# Operations Research and Implementation Science

## Introduction

Operations Research Mini-Course

August 2013

Stephen Gloyd

Professor and Associate Chair

Department of Global Health

University of Washington

# Background

- Operations research (OR) has been used for decades to improve the quality, efficiency, and effectiveness of service delivery strategies throughout the world.
- OR integrates research methodology into program evaluation implementation
- OR is an important tool to help project managers
  - develop and test new service delivery approaches
  - improve program effectiveness
  - inform policy decisions.

# Increasing use of HSR/OR/IS

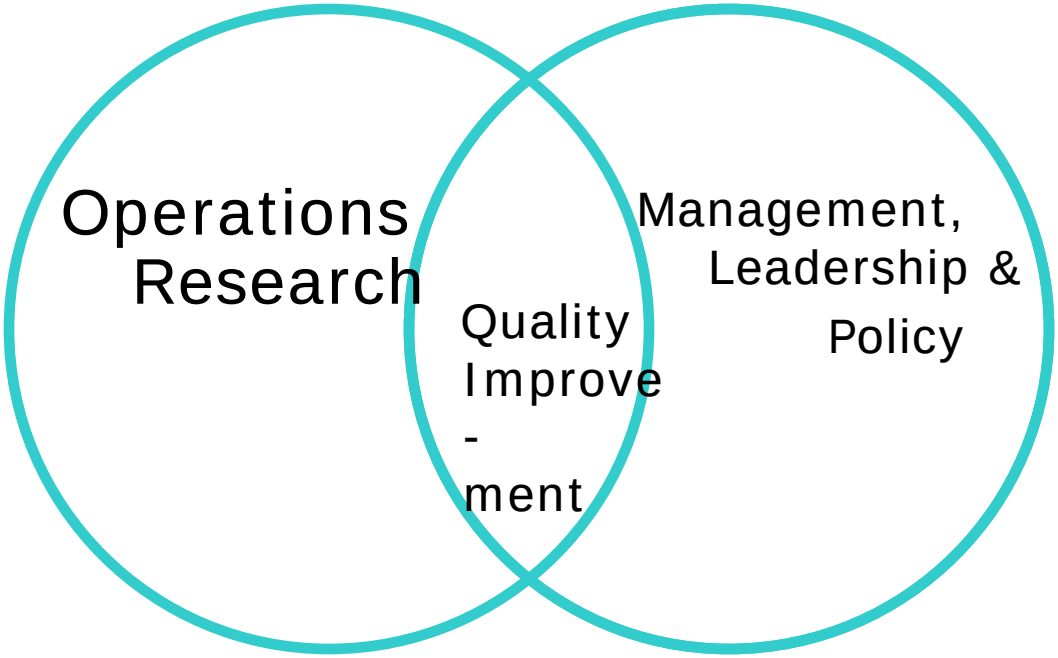
- WHO – grants, HSR conferences, society
- Doris Duke Foundation - OR grants
- PEPFAR -Technical Evaluations, Public Health Evaluations
- NIH/USAID/CDC – Implementation research FOAs
- IAS 2012 – Imp Sci/OR everywhere

# Implementation science at the UW

- Operations research in several courses (Mock/O'Malley, Dept of Industrial & Systems Engineering)
- CFAR: Implementation Science Working Group (since 2006)
- IS at Health Alliance International (HAI), ITECH, CIOB
- NIH IS grants, HIVCore, Project SEARCH (USAID)
- Implementation science course (Sherr, Wasserheit – since 2010)
- MPH in leadership, policy, and management (Katz)
- PhD in Global Health: Metrics & Implementation Science (Institute for Health Metrics and Evaluation and Health Alliance International)

