University Infrastructure for Dissemination and Implementation Research

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The Long Road from Discovery to Improved Population Health

**Louis Pasteur:**

To him who devotes his life to science, nothing can give more happiness than increasing the number of discoveries, but his cup of joy is full when the results of his studies immediately find practical application.

**Lawrence Green, ARPH, 2009:**

The 17-year odyssey: “It takes 17 years to turn 14 percent of original research to the benefit of patient care”
The 17-year Odyssey
Lawrence Green

Figure 1
The conceptualization of the production and transfer of knowledge from research to practice and policy usually assumes a pipeline in which the vetting of the research through successive screens assures the quality of the research delivered to practitioners and policy makers, but it does little to assure the relevance and fit of that research to the needs, circumstances, and populations of those practice or policy applications. From Reference 48 with permission.
Translating Evidence into Practice

Academic Discovery

Put research into practice

Population Health Improves

Whose job is this?
The Enormous Gap

American Journal of Public Health, September 2013, Vol 103, No.9
Ross Brownson and colleagues

- 266 University researchers and practitioners were surveyed

- How much time do you spend on dissemination of your research?
  - 73% spent less than 10% of their time

- Only 1/3 of respondents always or usually involved stakeholders in their research
All participants acknowledged the importance of dissemination.

Researchers reported their role was to identify effective interventions, but that they were not responsible for dissemination of research findings.

Practitioners also did not believe they were responsible for dissemination.
Rising Obesity in the US

Prevalence of Obesity Among U.S. Adults Aged 20-74

Derived from NHANES data (http://www.cdc.gov/nchs/data/hestat/obesity_adult_09_10/obesity_adult_09_10.html#table1)
The Institute for Public Health
San Diego State University
Graduate School of Public Health

MISSION
To improve population health by translating scientific discoveries into the community in full partnership with community stakeholders.

Established in 1992
The Institute for Public Health

GOALS

• To serve as a bridge between academics and practice

• To improve population health by promoting individual, community, and systems level changes to address complex health issues including health disparities, inequity and social determinants of health

• To encourage the dissemination and implementation of evidence-informed practices in partnership with the community

• To accomplish these goals through community engagement
Who Do We Partner With?

80% of our projects are initiated by service providers working with local populations in the community

- Hospitals, clinics and health care providers
- Primary care providers
- Private non-profit community-based organizations
- Advocacy groups/community members
- Local government agencies
  - County Health and Human Services
  - San Diego Department of Education
  - Law Enforcement
- California Department of Health Services
- Border Health Agencies
- National and International non-profit agencies
Many Years Ago......

We began by asking what the community needed from the University to improve their health.
A Typical Example:
A Request from a Small Local Health Care Facility

Our small health center in a poor neighborhood primarily serves Asian Pacific Islanders. Our patients have a significant problem with obesity.

Can you help us?
What do Our Partners Need?

• What is likely to work best in our community?
• Evidence-based best practice, translational research
• Practice-based/applied research
• Community-based participatory research
• Needs assessment
• Establishing and monitoring outcomes
• Program evaluation
• Training/professional development
• Data management
• Technical Assistance
• Distance Learning, Media and Technology
• Convening collaborations
Countries of Origin of Populations Served by Agencies Partnering with the IPH
Translational Research Definitions
From Discovery to Population Health

T1. **Discovery.** Basic bench science to human studies (observational studies, clinical trials, efficacy studies).

T2. **Efficacy** Evidence based guidelines, meta-analysis, scientific consensus

T3. **Effectiveness** From guidelines to health practice in specific settings, i.e. hospitals, non-profit agencies, community clinics, private practice. If it works in a controlled academic setting, will it work in practice?

T4. **Population Health.** The collective impact of different types of interventions in multiple settings to improve population health. Can you actually improve population health as measured by health indicators?

Khoury, AJE, Vol 172, 5, Aug 2010
Why is it so challenging to translate research into practice?

• It takes a lot of scientific evidence to convince academics that something is likely to work (many expensive studies).

• Scientific evidence is often collected under “perfect” conditions while implementation can be very messy.

• The context (culture, SES, neighborhood, language etc.) in which “evidence” is discovered does not match that in which it needs to be implemented.

• Scientific evidence is often developed without the input of the communities/people who are intended to benefit from it.
Funding is Content Specific and Supports Investigator - Initiated Research

**PROBLEM**
What health problem do you want to study?
Driven by interest and available funding

**EVIDENCE**
I know what works for this problem!

**COMMUNITY**
It doesn’t work for us!
- Too expensive!
- Who is going to pay for it?
- It doesn’t work for our culture
- It is not a problem for us

Please adopt this strategy!
- Pass a law
- Get insurance to pay for it
- Employers require it
- Professional societies recommend it
- Journals publish it
- Business sells products
A common unspoken assumption: 
*Those scientists whose careers have focused on the discovery of new interventions should now also be responsible for studying their dissemination and implementation.*

- These are very different skill sets!

