile, Academic OneFile from GALE CENGAGE Learning (Gale, n.d.). Commonly, each database contains from a few hundred to several thousand journals. Some journals and databases are acquired individually, e.g. The Cochrane Library, Longwoods, etc. The total ministry subscription covers over 17,000 journal titles with over 9.0 million articles (including prior years archive). Journals cover such topics as health, medicine, social science, business, policy, economics, finance, management, risk management, etc.

Usually, a database contains journals with different levels of access. Some journals are provided with complete full-text article coverage, others are available only at an abstract or indexing level. Some latest full-text journals have embargoes – delays in access from six (6) months to three (3) years. Most databases contain a mix of academic journals and professional magazines (non-peer reviewed). The types of content of several databases are illustrated in Table 1. The prime purpose of JAC is to provide access to the full-text articles (as abstracts and bibliographic data for most journals are available on the Internet free of charge). Hence, the most valuable segment of a database constitute full-text, current, non-embargoed journals. Despite the large number of journals and articles in the JAC repositories, occasionally a need arises for an article that is not available in full-text. In these cases, Article on Demand Service manned by JAC's support staff orders materials and sends them to the JAC users.

The technological backbone of the solution is a cloud-based application (search engine) that allows MOHLTC users to access journal databases offered by EBSCO through the ministry's intranet. End user need only web browser to access online journals. The EBSCO search engine provides integrated coverage of the databases (both owned by EBSCO and bought from different providers) – so end user can conduct a one-click search through all subscribed content. In addition, EBSCO search is integrated with the Google Scholar search, i.e. when a ministry user is conducting a search in Google Scholar he/she gets reminders if an article, presented in Google Scholar search results, is available in the ministry's EBSCO subscriptions, and can click on the link to be immediately transferred to a full-text article in EBSCO repositories. The service also provides automatic e-mail notifications of new content (on an article level) which may be very specific to meet individual information needs. The service is available 24x7 (with short periods of maintenance scheduled during weekends). The service proved to be highly reliable: one 3-hour incident of service disruption was observed in more than four (4) years.
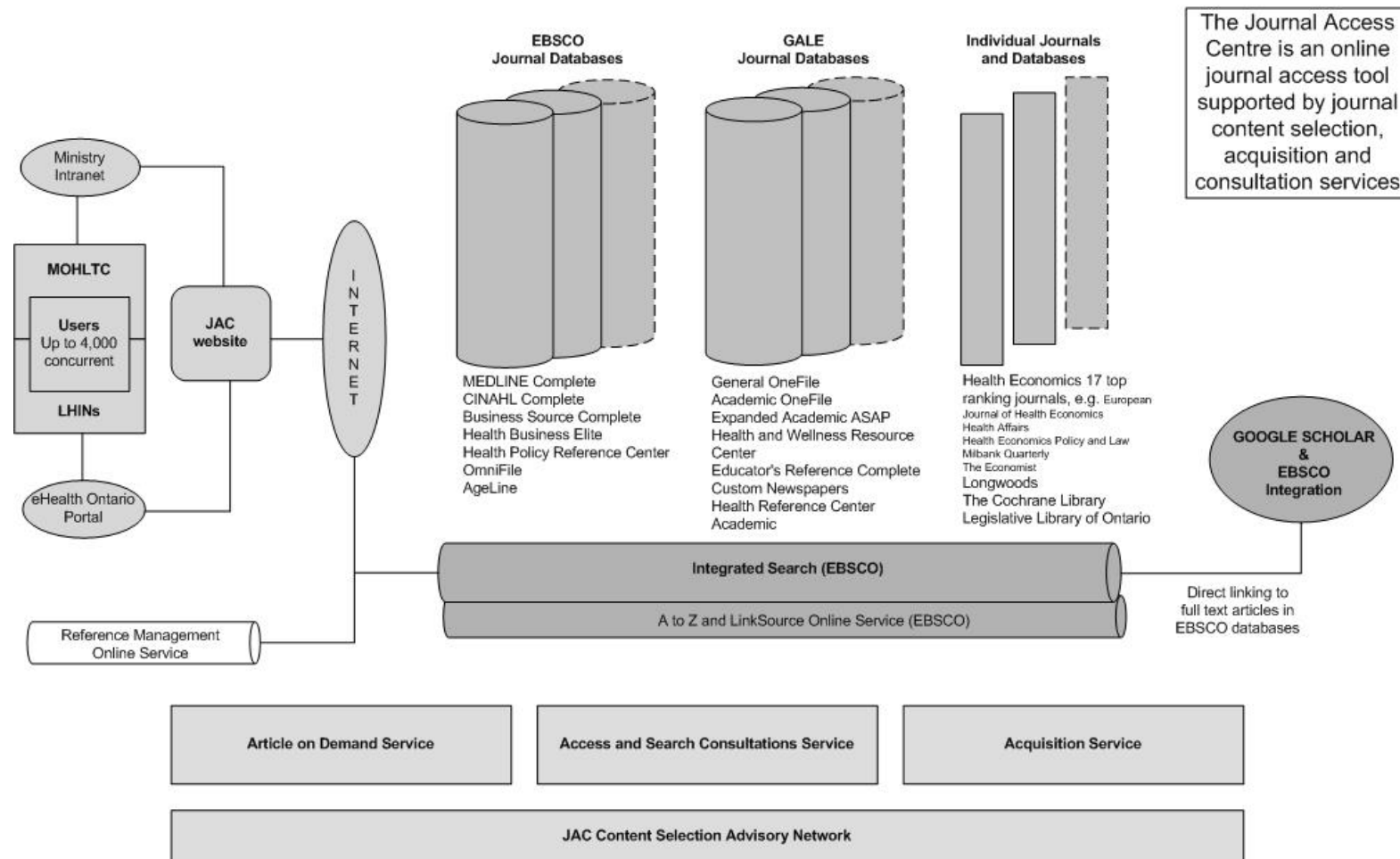
Journal Access Centre (JAC)

