Appropriate Research Methods

1. Learning Objectives

After reviewing this chapter readers should be able to:

- Challenge the prevailing notion of a hierarchy of research methods (from stronger experimental designs to weaker qualitative techniques) and crude dichotomous thinking (hard versus soft, quantitative versus qualitative, etc).
- Understand that there is no right or wrong methodological approach; rather the central concern should be the appropriateness of the method to the problem being investigated, the knowledge base, the resources available (including both financial and person power), the socio-cultural context, and the level of analysis.
- Recognize that most medical care and public health interventions still occur “downstream” and are unable to significantly affect the course of mortality, morbidity and disability in modern society. "Upstream" primary and secondary prevention is required, especially policy-level interventions designed to affect whole populations.
- Understand that behavioral and social science research methods are particularly well suited to measuring, explaining and evaluating "upstream" public health activities.
- View quantitative and qualitative research methods as complementary partners in the public health research enterprise, rather than competing with each other.

2. Introduction

Downstream vs. Upstream Approaches to Health Policy

Let's start with an exotic example to illustrate an important concept in health policy – **the problem of neonatal tetanus in South East Asia**, and local efforts being made to combat this serious condition.

At one point deaths from neonatal tetanus had reached 50 percent of live births in some areas: infants with this condition occupied most of the available hospital beds. Local health authorities, in a desperate search for a solution, sought consultant advice from overseas experts (from a major US School of Public Health).

These experts visited the region, reconfirmed (quantitatively) the needs already well understood locally and proposed the inappropriate building of neonatal intensive care units: the cost of this recommendation was absurd given the tiny amount available for health care in that developing country. Rejecting the advice of these outside experts, and with help from locals more familiar with cost constraints, health authorities assembled kits consisting of a small handkerchief size piece of cotton cloth, a tiny bottle of Dettol (a disinfectant) some bits of soap, a piece of cotton thread and a razor blade.

This kit was distributed to Traditional Birth Attendants (TBAs). When delivering babies these TBAs used the cloth as a clean field; they washed their hands with the soap bits; they cut the cord with the razor blade, tied it with the cotton thread and then disinfected it with the Dettol. Within a short period of time neonatal tetanus was under control. The cost per kit was just a few cents.

It worked – it was cost efficient, it was culturally acceptable, and it was usable by available staff within the existing indigenous system. In other words, this technology was neither high nor low, but **appropriate to the problem.**

2. Introduction

This is a situation familiar to those in the field of international health confronting the health challenges in developing countries. But the concept of appropriate technology also has relevance to the chronic disease challenges confronting the so-called more advanced countries, and particularly to the way they are researched.

Most behavioral and social science health studies today focus on downstream tertiary treatments (curative medicine) and the modification of individual risk factors. Today's dominant approaches have their origins in the prevailing biomedical paradigm, and behavioral and social science research methods appear to serve as handmaidens. And like good servants these research methods are always readily available, to unquestioningly do whatever is asked of them. In other words, research methods with their origins in the social and behavioral sciences are being narrowly and inappropriately applied to measure the effectiveness of tertiary and secondary prevention activities.

Yet efforts are now being redirected, to move beyond this downstream focus and towards a more appropriate whole-population health perspective, or an upstream social policy approach to health. Appropriate research methods are being developed and applied to match these emerging more appropriate levels of upstream activity. Some of the most promising of these methods are discussed in the digital anthology. Viewed from the history of behavioral and social science research, the emerging appropriate research methods approach actually represents a journey back to the future, rather than the development of entirely "new" research methods.

3. Different Methods

Different Methods have Different Philosophical Origins

The continuing debate over the most appropriate research methods has traceable origins in:

a) Divergent social philosophies; and

b) Different conceptions of disease and health.

Attention, however, focuses not on these two underlying origins, but rather on the more immediate applicability of current research methods to measuring and explaining some health problem. Inviting colleagues to move discussion to a more conceptual level, Nijhuis and Van der Maesen (1994) have suggested:

> "....most theoretical debates about the pros and cons of public health approaches are confined to the methodological scientific level. Philosophical foundations such as underlying ontological notions are rarely part of public health discussions, but these are always implicit and lie behind the arguments and reasoning of different viewpoints or traditions" (Nijhuis and Van der Maesen, 1994:1).

They make crucial distinctions that facilitate understanding of the logical everyday consequences of these different social philosophies and conceptions of health.

3. Different Methods

With respect to the different social philosophies that lie behind different methodological approaches they identify two major types as follows:

- **Individualistic** (or "individualistically oriented **social philosophy**"). Here the emphasis is on the individual with origins in the work of, for example, Pareto (1963) and Weber (1947), "the total (the Gestalt) is considered to be the outcome of the actions and motives of distinct individuals" (Nijhuis and Van der Maesen, 1994:2).
- **Collectivistic** (or "collectivistically oriented **social philosophy**"). Here the emphasis is on "the social constellations of which individuals are part." From this perspective and following the early views of, for example, Marx (1964) and Durkheim (1938), "the Gestalt... is primarily the social constellations of which individuals are part" (Nijhuis and Van der Maesen, 1994:2).

