Dissemination and Implementation Research: Building the Mental Health System of the Future

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University of Pennsylvania CMHPSR Seminar Series
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Presentation Outline

• The need for a better system
• The Challenge of D&I
• Progress and Future Steps in D&I
• Other Services Research Areas
• Tenets of an ideal system
The need for a better system...

OPPORTUNITIES FOR IMPROVEMENT!

Sources:
NSDUH (2009); Kessler, Chiu, Demler, Walters (2005); Wang, Lane, Olfson, Pincus, Wells & Kessler (2005); Merikangas, He, Burstein, Swendsen, Avenevoli, Case, Georgiades, Heaton, Swanson, Olfson (2011)
Key Dimensions of MH Services Research

- Relevance
- Impact
- Rigor
- Efficiency

Real-World Populations
Service Settings/Systems
Contextualized Information
Real-World Populations
Contextualized Information
“Consumer”-oriented Information
Real-World Populations
Contextualized Information
“Consumer”-oriented Information
Functioning vs. Symptoms
Behavior Change
“Consumer”-oriented Information
Functioning vs. Symptoms
Behavior Change
Method of inquiry
Qualitative, Quantitative, Mixed
Method of inquiry
Qualitative, Quantitative, Mixed
Method of inquiry
Qualitative, Quantitative, Mixed
Method of inquiry
Qualitative, Quantitative, Mixed
Primary versus Secondary Data
Practice, program, policy
Primary versus Secondary Data
Practice, program, policy
Primary versus Secondary Data
Practice, program, policy
Reach
Dissemination of Information
Reach
Dissemination of Information
Reach
Dissemination of Information
Primary versus Secondary Data
Implementation of effective practices
Dissemination of Information
Implementation of effective practices
Dissemination of Information
Implementation of effective practices
Dissemination of Information
Implementation of effective practices
Embedding research within service systems
Transfer to Service, Policy agencies
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Transfer to Service, Policy agencies
Fast-track from ITV development to uptake
Fast-track from ITV development to uptake
Fast-track from ITV development to uptake
Fast-track from ITV development to uptake
A balancing act...

RIGOR

RELEVANCE

IMPACT

EFFICIENCY

WHOOPS!

SWEET SPOT
A balancing act...

**RIGOR**
- Research Methods Portfolio
- Research Center Methodology Cores
- From RCTs to Case Studies

**RELEVANCE**
- RFA on CJ/MH
- Transition-Aged Youth
- Returning Veterans
- Health of SMI
- Suicide Px

**IMPACT**
- Dissemination/Implementation Research
- Duration of Untreated Psychosis
- Integrating Mental Health in PC

**EFFICIENCY**
- MHRN
- Pooling State Data
- Use of Health IT
- HCS Collaboratory
Services Research Initiatives (Selected)

- Dissemination and Implementation Research in Mental Health
- Mental Health Research Network (MHRN)
- Improving Services for Early Psychosis
- Improving the Health of People with SMI
- Improving Mental Health IT
It takes 17 years to turn 14 percent of original research to the benefit of patient care.

“PUBLICATION PATHWAY”
We assume... “If you build it...”
A Challenge from Multiple Perspectives...

[Cartoon: Trust me, Harold, it's not or demand... It's supply AND demand]

Says Washington Post Writers Group View
## Supply AND Demand Factors (selected)

<table>
<thead>
<tr>
<th>ITV Characteristics</th>
<th>Service System Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing of “Optimal Dose”</td>
<td>How often do people come?</td>
</tr>
<tr>
<td>Choice of “Expert Provider”</td>
<td>Actual providers in system</td>
</tr>
<tr>
<td>Choice of “Patients”</td>
<td>Case mix</td>
</tr>
<tr>
<td>Extensive assessment</td>
<td>Assessment is limited</td>
</tr>
<tr>
<td>Coverage of ITV costs</td>
<td>Financing challenges</td>
</tr>
<tr>
<td>Controlled protocol</td>
<td>Variation in use</td>
</tr>
<tr>
<td>“Starting from scratch”</td>
<td>What is usual care?</td>
</tr>
<tr>
<td>Extensive training</td>
<td>Available training opportunities</td>
</tr>
</tbody>
</table>
## RE-AIM Summary and Ultimate Impact of “The Magic Pill”

