
National Research Agenda for Prevention Research

The National Institute of Mental Health Report

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This article reports some of the most promising ideas to emerge from a review conducted by the National Institute of Mental Health of the achievements and prospects for research on the prevention of mental disorders. These ideas are organized around 3 conceptual hubs: the development and transformation of biological and social risk and protective factors across the life span, classifying and relating various approaches to preventive interventions in a single logical system, and concepts about community contexts in which prevention trials are executed. These conceptual hubs clarify the relationship between 3 forms of research in prevention: longitudinal studies of risk, randomized preventive intervention trials, and the implementation of successful interventions as part of routine community practice.

The National Institute of Mental Health (NIMH) review of prevention research was an intensely collaborative, consensus process extending from 1990 to 1994, requested by NIMH Director Lewis Judd. It involved three national meetings of scientists, advocates, and consumers of prevention research, mostly public health officials, and the continuous work of five panels. It culminated in a written report, *The Prevention of Mental Disorders: A National Research Agenda* (NIMH, 1994), and a presentation of the recommendations of that report, combined with those from the Institute of Medicine (IOM) report (Mrazek & Haggerty, 1994) to the National Advisory Mental Health Council of NIMH, which enthusiastically adopted the report on May 15, 1995, and voted to act on many of its recommendations. However, reports and council actions are famous for their rapid obscurity. What buoys a scientific field is the enthusiastic conviction of its practitioners and its consumers that it is on to something.

Often, at the beginning of a new field, investigators work in relative isolation and obscurity, overawed by the difficulties they face and sustained as much by grit as by justifiable visions of what might soon be discovered. Today, there is a cohering field of prevention science. The intensive collaborative and consensus process allowed a

sustained examination of what the best research in prevention science is now yielding. More important, it allowed experienced and junior professionals who participated in the review to recognize compelling themes that unite many successful efforts as well as motivate newly developing programs of research. This article delineates these themes; they are summarized in Table 1, which also shows the relationship between these groupings of concepts and ideas to the specific types and designs of studies relevant to successful prevention of mental disorders. The NIMH (1995) report noted that risk studies, controlled trials, and implementation efforts form an ordered sequence of efforts in the field, which can be called the preventive intervention research cycle. The IOM followed this lead and devoted a chapter to these principles of sequencing of research (Muñoz, Mrazek, & Haggerty, 1996, this issue).

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David Reiss and Richard H. Price are the past and the current chair of the National Institute of Mental Health (NIMH) Prevention Steering Committee, respectively. This article is drawn from the work of that committee and the many colleagues in the scientific, advocacy, and practitioner communities who helped prepare its report to the director of NIMH. We explicitly acknowledge other members of the steering committee: Leila Beckwith, Beverly Long, Sheppard Kellam, John Reid, and Sandra Scarr. We also acknowledge the contributions of the panels and their chairs, who worked for almost three years on the completion of the NIMH report. Chairs are as follows: Panel on Risk Factors, John Coie; Panel on Prevention Strategies, Kathryn Barnard; Panel on Community Context, JeanAnn Linney; Panel on Training, Irwin Sandler; and Panel on Persons and Biosocial Models, Robert Cairns. Although we have made every effort to accurately reflect the conclusions of this extensive review process, the views are our own and do not necessarily reflect the policies of NIMH or the views of colleagues who participated in the NIMH review process.

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Table 1
Conceptual Hubs for Prevention Research

Conceptual hub	Salient concepts	Examples of relevant data	Role in the prevention/intervention cycle
Life span development			
Theories of etiology	Risk and protective factors Risk and protective mechanisms 1. Person-environment correlations 2. Person-environment fit	Person and environment risk and protective factors from developmental studies across the life span 1. Environmental mediation of individual differences 2. Environmental modification of individual differences	Selecting specific risk or protective factors as proximal or distal outcomes of interventions
Malleability and sustained change			
Classifying and relating strategies for preventive intervention	Broad aim 1. Prevention of disorder 2. Reduction of risk 3. Mental health promotion	1. Specific pathways of pathogenesis 2. Identification of common risk factors 3. Conceptualization and assessment of resilience	Selecting the procedures of intervention 1. Timing of intervention 2. Extensive (in universal interventions) vs. intensive (selective or indicated) interventions 3. Follow-up and multiple interventions
	General strategies 1. Developmental timing 2. Focus 3. Ordering	1. Windows of opportunity 2. Identification of risk vs. cost of intervention 3. Distinguishing responders from nonresponders	
Community-based research and partnership			
Tailoring, implementing, and sustaining prevention practice	Defining communities Boundaries and contrasts Exploring communities Defining high-risk samples Entering communities Objectives and interventions Remaining in communities The scientist-community fit	Indexes of community stability and resilience; ethnographic studies and social histories Adaptive requirements and individual differences in adaptive fit Evidence of leadership, social networks, and response to innovation in community life Partnerships with community leadership	Precise definition of sample 1. Tailoring interventions to community perceptions, values, and standards 2. Developing a sustainable alliance with organization and community life 1. Assessing effectiveness of interventions and 2. implementing their routine adoption

