

**COMMENTARY**

# A research impact model for work and health

Dwayne Van Eerd PhD  | Cindy Moser BA | Ron Saunders PhD

Institute for Work and Health, Toronto, Ontario, Canada

**Correspondence**

Dwayne Van Eerd, 400 University Ave,  
Suite 1800, Toronto, ON M5G 1S5, Canada.  
Email: [dvaneerd@iwh.on.ca](mailto:dvaneerd@iwh.on.ca)

**Abstract**

Research organizations, governments and funding agencies are increasingly interested in the impact of research beyond academia. While a growing literature describes research impacts in healthcare and health services, little has focused on occupational health and safety research. This article describes a research impact model that has been in use for over a decade. The model was developed to track and describe the impact of research conducted by a mid-sized institute that focuses on work and health. Model development was informed by existing models, with the goal of contextualizing the institute's case studies describing three types of research impact: evidence of the diffusion of research; evidence of research informing decision-making; and evidence of societal impact. A logic model describes research actions and outcomes, as well as key audiences and knowledge transfer approaches. A unique element is its indication of the level of difficulty in determining types of impact. The model compares well with current research impact models developed or used in healthcare and health services research, and it has been useful in guiding a mid-sized research organization's process for tracking and describing the impact of its research. It may be useful to other small and mid-sized research organizations that focus on workplace health and safety.

**KEYWORDS**

integrated knowledge transfer and exchange, research impact, work and health

## 1 | INTRODUCTION

Research impact has been defined a number of ways,<sup>1,2</sup> but the key element is essentially about determining whether research has benefits beyond academia. Research organizations, governments, and funding agencies are increasingly interested in the impact of research beyond academia and are looking for evidence of impact on decision-making and broader societal outcomes.

For occupational health and safety (OHS) and work disability prevention (WDP) research—or, more broadly, work and health research—key outcomes potentially indicative of impact are: reductions in worker-related injuries; reductions in work disability (i.e., work absenteeism or

presenteeism due to occupational and nonoccupational injury and illness); earlier, safer, and more sustainable work-returns post injury or illness; decreased compensation insurance claims/costs; and, ultimately, improved worker health. Improved worker health allows for greater well-being and productivity (at both worker and workplace levels), as well as reduced social burdens (e.g., costs associated with healthcare and income-support programs).

While the literature on research impact is growing, especially in the fields of clinical and public health, little attention has been paid to the impact of research related to OHS/WDP. Although approaches to assessing research impact in clinical and public health research are potentially relevant to OHS/WDP, the lack of consistency in the terminology,

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models, and frameworks used within the health field makes it challenging to simply adopt an existing method for evaluating research impact.

Research has shown that OHS/WDP practitioners value research and make attempts to use it in decision-making and practice.<sup>3</sup> Furthermore, OHS researchers and research organizations employ a number of knowledge transfer and dissemination methods to get research outputs to various stakeholder audiences.<sup>4–7</sup> Among the different approaches, research suggests that integrated approaches that connect with or involve stakeholders throughout the stages of research improve uptake and implementation.<sup>8–12</sup> Recently, Schulte et al.<sup>6</sup> have proposed a detailed framework for translational research in OHS. The framework builds upon a National Academy of Science model to guide the study of processes that move research to practice to impact. Importantly the proposed framework considers the link between knowledge transfer and impact.

Given that assessing research impact is an important element of a comprehensive knowledge transfer and exchange (KTE) approach to applied research, the Institute for Work and Health (IWH) developed a research impact model (IWH-RIM) in 2010 to contextualize and guide its evaluation and communication of impact. IWH is an independent, not-for-profit research organization in Toronto, Canada. A mid-sized organization of about 55 people, the Institute's mission is "to promote, protect and improve the safety and health of working people by conducting actionable research that is valued by employers, workers and policy-makers" (<https://www.iwh.on.ca/about-us>).

The aim of this paper is to present a model of research impact by a mid-sized research organization that focuses on OHS and WDP issues, to briefly compare the IWH-RIM to other popular research impact models/frameworks, and to describe the use of the IWH-RIM to assess and communicate the organization's research impact. The IWH-RIM was developed within an integrated approach to KTE that emphasizes building relationships with key stakeholders and involving them in the research process.<sup>4</sup> Although developed for this research organization, the model builds on commonly used frameworks and, therefore, can be adapted by similar organizations.