EBSCO Journal Databases

MEDLINE Complete
CINAHL Complete
Business Source Complete
Health Business Elite
Health Policy Reference Center
OmniFile
AgeLine

GALE Journal Databases

General OneFile
Academic OneFile
Expanded Academic ASAP
Health and Wellness Resource Center
Educator's Reference Complete
Custom Newspapers
Health Reference Center Academic

Individual Journals and Databases

Health Economics 17 top ranking journals, e.g. European Journal of Health Economics
Health Affairs
Health Economics Policy and Law
Milbank Quarterly
The Economist
Longwoods
The Cochrane Library
Legislative Library of Ontario

The Journal Access Centre is an online journal access tool supported by journal content selection, acquisition and consultation services

Ministry Intranet

MOHLTC

Users Up to 4,000 concurrent

LHINs

JAC website

eHealth Ontario Portal

INTERNET

GOOGLE SCHOLAR & EBSCO Integration

Integrated Search (EBSCO)

A to Z and LinkSource Online Service (EBSCO)

Direct linking to full text articles in EBSCO databases

Reference Management Online Service

Article on Demand Service

Access and Search Consultations Service

Acquisition Service

JAC Content Selection Advisory Network

Figure 2
JAC structure.

Table 1

Types of Databases Content

Database	MEDLINE Complete	CINAHL Complete	Business Source Complete	Health Business Elite	Health Policy Reference Center	OmniFile Full Text	AgeLine	TOTAL
Total Number of Journals in the Database	2,184	5,453	5,023	714	472	3,125	209	**17,180**
Abstracts Only	0	3,825	1,191	64	37	0	209	**5,326**
Full Text	2,184	1,628	3,832	650	435	3,125	0	**11,854**
Stopped Full Text	357	537	1,139	414	149	982	0	**3,578**
Current Full Text	1,827	1,091	2,693	236	286	2,143	0	**8,276**
Embargoed Current Full Text	1,183	277	638	67	81	274	0	**2,520**
Non-embargoed Current Full Text	644	814	2,055	169	205	1,869	0	**5,756**
Non-embargoed Current Full Text Peer Reviewed	608	587	943	140	143	1,184	0	**3,605**
Non-embargoed Current Full Text Magazines, Trade Publications	36	227	1,112	29	62	685	0	**2,151**