<table>
<thead>
<tr>
<th>Dissemination</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>3.1%</td>
</tr>
<tr>
<td>50% Continue to Benefit After 6 Months</td>
<td>Maintenance</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

(Glasgow, 2011)

[www.re-aim.org](http://www.re-aim.org)
How Far Have We Come?
Challenges of Dissemination and Implementation Research (c 2001)

- Variability in terms
- Little awareness of research questions
- Minimal capacity within the field
- No shared vision
- Few opportunities to present/publish
- Commentaries outpace studies
- Not clear part of research agenda
Real-World Dissemination and Implementation: The influence of content, context, and process

Dissemination and Implementation

**Content**
- Evidence development and testing
- Evidence interpretation and packaging

**Process**
- Behavior change strategies (e.g., client motivation/behavior, provider practices)
- Systemic processes (e.g., supervisory practices, quality improvement)
- Engagement (e.g., teachers, physicians, families)

**Context**

**External:**
- Political and Professional
- Economic (e.g., reimbursement)
- Social (e.g., stigma)

**Internal:**
- Organizational culture and structure
- Practice setting characteristics
- Local stakeholders (e.g., attitudes and behaviors)

Adapted from Pettigrew et al, 1992 by Chambers, Ringeisen, Hoagwood & Patel, 2002
Dissemination and Implementation Research

- **Dissemination is** “the targeted distribution of information and intervention materials to a specific public health or clinical practice audience.”

- **Implementation is** “the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings.”

NIH PAR-13-055; Adapted from Lomas (1993)
Studying Implementation

THE CORE OF IMPLEMENTATION SCIENCE

Implementation Research Methods

Proctor et al 2009 *Admin. & Pol. in Mental Health & Mental Health Services Research*
Implementing EBPs affects multiple systems...

...As you scale up decision-making, does evidence exist to guide implementation?
The First NIH PAR(s) Portfolio ('06-'09)

- 24 R01s, 3 R03s, 13 R21s
- Primarily focused on implementation of specific EBPs
- Continuum of Intervention Types (Tx, Prevention, Screening, etc.)
- Clinical and Community Settings
- Most studies are prospective

(Ref: Tinkle et al, *Nursing Research and Practice*, 2013)
The Second NIH PAR(s) Portfolio (‘09-’12)

- 25 R01s, 3 R03s, 12 R21s (*2 rounds to go)
- Enhanced focus on sustainability, improved measurements
- Continuum of Intervention Types (Tx, Prevention, Screening, etc.)
- Expansion of clinical topics (e.g. Dental, CAM, Complex patients)
- Experimental, Quasi-experimental, observational designs

(Ref: Tinkle et al, *Nursing Research and Practice*, 2013)
Dissemination and Implementation Studies

- Effectiveness of implementation approach
- Quality Improvement Interventions
- Organizational change
- Provider Training and Supervision
- Financing/policy change

- Emerging approaches
  - Learning Collaboratives
  - Technology support system
Lessons learned (Selected)…
The Benefit of Organizational ITVs

- Charles Glisson’s ARC (Availability, Responsiveness, Continuity) Org. ITV—from 15 yrs of assessing child MH agencies’ culture and climate

- Henggeler’s Multisystemic Therapy (MST) program—EBP for disruptive behavior

- ARC+MST > MST or ARC alone in improving Implementation of MST, child outcomes

- Now testing with multiple EBPs

(Glisson, Schoenwald et al, J of Consult Clin Psychol, Aug 2010)
Implementation and Scaling-up

• MTFC is an effective strategy to treat children with behavior problems within foster care.