## 1.1 | Current state of research impact assessment

The past decade has seen a substantial increase in the attention being paid to research impact assessment (RIA).<sup>1,2,13,14</sup> However, the increase in attention and papers published on the topic have not resulted in consistency with respect to terminology or methods used for assessing research impact. A number of different approaches, frameworks, and models have been described in the literature that could be used to guide RIA, depending on the research context. Most approaches are developed for use in health services or public health research.<sup>1,2,14</sup> Approaches have also been developed for use in environmental, agriculture, and education research.<sup>13</sup>

Recent literature reviews on RIA describe the various approaches and guiding frameworks currently in use. Newson et al.<sup>14</sup> reviewed the RIA literature on the impact of research on health policy. They compared approaches that traced impact forward from

research to approaches that traced impact back from policy. Based on over 160 studies and reviews, the authors suggest that forward-looking evaluations, which follow research findings prospectively to determine its effect, tend to be concerned with research impact, while backward-looking approaches tend to be concerned with research use (i.e., evaluating the use of research in decision-making). They conclude that the different approaches tell different parts of the story about the use of research in health policy, and that methods that combine the two approaches may be useful in future studies of policy and research impact.

Heyeres et al.<sup>13</sup> also reviewed the literature on research impact, focusing on the reporting quality of case studies—a key method used in RIA.<sup>1,2,13</sup> The Heyeres et al.<sup>13</sup> review considered the reporting quality of 25 research impact case studies, using recently published statement on effective RIA by Adam et al.<sup>15</sup> to assess quality. Called the International School on Research Impact Assessment (ISRIA), the statement offers ten guidelines for an effective RIA process: analyzing the research context; continuously reflecting on study purpose, including advocacy, analysis, accountability, and allocation; identifying stakeholders and their needs; engaging stakeholder early; choosing theoretical frameworks critically; using mixed-methods and multi-data sources; selecting indicators and metrics responsibly; anticipating and addressing ethics and conflicts of interest; communicating results through multiple channels; and sharing the learning with the RIA community to grow its evidence base and further development. Heyeres et al.<sup>13</sup> found that the research impact case studies scored well on five ISRIA domains of reporting quality, but were weak around identification of stakeholder needs, engaging stakeholders, and ethics and conflict of interest. They concluded that greater consistency is required in reporting RIA case studies, that translation pathways need to be more systematically reported, and that greater transparency is required with respect to the estimated costs and benefits of the research, as well as its translation and impact assessment.

Raftery et al.<sup>2</sup> conducted a review of the RIA literature to determine the range of theoretical models and approaches to measuring research impact in health technology assessment. In a comprehensive update of a previous review up to 2005,<sup>16</sup> they found 161 articles describing over 20 different models. They reported that the Payback Framework (originally developed by Buxton and Hanney,<sup>17</sup>) and its adaptations are the most often used in RIA. They noted that other useful models also show promise, such as the Canadian Academy of Health Sciences Framework,<sup>18</sup> the Research Impact Framework,<sup>19</sup> and others that consider monetized impacts. They also noted that different models and approaches employ different assumptions and may, therefore, be most appropriate in certain contexts, as Newson et al.<sup>14</sup> reported. They concluded that the Payback Framework is suitable for health technology RIA, but that future policy changes may require selection of a different model of assessment.

Greenhalgh et al.<sup>1</sup> built on the Raftery et al.<sup>2</sup> review by looking at the strengths and weaknesses of six established and commonly used RIA approaches: Payback Framework, Research Impact Framework, Canadian Academy of Health Sciences, monetization, societal impact

assessment, and UK Research Excellence Framework. The narrative review provided an overview of the philosophical assumptions underlying the various frameworks and the applications of each approach. Greenhalgh pointed out that the most robust and sophisticated approaches are also labor-intensive and may not be feasible or affordable in some contexts. In addition, while the approaches are typically able to capture direct and proximate impacts, more could be done to examine indirect and diffuse elements of research impact. As others have concluded,<sup>2,14,20</sup> Greenhalgh et al.<sup>1</sup> also concludes that different RIA approaches are appropriate in different circumstances.

Based on these recent reviews of the RIA literature, the Payback Framework,<sup>17</sup> Canadian Academy of Health Sciences (CAHS) Framework,<sup>18</sup> and Research Impact Framework (RIF)<sup>19</sup> are most commonly used in research impact studies. While these popular frameworks share some attributes, particularly the Payback and CAHS Frameworks, their approaches to determine research impact are distinct. A brief description of each follows.

