DISSEMINATION AND IMPLEMENTATION (D&I) SCIENCE:

Russell E. Glasgow, Ph.D. Deputy Director, Dissemination and Implementation Science Designing for Dissemination Team DCCPS, NCI
OVERVIEW

• Current Situation (Gap Research—Practice)

• What Do We Know about D&I (or Think We Know)?

• Future Directions and Discussion
WHO IS THIS GLASGOW GUY?

- Behavioral scientist; public health research
- Former lives: smoking cessation, interactive technology work, disease self-management, health behavior change, primary care-based interventions
- Most recent life: senior scientist, Institute for Health Research, Kaiser Permanente – Colorado, member CRN and CRN CECCR
- Translation, D&I research: RE-AIM model
Where am I? You're 30 yards above the ground in a balloon.

Yes, how did you know?

Because what you told me is absolutely correct but completely useless.

Yes. How did you know?

You must be a researcher.

Yes, how did you know?

Because what you told me is absolutely correct but completely useless.

You must be a policy maker.

Yes. How did you know where you are, you don’t know where you’re going, and now you’re blaming me.

The problem...
CURRENT SITUATION IN UNITED STATES

- Underperforming health care system (McGlynn)
- Expensive, unsustainable cost, increasing
- Balkanized and silo approaches
- Inequitable: Health disparities
- CRISIS and OPPORTUNITY

WHAT DO WE KNOW? WHAT ARE WE LEARNING?

• Terminology in United States:
  - Implementation research: The scientific study of methods to promote the systematic uptake of clinical research findings and other evidence-based practices into routine practice and hence to improve the quality and effectiveness of health care.
  - Diffusion: The passive or “naturalistic” spread of innovation across settings and time.
  - Dissemination: The active process through which information needs (pull) of target groups working in specific contexts (capacity) are accessed; information is tailored to increase awareness, acceptance and use of lessons learned from science. (Kerner 2007)
  - Dissemination research: The study of processes and variables that determine and/or influence the adoption of knowledge, interventions, or practices by various stakeholders. (Lomas)
Bridging the Gap: A Synergistic Model
Getting Evidence Based Cancer Control Interventions into Practice

GOAL: To increase the adoption, reach and impact of evidence-based cancer control

Science Push
Documenting, improving, and communicating the intervention for wide population use

Delivery Capacity
Building the capacity of relevant systems to deliver the intervention

Market Pull/Demand
Building a market and demand for the intervention

Increase the number of systems providing evidence-based cancer control
Increase the number of practitioners providing evidence-based cancer control
Increase the number of individuals receiving evidence-based cancer control

ULTIMATE GOAL:
Improve population health and well being

Tracy Orleans (RWJF) – Designing for Dissemination Conference Presentation, 9/02
What Are We Learning?

• Multi-level, Embedded issues
• Practical and Pragmatic Trials
• PRECIS and CONSORT reporting
• Complexity
• Design Issues in T3 and T4 Research
• RE-AIM Perspective
• Current and Future "Hot Areas" and Opportunities

Glasgow, R; Emmons, K. *Am Rev Pub Health*; 2007, 28:413-33
INTEGRATED DYNAMIC, MULTI-LEVEL RESEARCH-PRACTICE PARTNERSHIPS SYSTEMS APPROACH

Evidence-Tested Program
  Program as Tested
    Critical Elements

Fit

Design Appropriate for Question

Broader Health Policy and Cultural Context
Research Design Team And Adaptive Design

Partnership

Health Care System
  Clinic(s)
    Program Delivery Staff
      Delivery Site(s)
        Organization

PRACTICAL (PRAGMATIC) TRIALS: KEY CHARACTERISTICS

• Multiple, heterogeneous settings
• Representative populations
• Comparison conditions are real-world alternatives
• Multiple outcomes important to decision and policy makers

Tunis SR et al. Practical clinical trials...JAMA 2003;290:1624-1632
Glasgow RE et al. Practical clinical trials...Med Care 2005;43(^):551-557
Thorpe et al. A pragmatic-explanatory continuum indicator summary (PRECIS) ...CMAJ 2009; 180(10):E47-357
Something Different is Needed!
IMPLEMENTATION AND DISSEMINATION RESEARCH CHARACTERISTICS (MY VIEW)

- Contextual
- Complex
- Multi-component programs and policies
- Non-linear
- Transdisciplinary
- Multi-level
## Key Pragmatic and Translation Content Issues in Need of Study by Research Design, Intervention and Evaluation Issues

