For Violence Prevention

BOOK SEVEN
Prenatal and Infancy Home Visitation by Nurses

Blueprints for Violence Prevention

PRENATAL AND INFANCY HOME VISITATION BY NURSES

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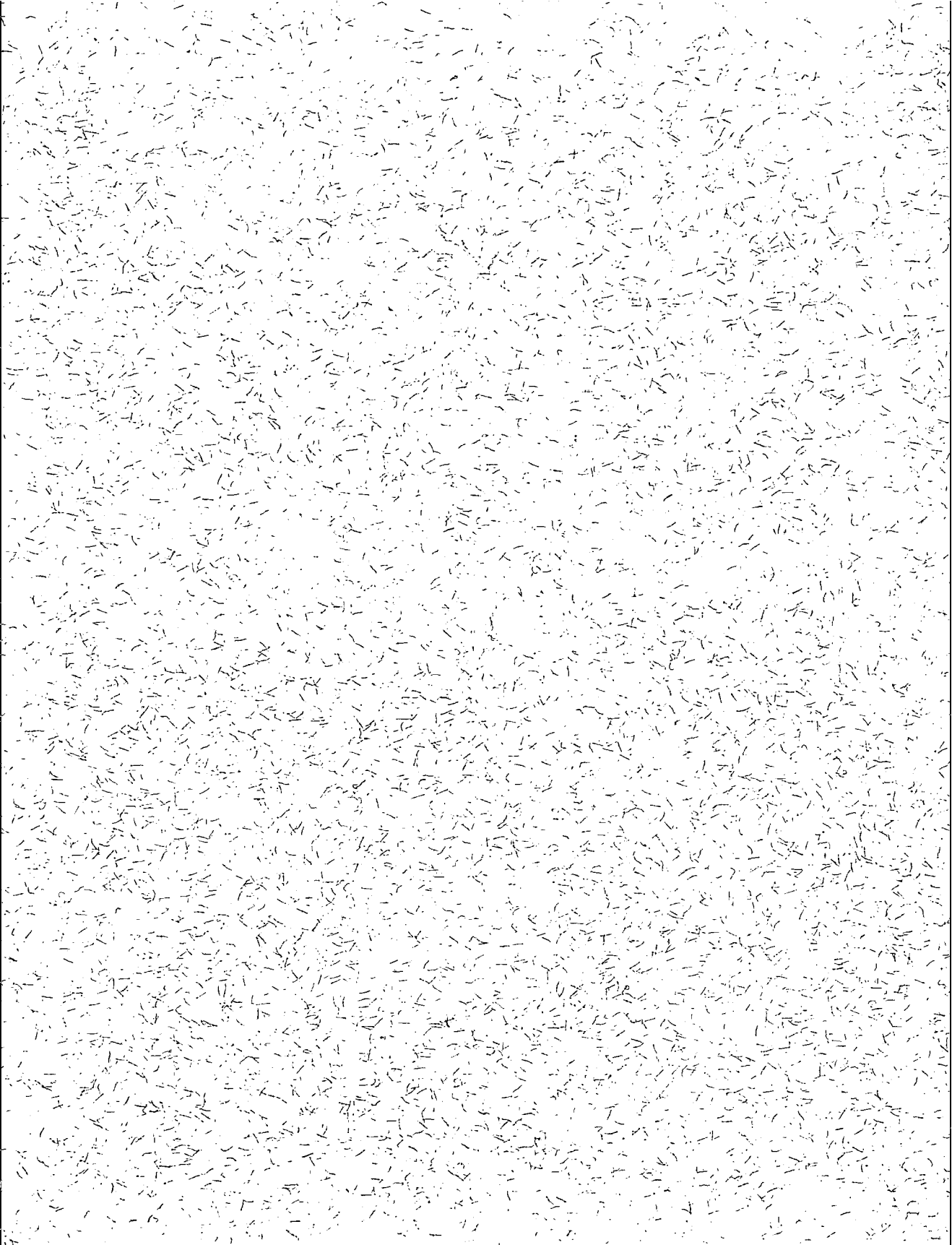

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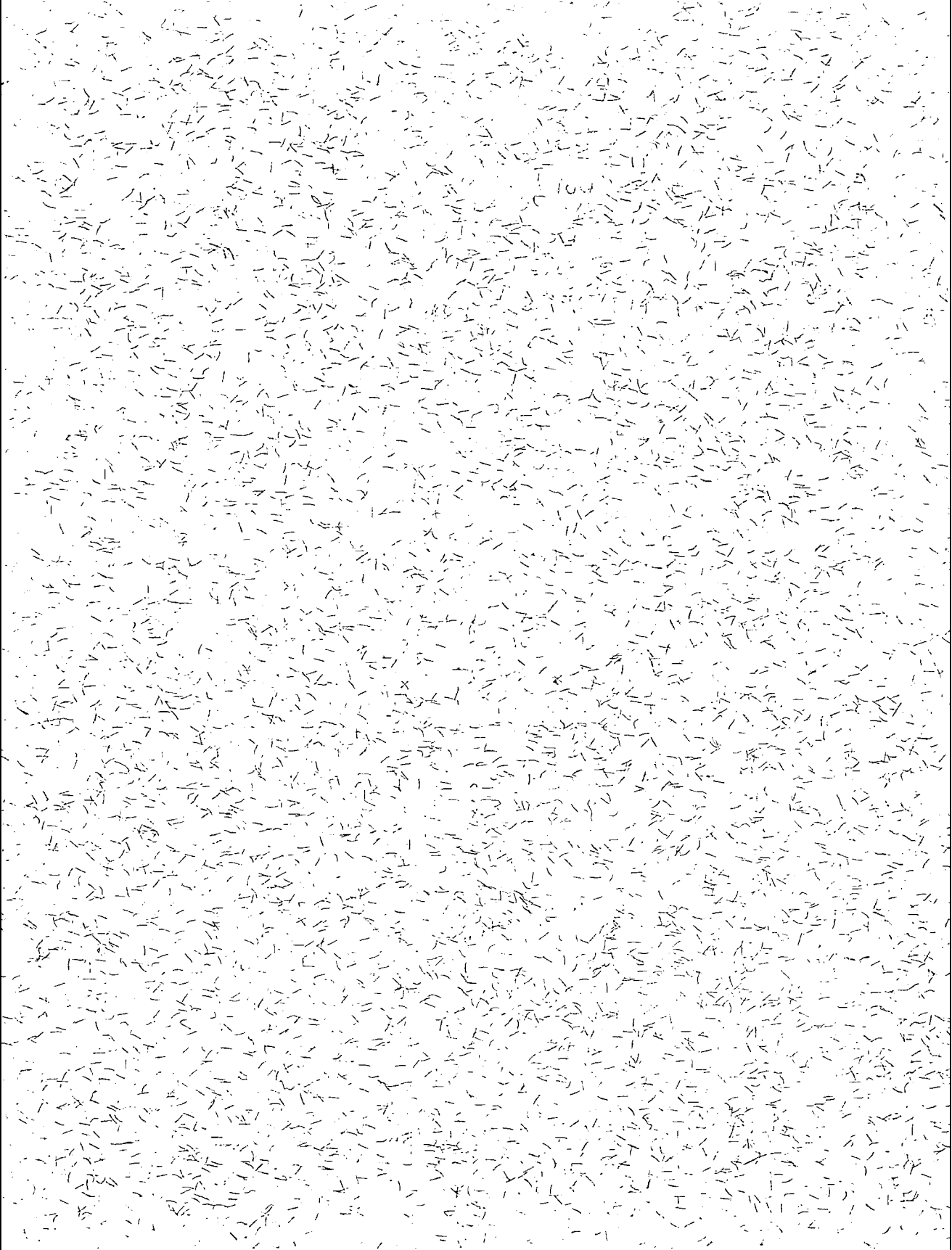

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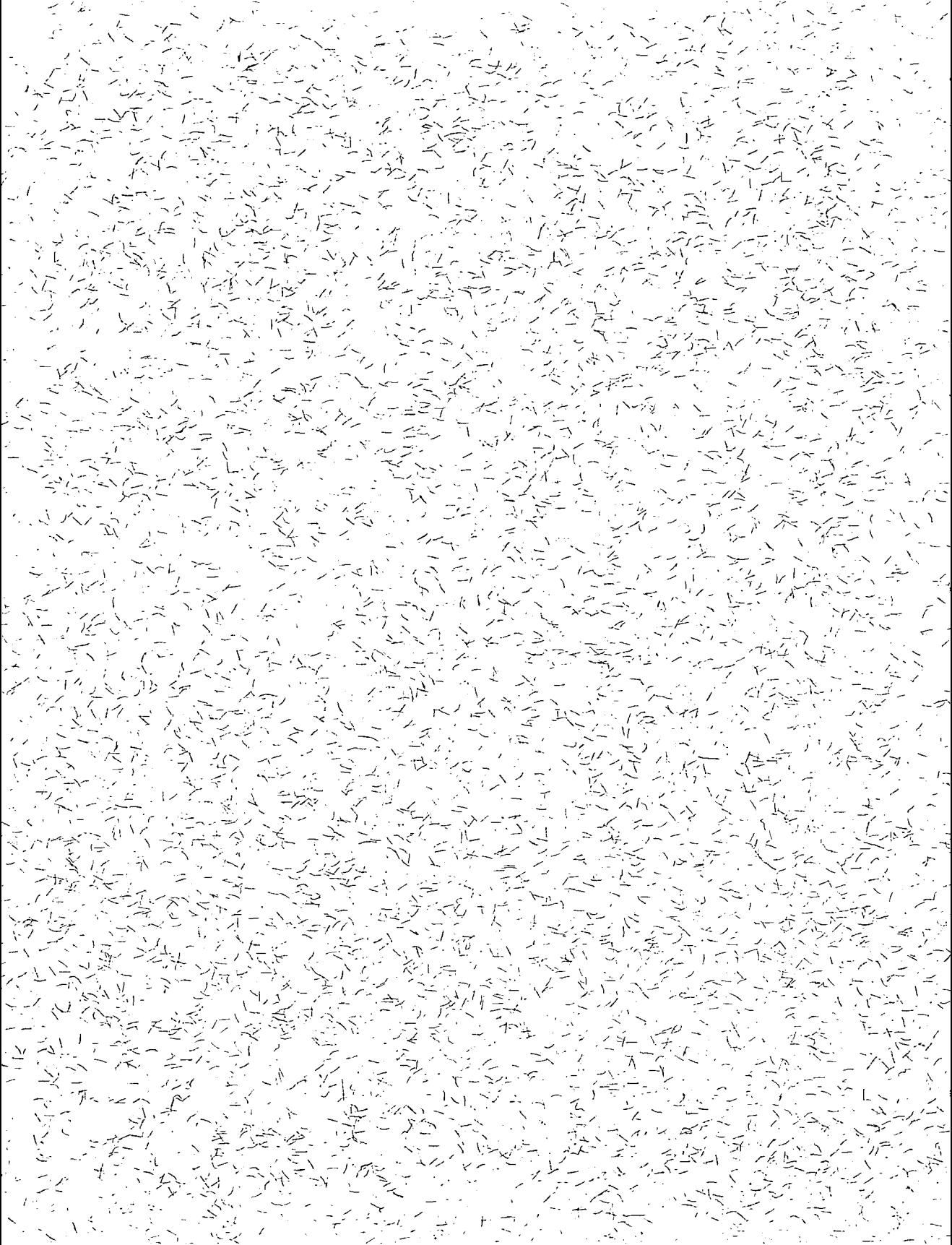


EDITOR'S INTRODUCTION

Introduction

The demand for effective violence and crime prevention programs has never been greater. As our communities struggle to deal with the violence epidemic of the 1990s in which we have seen the juvenile homicide rate double and arrests for serious violent crimes increase 50 percent between 1984 and 1994,[1] the search for some effective ways to prevent this carnage and self-destructiveness has become a top national priority. To date, most of the resources committed to the prevention and control of youth violence, at both the national and local levels, has been invested in untested programs based on questionable assumptions and delivered with little consistency or quality control. Further, the vast majority of these programs are not being evaluated. This means we will never know which (if any) of them have had some significant deterrent effect; we will learn nothing from our investment in these programs to improve our understanding of the causes of violence or to guide our future efforts to deter violence; and there will be no real accountability for the expenditures of scarce community resources. Worse yet, some of the most popular programs have actually been demonstrated in careful scientific studies to be *ineffective,* and yet we continue to invest huge sums of money in them for largely political reasons.

What accounts for this limited investment in the evaluation of our prevention programs? First, there is little political or even program support for evaluation. Federal and state violence prevention initiatives rarely allocate additional evaluation dollars for the programs they fund. Given that the investment in such programs is relatively low, it is argued that every dollar available should go to the delivery of program services, i.e., to helping youth avoid involvement in violent or criminal behavior. Further, the cost of conducting a careful outcome evaluation is prohibitive for most individual programs, exceeding their entire annual budget in many cases. Finally, many program developers believe they know *intuitively* that their programs work, and thus they do not think a rigorous evaluation is required to demonstrate this.

Unfortunately, this view and policy is very shortsighted. When rigorous evaluations have been conducted, they often reveal that such programs are ineffective and can even make matters worse.[2] Indeed, many programs fail to even address the underlying causes of violence, involve simplistic "silver bullet" assumptions (e.g., I once had a counselor tell me there wasn't a single delinquent youth he couldn't "turn around" with an hour of individual counseling), and allocate investments of time and resources that are far too small to counter the years of exposure to negative influences of the family, neighborhood, peer group, and the media. Violent behavior is a complex behavior pattern which involves both individual dispositions and social contexts in which violence is normative and rewarded. Most violence prevention programs focus only on the individual dispositions and fail to address the reinforcements for violence in the social contexts where youth live, with the result that positive changes in the individual's behavior achieved in the treatment setting are quickly lost when the youth returns home to his or her family, neighborhood, and old friends.

Progress in our ability to effectively prevent and control violence requires evaluation. A responsible accounting to the taxpayers, private foundations, or businesses funding these programs requires that we justify these expenditures with tangible results. No respectable business or corporation would invest millions of dollars in an enterprise without checking to see if it is profitable. No reputable

physician would subject a patient to a medical treatment for which there was no evidence of its effectiveness (i.e., no clinical trials to establish its potential positive and negative effects). Our failure to provide this type of evidence has seriously undermined the public confidence in crime prevention efforts generally, and is at least partly responsible for the current public support for building more prisons and incapacitating youth—the public knows they are receiving some protection for this expenditure, even if it is temporary.

The prospects for effective prevention programs and a national prevention initiative have improved greatly during the past decade. We now have a substantial body of research on the causes and correlates of crime and violence. There is general consensus within the research community about the specific individual dispositions, contextual (family, school, neighborhood, and peer group) conditions, and interaction dynamics which lead into and out of involvement in violent behavior. These characteristics, which have been linked to the onset, continuity, and termination of violence, are commonly referred to as "risk" and "protective" factors for violence. Risk factors are those personal attributes and contextual conditions which increase the likelihood of violence. Protective factors are those which reduce the likelihood of violence, either directly or by virtue of buffering the individual from the negative effects of risk factors.[3] Programs which can alter these conditions, reducing or eliminating risk factors and facilitating protective factors, offer the most promise as violence prevention programs.

While our evaluation of these programs is still quite limited, we have succeeded in demonstrating that some of these programs are effective in deterring crime and violence. This breakthrough in prevention programming has yet to be reflected in national or state funding decisions, and is admittedly but a beginning point for developing the comprehensive set of prevention programs necessary for developing a national prevention initiative. But we are no longer in the position of having to say that "nothing works."

Ten proven programs are described in this series of ***Blueprints for Violence Prevention***. These Blueprints (which will be described later in this Editor's Introduction) are designed to be practical documents which will allow interested persons, agencies, and communities to make an informed judgment about a proven program's appropriateness for their local situation, needs, and available resources. If adopted and implemented well, a community can be reasonably assured that these programs will reduce the risks of violence and crime for their children.

