### Appendix Table 1. Statements by Cluster

#### Cluster 1: Communicate research findings
- Graphic depiction of research results
- Write findings/conclusions for a variety of journals
- How to disseminate beyond academia
- Present useful nuggets of implications, not just statistical findings
- Social media, social networking
- Appropriate, tailored communication for targeted audiences with an understanding of their different perspectives
- Summarize study findings into compelling story ideas tailored for practice and policy makers
- Write in short, simple language, without jargon, for the lay person
- Present useful nuggets of implications, not just statistical findings
- Media relations
- Press releases
- Articulate how findings apply to real world settings to benefit all users
- Present research results in a simple and intuitively understandable way
- Marketing and sales

#### Cluster 2: Improve practice partnerships
- Potential negative consequences of policy and practice decisions
- Improved understanding of priorities and motivations of stakeholders (policy makers and practitioners)
- Systematic assessment of local stakeholder needs
- Training community stakeholders in feasible, relevant skills to identify needs, select and adopt evidence based practices, adapt, and implement
- Building lasting partnerships through work that benefits all partners, so they continue to engage
- Understand the impact that the research has on specific communities
- Respect for the realities of community providers and usual care settings
- Develop long-term and engaged relationships with policy makers, before seeking assistance with research funding
- Public-private partnerships
- The legal concerns of people in these settings
- The nature and process of policy making and the political system
- How to quickly and smoothly deal with turn-over in practice and policy settings
- Community empowerment
- Identify support for and opposition to implementation by key stakeholders
- Engaging stakeholders at all levels/contexts to ensure full implementation
- Develop effective relationships and partnerships with community partners, practitioners, and policy makers

#### Cluster 3: Make research more relevant
- Ensuring the emphasis of research will be of value to practitioners and policy makers, not just an interesting research question
- Better identification of questions whose answers are likely to change practice and policy
• Health literacy of different populations
• Engagement and collaboration skills
• Focus on helping find plausible solutions
• Involve practitioners in research question development
• Understand and work skillfully with power dynamics in organizations
• Participatory research that engages stakeholders in all phases of design to produce useful products

Cluster 4: Strengthen communication skills
• Provide tools to translate research into action
• Talk to the exact policy issue at hand
• Strong communication skills, empathy, and perspective taking skills
• Active listening skills

Cluster 5: Consider and enhance fit
• Build flexibility into the guidance of evidence-based programs and interventions to allow for accommodation of specific populations and settings
• How to plan for sustainability early in the process and achieve sustainability and institutionalizations of evidence based initiatives
• Adapt an evidence-based program to cultural or the SES needs of priority populations
• Aligning incentives for implementation with administrative objectives
• How to access best practices with real world examples for implementing the intervention
• Affecting organizational culture and behavior change
• Learning strategies to increase readiness of practitioners and organizational leaders
• The determinants of sustainment and how those differ from determinants of other D&I concepts (e.g., adoption, implementation)
• Select implementation strategies based on characteristics of the setting and innovation
• Incorporating strategies to obtain reimbursement for programs as part of the research evidence

Cluster 6: Develop research methods and measures
• Purposive sampling for qualitative research
• Training in qualitative research methods and data analysis
• Mixed methods training - better integration of qualitative and quantitative
• The conduct of intervention research in community settings
• Research methods for investigating discontinuation (are they different than examining sustainment?)
• Understand the gaps in the current literature
• Develop studies that tease out the effects of strategies instead of just programs to increase the feasibility of implementation
• Using large datasets
• Data collection in real practice settings
• Diffusion of innovation and related theories
• Develop more methods to accommodate real-life practice and policy
• Apply intervention design and evaluation frameworks
• Develop pragmatic measures
• Measurement of impact
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- Methods that account for multi-level and dynamic behavior (e.g., systems science methods)
- Study designs (e.g., adaptive designs and methods, clinical trial methodologies, simulation modeling)
- Conceptualizing good D&I research questions
- Improve generalizability without sacrificing validity
- Designing practice-based research for a practice-based research network
- Impact of reliability and validity on use of research findings in practice
- Develop measures with strong psychometric properties

Cluster 7: Build capacity for research
- How to use data to effectively address ideology
- Obtain external competitive funding for the research
- How to apply cost-effectiveness and cost benefit analyses so that they can communicate effectively the importance of the research in a practical/relevant way to policy makers
- How to select indicators for progress improvement and how to report these data in a way that is meaningful to others

