

## The New Statistics and Evidence-based Practice in Social Work

CHAN Yuk-chung, PhD  
23-24 March, 2014

### Objectives

- To highlight Evidence-based Practice
- To delineate the content and arguments of 'New Statistics'
- To identify the emergence of 'New Statistics'
- To explore implications of 'New Statistics' to EBP
- To discuss the unresolved issues in EBP

### Emergence of EBP

- Evidence-based practice (EBP) is
  - "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research." (Sackett D, 1996)
- EBP is an interdisciplinary approach to clinical practice that has been gaining ground following its formal introduction in 1992.
- It started in medicine as evidence-based medicine (EBM) and spread to other fields such as nursing, psychology, education, library, social services and other fields.

### EBP in Social Work

- Evidence-based practice (EBP) is
  - "an alternative to authority-based practice in the helping professions. In EBP a sharp distinction is made between claims that rely on authority or consensus and those that have survived critical tests of their accuracy." (Gambrill, 1999: 346)
- EBP is premised on the idea that
  - "good practice is ultimately to be delivered by research informed evidence which is underpinned by rigorous and effective methodologies..." (Webb, 2001: 58)

### Why EBP in Social Work

- Increasing use of public fund in social services
- Public demand for accountability
- Rising consciousness of users' rights
- Knowledge of differential effectiveness of programs
- 'What works' in social services
- Ensuring the best use of available resources in helping
- Informed decisions about programs/services for clients

### What is 'Evidence' ?

- Proven or undisputed facts
- Effectiveness as evidence
- Generated through empirical/scientific studies
- Randomized controlled trial as gold standard
- Evidence as best available evidence

## Hierarchy of Evidence

- Systematic review or meta-analysis
- Randomized, controlled trial (RCT)
- Controlled trial without randomization
- Case-control or cohort study
- Systematic review of qualitative or descriptive studies
- Qualitative or descriptive study
- Opinion or consensus

(AJN The American Journal of Nursing 110(5):41-47, May)

## Varieties of EBP in Social Work

- Positivist evidence-based social work
- Pragmatic evidence-based social work
- Political evidence-based social work
- Postmodern evidence-based social work
- Critical realist evidence-based social work

(Gray, Plath, and Webb, 2009:51-75)

## Problems with 'Evidence' in EBP

### Basic question

- Is 'best available evidence' good enough evidence on which EBP is based?

### Observations:

- EBP is based on answers to the question of 'what works?' and, to simply put, evidence of effectiveness.
- Current evidence of effectiveness are mostly based on research designs aiming at testing the hypothesis that intervention programs make a difference in service users.
- In a lot of the cases, evidence that intervention programs make a difference in service users is a weak evidence on which social work practice/intervention programs are based.

## The 'New Statistics'

- A term introduced by Professor Geoff Cumming of La Trobe University in 2002
- Main references:
  - Cumming, G. (2012). *Understanding the New Statistics: Effect Sizes, Confidence Intervals, and Meta-Analysis*. Routledge.
  - Cumming, G. (2014) The New Statistics: Why and How. *Psychological Science*, 25(1): 7–29
- Professor Cumming advocates the use of the 'New Statistics' in terms of effect sizes, confidence intervals, and meta-analysis because he believes that these are better statistical information on evidence of effectiveness in practice

## The 'New Statistics' - Background

- Social science research is dominated by the 'Null Hypothesis Statistical Testing' Approach (NHST)
- NHST cannot provide complete, accurate and useful information for decision-making
- NHST is the main hindrance of achieving the highly regarded research integrity
- Professor Cumming advocates the use of effect sizes, confidence intervals, and meta-analysis instead of the NHST approach to study effectiveness in practice

## What is new about 'NS' ?

- NS refers to a shift from reliance on "null hypothesis statistical test" (NHST) to a range of recommended practices, including estimation based on effect sizes (ESs), confidence intervals (CIs), and meta-analysis.
- The relevant statistical methods associated with NS are not new; however the attitudes towards and general adoption of the methods are new to researchers, policy-makers, administrators and frontline practitioners.

