FEASIBILITY OF A KNOWLEDGE TRANSLATION CME PROGRAM: COURRIELS COCHRANE.

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ABSTRACT

Introduction: Systematic literature reviews provide best evidence, but are underused by clinicians. Thus, integrating Cochrane reviews into Continuing Medical Education (CME) is challenging. We designed a pilot CME program where summaries of Cochrane reviews (*Courriels Cochrane*) were disseminated by email. Program participants automatically received CME credit for each Courriel Cochrane they rated. The feasibility of this program is reported (delivery, participation, and participant evaluation).

Method: We recruited French-speaking physicians through the Canadian Medical Association. Program delivery and participation were documented. Participants rated the informational value of *Courriels Cochrane* using the Information Assessment Method (IAM), which documented their reflective learning (relevance, cognitive impact, use for a patient, expected health benefits). IAM responses were aggregated and analysed.

Results: The program was delivered as planned. Thirty *Courriels Cochrane* were delivered to 985 physicians, and 127 (12.9%) completed at least one IAM questionnaire. Out of 1,109 *Courriels Cochrane* ratings, 973 (87.7%) contained one or more types of positive cognitive impact, while 835 (75.3%) were clinically relevant. Participants reported the use of information for a patient and expected health benefits in 595 (53.7%) and 569 (51.3%) ratings, respectively.

Discussion: Program delivery required partnering with five organizations. Participants valued *Courriels Cochrane*. IAM ratings documented their reflective learning. The aggregation of IAM ratings documented three levels of CME outcomes: participation, learning, and performance. This evaluation study demonstrates the feasibility of the *Courriels Cochrane* as an approach to

further disseminate Cochrane systematic literature reviews to clinicians and document self-reported knowledge translation associated with Cochrane reviews.

Key Words: Continuing medical education; e-learning; reflective learning; physicians; information assessment method; information behavior; information use; email alert; knowledge translation, feasibility.

INTRODUCTION

Ideally, clinical decisions are based on considerations of the best available evidence (e.g., results of a systematic literature review), the context (e.g., the access to treatment) and patient preferences. While systematic literature reviews are high in the ranking of evidence, their clinical use is not widespread.[1] In particular, due to their length and complexity, practicing physicians underuse Cochrane systematic reviews of experimental studies, and question their usefulness.[2,3] For example, compared to one-page Critically Appraised Topics (CATs) clinicians use reviews from the Cochrane Library infrequently.[4] One-page CATs include a clinical question, a generic clinical scenario and a bottom line recommendation (the bibliographic search strategy and summaries of relevant studies with an appraisal of their methodological quality being available in the same document). Moreover, the literature suggests systematic reviews emphasize the quality of research-based evidence over its clinical applicability,[5-7] making it a challenge to integrate Cochrane reviews into Continuing Medical Education (CME) programs. As a potential solution, Cochrane reviews can be linked to a more usable type of information for clinicians called knowledge translation products,[8] and the challenge of incorporating Cochrane Reviews into CME is linked more to the challenge of getting clinicians to use these products, such as *Practical Evidence About Real Life Situations* produced by the Cochrane Primary Health Care Field. These summaries, called P.E.A.R.L.S., are delivered via email worldwide and posted online (www.cochraneprimarycare.org). P.E.A.R.L.S. are structured one-page summaries that consist of excerpts of abstracts and lay summaries of systematic reviews deemed relevant to primary care. They are designed to include a clinical question, a bottom line, a caveat, a context and a reference to the corresponding Cochrane review (Figure 1).

A review of the literature shows that receiving clinical information on email is associated with positive impact.[9] We identified six relevant studies on email alerts in the health sciences. Three of these five studies globally evaluated satisfaction and usefulness of receiving health information on email.[10-12] From these studies, there is evidence that users of email alerts report high levels of satisfaction and perceive them to be useful for continuing education. The fourth study evaluated the effect of email alerts on subsequent information retrieval by physicians.[13] Results demonstrated that users of email alerts (push technology) are more likely to use information retrieval (pull) technology. The fifth study indicated that alerts are infrequently retrieved after initial reading.[14] The sixth study examined self-reported cognitive impacts of emailed synopses of recently published clinical research,[15] and results indicated that email alerts are frequently associated with positive impact.