Cluster 8: Ensure research is meaningful
- Engage trainees and students in the idea that research should be relevant and useful from the beginning of their training
- Whom to target when trying to assess implementation status
- Academic-community partnership models and participatory research designs
- Understand how to compare and prioritize options
- Building and managing interdisciplinary research teams to partner across disciplines and perspectives
- Understand (and mitigate) the harms arising from the misuse of the research evidence
- How to apply return on investment frameworks to social, public health programs and services

Cluster 9: Understand multi-level context
- Briefly assess the extent to which an intervention is being implemented
- Balance between fit and fidelity and tracking fidelity along the way
- Predictors and determinants of implementation effectiveness at multiple levels, including the individual, group, organization, and system
- Continuous quality improvement cycles
- Systematic approaches to adapting interventions
- Understand individual behavioral determinants in relation to the influence of contextual factors
- Individual behavior change
- How to briefly assess barriers to implementation

D&I, dissemination and implementation
## Appendix Table 2. Mapping of Existing Mentored Training for Dissemination and Implementation Research in Cancer (MT-DIRC) Competencies Onto Each Cluster

<table>
<thead>
<tr>
<th>Competency number</th>
<th>Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cluster 1. Communicate research findings</strong></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Define and communicate D&amp;I research terminology</td>
</tr>
<tr>
<td><strong>Cluster 2. Improve practice partnerships</strong></td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>Describe the importance of incorporating the perspectives of different stakeholder groups (e.g., patient/family; employers, payers, healthcare settings, public organizations, community and policy makers).</td>
</tr>
<tr>
<td>D4</td>
<td>Determine when engagement in participatory research is appropriate with D&amp;I research.</td>
</tr>
<tr>
<td>D6</td>
<td>Identify and apply techniques for stakeholder analysis and engagement when implementing evidence-based practices.</td>
</tr>
<tr>
<td>D9</td>
<td>Identify sites to participate in D&amp;I studies and negotiate or provide incentives to secure their involvement.</td>
</tr>
<tr>
<td>D10</td>
<td>Identify and develop sustainable partnerships for D&amp;I research.</td>
</tr>
<tr>
<td>D11</td>
<td>Describe how to measure successful partnerships for D&amp;I research.</td>
</tr>
<tr>
<td><strong>Cluster 3. Make research more relevant</strong></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>Identify the potential impact of disseminating, implementing, and sustaining effective interventions.</td>
</tr>
<tr>
<td>A8</td>
<td>Identify existing gaps in D&amp;I research.</td>
</tr>
<tr>
<td>A9</td>
<td>Identify the potential impact of scaling down (i.e., de-implementing) an ineffective but often used intervention.</td>
</tr>
<tr>
<td>B4</td>
<td>Describe a process for designing for dissemination (planning for adoption, implementation and sustainability during the intervention development stage).</td>
</tr>
<tr>
<td><strong>Cluster 4. Strengthen communication skills</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster 5. Consider and enhance fit</strong></td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td>Determine which evidence-based interventions are worth disseminating and implementing.</td>
</tr>
<tr>
<td>B3</td>
<td>Identify core elements (effective ingredients) of effective interventions and recognize risks of making modifications to these.</td>
</tr>
<tr>
<td>B5</td>
<td>Describe the relationships between various organizational dimensions (e.g., climate, culture) and D&amp;I research.</td>
</tr>
<tr>
<td>C11</td>
<td>Effectively integrate the concepts of sustainability/sustainment and the rationale behind them in D&amp;I study design</td>
</tr>
<tr>
<td>D7</td>
<td>Identify a process for adapting an intervention and how the process is relevant to D&amp;I research.</td>
</tr>
<tr>
<td>D12</td>
<td>Use evidence to evaluate and adapt D&amp;I strategies for specific populations, settings, contexts, resources, and/or capacities.</td>
</tr>
<tr>
<td><strong>Cluster 6. Develop research methods and measures</strong></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Differentiate between D&amp;I research and other related areas, such as efficacy research and effectiveness research.</td>
</tr>
<tr>
<td>B1</td>
<td>Describe a range of D&amp;I strategies, models, and frameworks.</td>
</tr>
<tr>
<td>B2</td>
<td>Identify appropriate conceptual models, frameworks, or program logic for D&amp;I change.</td>
</tr>
</tbody>
</table>
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C1 Describe the core components of external validity and their relevance to D&I research.
C2 Identify common D&I measures and analytic strategies relevant for your research question(s).
C3 Describe gaps in D&I measurement and critically evaluate how to fill them.
C5 Describe the application and integration of mixed-methods (quantitative and qualitative) approaches in D&I research.
C6 Apply common D&I measures and analytic strategies relevant for your research question(s) within your model/framework.
C7 Identify possible methods to address external validity in study design reporting and implementation.
C9 Identify and articulate the trade-offs between a variety of different study designs for D&I research.
C12 Effectively explain and incorporate concepts of de-adoption and de-implementation into D&I study design.
D2 Describe the concept and measurement of fidelity.
D3 Articulate the strengths and weaknesses of participatory research in D&I research.