Regarding different **conceptions of health**, two general types can be identified:

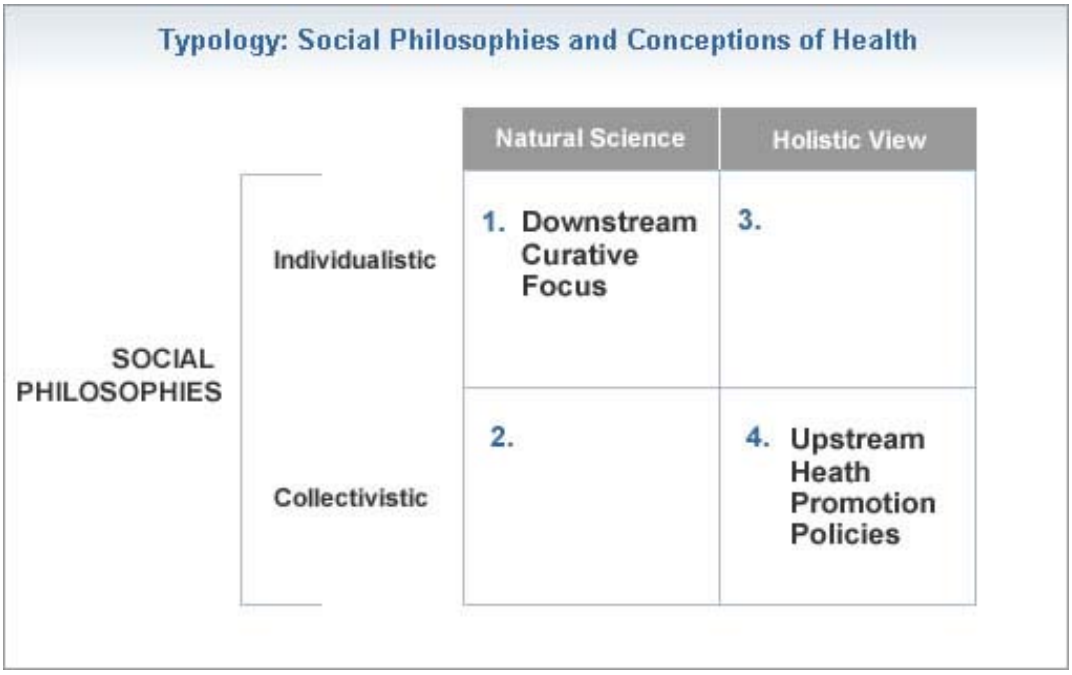
- The **natural science (mechanistic) view**, which is the dominant orientation of allopathic medicine, focuses on disease states and factors which predispose, are associated with, or increase chances of entering one of those states. This **pathogenic view** treats people as bio-psychosocial and neurophysiologic systems, with disease representing a perturbator which produces disequilibrium, dysfunction and disease. Apart from its mechanistic approach, this view results in a conception of health as "non-disease": it is an exclusionary state (or "intrinsically residual in nature"). Accordingly, "because health is seen as non-disease it can only be viewed as a condition brought into being through causal mechanisms" (Nijhuis and Van der Maesen, 1994:2).
- The **holistic view of health**, originally associated with the Goddess Hygeia in classical Greek thought, appears to be undergoing a renaissance in the renewed approach to whole population health today. This contrasting **salutogenic view** considers health "as an expression of the degree to which an individual is capable of achieving an existential equilibrium. This equilibrium is not static but constantly in motion" (Nijhuis and Van der Maesen, 1994:2).

3. Different Methods

Even though thinking in terms of dualities or binary opposites may itself be a consequential limitation of the prevailing paradigm, we combine these dimensions in a conventional 2 x 2 array to derive the typology depicted in Figure 1; simply a conceptual device to permit identification of general categories or classes of phenomena (or “ideal types”). This enables us to locate the origins of different behavioral and social science research methods in particular social philosophies and conceptions of health.

The goal is for discussion to advance from disparaging evaluations of the advantages and disadvantages of different research methods, or from futile discussion of "the best" approach, to appreciation of the underlying philosophies and views of health which manifest themselves in everyday health activities and their measurement.

Figure 1: Social Philosophies



3. Different Methods

Figure 1 invites several observations:

International Differences

It permits us to understand some international differences in research approaches to health problems. In Europe for example, where a more collectivistic/holistic orientation is evident, there is great interest in upstream healthy public policy, or the purportedly new population health. In the US, with its more individualistic/natural science orientation, there is heavy investment in individual knowledge and behavior change and the reduction of disease in identifiable categories (high risk individuals).

Different Methodologies

It also permits us to understand the dominance and resilience of different methodologies in different national settings. In the US and to a lesser extent the UK, Popperian logical positivism prevails (Popper, 1968; 1974). In other settings (e.g., Canada, Europe, Australia, and New Zealand) there is a refreshing interest in qualitative interpretative inductive methodologies, more appropriate to the programs suggested by a collectivistic/holistic orientation. These alternative approaches (I prefer the term "complementary") have their origins not in dissatisfaction with the limitations of positivistic methods, or the inherent superiority of one over the other according to some illusory standard of science, but in the collectivistic/ holistic philosophies of their proponents.

The next chapter, Science in the Social Sciences, by **Jeff Coulter** (Professor of Sociology and Philosophy at Boston University) is essentially an update on a milestone debate in the history of social science: whether it is possible to study human behavior scientifically. He illustrates the way in which current controversies over research methods have deep underlying philosophical origins.

Philosophical Views

Erudite and interesting debates among devotees within a particular orientation have little appeal to the proponents of divergent philosophical views. The utility of Popperian views and derivative falsificationist criteria for deciding causes (Weed, 1988), while important contributions within the

scientific materialist tradition (Whitehead, 1985), have little appeal to collectivistically oriented interpretists. This is not to disparage the valuable contributions of "positivists," nor to claim their contributions as errors; it is simply to emphasize their irrelevance to those driven by a fundamentally different social philosophy and conception of health.