The field of dissemination and implementation research including essential community engagement is very complex and expanding rapidly.

I believe we should not expect traditionally trained T1 researchers to now become T3/T4 researchers.

We need to be specifically training T3/T4 researchers as their own academic discipline with their own infrastructure available to partner with T1 experts.
## Different Skill Sets

<table>
<thead>
<tr>
<th>T1</th>
<th>T3/T4</th>
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</thead>
<tbody>
<tr>
<td>Content Experts</td>
<td>D&amp;I method experts. Methods apply to many different content areas</td>
</tr>
<tr>
<td>Specialize in efficacy study designs</td>
<td>Alternate study designs needed</td>
</tr>
<tr>
<td>(clinical trials)</td>
<td></td>
</tr>
<tr>
<td>Focus on characteristics of the</td>
<td>External validity. Focus on context including politics, power,</td>
</tr>
<tr>
<td>intervention and internal validity.</td>
<td>organizational structure, funding, systems, culture, literacy, etc.</td>
</tr>
<tr>
<td>Focus on effect size and fidelity.</td>
<td>Different populations may need to implement differently to attain the</td>
</tr>
<tr>
<td></td>
<td>same effect size. Interventions may need to be tailored to achieve this</td>
</tr>
<tr>
<td>Academic audiences</td>
<td>A variety of non-scientific audiences</td>
</tr>
<tr>
<td>Partner with T3/T4 expertise</td>
<td>Partner with T1 expertise</td>
</tr>
</tbody>
</table>
Levels of Change to Consider

**Levels of Possible Change**

**Systems/Environments**
Laws, reimbursement, regulations, policies

**The Organization**
Mission, goals, structure, strategies, leadership

**Group/Team**
Procedures, forms, information sharing, collaboration, shared goals

**Individuals**
Knowledge, behavior, compliance, health improvement

*adapted from Shortell, 2004*
What do we need to consider?

- Political Support
- Funding Interest and Stability
- Quality of the Partnerships we can establish and sharing of roles
- Organizational capacity
- Program Evaluation
- Program Adaptation
- Communications
- Public Health Impact
- Strategic Planning
- Culture/language/interpretations of health and disease.

Sara Schell et. al 2013
Sustainability of PH programs
Implementation Science
New Research Methods are Required

- The gold standard randomized control trials have many advantages related to internal validity and testing of treatments under optimal conditions.

- However they don’t address external validity, and don’t often work well for multi-level interventions. They take a long time to produce answers.

- Adaption and tailoring are often needed for specific communities. We need designs that can assess fidelity under these conditions. Do we get the same outcomes with tailoring? Better outcomes?

- Randomization is often not feasible or acceptable in underserved communities with few resources.

Landsverk et. al 2012
Examples of D&I Designs

- **Randomized Control Trials**
  - Always randomize at the level of the intervention
  - Randomization at multiple levels could occur (split-plot design)

- **Controlled Before and After Studies**
  - The use of non-randomized comparison groups

- **Interrupted Time Series (ITS)**
  - Baseline, clear timeframe for intervention, three data points before and after intervention

- **Regression-Discontinuity Designs** (Thistlewaite and Campbell)

- **Dynamic Wait List Designs**
  - Randomly assign units (schools, hospitals, etc) to different times of training

- **Mixed Methods Designs**
  - Quantitative and qualitative methods used sequentially or simultaneously

- **Social Network Analysis**
- **Agent-based modeling**
- **Latent variable analysis**
- **Decision analysis, simulations**

Landsverk et. al 2012
To encourage the academic study of the translation of research to practice, universities and other private or non-profit research centers should consider establishing infrastructure specifically to develop and enhance T3/T4 methodologists able to work in a wide variety of content areas.

We need to get beyond the idea that those who initially create and test an intervention are always the best to study its dissemination and implementation. Partnering with an experienced T3/T4 researcher connected to the community could be much more efficient.
Advantages of the Infrastructure

• A specific location at the university that community stakeholders know how to access. This relieves the stress of having to search for a specific scientist with similar interests.

• T3/T4 research is supported and recognized as a unique scientific discipline with its own academic infrastructure.

• Partnerships between T1 and T3/T4 scientists improve the likelihood of successful proposals for funding. A funding agency can request that T3/T4 scientists be included in proposals.
Advantages of the Infrastructure

• T3/T4 scientists foster long-term relationships with multiple community stakeholders in a wide variety of content areas.

• These relationships build trust across projects and across time. They do not disappear when the funding expires.