Malleable Risk and Protective Factors

It is essential for its success that prevention science enjoys a lively intellectual commerce with a broad range of biological and social sciences. If prevention science can lay claim to one central idea, it is that of malleable risk and protective factors. Risk and protective factors refer to those characteristics of persons and their environments that influence their chances of developing a serious mental disorder. The concept of malleable risk and protection is the lens through which prevention scientists look at development across the life span. Indeed, as is shown in Table 1, developmental research on risk and protective factors provides highly specific outcome variables for in-

tervention research. Some preventive trials have as their primary aim the reduction of risk factors or the enhancement of protective factors. In this case, specific risks are the distal outcomes of the study. Other prevention trials are aimed at reducing the incidence of definable mental disorders; in those cases, risk is a proximal outcome and its reduction should mediate the impact of an intervention on the pathogenesis of mental disorder.

The NIMH (1995) review concluded that good developmental research is yielding a clear picture of the relationships between risk and protective factors, on the one hand, and the pathogenesis of mental disorder, on the other. First, for many mental disorders several risk factors are necessary. For example, important risk factors

for drug abuse include genetic factors, parenting and other family processes, peer influences, school experiences, and community characteristics. In addition, drug abuse is often a secondary disorder arising from more primary conditions such as anxiety disorders.

Second, the greater the number of risk factors to which an individual is exposed, the greater the likelihood of developing a serious mental disorder. Some data suggest that this relationship may be exponential for many childhood psychiatric disorders.

Third, some risk factors can be identified as both general and serious; they have a high likelihood of leading to a number of different disorders. For example, marital discord appears related to conduct disorder in children as well as to depression among adult women. Likewise, attention deficits in early childhood predispose the child toward poor school performance, which, in turn, can lead to both serious conduct problems and affective disorders.

The NIMH (1995) review also noted research on factors that protect individuals against the development of mental disorders. These may include individual factors such as positive temperament. Of particular interest are perceived self-efficacy and coping skills that can be effectively taught and that have been targets in the design of successful prevention trials. Likewise, environmental factors may serve as protective factors. Examples include warm, supportive, and intellectually challenging families and well-organized schools that take pride in their pupils' achievements and fit teachers' expectancies to the abilities of the children. Again, these are all modifiable factors, and some have been targets of prevention trials.

However, the NIMH (1995) report concluded that it is important to distinguish between risk and protective factors and risk and protective mechanisms. Risk factors are those characteristics of the person or environment that invariably precede the onset of diagnosable mental illness. However, it is essential to understand the specific mechanisms by which risk factors lead to mental disorders. In many cases these mechanisms involve an intricate sequence of events, including characteristics of the person, the environment, and the interaction processes between the two.

Biological Risk and Protective Factors

The NIMH (1995) report gave considerable emphasis to biological risk factors. The review of these factors provided an opportunity to illustrate two forms of relationships between attributes of the person and attributes of the environment and how they fit together in a specific risk mechanism.

The first form of relationship is correlation between person and environmental factors that develop over time. Individuals are not randomly distributed across environments. Their personal characteristics, many of them based in biological factors, increase the probability that they will be found in certain environments. Behavioral genetics research has shown that many of the personal characteristics are heritable and has provided two explanations concerning their association with environmental char-

acteristics. First, children's and parents' characteristics may be associated because they share exactly 50% of their genes. This appears to explain, for example, why intelligent children are usually found in homes with bright, intellectually active parents. A second mechanism is that heritable characteristics in children may elicit environmental responses: Irritable children who are difficult to soothe can elicit equally irritable behavior from their parents and other caretakers. A cycle of conflict and coercion may develop that leads to serious childhood problems later on. The irritable cycle then mediates between a child risk factor and the ultimate development of a psychiatric disorder. However, if parents are trained to carefully monitor their children's temperament and respond differently to their child, then successful prevention of subsequent childhood disorder may be successful.