Using a selection of P.E.A.R.L.S. translated into French, the *Courriels Cochrane* pilot program was designed to provide French-speaking Canadian physicians with a CME opportunity where clinical information from Cochrane reviews would be more accessible to them. Since CME programs based on the reading and rating of email alerts are new, our questions with regard to the feasibility of the *Courriels Cochrane* program were as follows: (a) Delivery – can we deliver the program as planned? (b) Participation – do the physicians participate (i.e., read and rate the *Courriels Cochrane*) and engage with the program? (c) Evaluation – is the informational content valuable to participants? The value of information was conceptualized in terms of its cognitive impact, clinical relevance, information use and expected health benefits.

METHOD

Design

A longitudinal evaluation study was conducted in 2009-2010. Program participants received weekly *Courriels Cochrane* by email which they read and rated using the Information Assessment Method (IAM) (http://iam2009.pbworks.com/FrontPage). Ethics approval was obtained from the McGill University Institutional Review Board.

Participants

Two email invitations were sent in September 2009 to Canadian Medical Association members who had previously registered to receive clinical information in French through the portal

www.cma.ca. From this group, 985 practicing physicians subscribed to receive weekly *Courriels Cochrane*. Participants who were members of the College of Family Physicians of Canada (CFPC) could earn 0.1 Mainpro M1 CME credit for each Courriel Cochrane they rated using IAM.

Program

By way of illustration, a Courriel Cochrane is presented in Figure 1. Each Courriel Cochrane contained a link to the full-text Cochrane review (available to all Canadians at the time of this study). We emailed one Courriel Cochrane per week over thirty weeks to all participants (October 14, 2009 to May 5, 2010).

Courriels Cochrane were selected and adapted in accordance with the knowledge-to-action framework.[5] First, Cochrane P.E.A.R.L.S. were selected for their relevance to primary care in the Canadian context. Of 125 P.E.A.R.L.S. published in 2007 and 2008, 40 were selected by three Canadian family physicians (G.T., M.L., R.G.) based on their relevance and newsworthiness to primary care. These 40 were then reviewed and approved by the Director of Continuing Professional Development of the CFPC (B.M.).

Second, P.E.A.R.L.S. were translated into French and edited by a panel of family physicians (B.M., F.L., G.T., M.L., R.G., R.L.) and researchers (F.B., P.P., V.G.). Following an editorial process, 30 P.E.A.R.L.S. were retained as *Courriels Cochrane*. Our editorial process led to the exclusion of 10 P.E.A.R.L.S. when issues with the corresponding Cochrane review were noted by a panel of three family physicians (G.T., R.G., S.B.S.), one researcher (P.P.), and a librarian (V.G.). For example, we excluded one P.E.A.R.L.S. derived from a Cochrane review on antibiotics for symptomatic urinary tract infection. In this review of 15 randomized controlled trials, trials involving children (including six trials involving infants less than one year of age) were analyzed together with trials involving adults.[16] The panel felt that separate analyses of these two subgroups were needed to meet the needs of clinicians in primary care.

Evaluation Plan

Our evaluation plan was based on IAM. IAM has been used elsewhere and is a method that allows for systematic and comprehensive assessment of the value of clinical information.[17] IAM operationalizes the value of information using four constructs derived from information studies:

cognitive impact of information, clinical relevance, information use, and patient health benefits.[9,18] IAM questions are shown in TABLE 1.