• Linkages to community collaboratives, advocates, and patients are available to the entire university for consultation, pilot testing, cultural competency etc.

• The current system is inefficient as each researcher seeks their own community connections.
Content Areas of IPH Research

At-risk youth
Breast & cervical cancer
Child abuse and neglect
Childhood lead poisoning
Childhood obesity
Children with special healthcare needs
Chronic disease management
Community health measurement
Dating violence among adolescents & college students
Diabetes care & education
Domestic violence
Epidemiology of violence
Ethics as applied to public health
Health information technology
Hepatitis C
HIV
Homelessness
Human trafficking

Infant morbidity & mortality
Injury prevention among older adults
Home visiting programs
Overweight and obesity in children & adults
Pain management
Peace building & democratic processes
Physical activity measurement and promotion
Quality
Refugee & immigrant communities
Sexual & reproductive health
Sexual assault
Sexual practices & risk behaviors of young adults
Social indicators of health
Content Areas of IPH Research

Social marketing campaigns
Survivors of torture
Syringe exchange/harm reduction
Teenage pregnancy prevention
Tobacco cessation
Training & education for public health professionals
Transitional housing
Translation of research to practice in underserved communities
Web-based training evaluation
Young men of color who have sex with other men
Youth mentoring programs
Youth violence reduction
On-going IPH Community Connections

- Asian Pacific Islander Health Network
- African American Health Collaborative
- At-risk youth service providers
- Refugee and immigrant communities
- Survivors of Torture
- Transgender Communities
- Gay and Lesbian Communities
- Neighborhood Collaboratives
- Homeless Service Providers
- Middle and High School Health Providers
- Family Support Programs
- Safe Aging Service Providers
- Syringe Exchange Providers
- Tobacco Cessation Providers
- California Department of Public Health
- California Distance Learning Health Network
- Indian Health Council
- Jewish Family Services
- Hospital Association of San Diego & Imperial County
- Head Start
- San Diego County Health and Human Services
- Violence Prevention Advocates
T2: Evidence is Abundant

- Evidence-based Public health: http://prcstl.wustl.edu/EBPH/Pages/
- The Community Toolbox: http://ctb.ku.edu
- County Health Rankings: www.countyhealthrankings.org
- CDC’s Community Guide: www.thecommunityguide.org
- The Cochrane Library: www.cochrane.org
- The Campbell Collaboration: www.campbellcollaboration.org
Push vs Pull Strategies

Evidence based strategy

Push

Organizations or programs adopt and sustain

Improved program outcomes

Pull

Multiple organizations select the EBP most likely to succeed

Different organizations select different strategies

Improved program outcomes

Improved program outcomes

Improved program outcomes

No improvement

Improved program outcomes

Improved population health

EBP1
EBP2
EBP3
EBP4

Rabin, 2006
Health Care Settings:
Implementing Recommendations to Improve Population Indicators
Collective Impact
Challenges for the Infrastructure

• Traditional T1 research asks the question: Does this intervention work?

• D&I research asks about factors that encourage or discourage the adoption of strategies that have been proven to work elsewhere.

• There is still a very large bias in medicine and public health for proving that new and innovative strategies work, or discovering “something new”.

• Federal funding is categorized by disease. Communities categorize themselves by geography, culture/ethnicity, behavior or risk. This creates a mismatch (example of clinical trials).

• Is it essential that D&I researchers also be content experts?

• Until federal funding for D&I research becomes more available, universities must allow for partnerships funded by other entities which may require a willingness to accept smaller F&A.
<table>
<thead>
<tr>
<th>IPH Funding Partners</th>
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<tbody>
<tr>
<td>Alliance Healthcare Foundation</td>
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<tr>
<td>American Lung Association of San Diego</td>
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<td>&amp; Imperial County</td>
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<tr>
<td>Asian Pacific Health Center</td>
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<td>Awareness Inc</td>
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<td>California Black Health Network</td>
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<td>California Department of Health Care Services</td>
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<td>California Department of Public Health</td>
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<tr>
<td>California Distance Learning Health Network</td>
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<td>California Endowment</td>
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<td>California Rural Legal Assistance</td>
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<tr>
<td>Child &amp; Family Policy Institute of California</td>
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<tr>
<td>Children &amp; Families Commission of Orange Country</td>
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<tr>
<td>City Heights Wellness Center, Scripps Mercy</td>
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<tr>
<td>Community Action Partnership</td>
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<tr>
<td>Community Health Improvement Partners</td>
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<tr>
<td>Council of Community Clinics</td>
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<tr>
<td>DHHS Office of Minority Health</td>
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<tr>
<td>End Violence Against Women International</td>
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<tr>
<td>EYE Counseling &amp; Crisis Center</td>
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<tr>
<td>Fred J. Hanson Institute for World Peace</td>
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</tbody>
</table>
San Diego County Superintendent of Schools
San Diego Lesbian Gay Bisexual & Transgender Community Center
San Diego Police Department
San Diego Rescue Mission
SANDAPP, SD Unified School District
San Diego Urban League
San Diego Youth Services
SDSU College of Engineering
SHEP-TY, Embrace
Social Advocates for Youth, San Diego
Somali Family Service
Student Safety Awareness, UCSD
Survivors of Torture, International
Susan G. Komen Breast Cancer Foundation