Background

The violence epidemic of the 1990s produced a dramatic shift in the public's perception of the seriousness of violence. In 1982, only three percent of adults identified crime and violence as the most important problem facing this country; by August of 1994, more than half thought crime and violence was the nation's most important problem. Throughout the '90s violence has been indicated as a more serious problem than the high cost of living, unemployment, poverty and homelessness, and health care. Again, in 1994, violence (together with a lack of discipline) was identified as the "biggest problem" facing the nation's public schools.[4] Among America's high school seniors, violence is the problem these young people worry about most frequently—more than drug abuse, economic problems, poverty, race relations, or nuclear war.[5]

The critical question is, *"How will we as a society deal with this violence problem?"* Government policies at all levels reflect a punitive, legalistic approach, an approach which does have broad

public support. At both the national and state levels, there have been four major policy and program initiatives introduced as violence prevention or control strategies in the 1990s: (1) the use of judicial waivers, transferring violent juvenile offenders as young as age ten into the adult justice system for trial, sentencing, and adult prison terms; (2) legislating new gun control policies (e.g., the Brady Handgun Violence Prevention Act, 1993); (3) the creation of "boot camps" or shock incarceration programs for young offenders, in order to instill discipline and respect for authority; and (4) community policing initiatives to create police-community partnerships aimed at more efficient community problem solving in dealing with crime, violence, and drug abuse.

Two of these initiatives are purely reactive: they involve ways of responding to violent acts after they occur; two are more preventive in nature, attempting to prevent the initial occurrence of violent behavior. The primary justification for judicial waivers and boot camps is a "just desserts" philosophy, wherein youthful offenders need to be punished more severely for serious violent offenses. But there is no research evidence to suggest either strategy has any increased deterrent effect over processing these juveniles in the juvenile justice system or in traditional correctional settings. In fact, although the evidence is limited, it suggests the use of waivers and adult prisons results in longer processing time and longer pretrial detention, racial bias in the decision about which youth to transfer into the adult system, a lower probability of treatment or remediation while in custody, and an increased risk of repeated offending when released.[6] The research evidence on the effectiveness of community policing and gun control legislation is very limited and inconclusive. We have yet to determine if these strategies are effective in preventing violent behavior.

There are some genuine prevention efforts sponsored by federal and state governments, by private foundations, and by private businesses. At the federal level, the major initiative involves the Safe and Drug-Free Schools and Communities Act (1994). This act provided $630 million in federal grants during 1995 to the states to implement violence (and drug) prevention programs in and around schools. State Departments of Education and local school districts are currently developing guidelines and searching for violence prevention programs demonstrated to be effective. But there is no readily available compendium of effective programs described in sufficient detail to allow for an informed judgment about their relevance and cost for a specific local application. Under pressure to do something, schools have implemented whatever programs were readily available. As a result, most of the violence prevention programs currently being employed in the schools, e.g., conflict resolution, peer mediation, individual counseling, metal detectors, and locker searches and sweeps have either not been evaluated or the evaluations have failed to establish any significant, sustained deterrent effects.[7]

Nationally, we are investing far more resources in building and maintaining prisons than in primary prevention programs.[8] We have put more emphasis on reacting to violent offenders after the fact and investing in prisons to remove these young people from our communities, than on preventing our children from becoming violent offenders in the first place and retaining them in our communities as responsible, productive citizens. Of course, if we have no effective prevention strategies or programs, there is no choice.

This is the central issue facing the nation in 1998: *Can we prevent the onset of serious violent behavior?* If we cannot, then we have no choice but to build, fill, and maintain more prisons. Yet if we know how to prevent the onset of violence, can we mount an efficient and effective prevention

initiative? There is, in fact, considerable public support for violence prevention programming for our children and adolescents.[9] *How can we develop, promote, and sustain a violence prevention initiative in this country?*

Violence Prevention Programs—What Works?

Fortunately, we are past the "nothing has been demonstrated to work" era of program evaluation.[10] During the past five years more than a dozen scholarly reviews of delinquency, drug, and violence prevention programs have been published, all of which claim to identify programs that have been successful in deterring crime and violence.[11]

However, a careful review of these reports suggests some caution and a danger of *overstating* this claim. First, very few of these recommended programs involve reductions in violent behavior as the outcome criteria. For the most part, reductions in delinquent behavior or drug use *in general* or arrests/revocations for *any offense* have been used as the outcome criteria. This is probably not a serious threat to the claim that we have identified effective violence prevention programs, as research has established that delinquent acts, violence, and substance use are interrelated, and involvement in any one is associated with involvement in the others. Further, they have a common set of causes, and serious forms of violence typically occur later in the developmental progression, suggesting that a program that is effective in reducing earlier forms of delinquency or drug use should be effective in deterring serious violent offending.[12] Still, some caution is required, given that very few studies have actually demonstrated a deterrent or marginal deterrent effect for serious violent behavior.

Second, the methodological standards vary greatly across these reviews. A few actually score each program evaluation reviewed on its methodological rigor,[13] but for most the standards are variable and seldom made explicit. If the judgment on effectiveness were restricted to individual program evaluations employing true experimental designs and demonstrating statistically significant deterrent (or marginal deterrent) effects, the number of recommended programs would be cut by two-thirds or more. An experimental (or good quasi-experimental) design and statistically significant results should be minimum criteria for recommending program effectiveness. Further, very few of the programs recommended have been replicated at multiple sites or demonstrated that their deterrent effect has been sustained for some period of time *after* leaving the program, two additional criteria that are important. In a word, the standard for the claims of program effectiveness in these reviews is very *low*. Building a national violence prevention initiative on this collective set of recommended programs would be risky.

Blueprints for Violence Prevention

In 1996, the Center for the Study and Prevention of Violence at the University of Colorado at Boulder, working with William Woodward, Director of the Colorado Division of Criminal Justice (CDCJ), who played the primary role in securing funding from the Colorado Division of Criminal Justice, the Centers for Disease Control and Prevention, and the Pennsylvania Commission on Crime and Delinquency, initiated a project to identify ten violence prevention programs that met a very high scientific standard of program effectiveness—*programs that could provide an initial nucleus for a national violence prevention initiative.* Our objective was to identify truly outstanding programs, and to describe these interventions in a series of "Blueprints." Each Blueprint describes the

theoretical rationale for the intervention, the core components of the program as implemented, the evaluation designs and findings, and the practical experiences the program staff encountered while implementing the program at multiple sites. The Blueprints are designed to be very practical descriptions of effective programs which allow states, communities, and individual agencies to: (1) determine the appropriateness of each intervention for their state, community, or agency; (2) provide a realistic cost estimate for each intervention; (3) provide an assessment of the organizational capacity required to ensure its successful start-up and operation over time; and (4) give some indication of the potential barriers and obstacles that might be encountered when attempting to implement each type of intervention. In 1997, additional funding was obtained from the Division of Criminal Justice, allowing for the development of the ten Blueprint programs.

Blueprint Program Selection Criteria

In consultation with a distinguished Advisory Board,[14] we established the following set of evaluation standards for the selection of Blueprint programs: (1) an experimental design, (2) evidence of a statistically significant deterrent (or marginal deterrent) effect, (3) replication at multiple sites with demonstrated effects, and (4) evidence that the deterrent effect was sustained for at least one year post-treatment. This set of selection criteria establishes a very high standard, one that proved difficult to meet. But it reflects the level of confidence necessary if we are going to recommend that communities replicate these programs with reasonable assurances that they will prevent violence. Given the high standards set for program selection, the burden for communities mounting an expensive outcome evaluation to demonstrate their effectiveness is removed; this claim can be made as long as the program is implemented well. Documenting that a program is implemented well is relatively inexpensive, but critical to the claim that a program is effective.

Each of the four evaluation standards is described in more detail as follows:

1. Strong Research Design

Experimental designs with random assignment provide the greatest level of confidence in evaluation findings, and this is the type of design required to fully meet this Blueprint standard. Two other design elements are also considered essential for the judgment that the evaluation employed a strong research design: low rates of participant attrition and adequate measurement. Attrition may be indicative of problems in program implementation; it can compromise the integrity of the randomization process and the claim of experimental-control group equivalence. Measurement issues include the reliability and validity of study measures, including the outcome measure, and the quality, consistency, and timing of their administration to program participants.

2. Evidence of Significant Deterrence Effects

This is an obvious minimal criterion for claiming program effectiveness. As noted, relatively few programs have demonstrated effectiveness in reducing the onset, prevalence, or individual offending rates of *violent behavior*. We have accepted evidence of deterrent effects for delinquency (including childhood aggression and conduct disorder), drug use, and/or violence as evidence of program effectiveness. We also accepted program evaluations using arrests as the outcome measure. Evidence for a deterrent effect on violent behavior is certainly preferable, and programs demonstrating this effect were given preference in selection, all other criteria being equal.

Both primary and secondary prevention effects, i.e., reductions in the *onset* of violence, delinquency, or drug use compared to control groups and pre-post reductions in these *offending rates,* could meet this criterion. Demonstrated changes in the targeted risk and protective factors, in the absence of any evidence of changes in delinquency, drug use, or violence, was not considered adequate to meet this criterion.

3. Multiple Site Replication

Replication is an important element in establishing program effectiveness. It establishes the robustness of the program and its prevention effects; its exportability to new sites. This criterion is particularly relevant for selecting Blueprint programs for a national prevention initiative where it is no longer possible for a single program designer to maintain personal control over the implementation of his or her program. Adequate procedures for monitoring the quality of implementation must be in place, and this can be established only through actual experience with replications.

4. Sustained Effects

Many programs have demonstrated initial success in deterring delinquency, drug use, and violence during the course of treatment or over the period during which the intervention was being delivered and reinforcements controlled. This selection criterion requires that these short-term effects be sustained beyond treatment or participation in the designed intervention. For example, if a preschool program designed to offset the negative effects of poverty on school performance (which in turn effects school bonding, present and future opportunities, and later peer group choice/selection, which in turn predicts delinquency) demonstrates its effectiveness when children start school, but these effects are quickly lost during the first two to three years of school, there is little reason to expect this program will prevent the onset of violence during the junior or senior high school years when the risk of onset is at its peak. Unfortunately, there is clear evidence that the deterrent effects of most prevention programs deteriorate quickly once youth leave the program and return to their original neighborhoods, families, and peer groups or gangs.

Other Criteria

In the selection of model programs, we considered several additional factors. We looked for evidence that change in the targeted risk or protective factor(s) mediated the change in violent behavior. This evidence clearly strengthens the claim that participation in the program was responsible for the change in violent behavior, and it contributes to our theoretical understanding of the causal processes involved. We were surprised to discover that many programs reporting significant deterrent effects (main effects) had not collected the necessary data to do this analysis or, if they had the necessary data, had not reported on this analysis.

We also looked for cost data for each program as this is a critical element in any decision to replicate one of these Blueprint programs, and we wanted to include this information in each Blueprint. Evaluation reports, particularly those found in the professional journals, rarely report program costs. Even when asked to provide this information, many programs are unable (or unwilling) to provide the data. In many cases program costs are difficult to separate from research and evaluation costs. Further, when these data are available, they typically involve conditions or circumstances unique to a particular site and are difficult to generalize. There are no standardized cost criteria, and it is very

difficult to compare costs across programs. It is even more difficult to obtain reliable cost-benefit estimates. A few programs did report both program costs and cost-benefit estimates. There have been two recent cost-benefit studies involving Blueprint programs which suggest that these programs are cost-effective, but this information is simply not available for most programs.[15]

Finally, we considered each program's willingness to work with the Center in developing a Blueprint for national dissemination and the program's organizational capacity to provide technical assistance and monitoring of program implementation on the scale that would be required if the program was selected as a Blueprint program and became part of a national violence prevention initiative.

Programs must be willing to work with the Center in the development of the Blueprint. This involves a rigorous review of program evaluations with questions about details not covered in the available publications; the preparation of a draft Blueprint document following a standardized outline; attending a conference with program staff, staff from replication sites, and Center staff to review the draft document; and making revisions to the document as requested by Center staff. Each Blueprint is further reviewed at a second conference in which potential users—community development groups, prevention program staffs, agency heads, legislators, and private foundations—"field test" the document. They read each Blueprint document carefully and report on any difficulties in understanding what the program requires, and on what additional information they would like to have if they were making a decision to replicate the program. Based on this second conference, final revisions are made to the Blueprint document and it is sent back to the Program designer for final approval.

In addition, the Center will be offering technical assistance to sites interested in replicating a Blueprint program and will be monitoring the quality of program implementation at these sites (see the "Technical Assistance and Monitoring of Blueprint Replications" section below). This requires that each selected program work with the Center in screening potential replication sites, certifying persons qualified to deliver technical assistance for their program, delivering high quality technical assistance, and cooperating with the Center's monitoring and evaluation of the technical assistance delivered and the quality of implementation achieved at each replication site. Some programs are already organized and equipped to do this, with formal written guidelines for implementation, training manuals, instruments for monitoring implementation quality, and a staff trained to provide technical assistance; others have few or none of these resources or capabilities. Participation in the Blueprint project clearly involves a substantial demand on the programs. All ten programs selected have agreed to participate as a Blueprint program.

Blueprint Programs: An Overview

We began our search for Blueprint programs by examining the set of programs recommended in scholarly reviews. We have since expanded our search to a much broader set of programs and continue to look for programs that meet the selection standards set forth previously. To date, we have reviewed more than 450 delinquency, drug, and violence prevention programs. As noted, ten programs have been selected thus far, based upon a review and recommendation of the Advisory Board. These programs are identified in Table A.

The standard we have set for program selection is very high. Not all of the ten programs selected meet all of the four individual standards, but as a group they come the closest to meeting these standards that we could find. As indicated in Table A, with one exception they have all demonstrated

Table A. Blueprint Programs

PROJECT	TARGET POPULATION	EVID. OF EFFECT*	MULTI-SITE	COST/ BENEFIT	SUSTAINED EFFECT	GENERA-LIZABLE	TYPE OF PROGRAM
Nurse Home Visitation (Dr. David Olds)	Pregnant women at risk of preterm delivery and low birthweight	X	X	X	through age 15	X	Prenatal and postpartum nurse home visitation
Bullying Prevention Program (Dr. Dan Olweus)	Primary and secondary school children (universal intervention)	X	England, Canada; South Carolina		2 years post-treatment	Generality to U.S. unk.; initial S.C. results positive	School-based program to reduce victim/bully problems
Promoting Alternative Thinking Strategies (Dr. M. Greenberg and Dr. C. Kusche)	Primary school children (universal intervention)	X	X		2 years post-treatment	X	School-based program to promote emotional competence
Big Brothers Big Sisters of America (Ms. Dagmar McGill)	Youth 6 to 18 years of age from single-parent homes	X	Multisite single design, 8 sites			X	Mentoring program
Quantum Opportunities (Mr. Ben Lattimore)	At-risk, disadvantaged, high school youth	X	Multisite single design, 5 sites; replic. by D.O.L.	X	through age 20		Educational incentives
Multisystemic Therapy (Dr. Scott Henggeler)	Serious, violent, or substance abusing juvenile offenders and their families	X	X	X	4 years post-treatment	X	Family ecological systems approach
Functional Family Therapy (Dr. Jim Alexander)	Youth at risk for institutionalization	X	X	X	30 months posttreatment	X	Behavioral systems family therapy
Midwestern Prevention Project (Dr. Mary Ann Pentz)	Middle/junior school (6th/7th grade)	X	X		Through high school	X	Drug use prevention (social resistance skills); with parent, media, and community components
Life Skills Training (Dr. Gilbert Botvin)	Middle/junior school (6th/7th grade)	X	X		Through high school	X	Drug use prevention (social skills and general life skills training)
Multidimensional Treatment Foster Care (Dr. Paricia Chamberlain)	Serious and chronic delinquents	X	X	X	1 year post-treatment		Foster care with treatment

* "X" indicates the program met this criterion satisfactorily.

significant deterrent effects with experimental designs using random assignment to experimental and control groups (the Bullying Prevention Program involved a quasi-experimental design). All involve multiple sites and thus have information on replications and implementation quality, but not all replication sites have been evaluated as independent sites (e.g., the Big Brothers Big Sisters mentoring program was implemented at eight sites, but the evaluation was a single evaluation involving all eight sites in a single aggregated analysis). Again, with one exception (Big Brothers Big Sisters), all the selected programs have demonstrated sustained effects for at least one year post-treatment.

Nine of the Blueprints have been published. The last Blueprint, *Bullying Prevention Program,* will be published in January of 1999.

Technical Assistance and Monitoring of Blueprint Replications[16]

The Blueprint project includes plans for a technical assistance and monitoring component to assist interested communities, agencies, and organizations in their efforts to implement one or more of the Blueprint programs. *Communities should not attempt to replicate a Blueprint program without technical assistance from the program designers.* If funded, technical assistance for replication and program monitoring will be available through the Center for the Study and Prevention of Violence at a very modest cost. Technical assistance can also be obtained directly from the Blueprint programs with costs for consulting fees, travel, and manuals negotiated directly with each program.