The Payback Framework was developed in the mid-1990s to examine the impact of health services research. It consists of two elements. First is a logic model representing the stages of research, from inception and production, to dissemination of outputs, and to uptake and outcomes. Second are the five categories of potential “paybacks” or benefits of research, which include knowledge, as well as benefits to future research, policy-making and product development, health, and the economy. Donovan and Hanney<sup>21</sup> note that the Payback Framework has been adapted for use in the social sciences and humanities, while Greenhalgh et al.<sup>1</sup> report its widespread use in health technology research.

The CAHS Framework is an adaptation of the Payback Framework, and it tracks impacts from research translation to end use. The CAHS adaptation considers five impact categories: advancing knowledge, building capacity, informing decision-making, health impacts, and broader socioeconomic impacts. The primary addition from the Payback Framework is that the CAHS Framework considers decision-making by individual clinicians, not only policy-makers. Like the Payback Framework, the CAHS Framework logic model moves through the stages of research, from research activity to adoption and outcomes. The framework recognizes that research findings can influence decision-makers in health care, other industries (including work environments), government, research, and public bodies (including the public at large). This, in turn, can lead to changes in health care (through both prevention and treatment), and the determinants of health, resulting in improved health and well-being, and economic and social prosperity. The CAHS Framework takes a systems approach in its adaptation of the Payback Framework.<sup>18</sup> It also provides a selection of 66 metrics and measures for consideration. The breadth of these measures allows users to select those appropriate to their circumstances.

The Research Impact Framework was designed for use by individual academic researchers to describe possible outcomes or impacts of their research. It identifies four broad areas of impact: research-related, policy, services, and societal. Within each of these areas of impact, the framework also identifies descriptive categories

of potential impact that researchers can use as prompts when assessing the impact of their own research. The RIF is considered most useful for individual researchers as it does not require specialized skills or in-depth analyses in the field of research impact assessment. Initial testing by Kuruvilla et al.<sup>19</sup> showed that researchers were able to use the framework to identify a range of impacts of their research in a systematic manner. Greenhalgh et al.<sup>1</sup> and Raftery et al.<sup>2</sup> describe the RIF as a “light touch” approach and note that is not easily comparable with other approaches as it is less formal.

## 2 | IWH RESEARCH IMPACT MODEL

The impetus to develop a research impact model at the IWH was driven internally when preparing for a 5-year review of its research program. As a part of that review, the Institute decided to write a number of case studies describing known impacts. It became clear that the nature of these impacts varied, and a model was conceived as a way of contextualizing these case studies within a larger framework.