A second type of risk mechanism is person-environment interaction. Here, a personal risk factor is modified, up or down, by a salient environmental factors. For example, early menarche is a risk factor for several adolescent problems in young girls. In part, this appears mediated by early sexual behavior, which, in turn, leads to a broad range of problems of self-control. The rise in adrenal androgens during menarche is clearly another important mediating link. However, if the female peers of an early maturing girl do not themselves participate in or condone early sexual activity, the early maturing girl herself does not engage in it, despite her rising androgens; these positive peer relationships moderate or interact with biological risk factors to reduce the risk of subsequent psychiatric disorder.

A clear understanding of risk mechanisms leads to highly specific targets for preventive intervention. For example, drawing on the example above, effective parent training interventions are available to reduce counterattacks and coercive responses by parents to irritable and challenging children, and an increasing number of preventive interventions are aimed at enhancing positive peer relationships.

Malleability and Sustained Change

A critical ingredient of advances in prevention research has been identifying the principles by which planned procedures can change both persons and environments. Some of these principles are specific to particular targets for intervention. For example, principles for changing marital relationships are distinct, to a large extent, from principles for improving the coping capacities of children of divorced parents. However, the NIMH (1995) review noted certain broad principles relating to changing persons and environments; these principles provide an essential framework for research aimed at enhancing the efficacy of prevention trials. These principles fall into three broad areas: the selection of the broad aim of the intervention effort, the use of particular strategies, and the understanding of the influence of cultural and community contexts on preventive intervention trials.

Broad Aims

The NIMH (1995) review concluded that there is no justification for the dispute among those who advocate prevention interventions aimed at a substantial reduction of the incidence of mental disorders, those aimed at reduction of more general risk factors, and those aimed at promoting mental health. Each of these aims has an important place in prevention science, but the intervention procedures that flow from each of these aims are quite different.

When the aim is prevention of classifiable mental disorder, three broad approaches are now recognized as fruitful. First, as mentioned above, is research aimed at reducing risk and enhancing protective factors. When the aim is the reduction of the incidence of disorder, these factors are regarded as proximal objectives. A second strategy is to identify preclinical cases and prevent the development of full-blown disorder. Although this strategy has been tried in some cases, notably in schizophrenia, it is still hobbled by gaps in our knowledge of the prodromes of major mental disorders. Thus, a more secure strategy is currently being explored that has been dubbed the primary prevention of secondary disorders (Kessler & Price, 1993). This strategy is built on rapidly accumulating data on the comorbidity of mental disorders. Of particular interest are patterns of comorbidity in which one disorder is found to regularly precede the development of a second disorder. Thus, an important focus of prevention is to work with persons with the primary disorder to prevent the development of the secondary disorder.

The NIMH (1995) report recognized, as did the IOM review, the importance of research on the promotion of mental health, particularly the adaptive fit between persons and the challenges of their environments. This approach is developing with varying definitions and assessment of positive mental health. In addition, ideas for such definitions can come from unexpected quarters. For example, researchers on primates (Novak & Suomi, 1988) have made important contributions to the tasks of definition and assessment.

General Strategies for Prevention Research

As noted, specific targets for preventive intervention may require their own empirically based theory of intervention. However, the NIMH (1995) review noted approaches to strategy that cut across many prevention projects. Moreover, these strategies fell under two conceptual rubrics. The first concerned the link between knowledge of development and the timing of an intervention or window of opportunity. Interventions must occur only when a risk factor becomes manifest, but not after that risk factor has had an indelible impact on the development of psychopathology. The second rubric was focus. This reflected the increasing awareness that there is an important place in prevention for attempts to reduce risk factors in entire populations, very much as fluoride is introduced into the drinking water for entire populations. These, as the IOM noted in its report (Muñoz et al., 1996), are now termed

universal interventions. There are now equally clear indications for more targeted interventions that are attempted only for certain individuals who are at heightened risk for disorder. Indeed universal and targeted interventions can be linked conceptually as part of the preventive intervention research cycle.

Developmental Timing and Transitions

The NIMH (1995) report noted the importance of two developmental principles here. The first concerned the time in development when certain risk factors are most important. The development of conduct disorders is a case in point. In many cultures, by the time children reach the age of 12, membership in misbehaving peer groups becomes a crucial influence on the development of their own aggressive behavior. Thus, interventions aimed at altering peer relationships are not effective until this developmental period is reached. Earlier in development, parental monitoring, limit setting, and firm but not coercive control are critical protective factors. Enhancing those factors is an important aim for younger children at risk. Although parent training may continue to be an important ingredient after age 12, it must be combined with interventions aimed at peer relationships.