A bibliography on the 10-year development and validation of the IAM is available at http://iam2009.pbworks.com/FrontPage. Using literature reviews, and qualitative, quantitative and mixed methods studies, we have documented the feasibility, content validity, construct validity, and substantive validity (theoretical rationale) of the IAM questionnaire. The IAM questionnaire, originally developed in English, was adapted into French using a 6-step cross-cultural adaptation process:[19] two forward translations from English to French; a synthesis of these translations with resolution of minor differences; two back translations from French to English; a synthesis of the back translations; an expert committee review where minor changes were incorporated into the questionnaire; and a pilot-test in which a French native physician described the IAM questionnaire as very clear.

The IAM is both an intervention at the individual level and a program evaluation tool at the collective level. Using IAM stimulates reflection on information and concomitantly assesses it. *At the participant level (individual response),* reading material such as a Courriel Cochrane and assessing it with IAM qualifies as a 'brief individual reflective e-learning' activity,[20] and thus allows the provision of CME credit from the CFPC and the Royal College of Physicians and Surgeons of Canada. *At the program level (all responses from all participants),* IAM documents three CME outcomes (participation, learning, performance), while many current evaluations of CME programs provide "little more than documentation of attendance" (p.1).[21]

In this study, for each Courriel Cochrane, participants were invited to complete one IAM questionnaire (http://iam2009.pbworks.com/w/page/27147646/IAM%20in%20French).

Using a 'check all that apply' response format, the IAM questionnaire allowed participants to document the value of information in Courriels Cochrane by reporting the cognitive impact of each Courriel Cochrane (10 items), its clinical relevance for at least one patient (1 item), any expected use of information for that patient (4 items), and information-related patient health benefits (5 items).

Statistical Analysis

Descriptive statistics were calculated using Excel and SAS version 9.2. For each IAM questionnaire item, we counted the total number of positive responses per Courriel Cochrane

(items checked). This allowed the identification of *Courriels Cochrane* with minimal and maximal values of positive responses for each item (hence a range).

Feasibility

Feasibility was defined as the ability of the providers to *deliver* the program as planned, of the target audience to *participate*, and of the approach to *gather* the data needed for program evaluation. First, regarding program delivery, the plan comprised three steps: (1) translation and editing of P.E.A.R.L.S. into *Courriels Cochrane*; (2) diffusion by the CMA within a nationally accredited CME program; and (3) the evaluation of the program. Participants needed a computer, an internet connection and an email account. Completing the IAM questionnaire is designed as a no-charge online activity, making this e-learning activity possible to integrate into busy schedules without travel or other special arrangements. Reading and rating could be done on a weekly basis, or several *Courriels Cochrane* could be rated in batches.

Second, participation indicates the suitability of the program to its target audience. In our study, participation was measured by the number of subscribing physicians who read and rated at least one Courriel Cochrane using IAM. IAM documented both participation and engagement of participants. Engagement was defined as the intensity of participation.[22] Engagement is usually associated with positive educational outcomes.[23] Learners are engaged when they persist in CME activities and submit their required work despite barriers such as lack of time. Engagement was measured by the number of completed IAM questionnaires. Our experience regarding the utilization of IAM comes from another program, where physicians obtain CME credits for each completed questionnaire linked to emailed information in English.[15] In the present project, we did not have specific expectations because the information was in French and not all participants could claim credits for rating *Courriels Cochrane*. Nevertheless, the limited availability of high quality evidence in French justified moving forward and we anticipated we would better understand the conditions for increasing and maintaining participation as a result of this experience.

Third, IAM also documented the value of delivered clinical information, thus providing useful data for program evaluation.