Usage Statistics Results

Report on the numbers of sessions and searches covers two full calendar years 2011-2012. Figures 3 to 5 show monthly average number of sessions, monthly average number of searches, and quarterly number of downloaded full-text articles, respectively. Reported number of rejected sessions (turnaways) is zero.
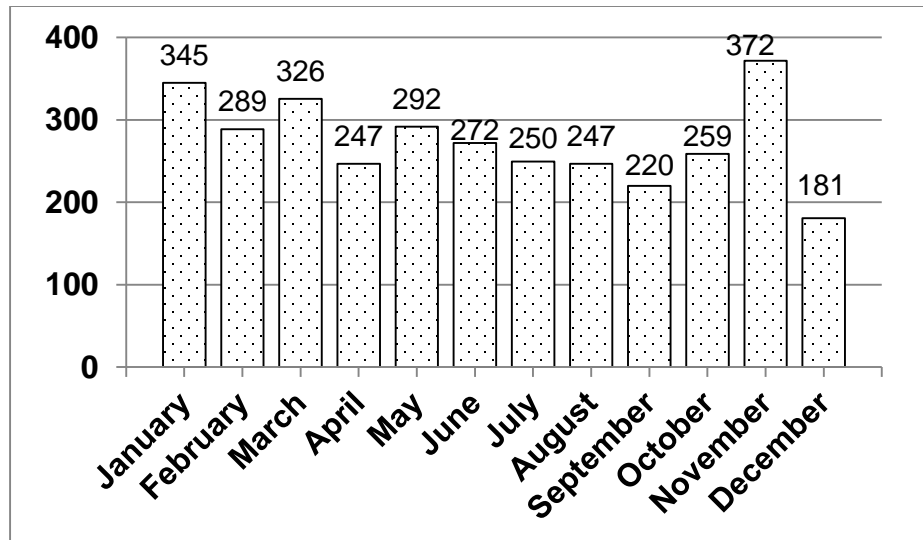

Figure 3
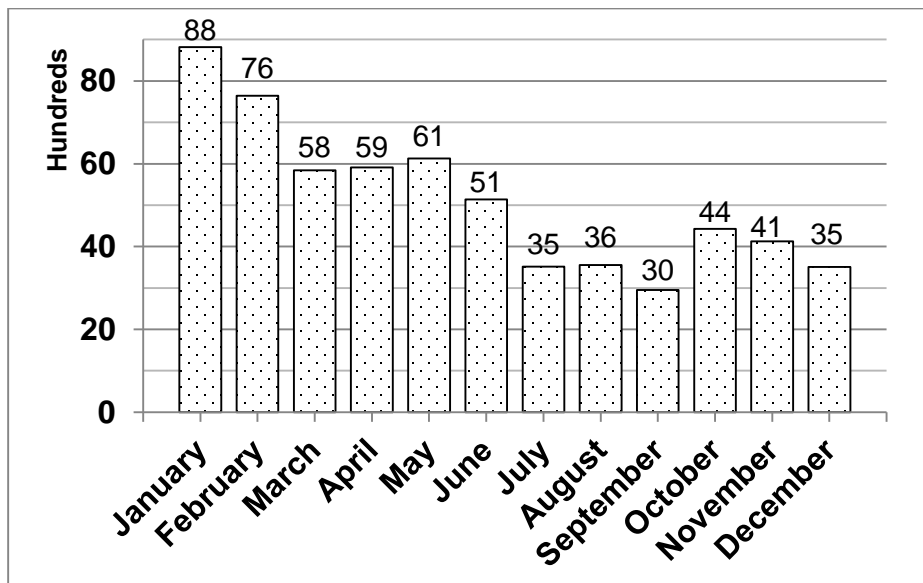Number of Sessions (monthly average for 2011-2012).