A second important developmental concept is that of transitions. During development, individuals and groups have periods of relative quiescence followed by periods of rapid change and adjustment. For example, when a couple has their first child there are many changes—changes in attitudes and feelings within each spouse; changes in the patterns of their interaction with one another and in their relationships with the new member in their household; and changes in their relationships with, for example, grandparents, health care agencies, and places of employment. Marital discord at this critical juncture is predictive of childhood psychological problems when the children approach school age; moreover, because so much is in flux, this is a propitious time to intervene to improve marital quality and prevent these disorders.

In adulthood, life transitions can be triggered for both individuals and families by negative life events, such as involuntary job loss. These transitions often produce a cascade of crisis and economic hardships that increase stress and erode family relationships. Without help, a portion of especially vulnerable job losers will fall into helplessness and depression; however, for those who are helped to negotiate the transition to reemployment, there is an increased sense of mastery, fewer episodes of depression, and economic benefits that far outweigh the cost of the help.

Focus

In the prevention of physical illness, universal prevention strategies have been carefully explored. For example, the Stanford Three-City Study and the follow-up Five-City Study (Farquhar et al., 1990) effectively used intensive media campaigns aimed at cardiovascular risk factors. Comparable strategies, also using public community in-

stitutions, have been used to reduce risk for mental disorders. For example, in Baltimore, first-grade classrooms provide an opportunity both to build academic mastery through sophisticated changes in curriculum and teaching methods and to reduce aggressive behavior through sustained use of cooperative activities. These universal interventions are possible when they are relatively inexpensive, acceptable to the communities in which they take place, and likely to reach and influence those at risk (Kellam & Rebok, 1992).

The alternate strategy, targeting interventions at persons who are at risk for mental disorders, has also been explored for both physical and mental health. The crucial advance is to recognize the links between this strategy and the universal strategy. In the Stanford heart studies, persons at high risk for heart disorder were recruited for more intensive face-to-face health training. Likewise, in the Baltimore study, children with attention difficulties were recruited for more intensive interventions. Indeed, the NIMH (1995) report noted that failure to respond to a universal intervention might itself be an important indication for including individuals in more intense, targeted interventions.

Community and Preventive Intervention: Exploration, Defining Risk, and Partnership

The NIMH (1995) report gave special emphasis to an important confluence of ideas, those drawn from epidemiology and those drawn from community studies. Although epidemiology is often associated with precise sampling methods and careful enumeration of the cases of disorder, its core contribution to prevention is its emphasis on the adaptive fit between persons and their environments. Conceptually, epidemiology attempts to characterize the challenges facing individuals and their success or failure in meeting those challenges. Along parallel lines, direct studies of human residential communities are clarifying more precisely what those challenges are and what capacities of individuals maximize their adaptation to those challenges. For example, there are important differences among teenagers living in violent and dangerous communities. Some teenagers may lack skills or the support for leaving these communities and entering and drawing on safer and more supportive communities. Other teenagers can escape from their own communities but lack support or skills to reenter them. Teenagers who do best, developmentally, are those who can traverse community boundaries in both directions: leave when they need to but also return and socially reintegrate with their home communities when they need to.

Community as an Arena for Prevention

The NIMH (1995) report noted the growing importance of careful community studies. First, the characteristics of communities may determine the trajectories of development and the timing of critical developmental transitions. Thus, generalizations from preventive trials are

most secure when they are applied to communities similar to those in which they have first been implemented. Second, variations within and across communities may influence the prevalence of mental disorders and the major risk factors for disorder. For example, community economic conditions influence the rates of hospitalization for mental disorder as well as risks for suicide. Third, community dynamics are likely to influence the acceptability of any form of professionally based preventive interventions as well as the acceptability of specific intervention strategies. Finally, characteristics of the community will influence whether efficacious interventions are effectively retained as part of ordinary community routines.

Defining and Exploring Communities

The NIMH (1995) report strongly argued for pre-intervention research aimed at understanding community dynamics. Not only the prevalence of mental disorders but also individual responses to preventive programs can vary as a function of community characteristics. The report noted that new scientific evidence clarifies the importance of community studies for a more complete understudying of the adaptive significance of both biological and social risk factors. Although some differences among communities (e.g., ethnic and language differences, incomes, arrest rates, availability of services, and educational opportunities) are routinely studied, alternative measurement approaches that draw from multiple disciplinary traditions offer considerable promise. For example, the NIMH report strongly endorsed more rigorous studies of community life, including ethnographic studies. Although these community studies were an important component of the NIMH portfolio in the 1960s and early 1970s, they have clearly been dropped because their importance is not appreciated, as that portfolio has become dominated by quantitative behavioral science and neuroscience investigation.