## Main Drawbacks of the NHST Studies

- NHST is a product of dichotomous thinking and our preference for clarity over nuance.
- However, a statistically significant result tend(s) more to provide a desired but illusory certainty.
- Little and inadequate information is provided by NHST reporting

## Publication Biases in NHST Studies

- Research studies with statistically “significant” results are more likely to be accepted for publication.
- Threatened integrity of researchers: temptation to mine data and select statistically “significant” results for reporting
- Impossible or expensive replication: false conclusions from single research attempts persist.
- Biased collection of statistical information for decision making in EBP in social work

## An example

- Research question:
  - Is there a positive effect of a certain intervention program to reduce parenting stress for its participants?
- Research design
  - Experiment (RCT)
- Hypothesis :
  - $H_0$ : No positive effect parenting stress
  - $H_1$ : Positive effect in reducing parenting stress
- Significance level:
  - $p = 5\%$  (one tailed test)

## An example (continued)

- Sample size:
  - 40 in each group of parents? (randomly assigned)
- Results :
  - $p = 0.03 \rightarrow H_0$  is rejected
- Conclusion :
  - Parenting stress is reduced for participants taking part in the parenting program. The program is effective
- Question
  - Do the results provide useful evidence to EBP ?
  - Should similar parenting programs be run in the future based on the results of this study
  - What information which we regard is more useful but is not provided/given the right focus in the study?

## The “How’s” of NS Research

- formulate research questions in estimation terms.
- identify effect sizes (ESs) that will answer research questions.
- declare full details of the intended procedure and data analysis.
- calculate point estimates and CIs for the chosen ESs.
- make one or more figures, including CIs.
- Interpret the ESs and CIs.
- use meta-analytic thinking throughout.
- report

## Strengths of the ‘New Statistics’ Studies

- Results are more reliable
- Results are more realistic
- Results is more informative
- Results are more useful for decision-making in EBP
- Results make it possible for meta-analysis to build up and improve evidence further

## NS Studies and EBP in Social Work

- Evidence is no longer understood in dichotomous terms – social work intervention is not either effective or not effective
- Evidence is better evidence compared with evidence generated out of NHST studies.
- Evidence is to be understood in terms of estimation thinking – effects of small, medium or large changes can be judged by practitioners whether a certain program is worthwhile
- Evidence is to be evaluated in the context of the research in which it is generated, i.e. design, sample size, etc.
- Evidence is still subject to changes upon better quality evidence of large samples or meta-analytic research studies

## Limitations and Unresolved Issues

- Social work as a moral enterprise is not only based on evidence and knowledge. In a lot of times, we are also value- and morally driven in our work.
- Findings based on large samples are usually regarded as strong evidence. When applied to working with people, there is the danger of working against the individuality of our clients.
- Framing evidence in terms of number and behaviors easily dehumanizes people. Even for NS studies, EBP at best provides a partial picture as we work with our clients.
- Like NHST studies, NS research consider findings from qualitative inquiries as 'weaker evidence'. When qualitative findings are inspirational, they should not be dismissed.

## Challenges Ahead for EBP

- Research based on the NS is a necessary but not sufficient condition for EBP
- Education and training should be provided to policy-makers, practitioners, clients and the public to help them understand the availability and meanings of statistical evidence (from NS)
- Guidelines should be compiled with inputs from different stakeholders to ensure empirical experience and professional expertise be both taken into consideration in decision making
- Rules and regulations should also be formulated to make sure evidence-based practices are always carried out in the profession

## Conclusion

- Evidences are where social work practitioners should start, not end.
- Three questions a practitioner might needs to ask in reading results of studies which may potentially inform his EBP
  1. What is the evidence?
  2. What should I believe? and
  3. What should I do?
- Let's always be inspired but not dictated by the evidence in EBP