RESULTS

Delivery

The program was delivered as planned. The budget included low direct costs and in-kind contributions from partners. Contributions from five partner organizations made the provision of this program feasible. The Cochrane Primary Health Care Field produced P.E.A.R.L.S. One CME expert from the CFPC chose P.E.A.R.L.S. that were relevant to Canadian physicians. The Réseau Cochrane Francophone funded the translation of selected P.E.A.R.L.S. (in English) to *Courriels Cochrane* (in French). Co-authors edited *Courriels Cochrane* to ensure there was consistency between the informational content of each Courriel Cochrane and the original systematic review. The CFPC accredited the '*Courriels Cochrane*' CME program. The company responsible for the 'cma.ca' portal recruited participants by sending two email invitations to their members, diffused the weekly *Courriels Cochrane* on email, and collected IAM ratings. The program was free to CMA members. A $25,000 grant from the Canadian Institutes of Health Research funded the final editing of P.E.A.R.L.S., program management and evaluation. Thirty *Courriels Cochrane* were delivered to 985 physicians on a weekly basis, from October 14, 2009 to May 5, 2010.

Participation

In this time window, 127 physicians (12.9%) participated in the CME program and completed at least one IAM questionnaire. The average age of participants was 49.6 years (range 27.0 to 83.0 years), 64 were male (50.4%), and 108 resided in the province of Quebec (85.0%). Ideally, participants could have completed one IAM questionnaire for each Courriel Cochrane, i.e., 3,810 questionnaires in total. In terms of engagement, 1,109 questionnaires (29.1%) were collected. On average, participants rated 8.7 *Courriels Cochrane* (median = 5; min = 1; max = 29). Of 48 comments provided by participants, none concerned the questionnaire itself.

Evaluation

The value of the information provided by *Courriels Cochrane* is presented in Table 1. Of 1,109 completed questionnaires, 973 (87.7%) reported at least one item of positive cognitive impact, while in 835 (75.3%) the information was clinically relevant. The most frequently reported types of cognitive impact were 'I learned something new' (38.1%), and 'This information confirmed I

did (am doing) the right thing' (32.6%). For each item of the IAM questionnaire, the range of positive responses varied greatly per Courriel Cochrane. For example, for the item 'I learned something new': while the frequency of positive responses was on average 38.1% across all *Courriels Cochrane* (423 positive responses over 1,109 completed questionnaires), it varied from a low of 14.0% for the Courriel Cochrane entitled 'Low efficacy of antibiotics for treating patients with sore throat' (see 'min' in Table 1), to a high of 72.2% for the Courriel Cochrane entitled 'Measures to control house dust mites do not reduce symptoms of asthma' (see 'max' in Table 1).

In 595 completed questionnaires (53.7%), participants reported that information from this Courriel Cochrane 'will be used for a specific patient'. The most frequently reported types of information use were 'to justify or maintain the management of this patient' (33.9%) and 'to modify the management of this patient' (12.2%). In 569 questionnaires (51.3%), information use was associated with at least one expected patient health benefit. The most frequently expected type of patient health benefit associated with the use of *Courriels Cochrane* was 'avoiding unnecessary or inappropriate treatment, diagnostic procedure or preventive intervention' (21.7%).

DISCUSSION

Overall, the program was delivered as planned. Physicians read and rated the *Courriels Cochrane*. They reported that the informational content was valuable. We believe the *Courriels Cochrane* CME program was successful because high quality online education was delivered at relatively low-cost. Spaced online education emails are associated with improved knowledge and significant topic-specific learning.[24] The use of IAM offered a friendly automated solution to integrate both the CME program and its evaluation.

The *Courriels Cochrane* CME program was made feasible through a collaborative partnership. The delivery of the program depended on contributions from universities and five partner organizations: the Canadian Institutes of Health Research, a company of the Canadian Medical Association, the Cochrane Primary Health Care Field, the CFPC, and the Réseau Cochrane francophone. Two other factors made delivery possible, 83.5% of family physicians had access to an e-mail account and 52.4% participated in online CME activities

(www.nationalphysiciansurvey.ca). By contrast to CME conferences or workshops, participants did not have to pay and could integrate program activities into their busy day. However, using email as the main channel for delivery of CME activities may contribute to increased email apprehension, which is associated with information overload and privacy concerns linked to internet communication.[25]