Qualitative and Quantitative

This analogy prompts the question asked by the late Peter Rossi (1994): can the quals and the quants ever live together in harmony? For some 20th century scholars, like Foucault (1973) Feyerabend (1987) and Habermas (1981), there appears to be little hope; different methodologies derive from distinct philosophical perspectives, each with their own ultimately irreconcilable presuppositions.

4. What's Wrong

What's Wrong With the Way We're Doing Things?

No one can question the remarkable contribution of the social and behavioral sciences to understanding the causes and consequences of illness, disability and death. From the early public health activities of 17th and 18th century Europe until today, the range of problems tackled, the exquisite methods developed, and the programs and policies attributable to specific findings has been remarkable. While acknowledging remarkable progress, some question the current direction of the behavioral and social sciences and their underlying theoretical assumptions, or whether they actually have a theoretical base. In marked contrast to the origins of behavioral and social science, research methods today appear hamstrung by the assumptions that follow from adherence to the individualist/natural science paradigm, and the types of activities suggested by its results.

Before moving in different directions it's important to critically assess the current state of play. Here's where things get a little controversial. Several key features of social and behavioral science are characterized here:

(a) Biophysiologic Reductionism. This involves a process by which phenomena, whether primarily physical or behavioral, are traced back to some bacteriological, genetic, or behavioral level of explanation such as lifestyle factors and risk behaviors. Even sociological phenomena --- like socioeconomic, race/ethnic difference in diabetes mellitus-– are often presumed to have biophysiologic or genetic origins. Plausible structural explanations in social deprivation and biases in treatment are overlooked in preference for identifying physiological and genetic factors and therefore biomedical interventions;

Established social and behavior science as applied to health is characterized by at least the following features:

- Biophysiologic Reductionism
- Absorption by Biomedicine
- It is Largely Atheoretical
- Limitations of Dichotomous Thinking
- A Maze of Risk Factors
- Observational Associations are Confused with Causality
- Dogmatism by Design
- More of the Same is Not the Answer

(b) Absorption by Biomedicine. Moving from their distinct philosophical origins and their status as independent disciplines, the behavioral and social sciences often appear to have become just an adjunct to clinical medicine.

4. What's Wrong

(c) It is largely atheoretical. Established behavioral and social science can explain very little because there is little interest in the development of theories, which can be tested. Lamenting this absence of theory development, Alwyn Smith once likened the products of today's epidemiology to "a vast stock-pile of almost surgically clean data untouched by human thought" (Smith, 1985). Much the same could be said of most behavioral and social science. While social and behavioral scientists ritualistically incant the importance of theory, little attention is given to how sound theories should be constructed (so that they are testable);

(d) Limitations of Dichotomous Thinking. Even though it is now widely accepted that, for most risk factors and conditions, the response curve is continuous and smooth, dichotomous thinking in the behavioral and social sciences still prevails and determines our actions. The now well demonstrated fact that most illness conditions and risk behaviors are normally distributed appears still to escape most researchers. Using hypertension as an example, Rose (1992) has described the quite different activities that logically follow from either dichotomous or continuous thinking. He observes a paradox: "it is epidemiological research which has now repeatedly demonstrated that in fact, disease is nearly always a quantitative rather than a categorical or qualitative phenomenon, and hence it has no natural definitions" (Rose, 1992;8). The new-whole population approaches to public health, which follow from acceptance of the continuous nature of risk, are precluded "because it is a departure from the ordinary process of binary thought to which they are brought up. Medicine in its present state can count up to two but not beyond" (Rose, 1992:7);

(e) A Maze of Risk Factors. Present day social and behavioral scientists resemble someone trapped in a maze (of risk factors) with no opening or exit in sight. We enter this maze with great enthusiasm, but are quickly diverted to the left, or the right, by new exciting and endless risk factor openings. Every new turn produces ever more promising openings, but results in exhaustion and frustrating disputes over which, among numerous possibilities, is the "correct" direction to proceed in. Often after spending much time, effort, and resources we seem to return to the same place we started --- but have we really added to the knowledge base required for action?

4. What's Wrong

(f) Observational Associations are Confused with Causality. Disregarding the explanatory superiority of experiments (even when feasible), there is a preference for weaker observational designs. When elevating simple associations to causal status (as in most risk factor research) important qualifications for membership in the causal club are disregarded. Bradford Hill (1965) listed five conditions, all of which must be fulfilled before observed associations can even qualify for consideration as reflecting cause and effect and hence candidates for interventions: these included magnitude, consistency, specificity, dose-response, and biologic plausibility. Using these criteria, what proportion of observational reports produced by behavioral and social scientists would qualify for membership in the causal club? Wider acceptance of Susser's discussion of levels of causality --- encompassing types of social organizations, individuals, organ systems, and molecular contributions may get us beyond the obstacles of single risk factor studies to social action (Susser, 1973).

> Recognizing that experimentation is not always appropriate, or feasible, in the Observational Studies chapter **Richard Berk** (Professor, University of Pennsylvania) discusses the strengths and recognized limitations of observational research methods (especially as applied to the evaluation research) and proposes some standards for the reporting of results from such studies.

(g) Dogmatism by Design. There is a belief, often incanted by some behavioral and social scientists, that certain designs are purer than others --- for example, it is common dogma that longitudinal studies are inherently superior to cross sectional studies. Of course, each of these observational designs has its own strengths and weaknesses. One may be more superior than the other in different circumstances: neither has an intrinsic advantage, or is more appropriate than the other.