Figure 4
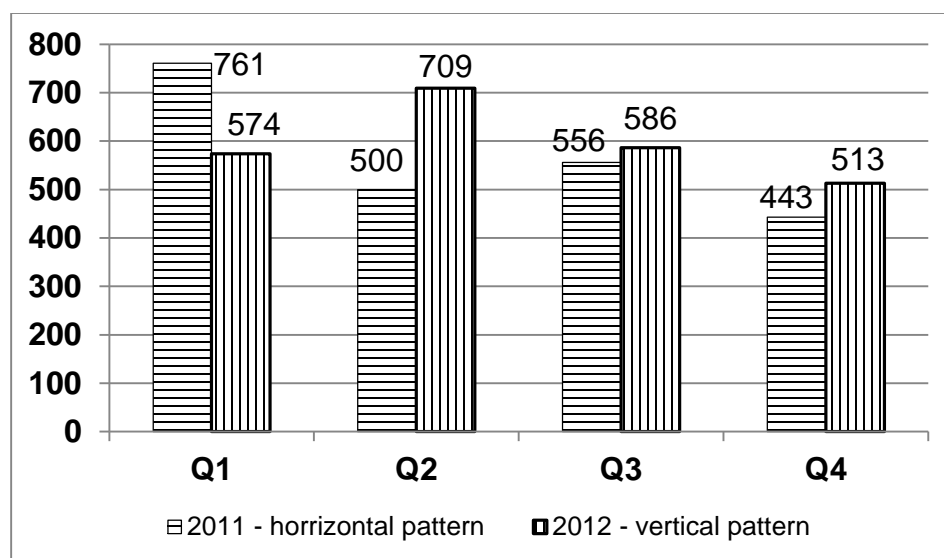Number of Searches (monthly average for 2011-2012).

Figure 5
Number of downloaded full-text articles (quarterly in 2011and 2012).

Report on the number of full-text articles and abstracts accessed by journal title (for approximately 5000 journals) is presented in Additional file 1. This report covers the period from January 1, 2009 through September 30, 2013. A list of the most frequently used journals (top-50) is presented in Table 2.

Table 2
List of the Most Frequently Used Journals

ISSN	Title	Full Text	Abstract
178012	Harvard Business Review	2208	734
900036	American Journal Of Public Health	303	129
284793	New England Journal Of Medicine	270	189
8203946	Canadian Medical Association Journal	183	177
84263	Canadian Journal of Public Health	129	113
15445208	Health Affairs	123	139
28614	Journal of the American Geriatrics Society	118	74
3092402	Journal Of Advanced Nursing	118	40
1628968	Inc.	114	5
13558196	Journal of Health Services Research and Policy	112	64
1357633X	Journal of Telemedicine and Telecare	94	9
7067437	Canadian Journal of Psychiatry	89	59

1607480	Modern Healthcare	86	47
9269630	Studies in health technology and informatics	69	49
10688838	HandHN: Hospitals and Health Networks	69	25
34819	Annals of Internal Medicine	68	44
11707690	PharmacoEconomics	67	31
1406736	Lancet	66	154
0887378X	Milbank Quarterly	64	40
17561833	BMJ: British Medical Journal	63	115
10966218	Journal of Palliative Medicine	62	29
14726963	BMC Health Services Research	58	50
13652702	Journal of Clinical Nursing	55	23
13869620	Health Care Management Science	54	33
9660410	Health & Social Care in the Community	53	21
13561294	Journal of evaluation in clinical practice	53	19
1958631	Health Care Financing Review	53	15
7350732	Healthcare Financial Management	51	40
9652140	Addiction	51	13
197939	Industrial and Labor Relations Review	50	21
14712458	BMC Public Health	48	29
10792082	American Journal of Health-System Pharmacy	48	18
1477030X	Palliative Medicine	48	14
7461739	Nursing economics	46	20
333107	Psychology Today	46	8
3190781	Toronto Star (Toronto, Ontario)	43	32
130613	Economist	42	24
1095158X	Psychiatric Rehabilitation Journal	42	24
87569728	Project Management Journal	41	39
3616878	Journal of Health Politics, Policy and Law	40	40
14756773	Health Services Research	40	34
413674	Trustee	40	31
296570	Nursing Standard	40	25

10903127	Prehospital Emergency Care	38	16
10786767	Journal of health care finance	37	19
8982759	Physician Executive	37	14
48674	Australian and New Zealand Journal of Psychiatry	36	16
8835381	Healthcare executive	35	24
15414469	International Journal of Health Services	34	44
8949867	Journal of traumatic stress (Wiley)	34	23

Discussion

This study has revealed a steady demand for the JAC services which is characterized by the numbers of sessions and searches. During 2011-2012, there were over 6,500 sessions and over 123,000 searches (see Figures 3 and 4) with monthly averages of 275 and 5,129, respectively.