There are three common problems encountered by communities when attempting to develop and implement violence prevention interventions. First, there is a need to identify the specific risk and protective factors to be addressed by the intervention and the most appropriate points of intervention to address these conditions. In some instances, communities have already completed a risk assessment and know their communities' major risk factors and in which context to best initiate an intervention. In other cases this has not been done and the community may require some assistance in completing this task. We anticipate working with communities and agencies to help them evaluate their needs and resources in order to select an appropriate Blueprint program to implement. This may involve some initial on-site work assisting the community in completing some type of risk assessment as a preparatory step to selecting a specific Blueprint program for implementation.

Second, assuming the community has identified the risk and protective factors they want to address, a critical problem is in locating prevention interventions which are *appropriate* to address these risk factors and making an informed decision about which one(s) to implement. Communities often become lost in the maze of programs claiming they are effective in changing identified risk factors and deterring violence. More often, they are faced with particular interest groups pushing their own programs or an individual on their advisory board recommending a pet project, with no factual information or evidence available to provide some rational comparison of available options. Communities often need assistance in making an informed selection of programs to implement.

Third, there are increasingly strong pressures from funders, whether the U.S. Congress, state legislatures, federal or state agencies, or private foundations and businesses, for accountability. The current trend is toward requiring *all* programs to be monitored and evaluated. This places a tremendous burden on most programs which do not have the financial resources or expertise to conduct a

meaningful evaluation. A rigorous outcome evaluation typically would cost more than the annual operating budget of most prevention programs; the cumulative evaluations of our Blueprint programs, for example, average more than a million dollars each. The selection of a Blueprint program eliminates the need for an outcome evaluation, at least for an initial four or five years.[17] Because these programs have already been rigorously evaluated, the critical issue for a Blueprint program is the *quality of the implementation*; if the program is implemented well, we can assume it is effective. To ensure a quality implementation, technical assistance and monitoring of the implementation (a process evaluation) are essential.

Limitations

Blueprint programs are presented as complete programs as it is the *program* that has been evaluated and demonstrated to work. Ideally, we would like to be able to present specific intervention components, e.g., academic tutoring, mentoring of at-risk youth, conflict resolution training, work experience, parent effectiveness training, etc., as proven intervention strategies based upon evaluations of many different programs using these components. We do not yet have the research evidence to support a claim that specific components are effective for specific populations under some specific set of conditions. Most of the Blueprint programs (and prevention programs generally) involve multiple components, and their evaluations do not establish the independent effects of each separate component, but only the combination of components as a single "package." It is the "package" which has been demonstrated to work for specific populations under given conditions. The claim that one is using an intervention that has been demonstrated to work applies only if the entire Blueprint program, as designed, implemented, and evaluated, is being replicated; this claim is not warranted if only some specific subcomponent is being implemented or if a similar intervention strategy is being used, but with different staff training, or different populations of at-risk youth, or some different combination of components. It is for this reason that we recommend that communities desiring to replicate one of the Blueprint programs contact this program or the Center for the Study and Prevention of Violence for technical assistance.

Our knowledge about these programs and the specific conditions under which they are effective will certainly change over time. Already there are extensions and modifications to these programs which are being implemented and carefully evaluated. Over the next three to five years it may be necessary to revise our Blueprint of a selected program. Those modifications currently underway typically involve new at-risk populations, changes in the delivery systems, changes in staff selection criteria and training, and in the quantity or intensity of the intervention delivered. Many of these changes are designed to reduce costs and increase the inclusiveness and generality of the program. It is possible that additional evaluations may undermine the claim that a particular Blueprint program is effective, however it is far more likely they will improve our understanding of the range of conditions and circumstances under which these programs are effective. In any event, we will continue to monitor the evaluations of these programs and make necessary revisions to their Blueprints. Most of these evaluations are funded at the federal level and they will provide ongoing evidence of the effectiveness of Blueprint programs, supporting (or not) the continued use of these programs without the need for local outcome evaluations.

The cost-benefit data presented in the Blueprints are those estimated by the respective programs. We have not undertaken an independent validation of these estimates and are not certifying their

accuracy. Because they involve different comparison groups, different cost assumptions, and considerable local variation in costs for specific services, it is difficult to compare this aspect of one Blueprint program with another. Potential users should evaluate these claims carefully. We believe these cost-benefit estimates are useful, but they are not the most important consideration in selecting a violence prevention program or intervention.

It is important to note that the *size* of the deterrent effects of these Blueprint programs is modest. There are no "silver bullets," no programs that prevent the onset of violence for all youth participating in the intervention. Good prevention programs reduce the rates of violence by 30-40 percent.[18] We have included a section in each Blueprint presenting the evaluation results so that potential users can have some idea of how strong the program effect is likely to be and can prepare their communities for a realistic set of expectations. It is important that we not oversell violence prevention programs; it is also the case that programs with a 30 percent reduction in violence can have a fairly dramatic effect if sustained over a long period of time.

Finally, we are not recommending that communities invest all of their available resources in Blueprint programs. We need to develop and evaluate new programs to expand our knowledge of what works and to build an extensive repertoire of programs that work if we are ever to mount a comprehensive prevention initiative in this country. At the same time, given the costs of evaluating programs, it makes sense for communities to build their portfolio of programs around interventions that have been demonstrated to work, and to limit their investment in new programs to those they can evaluate carefully. Our Blueprint series is designed to help communities adopt this strategy.

Summary

As we approach the 21st Century, the nation is at a critical crossroad: Will we continue to react to youth violence after the fact, becoming increasingly punitive and locking more and more of our children in adult prisons? Or will we bring a more healthy balance to our justice system by designing and implementing an effective violence prevention initiative as a part of our overall approach to the violence problem? We do have a choice.

To mount an effective national violence prevention initiative in this country, we need to find and/or create effective violence prevention programs and implement them with integrity so that significant reductions in violent offending can be realized. We have identified a core set of programs that meet very high scientific standards for being effective prevention programs. These programs could constitute a core set of programs in a national violence prevention initiative. What remains is to ensure that communities know about these programs and, should they desire to replicate them, have assistance in implementing them as designed. That is our objective in presenting this series of *Blueprints for Violence Prevention*. They constitute a complete package of both programs and technical assistance made available to states, communities, schools, and local agencies attempting to address the problems of violence, crime, and substance abuse in their communities.

Delbert S. Elliot
Series Editor

ENDNOTES

1. Cook and Laub, 1997; Fox, 1996; and Snyder and Sickmund, 1995 for an analysis of trends in juvenile arrests for violent crimes.

2. Lipsey, 1992, 1997; Sherman et al., 1997; and Tolan and Guerra, 1994.

3. The technical definition of a protective factor is an attribute or condition that buffers one from the expected effect of one or more risk factors, but many use the term more generally to refer to anything that reduces the likelihood of violence, whether that effect is direct or indirect.

4. Maguire and Pastore, 1996.

5. Johnston et al., 1996.

6. Fagan, 1996; Frazier, Bishop and Lanza-Kaduce, 1997; Lipsey, 1997; MacKenzie et al., 1992; Podkopaz and Feld, 1996; and Shaw and McKenzie, 1992.

7. Gottfredson, 1997; Lipsey, 1992; Sherman et al., 1997; Tolan and Guerra, 1994; and Webster, 1993.

8. Gottfredson, 1997.

9. Gallop, 1994.

10. Lipton, Martinson, and Wilks, 1975; Martinson, 1974; Sechrest et al., 1979; and Wright and Dixon, 1977.

11. Davis and Tolan, 1993; Dusenbury and Falco, 1995; Farrington, 1994; Greenwood et al., 1996; Hawkins, Catalano and Miller, 1992; Howell, 1995; Howell et al., 1995; Krisberg and Onek, 1994; Lipsey and Wilson, 1997; Loeber and Farrington, 1997; McGuire, 1995; National Research Council, 1993; Office of Juvenile Justice and Delinquency Prevention, 1995; Powell and Hawkins, 1996; Sherman et al., 1997; and Tolan and Guerra, 1994.

12. Elliott, 1993, 1994; Jessor and Jessor, 1977; Kandel et al., 1986; Osgood et al., 1988; and White et al., 1985.

13. Gottfredson, 1997; Lipsey, 1992; Osgood et al., 1988; and Sherman et al., 1997.

14. Advisory Board members included: Denise Gottfredson, University of Maryland; Mark Lipsey, Vanderbilt University; Hope Hill, Howard University; Peter Greenwood, the Rand Corporation; and Patrick Tolan, University of Illinois.

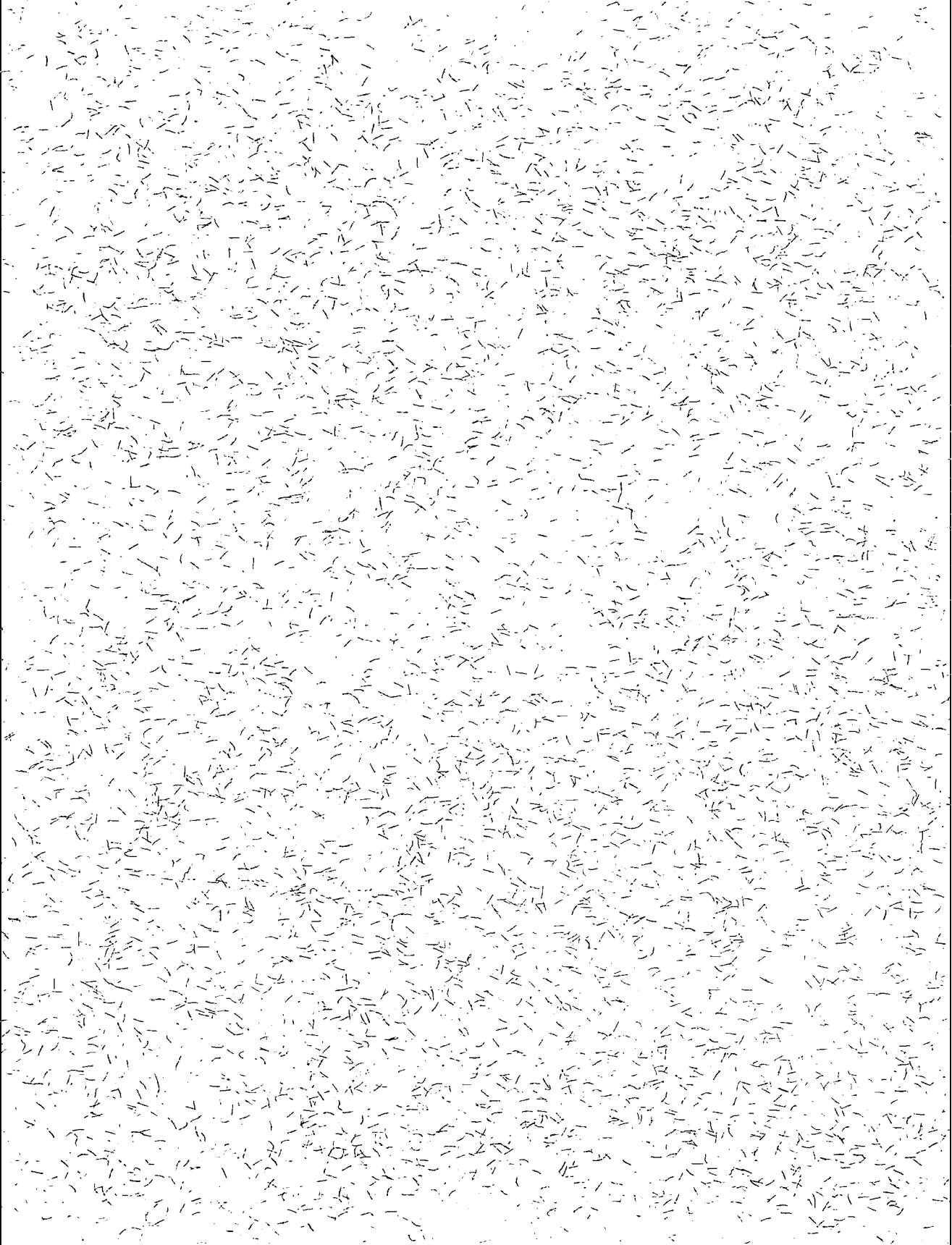
15. Greenwood, Model, Rydell, and Chiesa, 1996; Washington State Institute for Public Policy, 1998.

16. The Center has submitted a proposal to the Office of Juvenile Justice and Delinquency Prevention that would provide technical assistance and evaluation of program implementation for 50 replications of Blueprint programs.

17. At some point it will be necessary to reassess each Blueprint program to ensure that it continues to demonstrate deterrent effects and to test its generalizability to other populations and community conditions. In many cases, this will be done at the national level with federal support for large scale evaluations. For example, the U.S. Department of Labor and the Ford Foundation are currently funding seven Quantum Opportunity Programs with outcome evaluations; and the Office of Juvenile Justice and Delinquency Prevention is funding several Big Brothers Big Sisters Programs with evaluations. Local agencies replicating these Blueprint programs may never have to conduct rigorous outcome evaluations, but some continuing outcome evaluations at some level (national or local) is essential.

18. See Lipsey, 1992, 1997, for a review of issues and problems in estimating effect sizes and the range of effect sizes observed for delinquency prevention programs.

Model Program Descriptions



MODEL PROGRAM DESCRIPTIONS

Prenatal and Infancy Home Visitation by Nurses

Nurse home visitation is a program that sends nurses to the homes of pregnant women who are predisposed to infant health and developmental problems (i.e., at risk of preterm delivery and low-birth weight children). The goal of the program is to improve parent and child outcomes. Home visiting promotes the physical, cognitive, and social-emotional development of the children, and provides general support as well as instructive parenting skills to the parents. Treatment begins during pregnancy, with an average of eight visits for about 1 hour and 15 minutes, and continues to 24 months postpartum with visits diminishing in frequency to approximately every six weeks. Screenings and transportation to local clinics and offices are also offered as a part of treatment. Nurse home visiting has had some positive outcomes on obstetrical health, psychosocial functioning, and other health-related behaviors (especially reductions in smoking). Child abuse and neglect was lower and the developmental quotients of children at 12 and 24 months were higher in the treatment group than in the control group for poor, unmarried teens. Follow-up at 15-years postpartum showed significant enduring effects on child abuse and neglect, completed family size, welfare dependence, behavior problems due to substance abuse, and criminal behavior on the part of low income, unmarried mothers. Positive program effects through the child's second birthday have been replicated in a major urban area.

Bullying Prevention Program

The anti-bullying program has as its major goal the reduction of victim/bully problems among primary and secondary school children. It aims to increase awareness of the problem and knowledge about it, to achieve active involvement on the part of teachers and parents, to develop clear rules against bullying behavior, and to provide support and protection for the victims of bullying. Intervention occurs at the school level, class level, and individual level. In Bergen, Norway, the frequency of bully/victim problems decreased by 50 percent or more in the two years following the campaign. These results applied to both boys and girls and to students across all grades studied. In addition, school climate improved, and antisocial behavior in general such as theft, vandalism, and truancy showed a drop during these years.

Promoting Alternative Thinking Strategies

Promoting Alternative Thinking Strategies (PATHS) is a school-based intervention designed to promote emotional competence, including the expression, understanding, and regulation of emotions. The PATHS program is a universal intervention, implemented by teachers (after a three-day training workshop) with entire classrooms of children from kindergarten through fifth grades. The curriculum includes a feelings unit (with a self-control and initial problem-solving skills program within that unit) and an interpersonal cognitive problem solving unit. The generalization of those learned skills to children's everyday lives is a component of each major unit. An additional unit on self-control and readiness is provided for special needs classrooms. Studies have compared classrooms receiving the intervention to matched controls using populations of normally-adjusted students, behaviorally at-risk students, and deaf students. Program effects included teacher-, child sociometric-, and child self-report ratings of behavior change on such constructs as hyperactivity, peer aggression, and conduct problems.

Big Brothers Big Sisters of America

Big Brothers Big Sisters of America (BBBSA) is the oldest and best known mentoring program in the United States. Local programs are autonomously funded affiliates of BBBSA, with the national office in Philadelphia. The more than 500 affiliates maintain over 100,000 one-to-one relationships between a volunteer adult and a youth. Matches are carefully made using established procedures and criteria. The program serves children 6 to 18 years of age, with the largest portion being those 10 to 14 years of age. A significant number of the children are from disadvantaged single-parent households. A mentor meets with his/her youth partner at least three times a month for three to five hours. The visits encourage the development of a caring relationship between the matched pair. An 18 month study of eight BBBS affiliates found that the youth in the mentoring program, compared to a control group who were on a waiting list for a match, were less likely to start using drugs and alcohol, less likely to hit someone, had improved school attendance, attitudes and performance, and had improved peer and family relationships.