(h) More of the Same is Not the Answer. Even while recognizing some of these ontologic and epistemologic limitations, many social and behavioral scientists believe the solution lies in ever more of the same – bigger sample sizes, better measurement techniques, and more sophisticated multivariate manipulation. Forget about the building's crumbling foundations, slap

on another coat of even more expensive (and not necessarily higher quality) paint. Phillips and Smith (1993) once proposed an improvement to research designs: instead of even larger samples, more measurements of risk factors would overcome the limitations of reduced samples sizes! Skrabanek (1993) responds with the old Irish saying, "you can't make a pig grow by weighing him."

Appropriateness is a contingent status: advocacy of one research method over some other as an inherently superior method belies a shallow understanding of research methodology (as opposed to research techniques) and the distinct philosophical origins of different methods.

The point, of course, is that improved measurement techniques and statistical manipulation are no cure for the wasting condition now afflicting much established social and behavioral science research.

4. What's Wrong

Yet another logical consequence of the dominant paradigm is the current downstream risk factor approach to solving population-level health problems, and to evaluating our intervention efforts. The limitations associated with an almost exclusive individual risk factor intervention approach are well-known. Namely that:

(a) it **diverts limited resources** from upstream healthy public policies;
(b) it **blames the victim**;
(c) it produces **a life style approach to health policy**, instead of a social policy approach to healthy lifestyles;
(d) it **decontexualizes risk behaviors** and overlooks the ways they are culturally generated and structurally maintained;
(e) it seldom seeks to assess the relative contribution of **nonmodifiable genetic factors** and modifiable social and behavioral factors. (In this regard, socioeconomic reductionism among social scientists is as myopic as biophysiologic reductionism among natural scientists).

It is often stated that all social and behavioral science research "should have a theoretical base," or be "theory-driven." Some research can of course appear to lack a theory base and yet still contribute to the understanding of some problem, or provide a basis for intervention. But ideally, behavioral and social science research should be guided by or contribute to sound theory. Difficulties arise when there are as many different theories of some phenomenon as there are researchers investigating it! And then Kuhn (1962) points out that this rise and fall of different theories over time has little to do with empirical data that confirm or disprove a theory.

What constitutes a good theory and how it should be constructed (in a form that permits testing) is discussed by **Stephen Turner** (Graduate Research Professor, University of South Florida) in the Theory Development chapter.

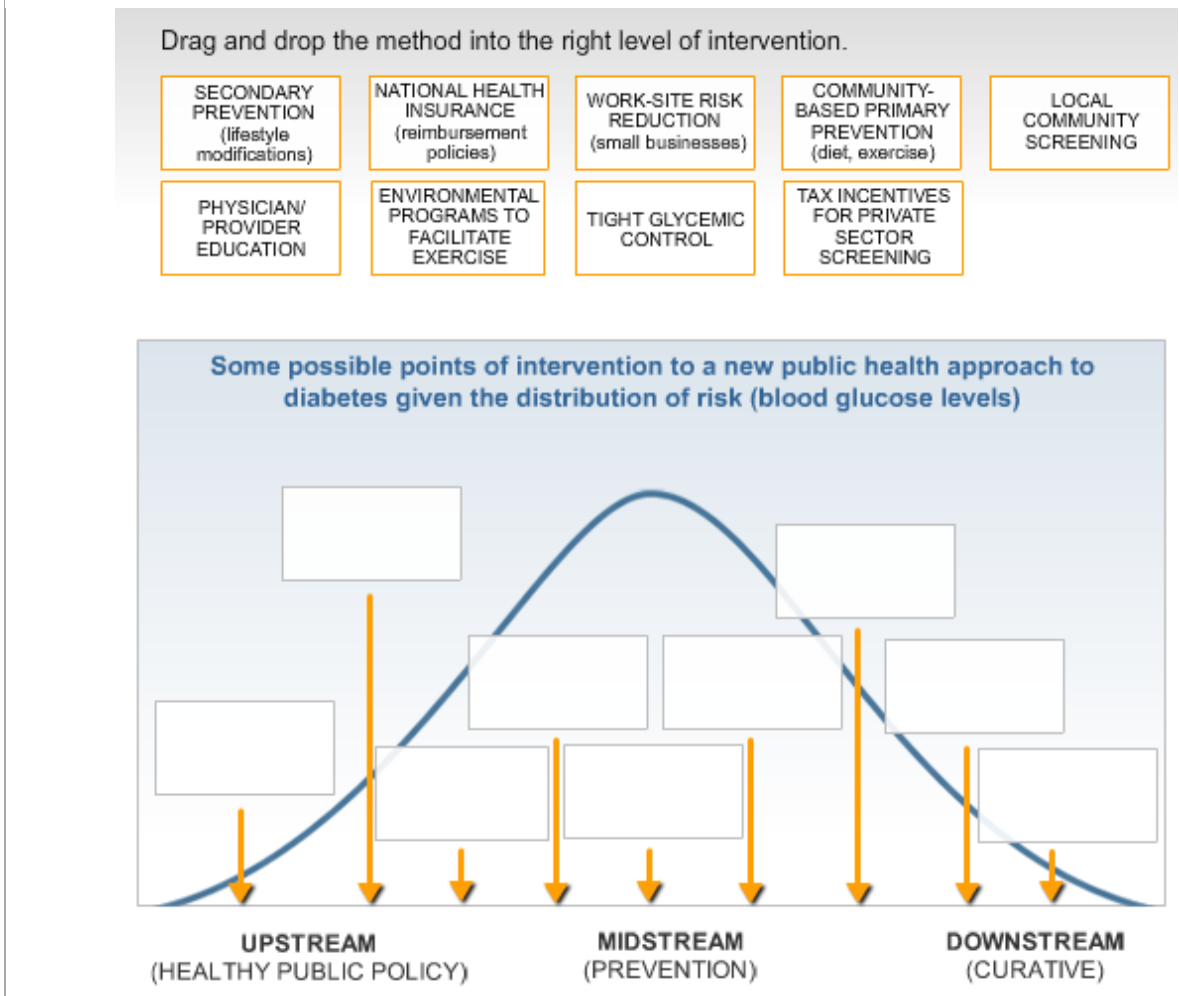
5. Where to Now

Where to Now – Back to the Future?