The number of full-text articles (either downloaded in PDF format or viewed on the computer screen in HTML) characterizes the desired output of the solution and can be used to estimate the value provided by the service. Figure 5 demonstrates high level of actual consumption of information in JAC's databases: in 2011-2012, over 4,600 full text articles were accessed. During the same period of time more than 5,800 abstracts were accessed. This indicator is secondary, keeping in mind that the main purpose of JAC is to provide access to full-text articles. However, the fact that the user accessed the abstract could be seen as an evidence of interest that the user had in the article but full-text may not be available. If a journal (not available in full-text) has experienced multiple abstract viewing, it testifies that this journal should be considered for subscription in full-text version.

It was noted that some journals were accessed at abstract level extensively, but had zero full-text downloads. That may demonstrate that these journals publish pertinent articles but are not available with full text. Top-10 of these journals, which were accessed from 117 to 30 times: JAMA- Journal of the American Medical Association, Healthcare Quarterly, Medical Care, Healthcare Papers, Health Policy, Vaccine, Journal of Palliative Care, Diabetes Educator. MOHLTC may consider exploring subscription to these journals with full text taking into account cost-efficiency (Botchkarev, 2013).

Usage statistics (number of full-text articles and abstracts) of individual journals for the period from 2009 to 2013 is presented in Additional file 1 (and the top-50 journals in the Table 2). This data shows that MOHLTC users accessed 12,790 full-text articles and abstracts 14,517. Total of 4,759 journal titles were accessed including 1,675 journals with full-text. Harvard Business Review is by far the most frequently used journal – it was used 7 times more than the journal with a second rank: American Journal of Public Health. It should be noted that the number of accessed journal titles is rather high. Usage doesn't demonstrate a "core" set of journals. There are only 30 journals that were accessed (full-text) 50 times or more. These journals contributed only 38% (4,953) of the accessed articles. 54% of the accessed journals (908 titles) were accessed with full text only one or two times. This group contributed 1,192 articles (9%). This

pattern of usage can be attributed to the following factors. First, there's an increasing amount of research being conducted which triggers a persistently growing number of publication venues. Second, MOHLTC has a very broad area of responsibilities with dynamically changing priorities which translates into diverse information needs of its employees. A practical conclusion from the usage analysis is that MOHLTC information needs cannot be mapped to a reasonably compact set of "core" journals with a subsequent subscription to those. In this case, subscription economics necessitate the use of journal aggregators (e.g. EBSCO, GALE, etc.) as the main source of journal access acquisition (Botchkarev, 2013).

Certain JAC user feedback is notable. This information has been collected in non-structured conversations with clients and is not supported by quantitative assessments. Despite availability and actual use of thousands of journals, there are needs for (i) expanding access to more peer-reviewed journals, (ii) expanding access to more journals with full text articles, (iii) exploring opportunities to reduce embargoes (access to articles delayed by the journal aggregator by months or years). Some users expect immediate online access to the full-text articles of interest (no abstract-only, no delays/embargoes). If these expectations are not met, user satisfaction might decline rapidly.

Study Assumptions and Limitations
To the best of our knowledge, this is the first study to address usage statistics for online journal databases in a Canadian ministry of health. However, this study has certain limitations that should be made explicit.

Use of JAC implies that its collections are of value for the MOHLTC employees. Although, numbers of article downloads may not be equal to actual use or satisfaction – users may download an article and find it worthless for their task or they may be unhappy because they did not find specifics they needed.

JAC statistics used in this study have been downloaded from the EBSCO reporting site. This data is based on the automatic logs and believed to be very accurate. However, the following should be noted.

Firstly, JAC is not an exclusive channel of information for MOHLTC users. Some users have access to online journals at the local universities through their alumni connections. Others have access to the journal repositories based on their memberships in professional associations. Certain departments used to have subscriptions to publications in their specific narrow fields. As a result, actual consumption of journal information is more intensive than is documented in the study.

Secondly, JAC is using EBSCO integrated search services that allow access to the databases that are owned by EBSCO, and those of the third parties (external to EBSCO). Search results presented to the user include both internal and external documents. When a person clicks on the link to external database, he/she is transferred to the document in the external database. As soon as a person moves to an external database, EBSCO (usually) does not have information what is happening there, and so cannot include activity in the report. That pertains especially to the full-text documents. As a result, JAC statistics may be missing data on the use of full-text documents in external databases. An example of this situation could be a report on the use of Cochrane database (shown in Table 3). JAC has a direct subscription to the Cochrane database with full-text documents which makes it external to EBSCO. The usage statistics indicate zero downloads

of the Cochrane full-text documents. This is not correct – it has been verified in the conversations with JAC users that Cochrane database actually has been used.