Quantum Opportunities

The Quantum Opportunities Program (QOP) provides education, development, and service activities, coupled with a sustained relationship with a peer group and a caring adult, over the four years of high school for small groups of disadvantaged teens. The goal of the program is to help high risk youth from poor families and neighborhoods to graduate from high school and attend college. The program includes (1) 250 hours per year of self-paced and competency-based basic skills, taught outside of regular school hours; (2) 250 hours per year of development opportunities, including cultural enrichment and personal development; and (3) 250 hours per year of service opportunities to their communities to help develop the prerequisite work skills. Financial incentives are offered to increase participation, completion, and long range planning. Results from the pilot test of this program indicated that QOP participants, compared to the control group, were less likely to be arrested during the juvenile years, were more likely to have graduated from high school, to be enrolled in higher education or training, planning to complete four years of college, and less likely to become a teen parent.

Multisystemic Therapy

Multisystemic Therapy (MST) views individuals as being nested within a complex of interconnected systems that encompass individual, family, and extrafamilial (peer, school, neighborhood) factors. Behavior problems can be maintained by problematic transactions within or between any one or a combination of these systems. MST targets the specific factors in each youth's and family's ecology (family, peer, school, neighborhood, support network) that are contributing to antisocial behavior. MST interventions are pragmatic, goal oriented, and emphasize the development of family strengths. The overriding purpose of MST is to help parents to deal effectively with their youth's behavior problems, including disengagement from deviant peers and poor school performance. To accomplish the goal of family empowerment, MST also addresses identified barriers to effective parenting (e.g., parental drug abuse, parental mental health problems) and helps family members to build an indigenous social support network (e.g., with friends, extended family, neighborhoods, church members). To increase family collaboration and treatment generalization, MST is typically provided in the home, school, and other community locations by master's level counselors with low caseloads and 24 hours/day, seven days/week availability. The average duration of treatment is

about four months, which includes approximately 50 hours of face-to-face therapist-family contact. MST has been demonstrated as an effective treatment for decreasing the antisocial behavior of violent and chronic juvenile offenders at a cost savings—that is, reducing long-term rates of rearrest and out-of-home placement. Moreover, families receiving MST have shown extensive improvements in family functioning.

Functional Family Therapy

Functional Family Therapy (FFT) is a short term, easily trainable, well documented program which has been applied successfully to a wide range of problem youth and their families in various contexts (e.g., rural, urban, multicultural, international) and treatment systems (e.g., clinics, home-based programs, juvenile courts, independent providers, federally funded clinical trials). Success has been demonstrated and replicated for over 25 years with a wide range of interventionists, including paraprofessionals and trainees representing the various professional degrees (e.g., B.S.W., M.S.W., Ph.D., M.D., R.N., M.F.T.). The program involves specific phases and techniques designed to engage and motivate youth and families, and especially deal with the intense negative affect (hopelessness, anger) that prevents change. Additional phases and techniques then change youth and family communication, interaction, and problem solving, then help families better deal with and utilize outside system resources. Controlled comparison studies with follow-up periods of one, three, and even five years have demonstrated significant and long-term reductions in youth re-offending and sibling entry into high-risk behaviors. Comparative cost figures demonstrate very large reductions in daily program costs compared to other treatment programs.

Midwestern Prevention Project

The Midwestern Prevention Project is a comprehensive population-based drug abuse (cigarettes, alcohol, and marijuana) prevention program that has operated in two major Midwestern SMSAs, Kansas City and Indianapolis, where it has been known locally as Project STAR (Students Taught Awareness and Resistance) and I-STAR, respectively. The goal of the program is to decrease the rates of onset and prevalence of drug use in young adolescents (ages 10-15), and to decrease drug use among parents and other residents of the two communities. The program consists of five intervention strategies designed to combat the community influences on drug use: mass media, school, parent, community organization, and health policy change. The components focus on promoting drug use resistance and counteraction skills by adolescents (direct skills training), prevention practices and support of adolescent prevention practices by parents and other adults (indirect skills training), and dissemination and support of non-drug use social norms and expectations in the community (environmental support). This program has been effective at reducing alcohol, cigarette, and marijuana use among young adolescents, with some effects maintained up to age 23.

Life Skills Training

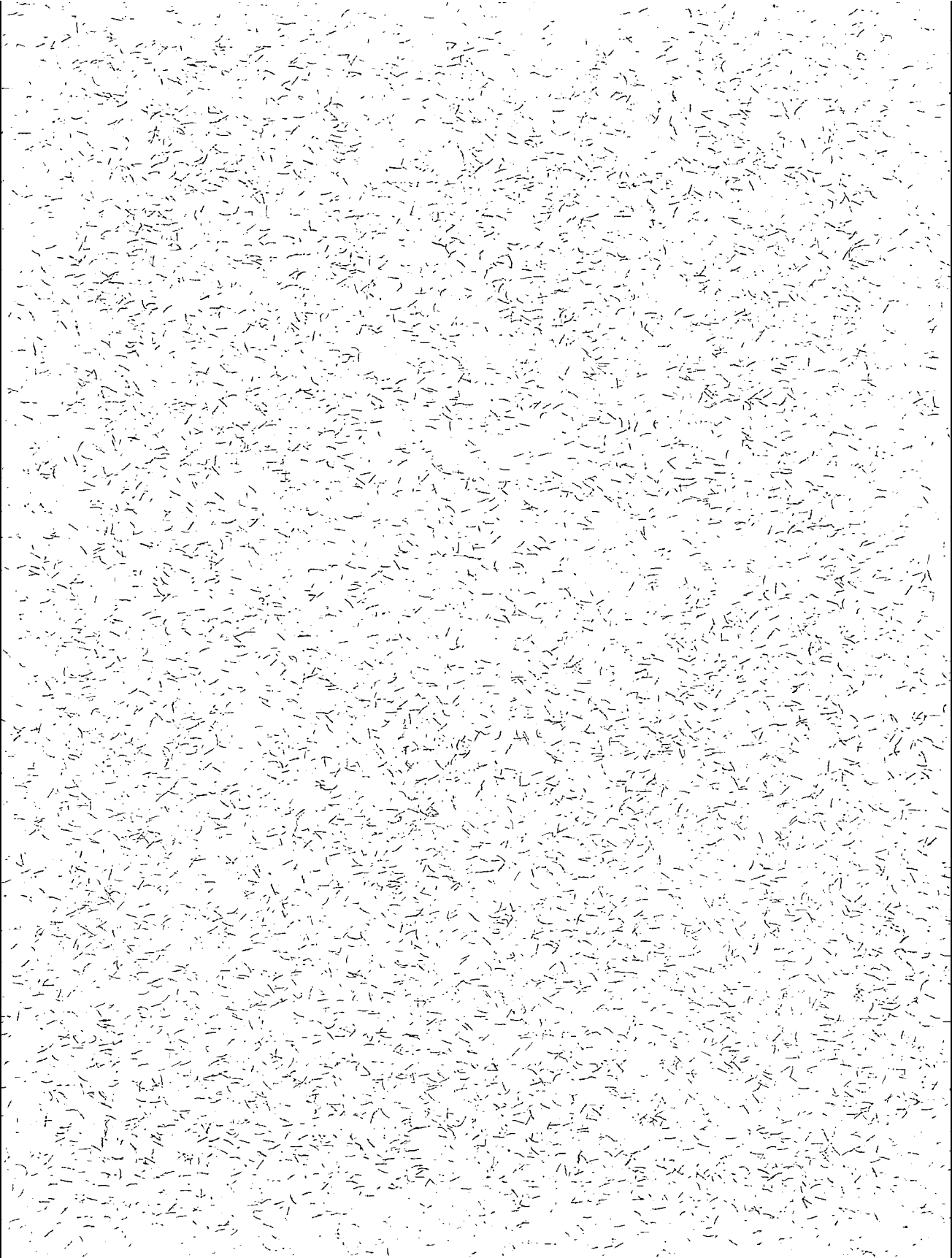
Life Skills Training is a drug use primary prevention program (cigarettes, alcohol, and marijuana), which provides general life skills training and social resistance skills training to junior high/middle (6th or 7th grade) school students. The curriculum includes 15 sessions taught in school by regular classroom teachers with booster sessions provided in year two (10 class sessions) and year three (five class sessions). The three basic components of the program include: (1) Personal Self-Management Skills (e.g., decision-making and problem-solving, self-control skills for coping with anxi-

ety, and self-improvement skills); (2) Social Skills (e.g. communication and general social skills); and (3) Drug-Related Information and Skills designed to impact on knowledge and attitudes concerning drug use, normative expectations, and skills for resisting drug use influences from the media and peers. Life Skills Training has been effective at reducing alcohol, cigarette, and marijuana use among young adolescents. The effects for tobacco and heavy alcohol use have been sustained through the end of high school.

Multidimensional Treatment Foster Care

Social learning-based Multidimensional Treatment Foster Care (MTFC) is a cost effective alternative to residential treatment for adolescents who have problems with chronic delinquency and antisocial behavior. Community families are recruited, trained, and closely supervised to provide MTFC placements, treatment, and supervision to participating adolescents. MTFC parent training emphasizes behavior management methods to provide youth with a structured and therapeutic living environment. After completing a preservice training, MTFC parents attend a weekly group meeting run by a program case manager where ongoing supervision is provided. Supervision and support is also given to MTFC parents during daily telephone calls to check on youths' progress. Family therapy is provided for the youths' biological (or adoptive) families. The parents are taught to use the structured system that is being used in the MTFC home. The effectiveness of the MTFC model has been evaluated, and MTFC youth had significantly fewer arrests during a 12-month follow-up than a control group of youth who participated in residential group care programs. The MTFC model has also been shown to be effective for children and adolescents leaving state mental hospital settings.

Program Overview



PRENATAL AND INFANCY HOME VISITATION BY NURSES

Program Overview

This program, guided by a strong theoretical orientation, consists of intensive and comprehensive home visitation by nurses during a woman's pregnancy and the first two years after birth of the woman's first child. While the primary mode of service delivery is home visitation, the program depends upon a variety of other health and human services in order to achieve its positive effects.

Program Targets:

The program is designed to serve low-income, at-risk pregnant women bearing their first child.

Program Content:

Nurse home visitors work with families in their homes during pregnancy and the first two years of the child's life. The program is designed to help women improve their prenatal health and the outcomes of pregnancy; improve the care provided to infants and toddlers in an effort to improve the children's health and development; and improve women's own personal development, giving particular attention to the planning of future pregnancies, women's educational achievement, and parents' participation in the work force. Typically, a nurse visitor is assigned to a family and works with that family through the duration of the program.

Program Outcomes:

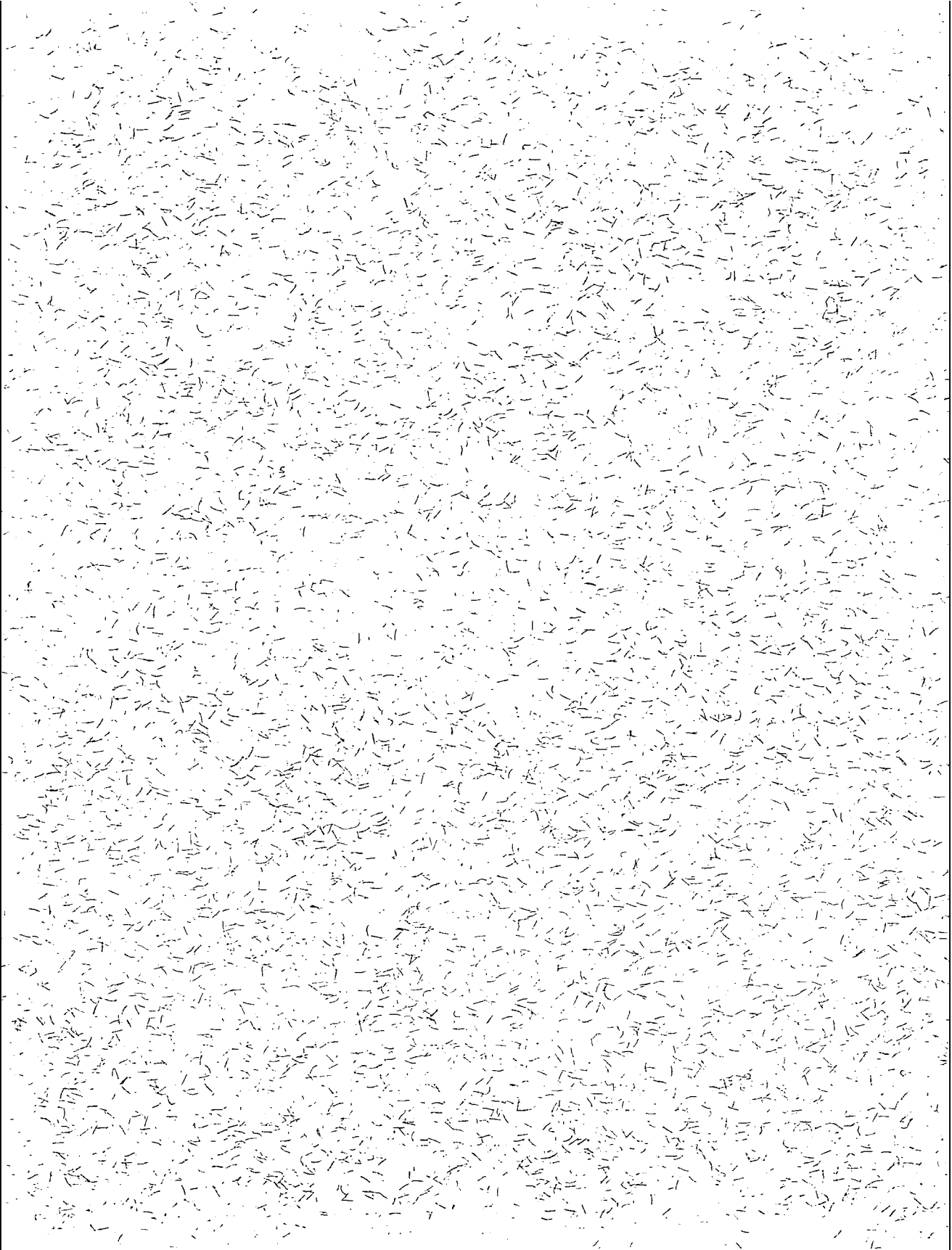
This program has been tested with both White and African American families in rural and urban settings. Nurse-visited women and children fared better than those assigned to control groups in each of the outcome domains established as goals for the program. In a 15-year follow-up study of primarily White families in Elmira, New York, findings showed that low-income and unmarried women and their children provided a nurse home visitor had, in contrast to those in a comparison group:

- 79% fewer verified reports of child abuse or neglect;
- 31% fewer subsequent births;
- an average of over two years' greater interval between the birth of their first and second child;
- 30 months less receipt of Aid to Families with Dependent Children;
- 44% fewer maternal behavioral problems due to alcohol and drug abuse;
- 69% fewer maternal arrests;
- 60% fewer instances of running away on the part of the 15-year-old children;
- 56% fewer arrests on the part of the 15-year-old children; and
- 56% fewer days of alcohol consumption on the part of the 15-year-old children.

Program Costs:

The cost of the program was recovered by the first child's fourth birthday. Substantial savings to government and society were calculated over the children's lifetimes. In 1997, the two-and-a-half-year program was estimated to cost $3,200 per year per family during the start-up phase (the first three years of program operation) and $2,800 per family per year once the nurses are completely trained and working at full capacity. Actual cost of the program will vary depending primarily upon the salaries of local community-health nurses. Communities have used a variety of local, state, and federal funding sources to support the program, including Medicaid, welfare-reform, maternal and child health, and child abuse prevention dollars.

CHAPTER ONE
Executive Summary



EXECUTIVE SUMMARY

Background

Many of the most pervasive, intractable, and costly problems faced by young children and parents in our society today are a consequence of adverse maternal health-related behaviors (such as cigarette smoking, drinking, and drug use) during pregnancy, dysfunctional infant caregiving, and stressful environmental conditions that interfere with parental and family functioning. These problems include infant mortality, preterm delivery and low birthweight, child abuse and neglect, childhood injuries, youth violence, closely spaced pregnancy, and thwarted economic self-sufficiency on the part of parents. Standard indices of child health and well-being indicate that many children in our society are suffering.

