Virtual Best Brains Exchange
SUMMARY REPORT
**Identifying and Addressing Research Gaps in Breast Cancer Screening:
Working towards Improved Breast Health for Canadians**
June 2021

On June 23, 2021, the Canadian Institutes of Health Research (CIHR) hosted a virtual Best Brains Exchange (BBE) in partnership with the Public Health Agency of Canada (PHAC). The objective of the event was to support the development of a pan-Canadian research agenda to address gaps related to breast cancer screening research and innovation. The discussion included perspectives from researchers, implementation experts, policy makers, health research funders and other key stakeholders.

Priority research themes highlighted through the discussion included **equity and access; prevention; technology; and risk criteria, prioritization, and communication**. Research methodologies to address gaps in knowledge included **knowledge translation, health systems research, behavioral research, qualitative research,** and **randomized controlled trials**. Finally, the report concluded that research should be **patient-centered**, **holistic**, and include **diverse perspectives.**

Extracted from a full BBE report, below is a summary of the key themes and gaps identified during the event.

RESEARCH THEMES

The following key areas of research were identified by participants.

1. **Equity and access:**
   o Understanding how to reach the 15% who are unscreened, including ethno-minority groups, and understanding their profiles better (including using qualitative research)
   o Risk-based approaches and corresponding interventions must consider intersectionality
   o Inequities in screening by jurisdiction

2. **Prevention:**
   o Research on how to improve prevention, the dollar impact on prevention, how many lives saved, and on quality-adjusted life years (QALYs)

3. **Technology:**
   o Which potential technologies should be moved forward
   o When should developers of new technologies partner with people who understand implementation factors and cost factors to introduce hybrid effectiveness/implementation trials (as it is important this is not too early but also not too delayed)
   o Using interval cancer rates and node status of cancer to evaluate newer technologies (rather than evaluating mortality)

- How good the **surrogate endpoints** are in correlating with ultimate endpoints (e.g. mortality reduction and total count of QALY adjusting for lead bias)
- Multimodal time-course data integration through opportunities with machine learning
- Molecular analyzers and other analytic methods with imaging can be used to learn collectively, using comparative data, to predict risk

4. **Risk/harm comparison:**
   - Better data on comparing benefits and harms associated with screening, including utility

5. **Age for screening:**
   - Studies on whether screening those aged 40-49 in the general population is effective
   - Evidence for screening those in their 40s and for those with dense breasts

6. **Use of risk factors for screening:**
   - Clearly defining the use of risk factors for guiding screening based on evidence
   - Ethics-based decisions on setting thresholds
   - Need more risk predictive tools for sub-types of breast cancer and for populations of non-European ancestry
   - Assess clinical utility of risk assessment tools in the context and the population where it will be used
   - Risk stratification

7. **Overdiagnosis:**
   - Research on overdiagnosis, especially regarding fist screen versus subsequent screenings
   - Lack of evidence that MRI is resulting in overdiagnosis

8. **Evaluation of Centres of Excellences** in other countries, including assessment of patients who do not have family physicians

9. Studies on **attitudes among healthcare providers** and the influence on treatment delay

10. Research on **improved techniques in the pathology lab** to better characterize biopsy samples and surgical tissue prior to treatment

11. Research for **therapies for prolonging life/high quality of life** for those already living with metastatic cancer

12. **Risk communication research:**
    - To understand how best to communicate risk, including for women who are low risk (for decreased interventions)
    - Messaging on benefits and harms of screening and uptake amongst different groups

13. **Impact of prioritization of screening during COVID,** including patients' perspective and predictors of behaviors

KNOWLEDGE TRANSLATION RESEARCH

- Research on understanding complex factors in decision-making (e.g., why decision aids are not used more often in clinical practice)

- Ensuring good evidence provided to patients and health care providers; how to break barriers to ensure factual information is discussed; ensuring clear communication; understanding what qualitative and quantitative data speaks to the patients to help with decisions

- It was noted that the primary care question is important, and physicians have a lot of information and activities to handle

- How to apply modalities in practice so that benefits are maximized, risk is minimized, and costs are ideal

RESEARCH METHODS

Various types of research and methods to answer specific research gaps were mentioned, including:

- **Qualitative research** to help understand what research gaps need to be filled, to understand women's decision making on screening and risk (e.g. who is influential)

- **More RCTs** using recent data as previous RCTs are out-of-date, and only RCTs can be used to answer certain questions
  - Others argue that RCTs are not the best approach for 2021, given complexity, ethical implications, contracts, cost, time, recruitment issues and sample size concerns
  - Identifying the outcome of interest is important – for RCTs, evidence (efficacy) does not always translate well to the real world (effectiveness). It would be useful to agree on what the criteria are for efficacy, and morbidity of treatment may be considered
  - Looking at overall survival beyond the 5 years typically reported in research studies

- **Hybrid implementation trials** could be used to collect data on communication, screening, diagnosis, compliance, and longer-term outcomes

- **Observational studies**

- **Behavioural research** to understand implications of testing and psychosocial factors (e.g., interpretation of polygenic risk scores, lifetime risk, and what women will do with this information)

- **Health systems research** on health services implications for high-risk screening including new models of care (e.g., who will deliver this information to patients about risk)
  - A framework needs to be created for a learning healthcare system that integrates research and clinical practice

- **Economic research** to look at economic aspects (e.g., see the work of CISNET), including cost savings of prevention

- **Modelling** has helped decision-makers react and make quick decisions to implement actions
  - Modelling could be used to understand capacity needed for implementation (e.g., what level of MRI resources are needed)
  - Modelling could also be used for screening intervals (USPSTF uses this for some guidelines)
  - Understanding how modelling can be used in an evidence-based evaluation
- **Natural experiments** from provincial/territorial screening programs and registries (e.g., screening data, how has stage of cancer shifted in provinces that have been welcoming women in their 40s versus those jurisdictions that are much more restrictive). An example was using the Specialized Program of Research Excellence (SPORE) networks that are already in place with robust networks to look at screening strategies.

PRINCIPLES FOR RESEARCH

Several recommended principles for research were also raised throughout discussions:

- Ensure research is **patient centered**
- **Involve policymakers** in research
- Ensure **Indigenous perspectives** as a voice at the research table, and collaborate with Indigenous communities on research
- **Research should be holistic**, including combining upstream factors and not only one screening modality. Ensure research is not too fragmented

LEADERSHIP ROLES FOR CIHR

Participants noted areas for leadership role for funders like CIHR:

- **Levels of evidence:** An individual suggested that with policymakers and the Cochrane group, CIHR may lead on a process to agree on the use of varying types of evidence and potential surrogate outcomes, similar to GRADE
- **Learning healthcare system:** It was also suggested that CIHR could be a leader on introducing the concept of a learning healthcare system, and work with key stakeholders to facilitate ethics approvals and contracts between institutions