Having said so much about what is inappropriate and mis-focused, it is important to discuss what is appropriate: where should we be focusing instead and what research methods should be employed?

Arguing for a refocusing of efforts towards upstream population health is not, of course, to suggest that everything should be invested upstream. That, obviously, can never occur and resource allocation would be as distorted as it is presently (some 90 percent of effort and resources are concentrated downstream). A balanced distribution of research effort and resources across the whole range of possible points of intervention is required to accommodate the likely continuous distribution of the phenomena in question. Exercise 1 illustrates the range of interventions at different levels that are possible for a major illness condition, like diabetes.

Exercise 1: Appropriate Research Methods



It is useful to distinguish three levels of public health intervention as follow:

1. **Upstream Healthy Public Policy**, which includes Governmental, institutional, and organizational actions (mainly through social policies) directed at entire populations (whole population public health), with adequate support through tax structures, legal constraints, and reimbursement mechanisms, for health promotion and primary prevention.
2. **Midstream Prevention Activities** are of two main types: (a) ***secondary prevention*** (to modify the risk levels of those individuals and groups who are very likely to experience some untoward outcome); and (b) ***primary prevention*** (actions to encourage people not to commence behaviors that may unnecessarily increase their chances of experiencing untoward events).

3. **Downstream Tertiary Care** comprises curative treatments, rehabilitation counseling and patient education for those already experiencing disease and disability. This is the level which, while consuming most of the available resources, encompasses a relatively small segment of the general population (those already occupying the sick role).

5. Where to Now

Geoffrey Rose in *The Strategy of Preventive Medicine* (1992), a landmark text that produced little impact or discussion in the US, provides elegant arguments for upstream whole-population approaches. He moves thinking from the level of statistical association (as in relative risks, odds, or rates) to the absolute levels of risk of populations. Of this new emphasis Marmot (1994) says:

"By shifting attention away from **relative risk** (how many times more likely is this exposed person to succumb than someone not exposed?) to **absolute risk** (what is this exposed person's increase in absolute level of risk?), and even further to some measure **of population attributable risk** (how much of the disease in the population can be attributed to this level of exposure?) the notion of what constitutes an important risk can change dramatically" (Marmot, 1994:3).

> Such distinctions lead to what may be called the **Rose Theorem**, one of the most important insights in modern public health: **"a large number of people exposed to a small risk may generate many more cases than a small number exposed to a high risk"** (Rose, 1992:24).

This theorem has dramatic implications for future social and behavioral science research. With necessarily limited resources, investment in questionably effective ***attempts*** to sustain a minority leaves little to promote the health of the majority. If utilitarian principles guide resource allocation, then small improvements in the health and quality of life of the majority are a better bet than dramatic attempts to treat the sick and prevent illness in a minority. Appreciation of the continuum of risk (the dose-response curve) suggests that small and perhaps even imperceptible improvements in everyone's health (including those at low risk) will yield greater overall gains for a society than very perceptible improvements in the health and quality of life of a minority of high risk individuals. This harsh reality must be coupled with an equally harsh certainty: we have necessarily finite resources for research, so that what is invested in attempts to improve the sickness levels of the minority diverts from promoting the health of the majority. We are confronted with what Rose terms the prevention paradox: **"a**

preventive measure that brings large benefits to the community can afford little to each participating individual" (Rose, 1992:3). Alternatively, downstream measures that yield possibly large benefits to sick or at-risk individuals afford little to the overall health of our community (which, given the continuum of risk, is where the real benefit lies).

6. Appropriate Methods

Towards More Appropriate Methods and Measures

The prevailing paradigm, with its inherent assumptions and orientation, results in a disproportionate emphasis on downstream, individually-oriented activities which have limited effectiveness for whole-population public health. This concern can be extended to the research methods currently employed to quantitatively measure these downstream activities. Upstream analysis requires the use of different research methods that are appropriate to this emerging new focus.

As defined by the Oxford Dictionary, the term "appropriate" denotes something that is "specifically fitting or suitable," or, phenomena that are "proper." With respect to the kit which was used to successfully combat neonatal tetanus, the term "appropriate technology" supersedes the high-low continuum. Depending on the problem of concern, so-called "low technology" may be appropriate or inappropriate --- likewise with so-called "high technology."

"Appropriate" health technology does not conform to some idealized national or international standard, nor is it necessarily optimal or even "simple" (Newell, 1977). Instead, it serves as a suitable approach for that purpose at a particular point in time, taking into account the nature and magnitude of the problem and the available resources.

Some observers appear to conceive of research methods in terms of a hierarchy, or along some continuum---from so-called gold standard approaches (like experimentation) to some lower level types of research. Thinking of some methods as intrinsically better than others, despite the nature of the research task, is absurd. It is akin to asking: “what’s better, a banana or a wristwatch?” One obviously cannot tell the time with a banana, nor are wristwatches edible. Everything depends on the research task---if the job is to estimate the prevalence and risk factors associated with some problem, then a social survey fits the bill. If however the task is to determine whether something works (i.e., is effective), then a well-designed experiment is required.