Cluster 7. Build capacity for research
B6 Explain how knowledge from disciplines outside of health (e.g., business, marketing, and engineering) can help inform further trans-disciplinary efforts in D&I research.
C13 Incorporate methods of economic evaluation (e.g., implementation costs, cost-effectiveness) in D&I study design.

Cluster 8. Ensure research is meaningful
A5 Describe the range of expertise needed to conduct D&I research (e.g., mixed method experience, economic, organizational, policy, clinical).
C4 Identify and measure outcomes that matter to stakeholders, adopters, and implementers.

Cluster 9. Understand multi-level context
A7 Assess, describe, and quantify (where possible) the context for effective D&I (setting characteristics, culture, capacity, and readiness).
B7 Identify and articulate the interplay between policy and organizational processes in D&I.
C8 List the potential roles of mediators and moderators in a D&I study.
C10 Describe how to frame and analyze the context of D&I as a complex system with interacting parts.
D5 Describe the appropriate process for eliciting input from community-based practitioners for adapting an intervention.
D8 Explain how to maintain fidelity of original interventions during the adaption process.

Competencies not mapping onto a cluster
A2 Define what is and what is not D&I research.
A10 Formulate methods to address barriers of D&I research.
C14 Evaluate and refine innovative scale-up and spread methods (e.g., technical assistance, interactive systems, novel incentives and ‘pull’ strategies).

D&I, dissemination and implementation
Appendix Figure 1. Go-zones categorize statements such based on importance and difficulty simultaneously, such that statements in the green zone ranked high for importance and low for difficulty and those in the white zone ranked high for difficulty and low for importance. The statements corresponding to each number are listed in the table below.