- Nine infants out of every thousand in the United States die before their first birthday. As a result of high rates of low birthweight (less than 2500 grams or 5 pounds 8 ounces), our infant mortality rate is worse than 19 other nations, in spite of dramatic reductions in infant mortality in the last two decades due to improvements in newborn intensive care. Low birthweight babies who survive are 50 percent more likely to use special education services once they enter school than are normal birthweight controls.
- Over 2.5 million children were reported as being abused or neglected in 1990, and one in three of the victims of physical abuse were infants less than one year of age. Between 1,200 and 1,500 children die each year as a result of parent or caregiver maltreatment. Not only is maltreatment morally unacceptable, but the social consequences are so devastating that the U.S. Advisory Panel on Child Abuse and Neglect has called child maltreatment a national emergency.
- Childhood injuries are the leading cause of death among children aged one to fourteen.
- High rates of violence among adolescents, both as victims and perpetrators, threaten the safety and well-being of our neighborhoods. Among young people aged 15-24, homicide is a leading cause of death, and for African Americans it is the number one cause.
- In 1992, 52 percent of the mothers on AFDC had their first birth as teens, costing the government approximately $12.8 billion. Rapid successive pregnancy increases the likelihood of continued welfare dependence and a host of associated problems.

Evidence indicates that a significant portion of these problems can be traced to parental behavior—in particular, to women's health-related behaviors during pregnancy, to the quality of care that parents provide to their children, and to women's life choices with respect to family planning, educational achievement, and workforce participation. While these problems cut across all segments of U.S. society, they are more common among women who begin childbearing as poor, unmarried adolescents. Low-income, single, adolescent mothers can have good pregnancy outcomes and children who do well, but their capacity to care for themselves and for their children is often compromised by histories of maltreatment in their own childhood, psychological immaturity or depression, stressful living conditions, and inadequate social support. These conditions contribute to the greater likelihood that socially disadvantaged parents will abuse cigarettes and other drugs during pregnancy and will fail to provide adequate care for their children, often with devastating results.

Women who smoke cigarettes and use other substances during pregnancy, for example, are at considerable risk for bearing low birthweight newborns, and their children are at heightened risk for neurodevelopmental impairment. Even subtle damage to the fetal brain can undermine children's

intellectual functioning and capacity for emotional and behavioral regulation. Parents' capacities to read and respond to their infants' communicative signals form the basis for children's sense of security and trust in the world and their belief in their capacity to influence that world. Breaches of that trust have long-term consequences, especially when caregiving dysfunction is combined with neurodevelopmental impairment on the part of the child.

A longitudinal study of a large Danish sample of children and their families found that children who experienced the combination of birth complications and parental rejection in the first year of life were at substantially increased risk for violent criminality at age 18 in comparison to children who experienced only birth complications or parental rejection alone. While only 4.5 percent of the sample experienced both birth complications and parental rejection, that group accounted for 18 percent of all violent crimes among those 18 years of age. Parental rejection or birth trauma by itself did not increase the risk for violence. When risk factors accumulate, the risk for adverse outcomes increases, often in synergistically vicious ways.

The problems listed have been resistive to government intervention over the past thirty years. However, scientific evidence is accumulating that it is possible to improve the outcomes of pregnancy, to improve parents' abilities to care for their children, and to reduce welfare dependence with programs of prenatal and early childhood home visitation, but it is not easy. Our optimism stands in contrast to earlier research on home visitation. The earlier research was difficult to interpret because the programs studied were often not designed to address the needs of parents in sensible and powerful ways, and the research itself frequently lacked scientific rigor.

The program of prenatal and infancy home visitation by nurses described here is distinguished from other programs by its firm foundation in epidemiology and theory. The program is based upon an analysis of proximal risks for the particular outcomes that it is designed to affect (usually parental behaviors or conditions in the home that increase the likelihood of adverse outcomes on the part of the mother or child). It also is founded upon three interrelated theoretical foundations—self-efficacy, attachment, and human ecology theories. Each of these theories addresses different aspects of the developmental system that contributes to adverse maternal and child outcomes in vulnerable families.

Theoretical Rationale/Conceptual Framework

The program has been grounded in theories of human ecology (Bronfenbrenner, 1979, 1992), self-efficacy (Bandura, 1977, 1982), and human attachment (Bowlby, 1969). The earliest formulations of the program gave greatest emphasis to human ecology, but as the program has evolved, it has been grounded more explicitly in theories of self-efficacy and human attachment.

The human ecological model emphasizes ways in which the environment influences individuals' social interactions and development.

Human Ecology Theory

The original formulation of this program was based in large part on Bronfenbrenner's theory of human ecology. Human ecology theory emphasizes the importance of social contexts as influences on human development. Parents' care of their infants, from this perspective, is

influenced by characteristics of their families, social networks, neighborhoods, communities, and cultures, and interrelations among these structures. Bronfenbrenner's original theoretical framework has been elaborated more recently (with greater attention to individual influences) in his person-process-context model of research on human development.

The *person* elements of the model are reflected in the program components that have to do with behavioral and psychological characteristics of the parent and child. In the formulation of the theoretical foundations of the program, parents, and especially mothers, are considered both developing persons and the primary focus of the preventive intervention. Particular attention is focused on parents' progressive mastery of their roles as parents and as adults responsible for their own health and economic self-sufficiency. This program emphasizes parent development because parents' behavior constitutes the most powerful and potentially alterable influence on the developing child, particularly given parents' control over their children's prenatal environment, their face-to-face interaction with their children postnatally, and their influence on the family's home environment.

The concept of *process* encompasses parents' interaction with their environment as well as the intrapsychic changes that characterize their mastery of their roles as parents and providers. Three aspects of process emphasized here relate to individuals' functioning: (1) program processes (e.g., the ways in which the visitors work with parents to strengthen parents' competencies); (2) processes that take place within parents (i.e., the influence of their psychological resources—developmental histories, mental health, and coping styles—on behavioral adaptation); and (3) parents' interaction with their children, other family members, friends, and health and human service providers. For the sake of simplicity, the discussion of these processes has been integrated below into the *person (parent)* part of the model.

The focus on parents elaborated here is not intended to minimize the role that *contextual* factors such as economic conditions, cultural patterns, racism, and sexism play in shaping the opportunities that parents are afforded. Most of those features of the environment, however, are outside of the influence of preventive interventions provided through health and human service systems. Certain contexts, nevertheless, are affected by parents' adaptive competencies. It is these features of the environment that the current program attempts to affect, primarily by enhancing parents' social skills. The aspects of context that we are most concerned about have to do with informal and formal sources of support for the family, characteristics of communities that can support or undermine the functioning of the program and families, the impact of going to school or working on family life, as well as cultural conditions that need to be taken into consideration in the design and conduct of the program.

One of the central hypotheses of ecological theory is that the capacity of the parent-child relationship to function effectively as a context for development depends on the existence and nature of other relationships that the parent may have. The parent-child relationship is enhanced as a context for development to the extent that each of these other relationships involves mutual positive feelings and that the other parties are supportive of the developmental activities carried on in the parent-child relationship. Conversely, the developmental potential of the parent-child relationship is impaired to the extent that each of the other relationships in which the parent is involved consists of mutual antagonism or interference with the developmental activities carried on in the parent-child relationship.

Limitations of Human Ecology Theory. Compared to other *developmental* theories, Bronfenbrenner's framework provides a more extended and elaborated conception of the environ-

ment. The original formulation of the theory, however, tended to treat the immediate settings in which children and families find themselves as shaped by cultural and structural characteristics of the society. Little consideration was given to the role that adults (in particular parents) play in selecting and shaping the settings in which they find themselves. While many investigators today reason that the personal characteristics that influence individuals' selection and shaping of their contexts have genetic origins, we have chosen to determine the extent to which and the means by which healthy choices and adaptive behaviors can be promoted.

Consequently, self-efficacy and attachment theories were integrated into the model to provide a broader conception of the parent-setting relationship. The integration of these theories allows for a conceptualization of development that encompasses truly reciprocal relationships in which settings, children, and other adults influence parental behavior, and in which parents simultaneously select and shape their settings and interpersonal relationships.

Self-Efficacy Theory

Self-efficacy theory provides a useful framework for promoting women's health-related behavior during pregnancy, care of their children, and personal development. According to Bandura, differences in motivation, behavior, and persistence in efforts to change a wide range of social behaviors are a function of individuals' beliefs about the connection between their efforts and their desired results. According to this view, cognitive processes play a central role in the acquisition and retention of new behavior patterns. In self-efficacy theory, Bandura distinguishes outcome expectations from efficacy expectations. Outcome expectations are individuals' estimates that a given behavior will lead to a given outcome. Efficacy expectations are individuals' beliefs that they can successfully carry out the behavior required to produce the outcome. It is efficacy expectations that affect both the initiation and persistence of coping behavior. Individuals' perceptions of self-efficacy can influence their choice of activities and settings, and can determine how much effort they will put forth in the face of obstacles.

Self-efficacy relates to one's perception that s/he is able to achieve a goal. A person with a strong sense of self-efficacy may put more effort into accomplishing a difficult task, while a person with a weak sense of self-efficacy may not try as hard or may not make an effort at all.

Limitations of Self-Efficacy Theory. While self-efficacy theory provides powerful insights into human motivation and behavior, it is limited in several respects. The first limitation is that it is primarily a cognitive-behavioral theory. It attends to the emotional life of the mother and other family members only through the impact of behavior on women's beliefs or expectations, which in turn affect emotions. Many people have experienced multiple adversities in the form of overly harsh parenting, rejection, or neglect that often contribute to a sense of worthlessness, depression, and cynicism about relationships. Self-efficacy gives inadequate attention to methods of helping parents cope with these features of their personal history or the impact of those early experiences on their care of their children. We have augmented the theoretical underpinnings of the program regarding these social and emotional issues with attachment theory (discussed below).

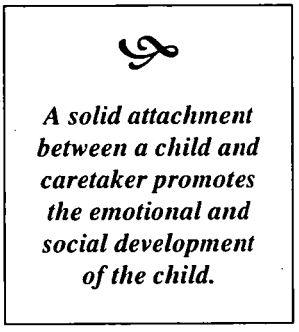
The second limitation is that self-efficacy attends to environmental influences in a cursory way. People can give up because they do not believe that they can do what is required, but they also can

give up because they expect that their efforts will meet with punitiveness, resistance, or unresponsiveness. While Bandura acknowledges that adversity and intractable environmental conditions are important factors in the development of individuals' sense of futility, the structure of those environmental forces is not the subject of Bandura's theory. In other words, individuals' feelings of helplessness and futility are not simply intrapsychic phenomena, but are connected to environmental contexts that provide limited opportunities and that fail to nurture individuals' growth and well-being. The structure of those environmental influences is the primary subject of human ecology theory, discussed above.

Attachment Theory

Historically, this program owes much to Bowlby's theory of attachment. Attachment theory posits that human beings (and other primates) have evolved a repertoire of behaviors that promote interaction between caregivers and their infants (such as crying, clinging, smiling, signaling), and that these behaviors tend to keep specific caregivers in proximity to defenseless youngsters, thus promoting their survival, especially in emergencies. Humans (as well as many other species) are biologically predisposed to seek proximity to specific caregivers under times of stress, illness, or fatigue in order to promote survival. This organization of behavior directed toward the caregiver is attachment.

In recent years, a growing body of evidence indicates that caregivers' levels of responsivity to their children can be traced to caregivers' own childrearing histories and attachment-related experiences. Caregivers' attachment-related experiences are thought to be encoded in "internal working models" of self and others that create styles of emotional communication and relationships that either buffer the individual in times of stress or that lead to maladaptive patterns of affect regulation and create feelings of worthlessness. Differences in internal working models, according to attachment theorists, have enormous implications for mothers' capacities for developing sensitive and responsive relationships, especially with their own children.



Limitations of Attachment Theory. Attachment theory provides a rich set of insights into the origins of dysfunctional caregiving and possible preventive interventions focused on parent-visitor and parent-child relationships. It gives scant attention to the role that individual differences in infants may play as independent influences on parental behavior, and it provides inadequate attention to issues of parental motivation for change in caregiving. Moreover, it minimizes the importance of the current social and material environment in which the family is functioning as influences on parents' capacities to care for their children. For more systematic treatments of these issues, we turned to self-efficacy and human ecology theories (discussed above).

Summary of the Role of Theory and Epidemiology in Program Design

The program and its specific intervention strategies have been built upon:

- theories about human development and change, and
- a solid understanding of the risk factors for particular negative outcomes and how to reduce those risks by promoting adaptive behavior.

Brief Description of Intervention

The program of home visitation begins during pregnancy and continues through the child's second birthday. Each family is assigned a nurse who visits families about once every other week during pregnancy and the first two years of the child's life. To the extent possible, programs should keep the same nurse assigned to a family for the entire time they participate in the program. Program process studies have shown that program effectiveness tends to decline when families are served by more than one nurse over the course of their participation.

The program is designed to accomplish three goals:

1. ***the improvement of pregnancy outcomes;***
2. ***the improvement of the child's health and development; and***
3. ***the improvement of the mothers' own personal development.***

The nurses use program protocols that are designed to accomplish three overriding goals: (1) the improvement of pregnancy outcomes; (2) the improvement of the child's health and development; and (3) the improvement of the mothers' own personal development. In the home visits, the nurses promote three aspects of maternal functioning: (a) health-related behaviors during pregnancy and the early years of the child's life; (b) the care parents provide to their children; and (c) parents' family planning, educational achievement, and participation in the work force. In the service of these three goals, the nurses link families with needed health and human services and involve other family members and friends in the pregnancy, birth, and early care of the child.

The nurses use detailed assessments, record-keeping forms, and protocols to guide their work with families but adapt the content of their home visits to the individual needs of each family. They provide a comprehensive educational program designed to promote parents' and other family members' effective physical and emotional care of their children. The nurses also help women clarify their goals and develop problem-solving skills to enable them to cope with the challenges of completing their education, finding work, and planning future pregnancies. Developing a close working relationship with the mother and her family, the nurses help mothers identify small achievable objectives that can be accomplished between visits that, if met, will build mothers' confidence and motivation to manage the demands of caregiving and become economically self-sufficient.

The program focuses on specific parental behaviors and modifiable environmental conditions that are associated with adverse outcomes in each of the domains identified as program goals. The protocols and record keeping system are designed to reinforce home visitors' focus on program goals and theoretical foundations of the program.

The nurses are scheduled to visit families once a week for the first month after registration and then every other week through delivery. After delivery the nurses are scheduled to visit once a week for the first six weeks of the baby's life and then every other week until the 21st month postpartum. From 21 to 24 months postpartum, the nurses visit once a month. In these visits, which typically last from 60-90 minutes, the nurses work to achieve the goals and objectives outlined above, employing clinical interventions that are grounded in theories of human ecology, attachment, and self-efficacy. It should be noted, however, that some mothers are in crises that interfere with their consistently keeping scheduled appointments. Although the nurses make every effort to follow the specified

schedule of visits, they are allowed to visit more frequently when families exhibit crises that would warrant more intensive support. In addition, although there are specified domains of program content that are developmentally organized and expected to be covered during particular periods, families exhibit considerable variation in their expressed needs. This leads to substantial individual variation in the amount of time that may be spent on particular program content areas. All of this leads to variation in the amount and content of the program experienced by any one family. The program nevertheless adheres to a core set of program goals, content, and methods.