Thirdly, in some cases, EBSCO usage reports are not perfect. There were certain number of duplications of journal titles in the initial version of Additional file 1, e.g. (i) Some titles (of same journal) we duplicated because of using different online and print ISSNs. E.g.: Academic Emergency Medicine: Official Journal Of The Society For Academic Emergency Medicine. Usage was attributed to one title. Another was deleted. (ii) Some titles were duplicated because in one case the title had ISSN and in another - ISSN was blank. E.g. Academy of Management Executive. Usage was attributed to one title. Another was deleted. (iii) Some titles were duplicated because of spelling mistakes. E.g. American Journal of PublicHealth vs American Journal of Public Health. (iv) Different title abbreviations were used (most likely in different databases). E.g. BMC HEALTH SERVICES RESEARCH vs BMC Health Serv Res. (v) Use of & instead of AND. (vi) Using titles with or without definite article. (vi) and just typos. Fourthly, it was shown in annual customer surveys (not reported in the current paper), that JAC users were not satisfied when search results contained a large number of articles with abstracts only. It took additional time to look through several pages of search results to find articles with full text. According to the recommendation of the JAC Content Selection Advisory Network, JAC default search was configured to present full text articles only. If a researcher was willing to analyze additional abstracts-only articles, he/she could adjust search configuration. That may decrease the number of retrieved abstracts from the second half of 2012.

Conclusions

Ministry of Health and Long-Term Care built and maintaining Journal Access Centre - an online access tool supported by journal content selection, acquisition and consultation services – that meets information needs of the ministry which are diverse and dynamically changing under the influence of the health system demands and altering political priorities. As a key prerequisite for evidence based policy making, JAC enables access to thousands of journals.

JAC usage statistics for 2011 – 2012 calendar years provide evidence of high demand (sessions, searches) for the journals included in the JAC databases and intensive consumption of its content creating a significant value (full-text articles) for the MOHLTC staff.

JAC usage statistics for the period 2009-2013 demonstrate availability and usage of high-quality research evidence (e.g. high impact factor journals or journals that contain systematic reviews) to inform health systems' decision making.

MOHLTC's broad area of responsibilities with dynamically changing priorities translates into diverse information needs of its employees: a total of 4,759 journal titles were accessed including 1,675 journals with full-text.

A practical conclusion from the usage analysis is that MOHLTC information needs cannot be mapped to a reasonably compact set of "core" journals with a subsequent subscription to those. In this case, subscription economics necessitate the use of journal aggregators (e.g. EBSCO, GALE, etc.) as the main source of journal access acquisition.

Future efforts could be focused on studying (i) usage statistics complemented with data beyond EBSCO reports and covering all sources of online academic journals available in JAC, (ii) in-

depth usage of information sources and patterns of behaviour at the level of individual article as compared to the journal title level in this paper, (iii) JAC users' information needs and preferences, (iv) and JAC's usability through the customer satisfaction survey.

List of abbreviation used
JAC   Journal Access Centre
LHIN   Local Health Integration Network
MOHLTC Ministry of Health and Long-Term Care

Competing interests
The author declares having no competing interests.

Acknowledgements

References

Arend, J. V. (2014). Bridging the research/policy gap: Policy officials' perspectives on the barriers and facilitators to effective links between academic and policy worlds. *Policy Studies, 35*(6), 611-630. doi:10.1080/01442872.2014.971731

Botchkarev, A. (2013). Mining Evidence in the Online Academic Journal Databases: Access and Performance in Public Sector. E-prints in Library and Information Science (E-LIS), http://eprints.rclis.org/19286

Brownson, R. C., Reis, R. S., Allen, P., Duggan, K., Fields, R., Stamatakis, K. A., & Erwin, P. C. (2014). Understanding Administrative Evidence-Based Practices. *American Journal of Preventive Medicine, 46*(1), 49-57. doi:10.1016/j.amepre.2013.08.013