• RCT of 54 CA, OH counties to a community development team implementation model vs. “implementation as usual”

• Looking at “Stages of Implementation Completion” -- implementation and sustainability outcomes

• Moving beyond “Can a strategy be implemented within a large system” to “How can effective programs be optimally implemented and SUSTAINED”

...and more to come
The Current Program Announcements

- PAR-13-054; 13-055; 13-056
- NIMH, NCI, NIDA, NIA, NHGRI, NIAAA, NIAID, NHLBI, NINR, NIDDK, NINDS, NIDCD, NIDCR, NCCAM, FIC, OBSSR
- 2010 CSR standing review committee
- Every round Submission
Selected D&I Research Themes

- Strategies to improve sustainability/ongoing improvement of ITVs
- “Scaffolding” of multiple ITVs within Care System
- Development/Use of innovative designs and measures
- Systems science approaches (e.g. simulation modeling) to D&I
- IS in the global health context

(See PAR 13-055, for more examples)
The DIRH Study Section (Review Committee)

- “The (DIRH) Study Section reviews applications intending to bridge gaps between public health, clinical research, and everyday practice. The focus of the studies reviewed is on the transmission and implementation of knowledge from scientific discovery to transform healthcare delivery, improve health outcomes, and manage acute and chronic illness.

- **SRO**: Jacinta Bronte-Tinkew, Ph.D.

D and I Resources (NIH and beyond)

- Funded Grants (e.g. NIH, AHRQ, CDC, VA, Foundations)
- Research Centers, CTSA cores, Networks
- Implementation Research Institute (R25)
- OBSSR-led Summer Training Institute—June, 2013
- Implementation Science
- Recent Book: Brownson, Colditz, Proctor, *Dissemination and Implementation Research in Health*, 2012
Annual NIH/VA D and I Meetings

- “State of the Science” Venue
- First meeting: September 2007: “Showcase”, ~350 participants
- Second meeting: “Building Capacity” January 2009, > 500 registrants
- Third meeting: “Methods and measures” March 2010, 900 people registered
- Fourth meeting: “Policy and Practice” March 2011, 1200 registrants
- Fifth meeting: “D and I at the crossroads”, March 19-20, 2012, 1200 registrants

http://obssr.od.nih.gov/scientific_areas/translation/dissemination_and_implementation/index.aspx
An Evolutionary Path of D and I

- Efficacy of Implementation Strategies
- Comparative Effectiveness of Active Strategies
- Sustainability / Evolvability

Barriers and Facilitators
Mental Health Research Network

- A Drive toward Efficiency, Quality and Impact—
- MHRN would:
  - develop an efficient method for conducting large-scale studies within health care systems of the effectiveness of treatment, preventive, and services interventions
  - Improve ability to identify, recruit and enroll representative consumers, providers and systems in research studies

Initial Activities:

- RFA-MH-10-030
- ARRA supplements to existing HC networks to include MH
- Related to Common Fund “HCS Collaboratory” (NIMH co-led)
Mental Health Research Network (2010-2013)

- 11-site cooperative agreement (U19)
- PI: Gregory Simon, MD, Group Health
- Sites include HMOs in CA, OR, HI, GA, MI, MA, OR, TX, MN, WA
- Activities:
  - Virtual Data Warehouse
  - Pilot Effectiveness Trial
  - Development of Registries
  - Evaluation of practice variation
  - Policy Impact Analysis
- UH2/UH3 – Suicide Prevention in health care systems
MHRN: Melding Research and Practice

- Understanding the care process
- Finding the win-win-win (research, practice, policy, outcomes)
- Personalization of Interventions
- Reciprocal Impact of Policy, Practice and Research

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- RFA-MH-14-110
  - Expanded capacity in 1) Medication studies, 2) Health IT, 3) MHRN Signature Project, 4) methodological advances
  - Open platform for collaboration...
Improving Services for Early Psychosis

- RAISE initiative—packaged ITV for first episode psychosis
- Reducing Duration of Untreated Psychosis (R34, R01)
- Research to Improve the Care of Persons at Clinical High Risk for Psychotic Disorders

Key Goals:

Reduce time to treatment from 3 years (est) to 12 weeks
Expand early intervention to be standard care
Implement and reimburse evidence-based FEP care
Improving Overall Health of SMI