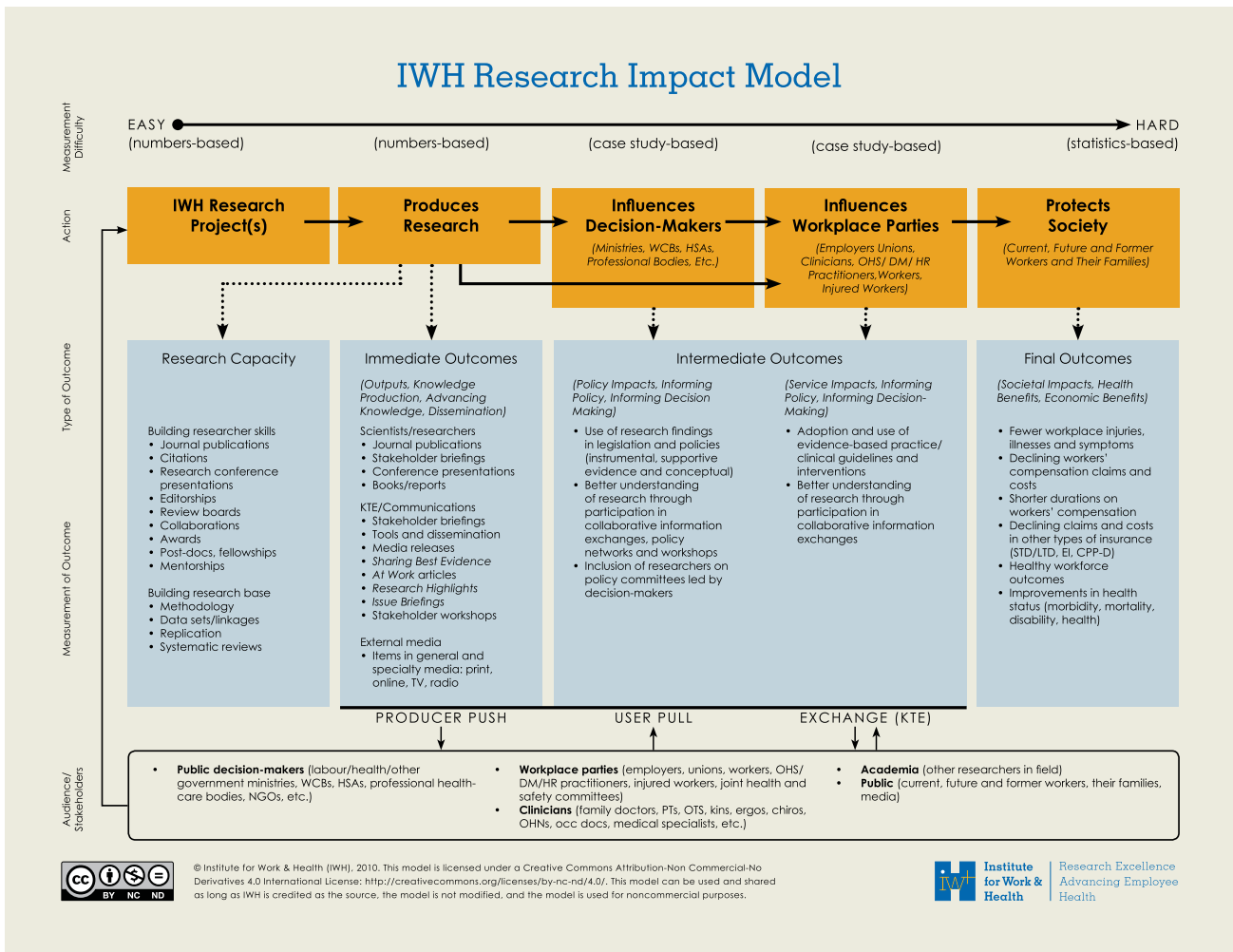
Model development began in 2009 with an environmental scan of available models at that time. The scan included gray literature and peer-reviewed sources describing RIA approaches broadly, with an emphasis on searching for those applicable to work and health research. Sources describing models and approaches related to health research practice and policy<sup>18,19,22–24</sup> guided the IWH-RIM development, as did a report from the US National Academies Committee<sup>25</sup> that included direction for assessing the impact of National Institute for Occupational Safety and Health (NIOSH) research programs. While the Payback Framework<sup>17</sup> was not considered directly, the CAHS adaptation of, and CIHR descriptions of, the Payback Framework were considered.

The resulting IWH-RIM (see Figure 1) has at its core a linear representation of how research may influence OHS/WDP audiences and society as a whole, moving from a research project through to its potential effect on decision-makers and workplace parties and, ultimately, its potential effect on societal outcomes. It is an adapted logic model, describing the activities (actions), outputs and outcomes, with a focus on “how to” determine/assess/evaluate the impact of IWH research. While the IWH-RIM is represented as linear, it should be noted that there are iterative actions and processes throughout the process of “moving” research into practice.<sup>4</sup> However, it would be too difficult and counterproductive to describe this level of complexity in a model meant to be simple and accessible.

### 2.1 | Actions and outcomes

#### 2.1.1 | IWH research project(s)

The IWH-RIM begins with the obvious: that research needs to be conducted before any impact can be realized. This also assumes the presence of the “inputs” that research requires, such as funding, resources, personnel, and so forth.



**FIGURE 1** The Institute for Work and Health Research Impact Model (IWH-RIM) [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

**2.1.2 | Produces research (immediate outcomes)**

Completed IWH projects result in the production of research findings, and the model recognizes that this has two potential immediate effects/impacts. One is the development of research capacity in the OHS/WDP field, by building researcher skills and building the research base. The other is the production and dissemination of knowledge outputs or products from research, such as journal articles, conference presentations, lay research summaries, media releases, media (including social media) mentions, and—very important within the Institute's integrated KTE approach—stakeholder briefings and presentations.