Entering Communities for Preventive Trials

Prevention research begins and ends in communities. All phases of the prevention research cycle involve research in host communities, moving from epidemiological and developmental research on risk and protective factors through design and initial testing to large-scale prevention field trials and, ultimately, to disseminating research results in the community.

Drawing on existing strengths in communities is critical to this research agenda. The NIMH Committee on Prevention Research (1995) reported that prevention research must be especially sensitive to the relationship between cultural and community characteristics, on the one hand, and risk and protective factors, on the other. For example, in developing preventive interventions in ethnic communities, special attention needs to be paid to kinship and friendship networks that often provide crucial support (Vega, 1992). Prevention trials need to integrate epidemiological and development studies of ethnic minorities, the impact of their cultures, and the

impact of these influences across their life span in communities in which minorities live.

Mental health risks occur in clusters in communities, and preventive intervention strategies must recognize and take account of this critical fact. The NIMH (1995) report was particularly concerned that preventive intervention research be undertaken with culturally diverse populations and that it should take account of multiple risk factors in the community. Many promising prevention programs now under development involve targeting multiple risk factors as they occur in configurations (e.g., poverty, job loss, discrimination, caregiver burden, medical problems, divorce, lack of social support, school failure, and family conflict). These programs provide an important base for more rigorous research trials with larger and more diverse samples.

The NIMH (1995) report also strongly recommended increased support for the development of prevention research methods. In particular, it was concerned with the development of new scientific methods in the design and implementation of preventive trials. Each preventive trial not only tests the efficacy of an intervention strategy but also can be a test of the theoretical models on which it is based. Preventive trials can further our understanding of how interventions alter environments, mediating mechanisms and the incidence of disorder in targeted populations.

Remaining in Communities

Too often, research in communities has lasted only as long as was necessary to collect the data. If prevention research is to have a lasting impact, it must learn how to establish long-term partnerships with host communities. The Committee suggested that prevention researchers should form partnerships with community leaders and negotiate effective and lasting alliances. Successful preventive programs are maintained in communities because they are psychologically owned and supported by their members. Establishing and maintaining lasting partnerships with communities is, in itself, a topic for systematic research that deserves support. Community alliances are essential to understanding the process of successful adoption of innovative preventive programs in community settings.

Strengthening Training and the NIMH Organization

The NIMH Committee felt that prevention research training is a keystone for future scientific development in the field and recommended increases in prevention research training grants, career awards, research consortia, and minority fellowships. Furthermore, increased training support should be available for midcareer and postdoctoral as well as predoctoral researchers. The future of the field depends heavily on high-quality scientific training, not only for new predoctoral and postdoctoral students but also for midcareer scientists, whose already developed expertise can play a role in the development of prevention

science. There are not nearly enough ethnic minority research investigators actively engaged in prevention research. The NIMH (1995) report recognized the underrepresentation of ethnic minority researchers and urged considerable investment of resources to train minority scholars.

Organization

Finally, the report (NIMH, 1995) strongly urged the strengthening of the NIMH infrastructure for support and, in particular, the Office of Prevention as a coordinating and convening structure within NIMH. Other critical structures including a group of NIMH scientists working with scientists in the field would greatly strengthen the prevention research agenda. There is also a government-wide leadership role for the NIMH in prevention research that should be pursued.

Implications for Psychologists

Earlier, we argued that it is essential that the field of prevention enjoys a lively intellectual commerce with a broad range of disciplinary specialties. This is true within the field of psychology as well. Many subfields of psychology can contribute in vital ways to the development of prevention science, including clinical, community, developmental, social, organizational, and health psychology, as can other specialties within the broad field of psychology. Each specialty has unique perspectives and scientific skills to bring to the prevention enterprise.

The prevention field also offers opportunities both to the science and the practitioner communities within psychology. For the practitioners' community, successful prevention programs offer the promise of new preventive services to add to the array of services that practitioners can offer in partnership with communities (Price et al., 1988). For psychologists whose primary commitment is to research, preventive trials offer the possibility of new insights into developmental processes, causal mechanisms, and the role of social and community context in shaping life trajectories and well-being.

Psychological research itself has to learn to traverse community boundaries from risky-but-promising to safe areas and back to the riskier ones. The NIMH (1995) report concluded that prevention science offers one of the most promising strategies for this larger aim. It links three important neighborhood regions: the best in the science of human development, the most effective approaches in the science of intervention, and the most illuminative studies of the adaptive challenges required for successful functioning in human communities.

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