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Graphic depiction of research results</td>
</tr>
<tr>
<td>2</td>
<td>Purposive sampling for qualitative research</td>
</tr>
<tr>
<td>3</td>
<td>Potential negative consequences of policy and practice decisions</td>
</tr>
<tr>
<td>4</td>
<td>Build flexibility into the guidance of evidence-based programs and interventions to allow for</td>
</tr>
<tr>
<td></td>
<td>accommodation of specific populations and settings</td>
</tr>
<tr>
<td>5</td>
<td>Improved understanding of priorities and motivations of stakeholders (policy makers and practitioners)</td>
</tr>
<tr>
<td>6</td>
<td>Write findings/conclusions for a variety of journals</td>
</tr>
<tr>
<td>7</td>
<td>How to use data to effectively address ideology</td>
</tr>
<tr>
<td>8</td>
<td>Ensuring the emphasis of research will be of value to practitioners and policy makers, not just an</td>
</tr>
<tr>
<td></td>
<td>interesting research question</td>
</tr>
<tr>
<td>9</td>
<td>Training in qualitative research methods and data analysis</td>
</tr>
<tr>
<td>10</td>
<td>How to plan for sustainability early in the process and achieve sustainability and institutionalizations of evidence based initiatives</td>
</tr>
<tr>
<td>11</td>
<td>Systematic assessment of local stakeholder needs</td>
</tr>
<tr>
<td>12</td>
<td>Adapt an evidence-based program to cultural or the SES needs of priority populations</td>
</tr>
<tr>
<td>13</td>
<td>Better identification of questions whose answers are likely to change practice and policy</td>
</tr>
<tr>
<td>14</td>
<td>How to disseminate beyond academia</td>
</tr>
<tr>
<td>15</td>
<td>Mixed methods training - better integration of qualitative and quantitative</td>
</tr>
</tbody>
</table>
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16 Aligning incentives for implementation with administrative objectives
17 Provide tools to translate research into action
18 How to access best practices with real world examples for implementing the intervention
19 Present useful nuggets of implications, not just statistical findings
20 The conduct of intervention research in community settings
21 Social media, social networking
22 Appropriate, tailored communication for targeted audiences with an understanding of their different perspectives
23 Research methods for investigating discontinuation (are they different than examining sustainment?)
24 Summarize study findings into compelling story ideas tailored for practice and policy makers
25 Talk to the exact policy issue at hand
26 Training community stakeholders in feasible, relevant skills to identify needs, select and adopt evidence based practices, adapt, and implement
27 Briefly assess the extent to which an intervention is being implemented
28 Building lasting partnerships through work that benefits all partners, so they continue to engage
29 Write in short, simple language, without jargon, for the lay person
30 Understand the impact that the research has on specific communities
31 Respect for the realities of community providers and usual care settings
32 Understand the gaps in the current literature
33 Engage trainees and students in the idea that research should be relevant and useful from the beginning of their training
34 Develop studies that tease out the effects of strategies instead of just programs to increase the feasibility of implementation
35 Health literacy of different populations
36 Develop long-term and engaged relationships with policy makers, before seeking assistance with research funding
37 Public-private partnerships
38 Using large datasets
39 Affecting organizational culture and behavior change
40 The legal concerns of people in these settings
41 Data collection in real practice settings
42 Learning strategies to increase readiness of practitioners and organizational leaders
43 Publish work in lay venues or practice focused venues in addition to research journals
44 Being able to translate the findings from research into practical, implementable actions
45 Engagement and collaboration skills
46 Whom to target when trying to assess implementation status
47 Media relations
48 Academic-community partnership models and participatory research designs
49 Diffusion of innovation and related theories
50 Balance between fit and fidelity and tracking fidelity along the way
51 Press releases
52 Articulate how findings apply to real world settings to benefit all users
53 Strong communication skills, empathy, and perspective taking skills
54 Focus on helping find plausible solutions
Predictors and determinants of implementation effectiveness at multiple levels, including the individual, group, organization, and system

Involving practitioners in research question development

Continuous quality improvement cycles

Understanding how to compare and prioritize options

Developing more methods to accommodate real-life practice and policy

Understanding and working skillfully with power dynamics in organizations

Applying intervention design and evaluation frameworks

The nature and process of policy making and the political system

The determinants of sustainment and how they differ from determinants of other D&I concepts (e.g., adoption, implementation)

Developing pragmatic measures

Measurement of impact

Building and managing interdisciplinary research teams to partner across disciplines and perspectives

Methods that account for multi-level and dynamic behavior (e.g., systems science methods)

Study designs (e.g., adaptive designs and methods, clinical trial methodologies, simulation modeling)

Conceptualizing good D&I research questions

Obtaining external competitive funding for the research

Systematic approaches to adapting interventions

How to apply cost-effectiveness and cost-benefit analyses so that they communicate effectively the importance of the research in a practical/relevant way to policymakers

How to quickly and smoothly deal with turnover in practice and policy settings

Selecting implementation strategies based on characteristics of the setting and innovation

Understanding (and mitigating) the harms arising from the misuse of the research evidence

Improving generalizability without sacrificing validity

How to apply return on investment frameworks to social, public health programs, and services

Presenting research results in a simple and intuitively understandable way

Community empowerment

Identifying support for and opposition to implementation by key stakeholders

Understanding individual behavioral determinants in relation to the influence of contextual factors

Participatory research that engages stakeholders in all phases of design to produce useful products

Individual behavior change

Incorporating strategies to obtain reimbursement for programs as part of the research evidence

How to select indicators for progress improvement and how to report these data in a way that is meaningful to others

Active listening skills

How to briefly assess barriers to implementation

Marketing and sales

Designing practice-based research for a practice-based research network

Impact of reliability and validity on use of research findings in practice

Engaging stakeholders at all levels/contexts to ensure full implementation
92 Develop effective relationships and partnerships with community partners, practitioners, and policy makers
93 Develop measures with strong psychometric properties

D&I, dissemination and implementation