**2.1.3 | Influences decision-makers and influences workplace parties (intermediate outcomes)**

A unique aspect of the IWH-RIM is that it incorporates research use in both policy and practice; that is, the model recognizes that research outputs and stakeholder briefings may influence decision-makers

(aka policy-makers) in OHS/WDP and/or the workplace parties. The decision-makers, such as labor ministries, workers' compensation boards, health and safety associations, professional associations, and others, may incorporate research findings into legislation, policies, programs, and/or recommended practices in a number of ways, and the model points to the instrumental, conceptual, or strategic use of research as outlined by Weiss.<sup>26,27</sup>

The IWH-RIM acknowledges that some decision-makers may act as intermediaries when it comes to the impact of research; that is, their incorporation of research into policies, programs, and recommended practices would only be seen to have a broader impact when the effects of the programs and practices of the workplace parties (i.e., of employers, workers and worker representatives, OHS/WDP and human resources professionals, and clinicians) are considered. It also recognizes that research findings may be taken up directly by workplace parties. Workplace OHS decision-makers and practitioners have indicated the importance of OHS research in their practice.<sup>3,28</sup>

Intermediate outcomes related to practice includes the use of research in government, intermediary, workplace, and practitioner

policies, procedures, and practices. While not outcomes per se, we also inquire about the importance of incorporating research evidence in decision-making and the capacity to do so. There is some evidence that policy-maker capacity matters. For example, Oliver et al.<sup>29</sup> identified policy-maker research skills as a factor in uptake. Also, in our experience, involving stakeholders in the research process has improved uptake in part through improving their understanding of, and respect for, research methods.

### 2.1.4 | Protects society (final outcome)

Finally, the IWH-RIM acknowledges the potential of research, when used by decision-makers and practitioners, to contribute to important societal level outcomes. These “final” or long-term outcomes include fewer work-related injuries and illnesses, improved remain-at-work or stay-at-work outcomes, reductions in government and workplace costs and, ultimately, improvements in the health status of workers.

## 2.2 | Audiences

IWH's approach to KTE is to integrate the engagement of key stakeholders into the research process. This involves regular dialog with representatives of stakeholder organizations to identify information gaps and develop ideas for new research. It also often involves consulting with multistakeholder advisory groups at different stages of the research process and/or working closely with stakeholders as co-investigators on the research team.<sup>4</sup> Integrating stakeholder engagement into the research process is designed both to improve the quality and relevance of research, as well as the uptake of IWH research findings to inform changes in policy or practice. This also facilitates the ability of IWH to monitor research impact.

IWH's KTE approach considers multiple OHS/WDP stakeholder audiences, including public decision-makers, workplace parties (including OHS/WDP practitioners), clinicians, researchers/academia, and the broader public. The IWH-RIM shows the various types of stakeholder audiences and the various ways in which they receive research findings: producer push (e.g., information pushed out by IWH's communications activities), user pull (e.g., stakeholders familiar with the Institute come looking for research evidence when they need it), and exchange (e.g., IWH engages with stakeholders throughout the process of conducting, communicating and disseminating research). The latter captures IWH's approach of engaging with stakeholders throughout the research process to ensure its findings and related messages are relevant and useful to its audiences. The push, pull and exchange approaches apply to all output levels, as indicated by the heavy black line under the immediate and intermediate outcome columns.

The model includes an explicit feedback loop indicated by the arrow on the model looping back from audiences to IWH Research Project(s). As part of this feedback loop, the audience-based KTE

activities, especially the exchange activities, allow for current practices and practitioner needs to feed into IWH research directions and priority setting.

## 2.3 | Difficulty

The IWH-RIM also acknowledges that the level of difficulty in determining impact gets more challenging as one moves from measuring immediate to intermediate to final outcomes. It is relatively easy to measure immediate outcomes, because this is largely a counting exercise (number of journal articles and citations, number of research fellows involved, number of lay summaries produced and presentations given, number of media mentions, number of stakeholder interactions, etc.). These numbers provide a cursory indication of potential research impact, but they are not a measure of impact, per se.

As for intermediate impacts, this is the area where the IWH-RIM points to the important role of case studies; that is, finding and telling stories about the uptake and use of IWH research by policy-makers, intermediaries, and workplace parties (and, in the latter case and if known, the impact of that research on workplace outcomes).

Final impacts are the hardest to measure. They generally demand statistical or economic “proof” of improved society-level outcomes. At this point, issues surrounding attribution (the degree to which a societal impact can be clearly attributed to research) and time lag (the length of time it takes for research findings to get published, noticed, acted upon, and have an effect) are also in play. Clearly, demonstrating attribution is particularly challenging and requires a level of control that researchers typically do not have when studying research use and impact. In addition, it is difficult to account for confounding variables; for example, when the structure of the economy shifts toward sectors in which injury rates are lower. However, the case study approach can be particularly useful as the details provided in the stories help to link the use of research with broader impacts.