Sweetwater Union High School District
Tariq Khamisa Foundation
University of California, San Diego
University of California, San Francisco
Vista Community Clinic
Vista Hill Foundation
Whittier Institute for Diabetes
YMCA Childcare Resource Service
Unique Challenges

• The long tradition of investigator-initiated research. What if investigator-initiated research does not match the needs of the community?

• Could the federal government find a mechanism to encourage community-initiated research questions? Even CBPR tends to begin with the interests of the academics and their funding sources.

• Publication of results. Most journals are still seeking “new and innovative” intervention results. Little understanding of D&I results.

• Many community partners would prefer that their results are NOT published in academic journals. Alternate forms of dissemination of research results need to be recognized in faculty promotion decisions.

• “Your are not doing real research”
Community Engaged Scholarship
Foundations of Community Engaged Scholarship

1. A community has its own identity and a good understanding of its strengths and weaknesses. Interventions most likely to work “fit” the local population well.

2. For interventions to work, they must build on the strengths of the community as they are understood by the community, and enhance or improve currently existing systems.

3. Collaborative, equal partnerships between academics and community members in all phases of the D&I research

4. Bi-directional learning and capacity building between academic and community partners.
   - Sharing funding, sharing data, sharing the dissemination of results
Foundations of Community Engaged Scholarship

• All types research are enhanced and improved by community engagement (T1 – T4).

• T3/T4 research cannot be done without excellent relationship with community partners
Who is this man?

John Snow
The Father of Epidemiology
Cholera in London 1854

Broad Street
Community Engagement for Collective Impact

John Snow

1854 London

Reverend Henry Whitehead
The Center for Population Health and Wellness

- An interactive public use web-portal
  - Displays population health indicators geographically
  - Describes evidence based practices
  - Community resources to address indicators
  - Local researchers whose work could affect indicators

- Academic-Community partnerships to address indicators

- Training and technical assistance

- Dissemination and Implementation Research
The San Diego Health and Wellness Data Portal
Translating Scientific Evidence into Practice for Population Health Impact

Local Data + Evidence Based Practices = Measurable Local Population Health Improvement

Local Data:
- Actionable Indicators
- Local population social determinants of health
- Resources: Who is doing what in the neighborhood to address the indicator?
- Local researchers whose work could affect the indicator

Evidence Based Practices:
- EBPs tested in similar local populations
- Collective Impact; multiple EBP efforts by hospitals, schools, social services, to address the same indicator
- Training in EBPs, how to find them, how to assess quality, how to adopt, adapt or tailor them
- Implementation research
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Funding
National Institute of Health
Office of Behavioral and Social Science Research
Dissemination and Implementation

http://obssr.od.nih.gov/scientific_areas/translation/dissemination_and_implementation/index.aspx
Figure 2: Framework for the Translation of PCORI National Priorities into the Research Agenda

<table>
<thead>
<tr>
<th>Priorities</th>
<th>PCORI Criteria</th>
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<tbody>
<tr>
<td>Assessment of Options for Prevention, Diagnosis, and Treatment</td>
<td>Impact on Health of Individuals and Populations</td>
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<td>Improvability via Research</td>
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<td></td>
<td>Inclusiveness of Different Populations</td>
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<td></td>
<td>Addresses Current Gaps in Knowledge/Variation in Care</td>
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<tr>
<td>Improving Healthcare Systems</td>
<td>Impact on Health Care System Performance</td>
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<td></td>
<td>Potential to Influence Decision Making</td>
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<tr>
<td>Communication and Dissemination Research</td>
<td>Patient-Centeredness</td>
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<td></td>
<td>Rigorous Research Methods</td>
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<tr>
<td>Addressing Disparities</td>
<td>Efficient Use of Research Resources</td>
</tr>
<tr>
<td>Accelerating PCOR and Methodological Research</td>
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</tbody>
</table>

PCORI Research Agenda → PCORI Funding Announcement(s)
US Department of Health and Human Services
Agency for Healthcare Research and Quality
Comparative Effectiveness Research

http://effectivehealthcare.ahrq.gov/index.cfm/what-is-comparative-effectiveness-research1/
Robert Wood Johnson Foundation
Public Health Services and Systems Research