# 'Implementation Science' in Health

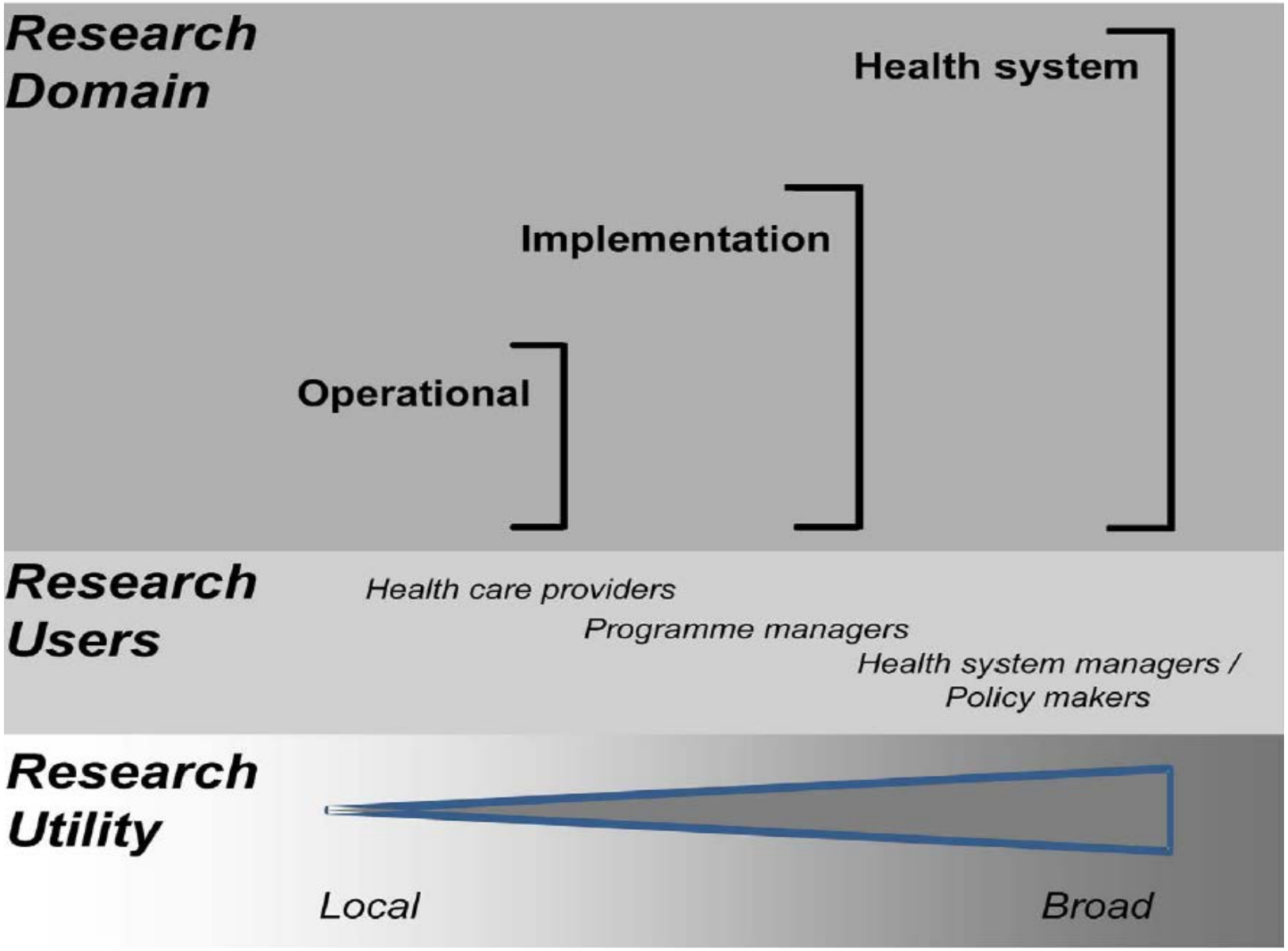
## Umbrella concept for rigorous approaches to improving health care delivery (Gloyd 2009)




Critical elements:

Information technology, financing, human resources, logistics, anthropology, clinical science

# Defining research to improve health systems, Remme et al, PLoS Medicine Nov 2010



# Learning Objectives
## for OR Mini-Course

1. Identify the major factors that limit the translation of efficacy trials to effective health programs, and describe the role of complementary research methods in the development of evidence-based health programs & policies.
2. Explain appropriate research and evaluation methods to overcome impediments to implementation and facilitate timely scale-up of proven interventions with high levels of fidelity and effectiveness.
3. List the common types of study design methodologies that are used in implementation science, and identify considerations for choosing an appropriate applied study design
4. Identify features of conducting implementation science that may make it more or less successful in changing health systems and health policy

# Operations Research & Implementation Science

## Schedule for the day

| Time | Session | Presenter |
|---|---|---|
| 08:00 – 08:15 | Welcome | Stephen Gloyd, MD, MPH |
| 08:15 – 08:45 | Introduction to IS | Kenneth Sherr, MD, MPH |
| 08:45 – 09:15 | Dissecting the 'Know-Do Gap' | Judith Wasserheit, MD, MPH |
| 09:15 – 10:00 | Impact Evaluation and Study Designs to Measure Effectiveness | Marie Ng, PhD |
| 10:00 – 10:15 | Break | |
| 10:15 – 11:00 | IS Study Methodologies: Stepped Wedge | James Hughes, PhD |
| 11:00 – 11:45 | Surveillance Systems and IS | Sarah Gimbel, RN, MPH |
| 11:45 – 12:30 | Qualitative Health Systems Research | James Pfeiffer, PhD, MPH |
| 12:30 – 13:30 | Lunch | |
| 13:30 – 14:15 | Quality Improvement | Pam Kohler, RN, PhD |
| 14:15 – 15:00 | Introduction to Optimization Models | Archis Ghate, PhD |
| 15:00 – 15:45 | IS and Policy Change | Stephen Gloyd, MD, MPH |
| 15:45 – 16:00 | Wrap-up and Course Evaluations | Kenneth Sherr, MD, MPH |

# Operations research - HAI/UW model

Problem identification

1. Frame problem/validate data/indicators
2. Identify variability in performance (disaggregate!)
3. Map steps/identify bottlenecks – compare high and low performers – plus other studies (qualitative or quantitative) as necessary

Intervention & assessment

4. Make changes to address bottlenecks
5. Measure impact of changes
6. Expand changes, impact policy

# Operations research - HAI/UW model

Today's course

## Problem identification

1. Frame problem/validate data/indicators *(Gimbel, Pfeiffer)*
2. Identify variability in performance (disaggregate!) *(Micek)*
3. Map steps/identify bottlenecks – compare high and low performers – plus other studies (qualitative or quantitative) as necessary *(Micek, Gimbel, Pfeiffer)*

## Intervention & assessment

4. Make changes to address bottlenecks *(Micek, Behrens,Hughes)*
5. Measure impact of changes *(Micek, Gimbel, Ghate, Hughes)*
6. Expand changes, impact policy *(Sherr)*