Evidence of Program Effectiveness

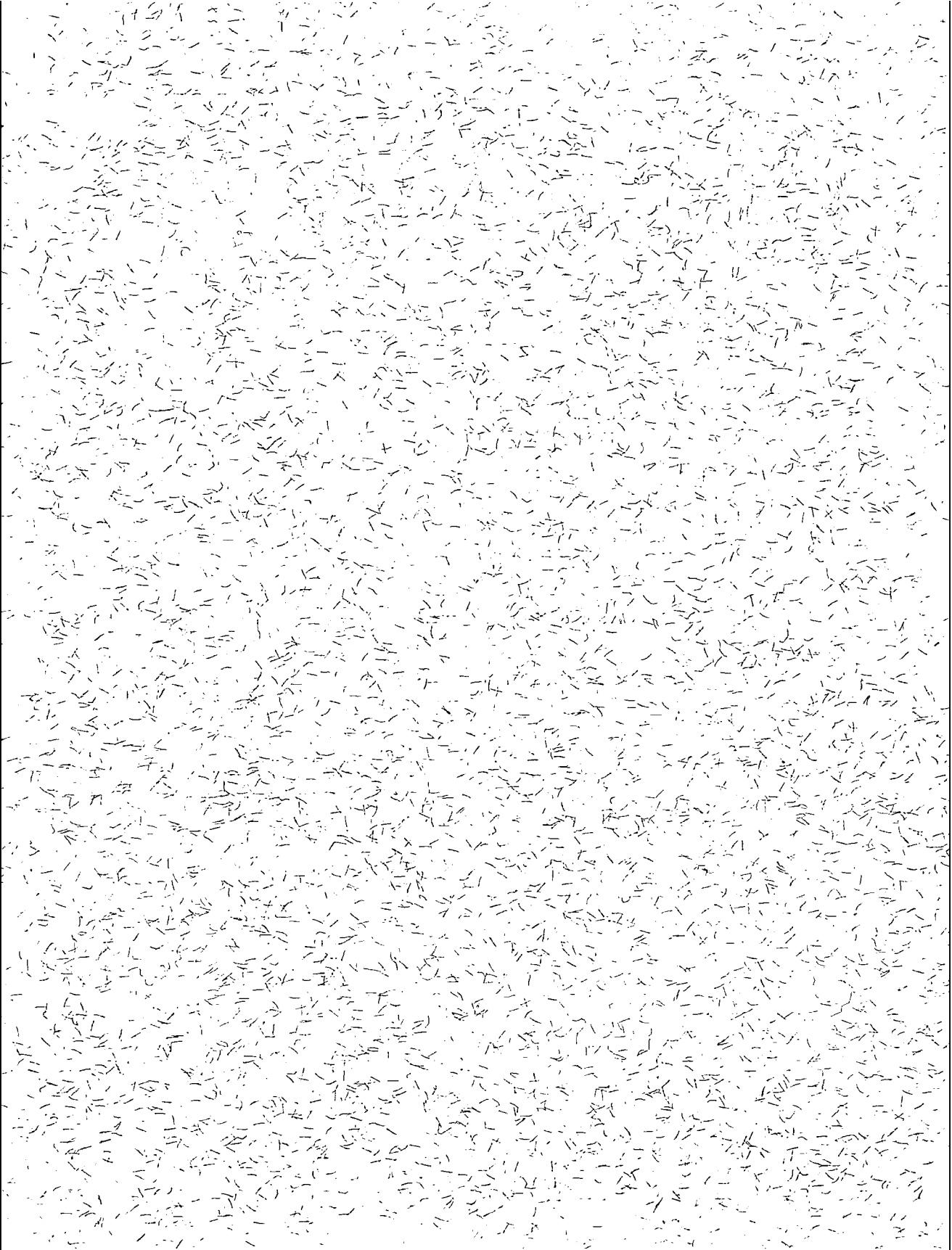
For low-income women and their children, the program has been successful in:

- improving women's prenatal health-related behaviors (especially reducing cigarette smoking and improving diet);
- reducing pregnancy complications, such as hypertensive disorders and kidney infections;
- reducing harm to children, as reflected in fewer cases of child abuse and neglect and injuries to children revealed in their medical records;
- improving women's own personal development, indicated by reductions in the rates of subsequent pregnancy, an increase in spacing between first and second born children, a reduction in welfare dependence, and reductions in behavioral problems due to substance abuse and in criminal behavior on the part of mothers who were unmarried and from low-income households at registration during pregnancy; and
- reducing criminal and antisocial behavior on the part of the 15-year old children as indicated by fewer arrests, convictions/violations of probation, and days of consuming alcohol.

The cost of the program, from the standpoint of government spending, is recovered by the time the children reach four years of age, and the cost savings to government and society exceed the cost of the program by a factor of at least 4:1 over the child's lifetime.

CHAPTER TWO

Program As Designed And Implemented



PROGRAM AS DESIGNED AND IMPLEMENTED

Goals and Measurable Objectives

The goals of the program of *Prenatal and Infancy Home Visitation by Nurses* are threefold, followed by the specific objectives:

1. **Prenatal**—to improve the outcomes of pregnancy (reduce the rates of preterm delivery, low birthweight, and obstetric complications, such as hypertensive disorders of pregnancy and kidney infections);
   - improve health-related behaviors (reduce cigarette smoking, use of alcohol and illegal drugs),
   - improve diets and weight gain,
   - identify emerging obstetric problems and learn how to use the health-care system to treat those problems before they become more serious.

2. **Infant Health and Development**—to improve infant health and development (reduce children's injuries, abuse, and neglect; improve infants' developmental accomplishments; and reduce emerging behavioral problems);
   - help parents provide more informed, sensitive, and responsive care to their infants and toddlers,
   - help parents create home environments that are safer and more educationally enriching for their children.

3. **Maternal Life Course**—to improve mother's own personal life-course development (reduce the rates of unintended subsequent pregnancy, increase the interval between the birth of the first and second child, increase women's educational achievements and participation in the work force, and reduce their use of welfare);
   - help women develop a vision for the future,
   - help mothers and partners clarify their expectations about the number and timing of subsequent children,
   - help women learn how to use contraceptive methods effectively,
   - help make appropriate child care arrangements so that women can complete their education and participate in the work force.

In addition to working with the mothers directly, the nurses promote the goals of the program by engaging other family members and close friends in the program and by assisting families to use other formal health and social services. These support systems can support the mothers' efforts to improve their prenatal health, parents' care of their children, and parents' own personal development.

Targeted Risk and Protective Factors

In designing the program, we reviewed the literature to determine behavioral and contextual conditions that were consistently correlated with the adverse maternal and child outcomes that we wished to affect. We analyzed the literature to determine the extent to which these variables were most likely to be causally related to the outcomes of interest, and which ones were simply markers for maladaptive functioning. Those that were hypothesized to be causally related to the outcome of interest and that were potentially modifiable with social and behavioral interventions became pri-

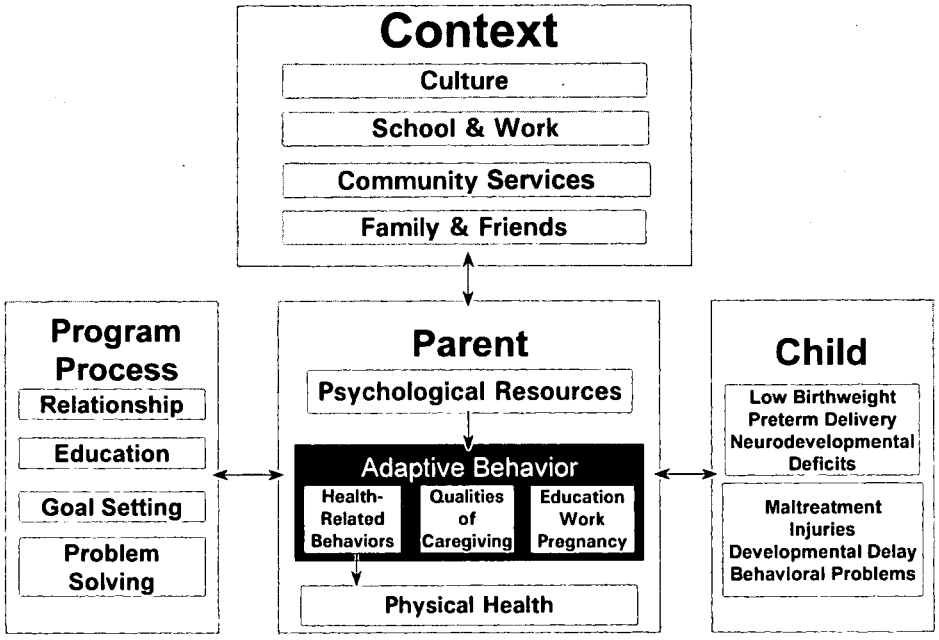
mary candidates for targeted intervention to reduce the rates of adverse outcomes identified for prevention. Theory played an important role in helping us integrate the epidemiologic data into a coherent developmental framework regarding both the hypothesized relationships among risks for adverse outcome as well as the developmental progression of maladaptive functioning. It is important to note that the epidemiologic evidence indicated that some of the problems targeted for prevention early in the program were also risks for problems targeted later. This is best illustrated by reference to Figure 1. This figure outlines the major domains of influence on the child's developing adaptation from the standpoint of Bronfenbrenner's person (parent), process (program process, intrapsychic/behavioral process within the parent), and context. The program embodies certain essential processes (relationship building, education, goal setting, problem solving to achieve goals) that are designed to bring about intrapsychic and behavioral changes within the parent that affect parents' efforts to improve their living conditions (context), prenatal health behaviors, and care of the child. These changes in parental behavior are hypothesized to improve the growth and development of the child.

Modifiable Risks for Low Birthweight, Preterm Delivery, and Fetal Neurodevelopmental Impairment

Epidemiologic evidence on risks for low birthweight indicates that in developed countries prenatal exposure to tobacco is an established determinant of compromised fetal growth and, to a lesser extent, shortened length of gestation (Kramer, 1987). Similarly, prenatal tobacco exposure increases children's likelihood of neurodevelopmental impairments associated with compromised intellectual functioning (Olds et al., 1995a,b) and behavioral problems (Olds, 1997), such as Attention Deficit-Hyperactivity Disorder (Milberger et al., 1996) and Conduct Disorder (Wakschlag et al., 1997). Similar risks are posed by prenatal exposure to alcohol (Streissguth, 1994), marijuana (Fried et al., 1987), and other illegal drugs, such as cocaine (Mayes, 1994). While the evidence on these risks was not as coherent at the start of this series of trials 20 years ago as it is today, we chose to promote a reduction in use of all of these substances as a precaution in the original program.

The epidemiologic evidence indicates that other behaviors, such as inadequate weight gain, inadequate diet, inadequate use of office-based prenatal care, and unattended obstetric complications, such as genitourinary tract infections and hypertensive disorders, increase the risk for low birthweight, preterm delivery, and compromised neurologic development.

Moreover, while the evidence is not as coherent as we would like, there is some suggestion that children with compromised neurodevelopmental functioning are more difficult for their parents to nurture. Compared to offspring of women who do not smoke, newborns whose mothers smoked cigarettes during pregnancy display higher rates of neurobehavioral disturbance—reduced habituation to a variety of stimuli, lower arousal, increased tremulousness, weaker suck, longer latency to suck, reduced autonomic regulation, reduced orientation to auditory stimuli, and cries with higher pitches and other altered characteristics suggestive of neurodevelopmental problems. These effects remain after controlling statistically for the newborns' exposure to other possible toxicants, such as alcohol and other adverse maternal behaviors. Such children are more likely to present challenges to their parents and to increase their risk for being abused or neglected.



Risks for Child Abuse and Neglect and Injuries to Children

In planning the research upon which this program is based, we made an explicit inventory of risks for child abuse and neglect and chose to design the intervention in a way that would reduce those risks. The risks for child abuse and neglect were organized according to their levels of proximity (closeness) to parental behavior.

At a proximal level, risk assessment focused on *the mother's psychological immaturity* and disturbance that affect parents' feelings about caregiving and their internal working models of self and relationships. Markers for immaturity and/or psychological disturbance include:

- holding unrealistic expectations for infants' development,
- lack of responsiveness toward their newborns,
- limited verbal engagement with their babies,
- expressing little empathy for their infant, and
- displaying either little capacity to cope with frustration or displaying apathetic or depressive interpersonal styles.

At a more distant level, risks focused on those *contextual factors* creating stressful conditions in the household that would interfere with parents' care of their children, such as:

- unemployment,
- poor housing and household conditions,
- marital discord,

- isolation from supportive family members and friends, and
- a history of punitive, rejecting, abusive, or neglectful caregiving on the parents' own part if they had no corrective emotional experience (such as a healthy marriage, effective care from a protective caregiver, or successful therapy) that would allow them to adequately resolve those early experiences.

Risks for Welfare Dependence and Compromised Maternal Life-Course Development

While many of the risks and developmental problems outlined above occur commonly in our society, they are found more frequently among children born into families in which the parents are teenagers, unmarried, and poor, and especially among women who have rapid successive pregnancies. Immediate risks for rapid successive pregnancies include women's having little sense of control over their general life circumstances and their contraceptive practices and their having limited visions for their own personal development in the areas of education and work.

Modifiable Risks for Early-Onset Antisocial Behavior

More recently, we have analyzed risks for early-onset antisocial behavior and determined that the impact of the program on aspects of maternal and child health early in the life cycle reduces important risks for this problem. We consider this work an elaboration of Moffitt's model of risks (that is, neuropsychological deficits and dysfunctional caregiving) by adding an explicit focus on maternal life-course—large family size, closely spaced children, parental criminal involvement, and welfare dependence. Moffitt has hypothesized that antisocial behavior emerges through two different developmental pathways. One type appears very early in life (with signs emerging as early as the preschool years), and a second appears in adolescence. The severity and longitudinal course of these two types of disorder are substantially different, with childhood onset being the more serious. In one longitudinal study of 535 males conducted in Dunedin, New Zealand, 13 percent had characteristics of childhood-onset conduct disorder, and 31 percent exhibited the characteristics of adolescent-onset conduct disorder. The investigators found that children with behaviors indicative of childhood-onset conduct disorder were substantially more likely as adolescents to become violent, to display antisocial personalities, to leave school early, and to have weaker bonds to their families than did children whose antisocial behavior began to appear in adolescence. The reader will notice that the domains of risk for early-onset antisocial behavior are exactly those targeted by the program to improve maternal and child health early in the life cycle.

Neuropsychological Deficits. Children with childhood-onset conduct disorder are more likely to have neuropsychological deficits, as reflected in compromised motor functioning, attention deficits, hyperactivity, impulsivity, and impaired language and cognitive functioning. Although most children with these problems do not grow up to become criminals, subtle neurological deficits can increase children's susceptibility to other adverse environmental influences, such as harsh and rejecting parenting and rejection by peers, that can further increase their risk for later delinquency and crime.

While some of these childhood neuropsychological deficits probably have some genetic origins, evidence is accumulating that a sizable portion can be traced to poor prenatal health conditions that compromise the development of the fetal nervous system. Some portion of these neuropsychological deficits, thus, may be prevented by helping pregnant women (1) reduce their use of alcohol, illegal drugs, and cigarettes; (2) improve their prenatal diet; and (3) identify and obtain prompt treatment for emerging obstetric problems, such as genitourinary tract infections and hypertensive disorders.

Dysfunctional Care of the Child. Abused and neglected children are at increased risk for persistent child behavior problems, academic failure, chronic delinquency, adult criminal behavior, antisocial personality disorder, and especially violent crime. Despite the risk posed by child abuse and neglect, it is important to keep in mind that the majority of such children do not become delinquent, criminal, or violent. Moreover, we do not know for sure why some abused and neglected children develop antisocial behavior and others do not. It probably has to do with some maltreated children's development of a belief that the world is a hostile place and corresponding accumulations of experiences that channel such children into environmental contexts where they are increasingly exposed to criminogenic influences, a topic that we address more completely below.

Some researchers have reasoned that poor parenting practices fail to instill within the child the capacity for impulse regulation and empathy, increasing the risk for adolescent criminal behavior. Particular attention has been given to abused and neglected children's difficulties regulating their emotions, such as anger and aggression. A number of investigators have noted that children who are abused develop a tendency to distrust others' motivations because they have found the world to be hostile, and that they tend to attribute hostile motives to others' neutral behavior. This tendency leads children to confront and, at times, to attack others, as if to strike first before they are harmed themselves.

Another area of emotion regulation that has strong ties to behavior in later life is the development of empathy. When children are able to respond empathically, they are at lower risk for the development of antisocial behavior both during early periods of development and later in life. Abused and neglected children are less likely to be empathic towards others.

Compromised Maternal Life Course. In earlier sections, we enumerated risks for welfare dependence and thwarted life-course development on the part of low-income women. It is important to note that compromised maternal life course, in itself, is associated with whether women's children will develop antisocial behavior. In a longitudinal study of adolescent parents in Baltimore, for example, young women with recent welfare experience were more likely to report that their children had been expelled from school and had engaged in a variety of antisocial and delinquent behaviors than were their low-income, non-welfare counterparts. Being unmarried, not having graduated from high school, and having three or more children also increased the likelihood of these reported behavioral problems. A Danish longitudinal study of 4,000 males and their families found that poor social circumstances (reflected by mothers who were young, unmarried, and of low socioeconomic status; and poor conditions in the home) increased the risk for boys' violent behavior at age 18. A recent study of tenth graders indicated that increased family size led to reduced parental influence and greater peer influence on both girls' and boys' development of antisocial behavior and delinquency.

As with child maltreatment and antisocial behavior, the mechanisms linking maternal life course to children's antisocial behaviors are not well understood. Some findings point to the role that parental monitoring may play in linking family size with antisocial behavior: the larger one's family, the more difficulties parents have supervising their children. This lack of supervision puts children at risk for poor academic outcomes, which, in turn, are associated with antisocial behavior among adolescents. In addition, poor parental monitoring, coupled with the likelihood that families with few economic resources tend to live in crime-ridden neighborhoods, may further increase children's exposure to negative peer influences.