<table>
<thead>
<tr>
<th>Research Issue</th>
<th>Practical and Feasible Interventions</th>
<th>Key Contextual Factors</th>
<th>Transparent Reporting</th>
<th>Design Fits Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental Design</strong></td>
<td>• Addresses issues relevant to decision makers</td>
<td>• Heterogeneous or typical settings</td>
<td>• Reports</td>
<td>• Fits specific question</td>
</tr>
<tr>
<td></td>
<td>• Representative settings and participants</td>
<td>• Study of moderating factors</td>
<td>• Modification and adaptation to recruitment and design</td>
<td>• Dynamic</td>
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<tr>
<td></td>
<td>• Includes complex patients and realistic comparison treatment(s)</td>
<td>• Includes qualitative features</td>
<td>• across sites</td>
<td>• Adaptive</td>
</tr>
<tr>
<td><strong>Intervention Characteristics</strong></td>
<td>• Designed for broad adoption and implementation</td>
<td>• Flexible</td>
<td>• local customization.</td>
<td>• Rapid and efficient</td>
</tr>
<tr>
<td></td>
<td>• Efficient</td>
<td>• Provides guidelines for fidelity and customization</td>
<td></td>
<td>• Information for scale-up and robustness analyses</td>
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<td></td>
<td>• MINC*</td>
<td>• Deliverable by variety of staff in typical settings</td>
<td></td>
<td>• Simulations</td>
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<td></td>
<td>• Stepped care</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Scalable</td>
<td></td>
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</tr>
<tr>
<td><strong>Evaluation Measures and Analyses</strong></td>
<td>• Analyses of modifier and subgroup effects</td>
<td>• Report policy, economic, and political context</td>
<td>• Reach by</td>
<td>• Evaluate systems impacts and unintended consequences</td>
</tr>
<tr>
<td></td>
<td>• Effects of Tx intensity and staff expertise</td>
<td>• Assess impact on</td>
<td>• Condition</td>
<td>• Understand multi-level effects and mediators</td>
</tr>
<tr>
<td></td>
<td>• Cost, cost-effectiveness, and sensitivity analysis</td>
<td>• 1. Disparities</td>
<td>• Unintended</td>
<td>• “Post-mortem” interviews</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2. high-risk subgroups</td>
<td>• Quality-of-life impacts</td>
<td>• long-term sustainability and program evaluation</td>
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<tr>
<td></td>
<td></td>
<td>• variation across settings</td>
<td>• Implementation by condition and over time</td>
<td></td>
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<td></td>
<td></td>
<td>• staff and time</td>
<td>• Maintenance at setting and individual levels.</td>
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<tr>
<td></td>
<td></td>
<td>• Generalization analyses</td>
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</table>
## RE-AIM MODEL: ULTIMATE IMPACT OF NEW HIV VACCINE

<table>
<thead>
<tr>
<th>Dissemination Step</th>
<th>Concept</th>
<th>% Impacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of Clinics Use</td>
<td>Adoption</td>
<td>50%</td>
</tr>
<tr>
<td>50% of Clinicians Prescribe</td>
<td>Adoption</td>
<td>25%</td>
</tr>
<tr>
<td>50% of Patients Accept Medication</td>
<td>Reach</td>
<td>12.5%</td>
</tr>
<tr>
<td>50% Follow Regimen Correctly</td>
<td>Implementation</td>
<td>6.2%</td>
</tr>
<tr>
<td>50% of Those Taking Correctly Benefit</td>
<td>Effectiveness</td>
<td>3.2%</td>
</tr>
<tr>
<td>50% Continue to Benefit After 6 Months</td>
<td>Maintenance</td>
<td>1.6%</td>
</tr>
</tbody>
</table>
Figure 1. The continuum of genetics translational research from gene discovery to reducing the burden of disease in population

Schully SD, et al. Translational Research in Cancer Genetics... Public Health Genomics, 12/29/09
D&I OPPORTUNITIES: EVOLVING ISSUES

- Simulations, modeling, system dynamic models (prior to large-scale efforts, identify unanticipated outcomes)
- Time-lagged replications
- Natural experiments
- Well-documented quality improvement studies
- Rapid learning electronic medical records databases
- Practical and pragmatic trials
Dynamic Model of Cancer Research & Diffusion and Dissemination

- Fundamental Research
- Surveillance Research
- Intervention Research
- Knowledge Synthesis
- Application and Program Delivery

Reducing the cancer burden

Adapted from the Advisory Committee on Cancer Control, National Cancer Institute of Canada, 1994.
ANNUAL D&I MEETINGS

• “State of the D&I Science” Venue
• First meeting: September 2007 “Showcase” ~350 participants
• Second meeting: January 2009 “Building Capacity” > 500 registrants
• Third meeting: March 2010 “Methods and Measures” > 900 people registered

Next meeting: Bethesda, MD March 21-22, 2011
THE MAJOR CROSS-NIH D&I FUNDING ANNOUNCEMENT

- PAR 10-038; 10-039; 10-040
- NIMH, NCI, NIDA, NIAAA, NIAID, NHLBI, NINR, NIDDK, NINDS, NIDCD, NIDCR, OBSSR
- Starting October 2010, new standing review committee
- Every round submission

* New participants
SUMMARY: D & I EMPHASIS

• Need evidence that is:
  – Contextual
  – Practical
  – Rapid

• 3 “R’s”:
  – Robustness
  – Relevance
  – Replication

• Generalization across 3 “S’s”:
  – Settings
  – Subgroups
  – Simulations

Glasgow, R., Ann Behav Med, 2008; 35: 19-25
D&I OPPORTUNITIES: ADD YOURS

- “T3” and “T4” research
- Comparative effectiveness research
- Scale up and sustainability
- Incorporation of economic perspectives
- Training
  - Annual NIH meeting
  - Summer institute for researchers
  - Mentorship pilot project for practitioners
WHY? (TARGETS FOR CHANGE?)

- Much research not relevant to patients, practitioners, policy makers
- Vested interests (FDA model)
- Way we were trained – “unlearning”
- Complex, “wicked issues”*
- Insufficient funding (98.5% NIH budget for basic)