- Gap in life expectancy for people with SMI (8-25 years)
- September 2012 NIMH meeting
- RFA-MH-13-140 “Leveraging Existing Natural Experiments...”
- RFA-MH-14-060 “Improving Health and Reducing Premature Mortality in People with SMI”
- Goal to connect evidence base for chronic conditions to people with SMI
Improving Health IT for MH

- Interest of MH Researchers in using Health IT
- November 2010 Meeting with AHRQ
  - Special paper series in *General Hosp Psych 2013*
- RFA-MH-13-060/061, “Use of Advanced Technologies to Drive Mental Health Improvement”
- Challenges to Overcome
mHealth Apps

• 82 million smartphone users in the US
• roughly 1,500,000 apps available
• Over 56 billion apps will be downloaded this year (*Information Week*, Mar 5)

• 40,000 mobile health apps on market
  • “mental health” – 253 on Appstore
  • “depression” – 571
  • “mood” – 956
• 19% of mobile phone users actively use health apps
Challenge One: How to Evaluate Technologies that Outpace Usual Research Timelines?

2005

Grant Submit and Award

2006

Development and Pilot Testing

2007

Recruit and Randomize

2008

Follow-ups

2009

Analyze and Publish

2010

2011

2012+

Facebook reaches 1B users

iPhone

Android

iPad

YouTube

Adapted from William Riley, NCI; IOM Report
Additional MHIT Challenges

- Reinventing the wheel (e.g., research funds to develop user interfaces, data capture per study)
- Recruitment/enrollment within studies (efficiency?)
- “Freezing of Interventions” prematurely (ongoing improvement?)

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- Collaborating with Health IT Experts
- Infusing MH evidence within Health IT products
Complementary Pathways for NIMH

NIMH-funded Grants to improve MH care through technology

- Device Independent
- Required use of existing tools
- Efficiency in recruitment—use of “testbeds”
- Demonstrable improvement, not equivalence

NIMH support of science in industry

- Incentives for Technology Experts to incorporate MH science
- Aggregate/Share Health IT tools to lower “barriers to entry”
- Matchmaking b/w researchers and tech firms
Moving Forward:
Challenging More Assumptions
Current Assumptions

- EBPs are static
- System is static
- Implementation proceeds one practice at a time
- Consumers/Patients are homogeneous
- Choosing to not implement is irrational
The Value of Consistency?

ITV Development → Efficacy → Effectiveness → Implementation

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Intervention X Evidence

Site 1

Site 2

Site 3

Site 4
“Voltage Drop” of an intervention as it moves through stages of development

Expected Effect

Intervention X

Evidence

Impact

Relevance

Intervention X

Evidence

Impact

Relevance

Intervention X

Evidence

Impact

Relevance

0

Efficacy Trial

Effectiveness Trial

D and I Trial

Time
“Program Drift” of a fielded intervention (ITV) over time, with expected decrease of effect.
Emphasizing Multi-level, Multi-Domain Change

Context

- Evidentiary Changes
- Environmental Changes
- Practice Changes
- Personnel Changes
- Knowledge Changes
- System Changes
- Policy Changes

Intervention

Evidence

Chambers, Glasgow, Stange, 2013, Under Review
A learning health care system...

- Decision-making based on data
- Iteration/ongoing improvement of practices
- Shared learning across providers, patients, networks
- Patient/Consumer centered and engaged
- Dynamism and complexity is assumed
We Can do This...

- Outcome management system (are the clients/patients/consumers getting better?)
- Quality measurement system (is the ITV being delivered in a high-quality way?)
- Adaptation Monitoring (How is the delivery of the ITV changing?)
- HC setting monitoring (How is the organization changing over time?)
The DSF: Managing the Fit Between an Intervention and Context to Optimize Benefit

CONSTANTLY CHANGING
- Evidence
- Interventions (Intv)
- Practice Settings (Context)
- Care System

Increasing Public Health Benefit

Chambers, Glasgow, Stange (2013), The Dynamic Sustainability Framework. Under Review