## 2.4 | Comparison of the IWH-RIM with commonly used RIA models/frameworks

The IWH-RIM development was influenced by a variety of RIA approaches. Key among them were the RIF<sup>19</sup> and the CAHS adaptation of the Payback Framework.<sup>18,23</sup> Therefore, it is not surprising that the IWH-RIM shares a basic structure with these frameworks as described in a CIHR<sup>23</sup> report (see Table 1). Both the Payback and CAHS Frameworks consider a broad range of health or health-services research and research funders, whereas the IWH-RIM focuses on the research of a specific organization both to guide the process and the evaluation of research impact while linking with an existing KTE approach. The following comparison highlights where the IWH-RIM differs to the others. In particular, those differences that relate to the target audience (OHS/WDP stakeholders), the

**TABLE 1** Comparison of selected RIA frameworks/models

Comparison of elements	IWH-RIM	Payback <sup>17</sup>	CAHS <sup>18</sup>	RIF <sup>19</sup>
Logic model (actions)	A logic model that moves from completion of research to its end use/impact	A logic model incorporating seven stages, from research conceptualization to impact	A logic model indicating where health research impacts can be found (health industry, other industries, government, and public information groups, as well as broad areas of healthcare access, prevention, treatment and determinants of health)	N/A
Impact categories (outcomes)	Four categories: <ul style="list-style-type: none"> <li>- research capacity</li> <li>- immediate (outputs and dissemination)</li> <li>- intermediate (informing policy and practice)</li> <li>- final (societal, health, and economic benefits)</li> </ul>	Five categories (paybacks): <ul style="list-style-type: none"> <li>- knowledge (e.g., academic publication)</li> <li>- benefits to future research</li> <li>- benefits to policy</li> <li>- benefits to health and health systems</li> <li>- broader economic impacts</li> </ul>	Six categories: <ul style="list-style-type: none"> <li>- advancing knowledge</li> <li>- building capacity</li> <li>- informing decision-making</li> <li>- health impacts</li> <li>- economic impacts</li> <li>- societal impacts</li> </ul>	Four categories: <ul style="list-style-type: none"> <li>- research-related impacts</li> <li>- policy and practice-related impacts</li> <li>- service impacts</li> <li>- societal impacts</li> </ul>
Audiences/application	Work and health research users [with a focus on the target audiences: policy makers, OHS practitioners, workplace personnel]	Health services research users	Health research users	Academic research users (university-based)
How applied	Case studies (end-user focus)	Case studies, surveys, interviews, and document analysis	Surveys and case studies (researcher-based)	Case studies (researcher-based)

Abbreviations: CAHS, Canadian Academy of Health Sciences; IWH-RIM, Institute for Work and Health Research Impact Model; RIA, research impact assessment; RIF, Research Impact Framework; OHS, occupational health and safety.

context of a not-for-profit research institute, and the model's integration with the IWH KTE approach<sup>4</sup> are noted.

The IWH-RIM outcome categories and labels were guided by the RIF<sup>19</sup> and adapted to reflect the context of worker and workplace health and safety; therefore, they differ somewhat from those of the Payback and CAHS Frameworks. Unlike the Payback Framework and CAHS adaptation, the IWH-RIM is simplified by aligning outcomes and impacts according to actions/audiences. This is not to suggest that outcomes and impacts are limited to specific actions/audiences, but it does suggest those these actions/audiences are most likely to be affected.

The IWH-RIM does not describe the “knowledge pool” or “global research” explicitly. Rather, the IWH-RIM recognizes that stakeholders of IWH research may have access to broader sources of evidence and may use these sources in their decision-making. Therefore, descriptions of knowledge transfer and exchange elements are included which consider that there are other sources of “knowledge” that can be used in decision-making. The IWH-RIM incorporates the Institute's knowledge transfer approach, which was influenced by Lavis et al.<sup>24</sup> This is seen most clearly in the actions and outcomes related to influencing decision-makers and workplace parties, as well as the KTE concepts of producer push, user pull and exchange (KTE) that are included in the model. While the CAHS approach takes into account the Canadian context, the IWH-RIM further focuses the context to address audiences that are important to worker health and safety (with a particular focus on Ontario, Canada).