These concepts have been described elsewhere and their utility for policies designed to ensure equitable resource allocation demonstrated (McKinlay, 1979; 1980). They all appear to be applicable to behavioral and social science research methods:

- What is the task or problem?
- Are there resources and people with adequate training to conduct the study?
- Will the group affected agree to being investigated?

Obviously, what is appropriate in one cultural setting may be quite inappropriate in another setting. Moreover, even within a particular setting there are often differences over time in what is deemed appropriate.

The neonatal tetanus kit described previously was appropriate in at least three ways:

- it was appropriate to **the problem;**
- it was appropriate in terms of **community resources and skills** (i.e., it was cost efficient); and
- it was **socioculturally** appropriate (i.e., it was compatible with local community values and the indigenous health system).

In other words, the term "appropriate" encompasses effectiveness, cost efficiency, and sociocultural acceptability at whatever level.

Appropriateness is a Heraclitan notion: it connotes fluidity. It is not a state that is achieved, with progress easily measured against some gold standard.

7. Danger in Dichotomizing

Danger in Falsely Dichotomizing Research Methods

The notion of “appropriateness,” as applied to social and behavioral research methods, refers to the most suitable research approach associated with different points across the broad spectrum of methodologic strategies. Just as it is inappropriate to distinguish high from low interventions, so is it also inappropriate to falsely dichotomize research methods as:

- Quantitative vs. qualitative;
- Hard vs. soft;
- Deductive vs. inductive; or
- Objective vs. subjective.

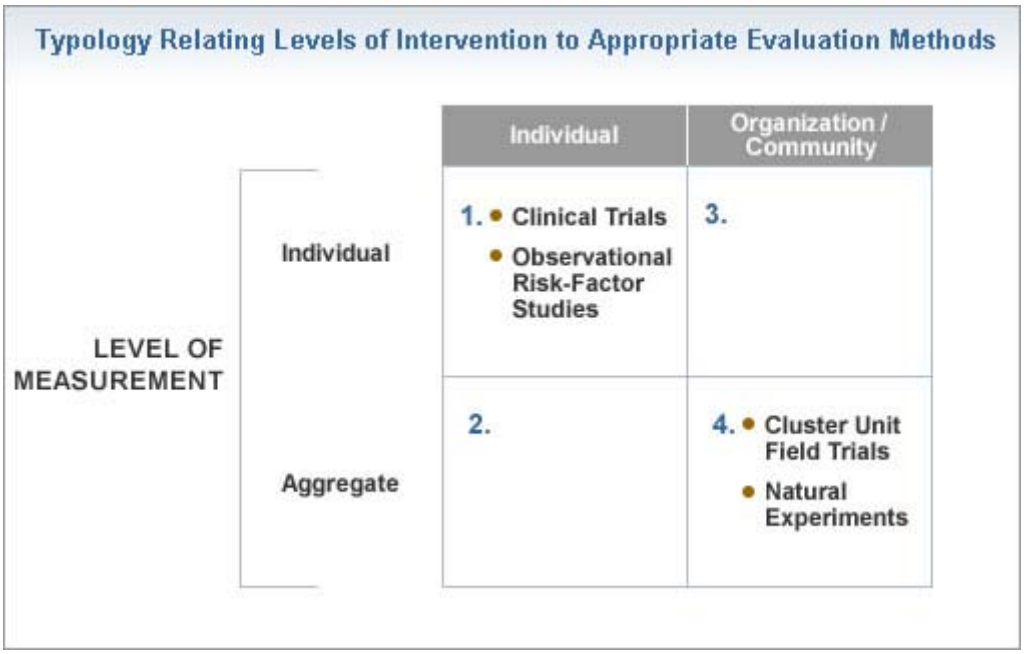
The utility of a particular methodologic approach is, in large part, a function of the load you're asking it to carry and to whom it's being delivered. The appropriateness of any research methodology depends on the phenomenon under study: its magnitude, the setting, the current state of theory and knowledge, the availability of valid measurement tools, and the proposed uses of the information to be gathered. So the appropriateness of any research method is determined not by some abstract norm or idealized Popperian conception of science, but by:

- The nature of the problem under consideration;
- The community resources and skills available; and
- The prevailing norms and values at the national, regional, or local level.

Acceptance of the notion of "appropriate methodologies" requires adaptation and refinement of traditional quantitative research methods in order for these methods (such as social surveys and conventional experimental designs) to remain applicable to the emerging approach to population health. Moreover, well-designed and carefully conducted qualitative studies, including ethnographic interviewing, participant observation, conversation or narrative analysis, case studies, and focus group activities, are now required not only to complement quantitative approaches, but also to fill explanatory gaps where quantitative techniques are suboptimal or even inappropriate.

One problem is that quantitative and qualitative methods are viewed by their more rigid adherents as fundamentally incompatible rather than as mutually enriching partners in a common enterprise. Many quantitative social scientists view qualitative approaches as inductive, subjective, unreliable, and "soft." These advocates of quantitative methods constitute the dominant force in behavioral and social science research (and control the purse strings). Likewise, researchers employing qualitative methodologies see quantitative researchers as positivistic, mindless data dredgers who suffer from hardening of the categories.