Interrelations Among these Domains of Functioning

Thus far, consideration has been given to how these general domains of risk are individually related to the development of adverse outcomes. It is important to note, however, that the risk for adverse outcomes, such as violent behavior among adolescents or impaired intellectual functioning among young children, increases substantially as risk factors accumulate.

Targeted Population

Although the problems identified above cut across all segments of U.S. society, they are more common among children born to poor, teenage, and single parents. This observation led to our decision in the original trial conducted in Elmira, New York, to focus recruitment on women bearing first children who were either teenaged, unmarried, or from low-income families. We actively recruited women who fell into these target groups by meeting privately with our primary referral agents (the public health department and private obstetricians) and describing the program goals. All of our publicity and program materials, however, described the program as open to any first-time mother and her family. Any woman bearing her first child was accepted in order to avoid creating a program stigmatized because it served only the poor.

The program specifically targets:

- ***low-income women, and especially those who are teenaged and unmarried,***
- ***with no previous live births.***

Given that the beneficial effects of the Elmira program (described in the Evaluation section) were concentrated on women who were unmarried and from low-income families, the sampling design in Memphis was modified to focus more exclusively on low-income women, the vast majority of whom were unmarried and teenaged. Each of the trials focused on women who had no previous live births, because we reasoned that offering them services during the transition to parenthood would increase their receptivity to our offers of help. Moreover, as a public health strategy, this approach held the promise of improving the life chances of subsequent children, because parents were hypothesized to have better skills for managing the demands of pregnancy and early care of the child after they had been helped with their first child. In addition, to the extent that the rates of rapid successive births were reduced, parents would be able to focus their caregiving resources on a smaller number of children.

It is important to note that the first trial, conducted in Elmira, New York, was conducted with a primarily White sample in a rural area and a small city. The second study in Memphis, Tennessee, was conducted with a primarily African American sample in an urban area. This means that the findings can be more confidently applied to African Americans as well as Whites who live in both urban, rural, and small city environments.

As the program model was transferred from Elmira, New York, to Memphis and Denver (where it serves a large portion of Mexican Americans), it was reviewed from the standpoint of its congruence with the cultural beliefs of the African American and Mexican American families that it increasingly served. This work was facilitated by the creation of community advisory committees that reviewed the protocols. The reassuring message in both Memphis and Denver was that the protocols were essentially culturally competent. This approval of the program was based in part on its inclusion of

other family members and friends in the program, and on the fact that the group of nurses working in the program was racially and ethnically diverse. In Denver, each monolingual Spanish-speaking client was provided a nurse who spoke Spanish; and Latina, Asian, and African American nurses were assigned to serve regions of the city where the likelihood was high that they would be working with similar minority families. However, to avoid confounding the race and ethnicity of the families with the race and ethnicity of the visitor as influences on outcomes, no attempt was made to match individual clients and nurses based on race or ethnicity.

Program as Designed

Program Overview

This program of prenatal and infancy home visitation by nurses begins during pregnancy as early as is possible and continues through the child's second birthday. Nurses use the following visit schedule:

Registration:	Weekly for four weeks
Until delivery:	Every other week
Following delivery:	Weekly for six weeks
6 weeks to 21st month:	Every other week
21st month to 24th month:	Once a month

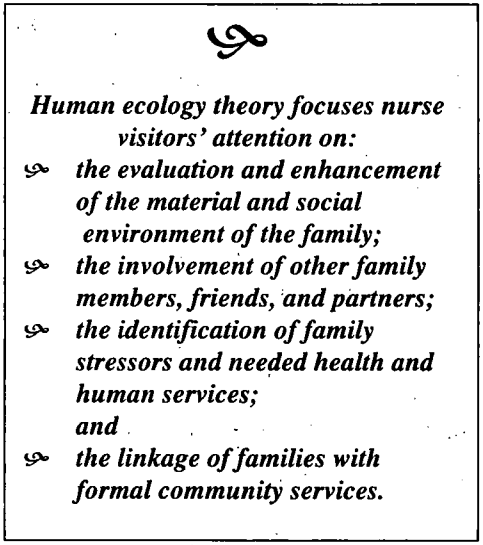
Each visit lasts 60-90 minutes. Nurses work to achieve the goals and objectives outlined above, using clinical interventions that are grounded in theories of human ecology, attachment, and self-efficacy, described in detail above. In the following sections, the nature and role of these theories in the design of the program is described.

Implications of Human Ecology Theory

Human ecology theory played an important role in identifying which families would be enrolled in the study and when. We chose to work with women who had no previous live births, and thus were undergoing a major role change that Bronfenbrenner calls an *ecological transition*. We began the program during pregnancy and the early years of the child's life because during pregnancy women have not yet formally assumed the parental role. In providing support to young people prior to and while they were learning about being parents, we reasoned that the visitors would enhance their influence on parents' enduring orientation to their roles as parents and providers. The skills and resources that parents develop around the care of the first child would also carry over to later children. To the extent that the program was successful in helping parents plan for their futures (including planning subsequent pregnancies), parents would have fewer unwanted or unintended children. This would ease some of the challenges of caring for the first child.

Human ecology theory also focused the home visitors' attention on the systematic evaluation and enhancement of the material and social environment of the family. Indeed, it was because of our conviction that these social and material contexts of the family were so important that we chose to deliver the services in the home, where the nurses could evaluate, first hand, the family environment in which the parents and children were living. The visitors assess and promote informal social support (individuals within the family and friend network who can serve as reliable sources of material and emotional support for the mother in her efforts to care for her children), and families' use of formal community services.

Human ecologists would hypothesize that women's capacity to improve their health-related behaviors is influenced by their levels of informal support for change. Women's efforts to reduce cigarette smoking during pregnancy, for example, are affected by the extent to which individuals close to them believe that smoking is bad for pregnant women and the fetus, and to the extent that they actively support women's efforts to quit. Consequently, the visitors encourage mothers during pregnancy to invite other family members and friends to the visits in an effort to enhance friends' and family members' support of the mothers' efforts to improve their health-related behaviors and to prepare for labor, delivery, and early care of the child.



The involvement of other family members, friends, and mothers' partners is especially important in helping women practice contraception, finish their education, and find work. In discussions of family planning and contraception, the visitors make every effort to conduct some of those visits when mothers' partners are present. In addition, returning to school after delivery or finding work usually requires finding appropriate care for the child. In low-income families this usually means that the mother must find someone in the household or network of friends who might be able to provide reliable and safe care for the baby. The nurses help mothers identify safe and nurturant care within their network of family members and friends and, if none can be found, help them find appropriate subsidized center-based care. To the extent that the visitors have been successful in helping women complete their education and participate in the work force, they have altered the ecology of the family by placing additional demands upon other family members and friends. Moreover, in spending more time in educational or work settings, women are integrated into social contexts where there are greater pressures to conform to societal expectations. These activities also change the ecology of the family in fundamental ways.

Human ecology theory also focuses the visitors' attention on the identification of family stressors and needed health and human services. The visitors assess families' needs and then systematically help them make use of their health-care providers and obtain other needed services in an attempt to reduce the situational stressors that many low-income families encounter. Families are helped to obtain services such as Medicaid, temporary financial assistance, subsidized housing, help with family counseling, nutritional supplementation, substance abuse counseling, and assistance with finding clothing and furniture.

After the baby is born, the visitors continue to inform mothers and other family members about the availability of formal community services and provide mothers with the skills to use those services more effectively. As during pregnancy, the visitors communicate with the children's physicians and their office staff in order to reinforce the medical staff's recommendations in the home and to enable the medical staff to provide more informed and sensitive care in the office. Parents are taught to

observe their children's indicators of health and illness, to use thermometers, and to call the physician's office with signs of their children's illnesses. The expectation is that this approach will increase the appropriate use and decrease the inappropriate use of emergency departments.

Implications of Self-Efficacy Theory

Self-efficacy theory played a role in the design of the Elmira program, through an emphasis on helping women set small achievable objectives for themselves that would strengthen their confidence in their capacity for behavioral change. However, it was not emphasized explicitly as a theoretical foundation in Elmira to the same degree as it was in Memphis. The increased focus on self-efficacy in Memphis grew out of our observation that several of the most important program effects in Elmira, such as the reduction in child maltreatment and emergency-department encounters for injuries, were concentrated among women who at registration had little sense of control over their life circumstances. We hypothesized that the promotion of self-efficacy in the Elmira program played a central role in enabling at-risk women to reduce their prenatal cigarette smoking, rates of subsequent pregnancy, and rates of unemployment, given that the nurses used these methods in helping women manage these aspects of their lives. We reasoned that the nurses' emphasis on helping women gain control over specific life circumstances such as these promoted women's generalized self-efficacy.

As a result of these observations, in the Memphis trial the visitors were trained explicitly in self-efficacy theory and its applications, and the program protocols were written in a way that distinguishes efficacy expectations from outcome expectations. For instance, women may acknowledge that smoking is harmful for themselves and their babies (an outcome expectation), but not believe that they will be able to quit (an efficacy expectation). Distinguishing these two aspects of the problem helps in the specification of smoking reduction efforts and other individualized interventions.

Much of the educational content of the program was focused on helping women understand what is known (or thought about) the influence of particular behaviors on the health and growth of the fetus, on women's own health, and on the subsequent health and development of the child. The educational program represents an effort to bring women's outcome expectations into alignment with the best evidence available.

Behavioral improvements depend upon individuals' confidence in their ability to change. According to Bandura, helping services like those carried out in the current program achieve their primary effect by creating and strengthening the individual's expectation of personal efficacy. Self-efficacy theory has a number of direct implications for the methods that the home visitors use to promote mothers' healthy behavior, optimal caregiving, family planning, and economic self-sufficiency.

First, because the power of efficacy information is greater if it is based on the individual's personal accomplishments than if it derives from vicarious experiences and verbal persuasion, the home visitors emphasize methods of enhancing self-efficacy that rely on women's actually carrying out parts of the desired behavior. Verbal persuasion methods are used, of course, but whenever possible, they serve as guides and reinforcers for behaviors that the women already have enacted. Women who already display some adequate prenatal behaviors are encouraged for what they are doing well. Similarly, the visitors reinforce caregiving behaviors that are close to the goals of the program, such as the sensitive identification of and response to the child's cries, or removal of safety hazards in the

Self-efficacy theory focuses nurse visitors' attention on promoting mothers' healthy behavior, optimal caregiving, family planning, and economic self-sufficiency by:

- ***identifying family strengths and reinforcing behaviors that are close to the goals of the program;***
- ***establishing realistic goals and behavioral objectives in which the chances for successful performance are increased; and***
- ***teaching the problem-solving method (defining the problem, generating sets of possible solutions, trying certain solutions, and evaluating the results) as a general approach to coping.***

home environment. This identification of family strengths helps build mothers' and other family members' confidence in their roles as parents and provides incentives for their acquiring new caregiving skills.

Second, the visitors employ methods of behavioral and problem analysis that emphasize the establishment of realistic goals and behavioral objectives in which the chances for successful performance are increased. The same principles apply whether the individual is trying to quit drinking, correct her diet, or improve her relationship with her boyfriend. Because perceptions of self-efficacy predict coping and self-regulatory behavior, the home visitors periodically ask women about their beliefs concerning their abilities to manage all types of problems related to the overall goals of the program or to the concerns of the women themselves. This information is used to help the home visitors focus their efforts on creating opportunities for women to accomplish small, achievable objectives related to particular goals. As a result of these observations, visitors in the Memphis program developed a series of questionnaires used clinically to assess women's and other family members' beliefs (outcome and efficacy expectations) and behaviors about their health-related behavior, their care of their children, and their life course. These assessments (called facilitators) now provide visitors with a basis upon which to begin their educational work with mothers and other family members.

Our articulation of self-efficacy in the program protocols evolved over each of the two early trials (and has continued to evolve since then). In the Memphis trial we augmented the emphasis on setting small, realistic objectives with a program of goal-setting and problem-solving. The theory of self-efficacy was built into the training program more formally, and we began teaching the problem-solving method (defining the problem, generating sets of possible solutions, trying certain solutions, and evaluating the results) as a general approach to coping. In addition, assessments of efficacy and outcome expectations with respect to critical behaviors were added to the formal test of program effects.

Implications of Attachment Theory

Attachment theory has affected the design of the home visitation programs in three fundamental ways. The first has to do with its emphasis on the visitors developing an empathic relationship with the mother (and other family members where possible). The second has to do with the emphasis of the program on helping mothers and other caregivers review their own childrearing histories. And the third has to do with its explicit promotion of sensitive, responsive, and engaged caregiving in the early years of the child's life.

A fundamental element of the program involves the visitors developing close, therapeutic alliances with the mother and other family members beginning during pregnancy. The establishment of such a relationship, consisting of empathy and respect, was expected to help modify a woman's internalized beliefs about herself and the way she relates to others (most importantly her developing relationship with her child).

Attachment theory focuses nurse visitors' attention on:

- ***developing a close and empathic relationship with the mother and other family members;***
- ***understanding the mothers' beliefs and attitudes about childrearing to help change destructive practices; and***
- ***promoting sensitive and responsive caregiving in the early years of the child's life.***

It is important for the visitors to know how the women were raised as children and their corresponding "internal working models" of relationships because, without intervention, destructive models are likely to undermine the quality of care that parents provide to their own children. By assessing women's beliefs and attitudes during pregnancy, the visitors are able to help women and other caregivers develop more accurate conceptions about the infant's motivations and methods of communicating.

Program protocols have been designed to present systematically how infants communicate, giving special attention to nonverbal cues, crying behavior, and colic, and how parents can meet their infants' and toddlers' emotional needs. An emphasis on mothers' and other caregivers' correctly reading and responding to the infant's cues begins during pregnancy and continues through the end of the program.

In order to promote sensitive and responsive caregiving, increasingly comprehensive parent-infant curricula were incorporated into the program in each of the trials. For example, in the Elmira program all of the nurses were trained in the Brazelton newborn examination, and they were provided teaching materials to promote sensitive, responsive care on the part of parents, including materials to help parents learn how to empathize with their baby. The nurses in the Elmira program, however, felt that the primarily didactic nature of the parent-child curriculum failed to provide them with the kind of guidance they needed to promote emotionally responsive caregiving. We realized that we had too few activities incorporated into the program to promote parents' sense of success in interacting with their children.

In the Memphis program, the number of standardized materials employed to promote sensitive and responsive caregiving was expanded. They include activities such as Barnard's Keys to Caregiving program, the NCAST feeding scale, and an adaptation of Sparling's Partners for Learning program (subsequently replaced by the Partners in Parenting Education (PIPE) program in Denver.) Keys to Caregiving is a series of educational materials and videos designed to help mothers recognize different newborn states (alert, drowsy, etc.) and modulate their caregiving to match the infant's state. NCAST is a systematic approach for assessing parent-child interactions. The PIPE program provides strategies for teaching mothers to read their babies' communicative signals and nurture attachment. The PIPE program has now been fully integrated with training in the nurse home visitation program and replaces the Partners for Learning curriculum, which is no longer available. Keys to Caregiving must be purchased separately, but guidance is given in the training for using these materials with families. The NCAST training must be purchased in addition to our training, and is considered essential to the program's effectiveness.

Summary of the Role of Theory in Program Design

The visitors have been equipped with a theory-driven program design and visit-by-visit protocols that are designed to guide their efforts to help women improve their health-related behaviors, their care of their children, their planning of subsequent pregnancies, educational achievement, and participation in the work force. These adaptive skills focus on both their own behavior and their ability to summon family and community support to improve the material and social contexts in which they live.

Nurses as Home Visitors

This program model calls for nurses to be the home visitors. We have chosen nurses because of their formal training regarding women's and children's health and because of their competence in managing the types of complex clinical situations often presented by at-risk families. We have hypothesized that the nurses' ability to effectively address mothers' and family members' concerns about complications of pregnancy, the physiologic and anatomic changes of pregnancy, labor, and delivery, and the physical health of the infant provides nurses with credibility in the eyes of the family that increases their influence. Moreover, through their ability to teach mothers and other family members to identify emerging health problems and to use the health-care system to address those problems, the nurses increase the clinical influence of the program through the early detection and treatment of disorders.

While the content, theory, and clinical methods of the program have now been thoroughly specified, these materials cannot provide unequivocal guidance in all situations, as qualitative studies of the implementation of this program have demonstrated. In the highly complex situations often encountered in this program, the nurses must rely upon their competent clinical-decision making skills and excellent supervision in order to maintain an effective working relationship with the mother (and her family) and to simultaneously accomplish the goals of the program.