The 12.9% participation rate in the *Courriels Cochrane* CME program was similar to another program, *InfoPOEMs* (emailed synopses of original clinical research selected for relevance to primary care) which also uses IAM and had a participation rate of 15.2% in 2010. In contrast, the participation rate for *e-Therapeutics+ Highlights* (emailed evidence-based summaries with therapeutic recommendations) was 31.4% in 2010. Comparing these three programs, the offer of CME credit as an incentive might have contributed to the observed difference in participation. Whereas all participants are CFPC members in the *e-Therapeutics+ Highlights* program, and are eligible to receive CME credits; in the *Courriels Cochrane* and *InfoPOEMs* programs, only a fraction of participants can claim CME credits (CFPC members). In addition, the higher number of participants in the *e-Therapeutics+ Highlights* program could be explained by the fact that CFPC members were invited to participate on a weekly basis unless they specifically asked not to receive *Highlights*. Whereas in the *Courriels Cochrane* program, only two email invitations were sent out to 'cma.ca' members. However, the level of engagement of participants in the *e-Therapeutics+ Highlights* program (11.5% questionnaires completed) was lower than the level of engagement of participants in the *Courriels Cochrane* program (29.1% questionnaires completed), which could be linked to the relevance of information and the lack of high quality evidence in French.

Participants perceived *Courriels Cochrane* to be valuable in terms of cognitive impact, clinical relevance, information use and expected patient health benefits. Moore et al., have identified seven levels of CME outcomes: participation, satisfaction, learning (declarative and procedural knowledge), competence, performance, patient health and community health. [21] Of these, IAM data allowed the information provider to document three of seven levels of CME outcomes: participation (level 1), learning (level 3) and physician performance (level 5). For participation, 127/985 physicians (12.9%) who received weekly *Courriels Cochrane* completed at least one IAM questionnaire linked to a Courriel Cochrane. For declarative knowledge (the degree to which participants state that they gain knowledge on something that the CME activity intended

them to know), 423/1109 questionnaires (38.1%) reported that information from a Courriel Cochrane led a participant to learn something new. For performance (the degree to which participants do something that the CME activity intended them to be able to do in their practices), 376/1109 questionnaires (33.9%) reported that information from a Courriel Cochrane was used 'to justify or maintain the management' of a specific patient, and 135/1109 (12.2%) indicated the information was used 'to modify the management' of a patient. In contrast to objective sources of outcomes data such as might be documented in a patient record, physician reports of CME outcomes collected through IAM were easy to obtain.

There are limitations to this study. Our data were self-reported and outcomes were most likely overestimated.[26] Participants were not representative of the Canadian physician population; the audience was unique, namely French-speaking Canadian physicians. Compared to all Canadian physicians, program participants were certainly more interested in online CME programs involving the email delivery of clinical information. As we had no access to physicians who received *Courriels Cochrane* but did not read the content or who read the content but did not rate it, our results are not generalizable. Nonetheless, the IAM permitted integrating the intervention with the evaluation. In contrast, the intervention and the evaluation are separate activities in typical CME programs (e.g., attending a workshop and completing an evaluation form after the workshop).

This study suggests areas for further research. The IAM questionnaire is unique in its ability to identify an aspect of information behavior and healthcare of particular interest to health services research. When physicians reported that the use of *Courriels Cochrane* helped them to 'avoid unnecessary or inappropriate treatments, diagnostic procedures or preventive interventions', IAM documented what would not be done in practice. Administrative databases or electronic medical records can typically capture only what is done in the doctor-patient encounter, as opposed to what is avoided because of new clinical information. Thus, further research comparing self-reported IAM data with an audit of the patient chart should examine any increase of desirable practices and decrease of undesirable practices. This is important since CME programs are typically associated with a change in knowledge, while reported associations with behavior change should be objectively confirmed.[27] It remains to be determined whether the increase in awareness is associated with knowledge improvement and translation into practice.[28]

Thus, further research may compare self-reported CME outcome with an audit of the patient chart, by linking IAM data to patient data derived from electronic medical records for instance.