Counting Online Usage of Networked Electronic Resources. COUNTER-2008 (n.d.). Retrieved July 5, 2016, from http://www.projectcounter.org

EBSCO Information Services. (n.d.). Retrieved July 05, 2016, from https://www.ebsco.com

EBSCOhost website. (n.d.). Retrieved July 5, 2016, from http://eadmin.ebscohost.com/EAdmin/Reports/SelectReportsForm.aspx

Field, P., Gauld, R., & Lawrence, M. (2012). Evidence-informed health policy - the crucial role of advocacy. *International Journal of Clinical Practice, 66*(4), 337-341. doi:10.1111/j.1742-1241.2012.02883.x

Gale Cengage Learning. (n.d.). Retrieved July 5, 2016, from http://www.gale.cengage.com

Humphries, S., Stafinski, T., Mumtaz, Z., & Menon, D. (2014). Barriers and facilitators to evidence-use in program management: A systematic review of the literature. *BMC Health Services Research, 14*(1), 171. doi:10.1186/1472-6963-14-171

Lomas, J., & Brown, A. D. (2009). Research and Advice Giving: A Functional View of Evidence-Informed Policy Advice in a Canadian Ministry of Health. *Milbank Quarterly, 87*(4), 903-926. doi:10.1111/j.1468-0009.2009.00583.

Madhavji, A., Araujo, E. A., Kim, K. B., & Buschang, P. H. (2011). Attitudes, awareness, and barriers toward evidence-based practice in orthodontics. *American Journal of Orthodontics and Dentofacial Orthopedics, 140*(3), 309-316. doi:10.1016/j.ajodo.2010.05.023

O'connor, S., & Pettigrew, C. (2009). The barriers perceived to prevent the successful implementation of evidence-based practice by speech and language therapists. *International Journal of Language & Communication Disorders, 44*(6), 1018-1035. doi:10.3109/13682820802585967

Oliver, K., Innvar, S., Lorenc, T., Woodman, J., & Thomas, J. (2014). A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research, 14*(1), 2. doi:10.1186/1472-6963-14-2

Rapp, C. A., Etzel-Wise, D., Marty, D., Coffman, M., Carlson, L., Asher, D., Callaghan J., & Holter, M. (2010). Barriers to Evidence-Based Practice Implementation: Results of a Qualitative Study. *Community Mental Health Journal, 46*(2), 112-118. doi:10.1007/s10597-009-9238-z

Solomons, N. M., & Spross, J. A. (2011). Evidence-based practice barriers and facilitators from a continuous quality improvement perspective: An integrative review. *Journal of Nursing Management, 19*(1), 109-120. doi:10.1111/j.1365-2834.2010.01144.x

Sosnowy, C. D., Weiss, L. J., Maylahn, C. M., Pirani, S. J., & Katagiri, N. J. (2013). Factors Affecting Evidence-Based Decision Making in Local Health Departments. *American Journal of Preventive Medicine, 45*(6), 763-768. doi:10.1016/j.amepre.2013.08.004

Ubbink, D. T., Guyatt, G. H., & Vermeulen, H. (2013). Framework of policy recommendations for implementation of evidence-based practice: A systematic scoping review. *BMJ Open, 3*(1). doi:10.1136/bmjopen-2012-001881

Ubbink, D. T., Vermeulen, H., Knops, A. M., Legemate, D. A., Oude Rengerink, K., Heineman, M. J., Roos Y.B., Fijnvandraat C.J., Heymans H.S., Simons R., & Levi, M. (2011). Implementation of evidence-based practice: outside the box, throughout the hospital. *Neth J Med*, *69*(2), 87-94.

Wallace, J., Nwosu, B., & Clarke, M. (2012). Barriers to the uptake of evidence from systematic reviews and meta-analyses: A systematic review of decision makers' perceptions. *BMJ Open, 2*(5). doi:10.1136/bmjopen-2012-001220

Wooding, S., Hanney, S. R., Pollitt, A., Grant, J., & Buxton, M. J. (2014). Understanding factors associated with the translation of cardiovascular research: A multinational case study approach. *Implementation Science*, 9(1), 47. doi:10.1186/1748-5908-9-47

Additional files

Additional file 1 – JAC Usage Statistics by Journal Title 2009-2013