The IWH-RIM was developed to help track and describe impacts of IWH research and KTE efforts rather than to conduct a rigorous evaluation of the impact of each research project, which is contemplated in the Payback and CAHS Frameworks, but would be beyond the resources of a smaller research organization such as IWH. While not explicitly noted in the model, the easy, immediate, count-based outcomes (quarterly reports tracking media mentions, subscribers, social media, website, as well as annual reports tracking articles published, and number of stakeholder meetings) are tracked. The IWH-RIM also guides the way the Institute categorizes case studies according to the level of impact.

## 2.5 | Case study methods

IWH uses case studies to tell the story of immediate to final research impact outcomes, although the majority tell the story of intermediate outcomes: how research informed the activities/decision-making of particular policy-makers, workplaces, and other stakeholders. Case studies are a method used in many RIA approaches described in the literature.<sup>1,2,13,14</sup> IWH considers three types of case studies.

### 2.5.1 | Type 1 case studies: Evidence of the diffusion of research

These case studies report on the degree to which IWH research is noticed and referred to by external OHS/WDP stakeholders in their own deliberations and information vehicles.

### 2.5.2 | Type 2 case studies: Evidence of research informing decision-making

These case studies tell the story of IWH research being acted upon by external stakeholders in developing and changing legislation, policies, directives, and programs that have an impact (often through intermediaries) on workplaces, as well as the degree to which evidence-based practices suggested by IWH research are taken up directly by workplaces or clinicians.

### 2.5.3 | Type 3 case studies: Evidence of societal impact

These case studies report on the contributions of IWH research to improvements at the societal level, including changes in: work injury and illness rates; workers' compensation and other insurance claims rates, durations, and costs; healthy workforce outcomes; and population health status.

IWH's case study types reflect the categories of impacts described by Kuruvilla et al.<sup>19</sup> and the CAHS<sup>18</sup> Frameworks. They are focused on effects beyond research outputs by considering how stakeholders access (or learn about) research, how research is used in decision-making, and if there is evidence of societal impacts. While the different types of case studies typically capture impacts at different outcome levels (immediate through to final), IWH does not formally evaluate the sequential nature of impacts; that is, it may be possible to discover societal level impacts without documenting intermediate impacts. This would only occur if intermediate impacts were not discovered before learning about societal impacts, in which case we would not create a Type 2 case study.

The identification of potential impacts of IWH research is a responsibility shared by the scientific and KTE/communications staff at the Institute. The Institute uses both forward- and backward-looking methods to identify potential examples of impact. For example, when stakeholders in decision-making roles are part of a research project's advisory committee, they may incorporate findings into their programming as they become aware of them. This forward-looking approach (from the project to impact) is easily identified by the scientists and KTE staff on the project team because of established relationships. The IWH-RIM also considers how intermediaries can influence impact. For example, a stakeholder might contact a scientist to learn more about his or her research and, in the course of their exchange, the scientist learns that the stakeholder is planning to use the research in an upcoming policy or program initiative. Sometimes, the Institute becomes aware of a change in OHS/WDP regulation or policy that accords with IWH research findings. Taking a backward-looking approach (from outcome to project), the Institute will call the decision-maker to learn more about the sources used in developing the regulation or policy.

Most often, case studies are told from the research user's point of view, not from the Institute's point of view. To do this, the writer (usually KTE/communications staff) interviews the knowledge user,

asking how they learned of the research, how and why they used it (i.e., what problem or issue were they addressing), and what impact, if any, the use of the research (or the program or practice into which it was incorporated) has had at the time of the interview. In most cases, the researcher's point of view is not gathered or reported. This reduces some of the potential bias noted by others who have examined the case study approach.<sup>1,2,13</sup> Written case studies are reviewed by the director of communications and the president before they are published or posted.

To date, 42 case studies have been written and posted on the IWH website (<https://www.iwh.on.ca/research-impact>). IWH case studies focus on success stories; that is, there is some indication that IWH research has had an impact. While IWH has learned from cases where its research has had little impact, these are not documented in its case-study series. However, these less successful cases are used to strengthen the KTE approach, with the intent of improving research impact.