Figure 2



8. The Essentials

Essentials of Methodological Approaches

This digital anthology discusses ways to improve both the quantitative and the qualitative approaches to behavioral and social science research. Whereas natural scientists (such as physiologists or chemists) and clinicians measure with varying degrees of precision seemingly more tangible phenomena (e.g. blood pressure, urodynamic flow rates, or cholesterol levels) social and behavioral scientists have a more difficult task---to capture phenomena which are intrinsically elusory (some philosophers would term these "incorporeal"). They may include the measurement of largely emotional states, like anxiety, depression, quality of life, happiness, and grief.

Measuring these is akin to measuring clouds---we can observe them and know that they can have important consequences. How to actually operationalize and measure these elusory phenomena is discussed by **Keith Widaman** (Professor, University of California, Davis) in the Psychosocial Variables* chapter. **Note: this chapter is still in development and will be available soon.*

In the chapter on Sample Surveys **Sarah Nusser** (Director of Survey Research at Iowa State University) discusses the key ingredients of a well designed and rigorously conducted social survey. Survey research is the bread and butter of much social science, but much of this work falls far behind minimal standards required for quality science. To take a few examples: the training and monitoring of field interviewers is vitally important to the production of valid and reliable research results. Indeed, interviewer variability, especially when gathering social and behavioral data, is clearly the Achilles heel of much survey research: variability in measured outcomes may be a function of variability between the data gatherers.

Based on extensive field experience with national surveys in the UK, **Steve Woodland** (Office for National Statistics, UK) discusses the "dos and don'ts" of interviewer training and some well-tested techniques that are likely to yield quality data in the chapter Social Survey Data Collection. This is a deliberately practical contribution because the devil besetting much social and behavioral research often lies in the practical details of implementation. It is sometimes possible to address emerging issues in health care not by collecting new studies, but by using and creatively integrating existing data sets (often collected for other purposes). In the

Administrative Data Systems chapter **Vince Mor** (Chair, Department of Community Health and Professor of Medical Research at Brown University) discusses and illustrates the potential (and limitations) of existing data for health care research.

9. From Description to Explanation

With respect to qualitative approaches, **David Silverman** (Professor, University of London) provides an overview of the range and potential of different methods and the unique answers they can provide in the chapter Qualitative Methods. The considerable potential of ethnomethodologic approaches, including conversation analysis, are addressed by **John Heritage**, (Professor of Sociology, University of California, Los Angeles) in the Conversation Analysis chapter. This promising approach is a relatively new development with deep origins in the social sciences, and permits researchers to move from simple description ("how" questions) to explanation ("why" questions). It is one thing to gather exquisitely detailed and precious qualitative data, but it is another thing entirely to analyze it in a way that satisfies the most rudimentary canons of science-- like falsifiability and replication. Researchers opting for appropriate qualitative approaches do not necessarily discard essential scientific requirements usually associated with quantitative approaches.

Eben Weitzman (Associate Professor, University of Massachusetts, Boston) discusses the ways in which new computer software can assist with the analysis of what can sometimes appear as mountains of qualitative data. Emphasis is given to their potential to assist the qualitative researchers--- but to believe one can simply press a button for an answer evidences shallow understanding of the complexities of the analytic task confronting qualitative researchers. It is common for behavioral and social science researchers to want to compare and contrast phenomena between different countries or cultures, or differences between socio-cultural groups within a country. One cannot assume that an instrument developed and validated in one cultural setting can be used in other cultural contexts. Ensuring both conceptual and cultural equivalence is an issue which will be addressed in Chapter 15.

10. Understanding What Works

Quite often, egregious methodologic errors result from confusing an upstream unit of random assignment (such as a community or school) with a downstream unit of analysis (such as an individual student).

Generally speaking, quantitative methods tend to be employed exclusively to measure outcomes of downstream interventions, where individuals are the unit of analysis. These individual-level experiments could almost certainly benefit from judicious integration of appropriate qualitative methods (e.g., focus groups to optimize the intervention). As one moves upstream, the utility of quantitative methods becomes problematic, not because they are intrinsically defective or flawed, but because the phenomena to which they are applied (the units of investigation) are of a ***qualitatively different*** type. This is demonstrated by the typology presented in Figure 2. Rigorous experimental control and manipulation are not always possible at the level of sociopolitical intervention, especially when change is unexpected or unplanned. Thus, different design approaches, measurements, and data collection techniques must be employed.

When an intervention program is applied to an aggregate unit (community, school, worksite) and the analysis is based on individual level observations, the residual error is deflated by intracluster correlation and leads to overstatement of the statistical significance, not to mention the more important problem of measuring the wrong outcome. Downstream approaches to assess the effectiveness of interventions for individuals (usually patients) required the randomization of individuals. Individual-level randomized controlled trials (RCTs) remain the principal means to determine the effectiveness and safety of therapeutic interventions and they are discussed in Clinical Trials by **Duolao Wang** (Senior Lecturer in Medical Statistics, London School of Hygiene and Tropical medicine and **Ameet Bakhai** (consultant cardiologist and physician at Barnet General & Royal Free Hospitals, London, UK).

Moving upstream to organizations (like schools and factories) or to neighborhoods or communities requires cluster or group randomized trials, where social entities are randomly assigned to receive or not receive some intervention. The challenges and potential of these

cluster trials are discussed in the chapter Cluster Unit Randomized Trials by **Allan Donner** (Professor, University of Western Ontario). Renewed conceptual clarity on different levels of analysis (individual biophysiologic processes, life style influences, environmental factors and the role of geographic location (and the different interventions required at these different levels) has ushered in renewed interest in multi-level modeling and this is described by **Dr. SV Subramanian** (Professor, Harvard School of Public Health) in the Multilevel Modeling chapter.