CONCLUSION

This evaluation study demonstrates the feasibility of the *Courriels Cochrane* as an approach to further disseminate Cochrane systematic literature reviews to clinicians and to document self-reported knowledge translation associated with Cochrane reviews. Participants used IAM for rating *Courriels Cochrane* (a brief individual reflective e-learning activity) and participation was associated with CME credits. They valued the *Courriels Cochrane* and reported that email alerts of Cochrane summaries contributed to their learning and their performance. Finally, this study illustrates how the IAM can facilitate documentation of three levels of CME outcome, namely, participation, learning, performance.

LESSONS FOR PRACTICE

- Project partners' openness to collaboration and cooperation enhanced program feasibility.
- Physicians reported the informational value of reading summaries of Cochrane systematic reviews.
- The Information Assessment Method (IAM) can automate documentation of clinicians' reflection on and perceived value of email alerts.
- For e-learning programs, aggregating IAM data allows the assessment of three levels of CME outcome: participation, learning and performance.

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Table 1. Physicians' perceived value of *Courriels Cochrane* (N=1,109 responses)

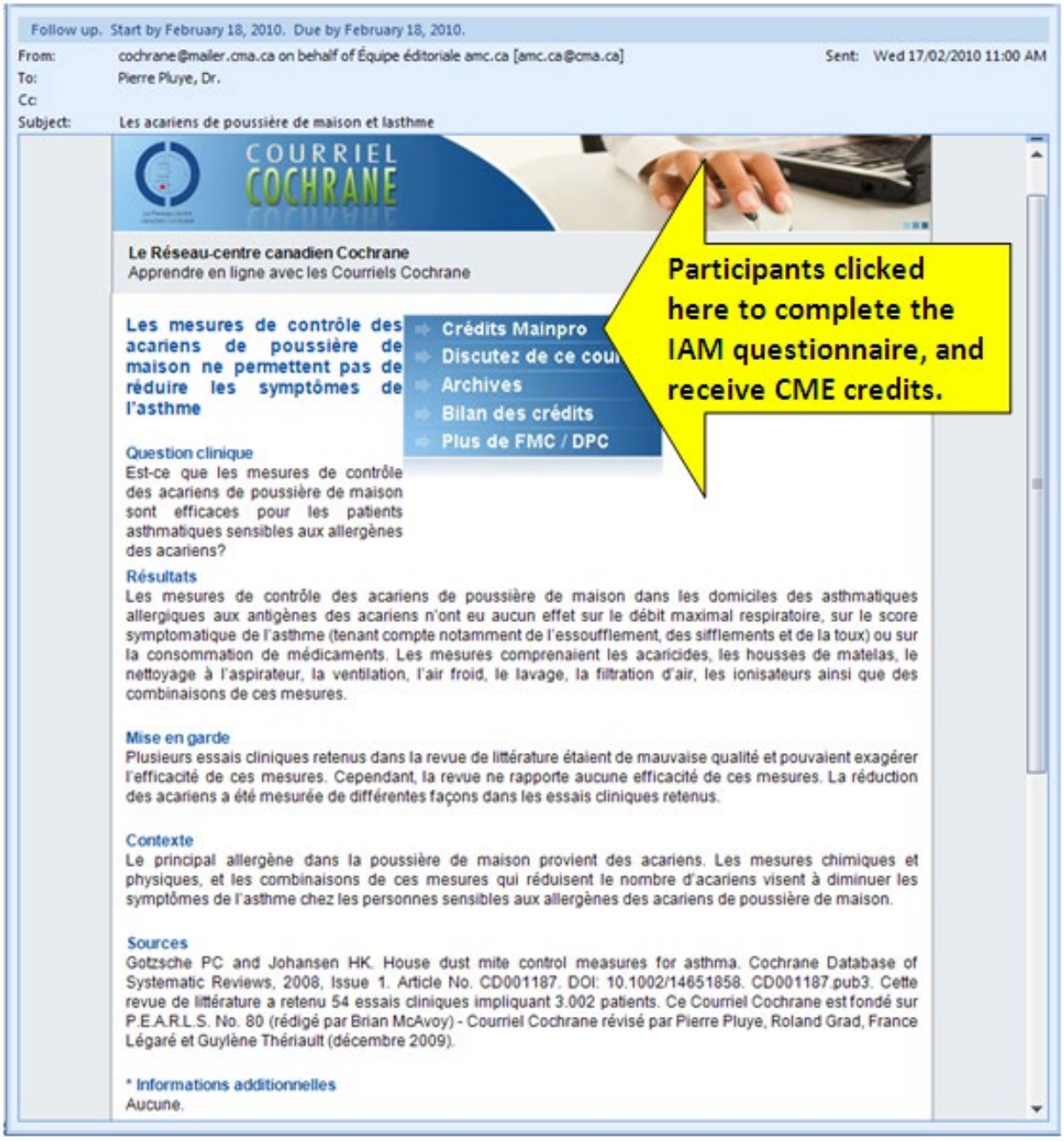
I. COGNITIVE IMPACT*		
What is the impact of this "Courriel Cochrane" on you or your practice?	N	% (min - max)**
I learned something new	423	38.1 (14.0 - 72.2)
This information confirmed I did (am doing) the right thing	362	32.6 (5.3 - 65.1)
I am motivated to learn more	209	18.8 (3.8 - 32.4)
I am reassured	179	16.1 (0 - 44.2)
I am reminded of something I already knew	138	12.4 (0 - 28.6)
My practice is (will be) changed and improved	92	8.3 (0 - 33.3)
I am dissatisfied	29	2.6 (0 - 11.4)
There is a problem with this information	19	1.7 (0 - 7.9)
I disagree with the content of this information	12	1.1 (0 - 5.3)
I think this information is potentially harmful	6	0.5 (0 - 7.9)
II. CLINICAL RELEVANCE		
Is this information relevant for at least one of your patients?	N	% (min - max)
Totally relevant	526	47.4 (19.4 – 81.4)
Partially relevant	309	27.9 (11.6 - 50.0)
Not relevant	274	24.7 (7.0 – 47.2)