The majority of IWH case studies fall into the category of "Type 2" category—evidence of research informing the decision-making of policy-makers and workplace parties (e.g., occupational health, safety and disability management professions). There are fewer "Type 1" case studies—evidence of diffusion—because diffusion of IWH research is common, and diffusion is the farthest removed from real impact. There are also far fewer "Type 3" case studies—evidence of societal impact—because, as the model indicates, they are much harder to identify and quantify and, as mentioned earlier, issues surrounding attribution and time lag are also in play.<sup>1,14,30</sup> We also note that for Type 3 case studies, IWH relies mainly on stakeholders for the data that would substantiate this level of impact. It is typically those who have made changes to policy or practice in light of research who are in the best position to collect such data.

### 3 | DISCUSSION/CONCLUSION

In this article, the components of the IWH-RIM are described and compared with other commonly used RIA models described in the literature. The IWH-RIM was developed at a time when few other models were available, particularly in the area of work and health. The impetus for developing the IWH-RIM was to provide context for types of impact case studies being written as part of a review of the IWH research program, within the context of an integrated KTE approach at IWH.

Since the time of development, the IWH-RIM has been used to guide 42 case studies describing the impact of IWH research. Also, since its development, the attention paid to RIA has increased substantially, allowing for comparisons with the most commonly used models and approaches described in the literature. IWH did not look to reinvent the wheel and developed the model based on those already available, adapting them to its size (a single, mid-sized research organization), its geographic context (Canadian) and its subject-matter focus (OHS/WDP).

Reflecting back on 10 years of using the IWH-RIM, it has served IWH well. The model allows IWH to describe its research impact and consider this impact in strengthening both its research and KTE practices. IWH has faced challenges in tracking and describing its

research impact, as many others have described.<sup>1,2,14,15,20</sup> In addition, the IWH-RIM is public and transparent and therefore it is available for comparison with how other organizations assess research impact.

RIA approaches for work and health research are rare. Recently, Downes et al.<sup>31</sup> presented an RIA approach from the National Institute for Occupational Safety and Health (NIOSH). NIOSH conducts occupational safety and health research in the United States and strives to transfer that knowledge into practice. NIOSH is part of the Centers for Disease Control and Prevention (CDC), an operating division of the US Department of Health and Human Services. NIOSH has been engaged in evaluations of its research program through peer review,<sup>32</sup> but it appears it is now adopting a more comprehensive RIA approach that incorporates contribution analysis (CA).<sup>33,34</sup> CA, while not technically RIA, can be adapted to formally evaluate research impact. CA uses logic models and theory of change to provide a structured approach to evaluating the plausible association between research and impacts. IWH awaits the outcomes of the NIOSH RIA and the opportunity to make comparisons with the NIOSH approach to improve IWH practices and, ultimately, its research impact.

Future steps: This article describes and documents the current IWH-RIM. Future steps will consider potential updates to the logic model, as well as the categories and labels used. This process began over the past year, and work continues on exploring potential improvements to the model. In doing so, the (ISRIA) statement<sup>15</sup> will be considered to improve on the identification and reporting of its case studies—a core part of IWH's research impact activities.

IWH is building up a small database of case studies, and it may be useful to analyze them further. Morrow<sup>35</sup> completed an evaluation of the Research Excellence Framework case studies collected in the UK. They found that the case studies were useful in determining trends in research impact. They also suggested an evaluation method that could be explored and adapted for use when sufficient case studies are available.

The IWH-RIM has been useful in guiding a mid-sized research organization's process for tracking and describing the impact of its research. By describing and sharing the IWH approach more broadly, the IWH-RIM may be of potential use to other small and mid-sized research organizations similar to IWH. The approach is practical, logical and easy to use. It is adaptable to multiple contexts, but also works particularly well in the context of an integrated approach to knowledge transfer and exchange (where stakeholders are involved in multiple stages of the research process). The IWH approach to assessing research impact builds on the solid work of other models, allowing for comparability.

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## CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

## DISCLOSURE BY AJIM EDITOR OF RECORD

John Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

## AUTHOR CONTRIBUTIONS

Dwayne Van Eerd conceived of the idea for the manuscript and Cindy Moser developed the model described. All authors considered and interpreted the data to describe the model, participated in drafting and revising the paper, approved the final version, and agree to be accountable for all aspects of the work.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

## ETHICS APPROVAL AND INFORMED CONSENT

There was no requirement for institution and ethics approval as the paper does not report on primary data.

## ORCID

Dwayne Van Eerd  <http://orcid.org/0000-0002-5672-0168>

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