11. Finding Harmony

Finding Methodological Harmony

Diverse methods can obviously complement and enrich each other, leading to better understanding and appreciation of the social and behavioral phenomena under investigation (Strange and Zyzanski, 1989). As discussed previously, the use of qualitative methods can provide insight into the meaning of quantitative findings at both the individual and system level.

While quantitative techniques can elucidate statistical significance, qualitative methods can reveal substantive significance. Similarly, quantitative methods can be used to improve the generalizability and inferential strength of findings from qualitative approaches.

Some years ago New England Research Institutes conducted a traditional ethnographic study as an essential early component of a larger AIDS community intervention experiment (Smith et al., 1993). This study employed purposive sampling schemes, stratified in various ways to ensure the development of a picture of the whole community and to guard against the danger that the ethnographer would end up with informants who, while conveniently available, did not represent all groups of interest. Incidentally, this ethnography was not an afterthought, but actually served as the source of specific components of the subsequent intervention. In other words, it was the very foundation for the entire two-community experiment and informed the content of the pre- and -post-intervention surveys. The intervention that resulted from this ethnography proved to be the most effective field trial we ever conducted.

As applied to the area of health, behavioral and social science research needs to move from the level of de-contextualized individuals and rediscover the level of the social system (whole population approaches to health). Although tried and true quantitative methods generally work when the focus is limited to voluntary lifestyle changes at the individual level, they are not always useful or adaptable when the emphasis shifts to the whole population. Some techniques are misapplied, while others are inherently inappropriate.

The notion of "appropriate methodology" emphasizes the match between the level of intervention and the most suitable evaluation approach, with the choice of approach contingent on the problem, state of knowledge, availability of resources, audience, and so forth. There is no right or wrong methodological approach: appropriateness to the level and purpose must be our central concern.

11. Finding Harmony

Any future reorientation of our efforts upstream, to organizations, communities, and even national policies, obviously requires the development of measurements and indicators appropriate to that level of focus. There has recently been a move towards what are termed "patient-reported outcomes" (PROs), which usually involve considerable qualitative research during early stages in their development.

In contrast to these measurements of individuals (patients with a condition or subjects with particular risk factors) the systemic or upstream interventions represented by the "new" public health must be assessed through the use of systemic outcomes: how have you improved the community, ***independent of individuals and their risky behaviors***.

Donald Patrick (Seattle Quality of Life Group) and **Gordon Guyatt** (physician and Professor of Clinical Epidemiology & Biostatistics at McMaster University in Hamilton, Ontario) address issues in the conceptualization and measurement of outcomes measured at the level of individual patients in the chapter Patient-Reported Outcomes.

In other words the traditional QOLs need to become QOCs (quality of community) or QORGs (quality of organizational environment). The interest is not in whether an individual quits smoking or lowers his or her cholesterol level, but whether there is improvement in the quality of the organizational environment (how many work places are designated no smoking); whether and how many restaurants add heart healthy items to their menus; whether the air quality (measured by C02 concentrations or particulate matter) shows observable improvement.

- What proportion of schools change the way school meals are prepared?
- How many exercise facilities become available and what proportion of the population utilizes them?
- Is there a change in the availability of healthful products in stores (say, low fat milk) and what proportion of space is devoted to them?

- How many different voluntary organizations devote what amounts of time to which healthful activities?
- How often do local leaders devote themselves to health promotion activities in fulfilling public responsibilities?
- What added revenues are generated from the imposition of taxes upon harmful products?
- Is there a reduction in the overall rate of avoidable death?

The list of system outcomes is extensive and the appropriateness of any is largely a function of the problem being addressed. Much work remains to be done by social and behavioral scientists to strengthen research methods appropriate to the emerging upstream approach to the health of populations.

12. Summary

This anthology adopts a selectively ecumenical approach to behavioral and social science research methods. Customary quantitative approaches can be enormous contributions to the still dominant downstream, individualistic approach to health problems. Higher quality social surveys need to be conducted (reliably), interviews completed (accurately), complex behavioral phenomena operationalized (validly), data analyzed appropriately (multi-level modeling), etc. All of these and many other issues are addressed in this collection.

Social and behavioral sciences should be involved in randomized trials (whether individual or group) and outcomes appropriate to the level of analysis must be conceptualized and then measured. Complementing these quantitative approaches are a range of equally valuable qualitative techniques, which offer great potential and which also have deep origins in the social sciences. The emergence of these qualitative methods is, in many respects, a back to the future approach to emerging health issues. The central organizing theme for this collection is the notion of appropriateness. We employ this notion to avoid the distinction between hard and soft, quantitative or qualitative, stronger and weaker methods.

Appropriate or inappropriate to the level of analysis (and intervention)? That is the question.

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14. Author Biography

John McKinlay, PhD is co-owner of New England Research Institutes, an internationally respected, independent research organization, known for scientific excellence and integrity.

Following John McKinlay's distinguished career at Boston University (where he simultaneously held professorships in Medicine, Epidemiology and Biostatistics and Sociology) and a continuing 30-year association with Harvard Medical School, Dr. McKinlay became Founding Director of NERI, Senior Vice President and Chief Scientist, and Director of NERI's Community Health Studies Research. In addition to his administrative functions at NERI, Dr. McKinlay maintains an extensive portfolio of research in community-based epidemiology, male endocrinology, clinical decision-making, health disparities, and healthy public policy.