III. INFORMATION USE*		
When this information is relevant for one of your patients, how will you use it?	N	% (min - max)
To justify or maintain the management of this patient	376	33.9 (5.9 - 62.8)
For thinking about this patient	153	13.8 (0 - 33.3)
To modify the management of this patient	135	12.2 (2.3 - 33.3)
To persuade this patient or other health professionals to make changes	79	7.1 (0 - 25.6)
IV. EXPECTED PATIENT HEALTH BENEFITS*		
With respect to a specific patient, do you anticipate any health benefits from using this information?	N	% (min - max)
Avoiding unnecessary or inappropriate treatment, diagnostic procedure or preventive intervention	241	21.7 (2.3 - 58.1)
Increasing patient knowledge about health or healthcare	204	18.4 (2.6 - 30.2)
Increasing patient acceptability of treatment, diagnostic procedure or preventive intervention	178	16.1 (0 - 37.2)
Improving patient health or functioning or resilience (the way patients face difficulties)	109	9.8 (0 - 21.1)
Preventing disease or health deterioration (including acute episode of chronic disease)	107	9.6 (0 - 33.3)

**Response format was 'check all that apply', thus the sum of answers may be greater than 100%.*

***Across the 30 Courriels Cochrane.*

Figure 1. Example of an email *Courriel Cochrane*



Legend:

- Email subject: House dust mites and asthma
- Bottom line: Measures to control house dust mites do not reduce symptoms of asthma

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