Evidence from published randomized trials indicates that programs that use comprehensive program models and employ nurses who work intensively with families are more likely to achieve their goals than programs that employ paraprofessionals.

Program Content

Nurse home visitors follow detailed visit-by-visit program protocols (see example in Appendix B) that focus on five domains of functioning: personal health, environmental health, maternal role development, maternal life course development, and family and friend support. The content of the protocols is organized developmentally to reflect those challenges that women are likely to confront at different stages of pregnancy and during the first two years of the child's life. Within each of the five domains specific assessments are made of maternal, child, and family functioning, and specific educational content and psychosocial interventions are prescribed depending upon the nature and degree of vulnerability revealed in the assessment.

The predominant population served by the program is low income, unmarried women. The women's husbands or boyfriends and their own mothers are especially encouraged to participate in the home visits. These family members often play decisive roles in determining the extent to which women will improve their health habits, finish their education, find work, secure appropriate child care, and address the needs of the child. In order to facilitate the involvement of friends and family members, nurses schedule weekend and evening visits to accommodate their work schedules.

During home visits, nurses carry out three major activities:

1. promoting adaptive change in behavior that affects the outcomes of pregnancy, the health and development of the child, and maternal life-course;
2. helping women build supportive relationships with family members and friends; and
3. linking family members with other health and human services.

In carrying out these activities, emphasis is placed on the importance of building on parents' strengths and promoting parental competence and control over life's circumstances.

1. Adaptive Behavior Change

The first major activity of nurses during home visits is to promote adaptive change in behavior that affects the outcomes of pregnancy, the health and development of the child, and maternal life-course.

a. Prenatal Behavioral Objectives

The nurse's activities during pregnancy vary considerably among families because women enroll at various stages of gestation and because their knowledge, motivation, and ability to assimilate material differ, thus affecting the time nurses spend on any one topic. The major behavioral objectives include:

- helping women improve their diets and monitor weight gain;
- helping women eliminate their use of cigarettes, alcohol, and drugs;
- teaching parents to identify the signs of pregnancy complications and to use the health-care system to address those problems before they become more serious;
- encouraging regular rest, appropriate exercise, and good personal hygiene related to obstetrical health;
- preparing parents for labor and delivery;
- preparing parents for early care of the newborn;
- encouraging appropriate use of the health care system;
- encouraging mothers to make plans regarding subsequent pregnancies, returning to school, and finding employment.

b. Infancy and Early Childhood Behavioral Objectives

As during pregnancy, women's learning needs and ability to assimilate educational materials vary considerably. The curriculum is organized so nurses are able to cover issues of common concern to all first-time mothers, while simultaneously responding to individual needs and differences. Through this phase of the program, the nurses assess the mother and infant with respect to the behavioral objectives outlined below, recognizing that the norms within these categories change as both the infant and mother mature. The major objectives include:

- improving parent's understanding of the infant's temperament;
- promoting the physical care of the child;
- promoting the behavioral and emotional regulation of the child;

- improving the safety of the home environment;
- helping mothers adapt to changing roles;
- encouraging mothers to further clarify their plans for returning to school, finding work, and family planning;
- helping women make concrete plans for completing their education;
- helping women search for, secure, and retain a job;
- identifying safe and reliable child care;
- employing a reliable method of contraception.

2. Enhancing Informal Support

The second major activity of the nurses during home visits is helping women build supportive relationships with family members and friends.

The second major activity of the nurses during home visits is to enhance the informal support available to the women during pregnancy, birth, and the first two years after delivery. The nurses assess the quality of the women's relationships with their husbands, boyfriends, mothers, friends, and other family members by asking the mother about these individuals and by observing their interaction. The nurses determine the extent to which inadequate support is due to the mother simply having no one to turn to, versus an inability to use the support she has available to her. The nurses also attempt to predict the likelihood that new ideas introduced by the program will create or intensify hostilities among members of the support network or between the mother and the primary support person.

In general, nurses become involved in developing relationships with other family members and friends and in addressing their needs when the nurse determines that these individuals play a direct role in affecting maternal and child functioning. During the home visits, insofar as possible, these individuals are encouraged to be sensitive to the mother's needs, to help with household responsibilities, to accompany the women to the hospital at the time of delivery, to be present for the birth, to aid in the subsequent care of the child, and to reinforce the advice of the nurses in their absence. They are encouraged to help her follow appropriate health behavior and health care practices—without nagging or finding fault.

The mother's husband or boyfriend, whether or not he is the father of the child, is included in the program as an important and highly influential figure in the child's life. His parenting skills, contributions to family life, and support to the mother are all seen as important resources. In some cases, the mother may be involved with men who are abusive and neglectful, or engaged in illegal activities. In many of these cases, the nurse is able to serve as a support to the mother as she breaks away from these destructive relationships. In other cases, the mother may be determined to maintain contact with the man, almost at any cost. It may not be prudent for nurses to actively intervene to discourage women's involvement in these relationships. However, by showing concern and respect for the women, nurses communicate their belief that the women do not have to accept poor treatment, and in the process help women make decisions that are truly in their own best interests.

The mother is viewed, for the most part, as the primary figure responsible for the health and well-being of the child. However, in some families, the grandmother is the individual most willing and able to provide for the child. For these families, the nurse directs her educational efforts regarding child care to the

grandmother, and tries to help the young mother articulate her own goals in life. Conflict between the mother and grandmother sometimes arises in those families in which both individuals are capable of and willing to assume responsibility for the child or in which neither is willing to assume responsibility for the child. The nurse's role in such situations is to help them resolve the conflict by encouraging both mother and grandmother to communicate openly about the issue.

3. Linkage with Formal Services

The nurses also attempt to reduce family stresses by connecting families with formal health and human services. Beginning with the first home visit, the nurses systematically assess the extent to which the family's basic survival needs are being met. Areas considered are income and basic shelter, food, and medical care; reliable and adequate housing; and physical, mental, or substance abuse problems that are unattended.

The third major activity of nurses during home visits is to link family members with formal health and human services.

The nurses urge parents to keep prenatal and well-child care appointments and to call the physician's office when a health problem arises, so that the office staff might help them make decisions as to whether or not sick or emergency room visits are necessary. With the mothers' permission, the nurses send reports of their observations regarding medical, social, and emotional conditions to both the obstetricians and pediatricians who provide the mothers' and babies' care. In this way, the physicians and office staff can provide more informed and sensitive care, and by communicating regularly with the mother's and baby's primary health care providers, the nurses can clarify and reinforce physicians' recommendations in the home. When necessary, the nurses refer parents to other social services such as public assistance, Medicaid, or food stamps; Planned Parenthood for contraceptives; mental health or family counseling; legal aid; WIC; and educational services or job training.

Core Program Elements

The elements of the program have been refined over the past twenty years, and visit-by-visit protocols have been prepared to guide the home visitors (see Appendix B for illustrative materials). While local adaptations will inevitably be necessary as the program is developed in new locations, research and experience have indicated that certain aspects of the program are vital for its effective operation.

- **The program is focused on low-income, first-time mothers.**

Given the emphasis on prevention of problems rather than treatment, the program is most likely to benefit women who are having their first child and who have not yet developed firmly established ways of caring for themselves during pregnancy and for their children. The skills and resources first-time mothers develop in coping with their first pregnancy and child set a pattern for subsequent pregnancies and children. Also, it is easier for women to return to school and work if they have only one child. Low-income parents experience more than their share of life challenges, which make it more difficult for them to provide competent care for themselves and their children. Without help, they and their children are more likely to experience compromised development.

- **Nurses must be employed as home visitors.**

Because of the professional health training required by this program model, nurses must be employed as home visitors. To the extent possible, programs should assign or recruit trained bachelor degreed nurses with community health and maternal and child health home visiting experience. Nurses must be mature individuals with strong interpersonal skills and motivation to work in the home environment rather than in a clinic setting.

- **Nurse home visits begin during pregnancy and continue for two years after the child is born.**

During pregnancy, first-time parents have questions and special needs regarding the biological, psychological, and social changes they are experiencing. Responding to those concerns enhances the home visitors' ability to establish rapport with parents. And obviously, only by beginning services during pregnancy can the nurses influence health-related behaviors known to affect low birth weight, prematurity, and neurologic damage to the fetus. Visits continue to occur through the first two years of the child's life. This is a crucial time in the development of the relationship between mother and child—when effective qualities of parenting need to be established.

- **Nurse home visitors follow a visitation schedule that varies over the two and a half years a family is in the program:**
  - **weekly visits during the first month following enrollment;**
  - **visits every other week for the remainder of the pregnancy;**
  - **weekly visits during the first six weeks after delivery;**
  - **visits every other week thereafter until the 21st month of childhood;**
  - **monthly visits until the child reaches age two.**

The visitation schedule has been designed to meet two purposes: (1) to enable the nurse home visitor to provide appropriate services and information consistent with the developmental stages of pregnancy and early childhood; and (2) to foster the setting of small, achievable objectives for the visitor and family to work on between visits. This second purpose is important in that families generally make progress when they are encouraged to accomplish manageable, incremental steps toward larger goals.

- **Nurse home visitors follow a comprehensive program protocol that focuses on mother's personal health, environmental health, quality of caregiving for the infant and toddler, and mother's own personal development (such as preventing unintended subsequent pregnancies and finding work).**

These content areas represent the core of the program and are well grounded in both theory and practice. Improvements in one area make it easier for positive change to occur in others. Reviews of research suggest that the comprehensiveness of this program is responsible for its success. The procotols are designed to provide guidance to the visitors on a visit-by-visit basis. They include detailed assessments of maternal, child, and family functioning that provide specific focus to the nurses' work with mothers and their families around vulnerable areas of functioning. While these protocols cannot be used effectively without thorough training, supervision, and solid clinical decision-making skills on the part of the nurses, they have been developed and tested over a twenty-year period and provide the foundation for the operationalization of the program.

- **Nurse home visitors are expected to involve family members and friends in the program and to help families use other community health and human services they may need.**

One of the most important roles that the nurse home visitors play is to help families make use of other family members and friends as well as formal health and human services to meet their needs. By helping families learn how to use these community resources, the nurses enable families to develop their strengths and achieve their goals.

- **A full-time nurse home visitor carries a caseload of no more than 25 families.**

The comprehensiveness of the model and the intensity of the visit schedule require manageable caseloads. The nurse home visitor is expected to carry the same caseload of families for the full duration of the program. Research and experience indicate that continuity in the relationship between the nurse and the family is critical in achieving desired outcomes. This continuity is best realized when caseloads are kept to no more than 25 families at any one time.

- **A team of nurse home visitors should have a well-prepared nursing supervisor to provide guidance and oversee program implementation.**

Supervisors hold individual supervisory conferences with nurse home visitors once a week as well as a weekly case conference in which all visitors participate. Observations and evaluations of how each home visitor is carrying out the program with participating families are conducted quarterly to foster ongoing improvement in practice. Supervisors also play a vital role in developing collaborative relationships with other health and human service providers upon whom the home visitation program depends for ancillary support. A full-time supervisor should support no more than 8 nurses, particularly during the initial cycle of program implementation.

- **Detailed records are kept on families and their needs, services provided, and progress and outcomes realized.**

A well-designed and well-maintained record-keeping and management information system has proven to be both clinically and administratively necessary in the successful operation of the program. It is important that relevant information be collected so that those operating the program locally can monitor their performance.

The specific content and educational materials employed to achieve program goals and objectives will naturally be refined over time. We expect new program sites to adhere to the specific content and methods reflected in the program protocols, but welcome insights and new educational materials that may be tested and incorporated in future generations of the program.

Planning and Implementation

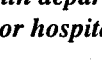
Needs Assessment

As new communities consider developing this program model, we encourage them to identify geographic areas in their community where rates of adverse outcomes for children and families indicate that neighborhoods are at heightened risk. The kinds of factors that they are encouraged to examine include rates of low birthweight, infant mortality, child abuse and neglect, low-income households,

and crime. These indicators reflect the types of outcomes the program is attempting to influence and are markers for general social adversity.

Key Contacts

Communities must decide what organization will take the lead for administering the program. This usually has been a health-care provider such as a local health department or hospital. This is sensible given that most women are registered in the program through their prenatal care provider. However, program success depends primarily on strong local leadership and a commitment to implementing the program model effectively. The method in which a particular community administers and manages the program will vary. For example, in one site the nurses may be employed by and obtain referrals from the local public health department, but may work out of offices in a neighborhood or school-based clinic or family resource center. In another site, the program may be entirely housed and funded by the city hospital, though clients are recruited from several prenatal clinics.



The lead organization for this program has usually been a local health department or hospital.

Usually, decisions about which agencies should be involved in developing the program are made by local multidisciplinary planning task forces, which often include state or local directors of health and/or social services, or administrators of hospitals. It has been our experience that this requires both individual leadership and a community of health and human service providers, local community groups, and sometimes religious leaders who are committed to seeing this program made available in their community. Once in operation, this program model relies upon cooperation among a variety of health and human service providers. That cooperation needs to be evident in a clear commitment among those providers to help make this program a success and to assure its integration with existing community systems and supports.

Interagency Linkages and Collaboration

Nurses are the primary provider of service in this program model, but no single professional has the expertise to manage all of the types of physical health, mental health, and social problems faced by high-risk families. Consequently, this program requires the cooperation of professionals from many different disciplines to support the work of the nurses, often in the form of case conferences designed to improve the delivery of services to selected families. Moreover, the nurses will need to make referrals to other health and human service providers, so they must understand and have good working relationships with those other services such as mental health services, substance-abuse treatment programs, housing agencies, sources of emergency food and material assistance, and so forth.

Formal cooperative agreements may need to be established with prenatal care providers to recruit pregnant, low-income, first-time parents. The process of establishing the necessary relationships with other key service providers in the community will vary from community to community. In some communities, service providers have long-standing relationships with one another and agreements can be informal, an outgrowth of the joint planning and communication networks already established. In other communities, relationships may need to be cultivated in advance between agencies that have little or no prior working ties such as public health departments and vocational education and work training programs. Activities to cultivate these relationships may range from information

exchanges conducted by the program at the staff meetings of each cooperating agency to meetings with agency heads and program intake staff to developing formal contracts to serve a certain number of families each year referred by the home visitors. Programs serving large numbers of families with substance abuse or more severe mental health needs may choose to work out more formal agreements or supplement the basic program with contracted mental health services to assure that families have ready access to affordable treatment. Our model requires the home visitor to be a nurse, but she cannot do it alone.

Funding and Program Costs

In 1997 dollars, it costs about $2,800 per family per year to conduct this program. The program lasts 2.5 years, so the total cost of the program per family is $7000. Because of start-up inefficiencies due to training and the time required for the nurses to develop a full caseload, for the first three years of program development, it costs about $3,200 per year per family. Thus, we have estimated that a typical program serving 100 families for the first three years of operation will cost about $800,000. After that, we have estimated that the actual operating expenses will drop to $2,800 per family per year. This figure assumes a team of four nurses, one half-time supervisor, and one half-time secretary serving 100 families. It includes office supplies; program and medical supplies; postage; copying; liability insurance; cell phone costs for the home visitors; and mileage reimbursement. Costs for training (excluding costs for nurses to travel to Denver) and the purchase of a computer and modem are included in the start-up estimate of $3,200 per family per year for the first three years. The budget assumes a sponsoring agency with office space and basic utilities covered, and does not include a percentage for overhead costs. Sponsoring agencies have included public health departments, private hospitals, and family centers associated with family health and social service collaboratives. While it might be possible to initiate the program with fewer nurses, we recommend a team of four to enhance the likelihood that enough staff will become familiar with the model to sustain it through staff turnover and other typical agency transitions. Serving 100 families also ensures a diverse enough experience with program implementation that it creates a good base for learning and adapting the program model to the unique needs of diverse families. Developing a team of this size and serving a minimum of 100 families is one of the current requirements to be considered as a prospective demonstration site.

The program will cost more or less to deliver in different parts of the country, with variations in program costs primarily reflecting regional differences in nurses' salaries. An example of a program budget is included in Appendix C, which should enable program planners to estimate what it will cost to develop the program in their own communities. It is important to note that the cost of the program and training includes a management information system (MIS) designed to monitor program implementation. It has been our experience that communities should budget some funds to cover the cost of additional training in case there is staff turnover.

As the program has been replicated in new sites, funding has been generated from a variety of state and local sources, including Medicaid, Temporary Assistance for Needy Families (TANF), Maternal and Child Health Block Grants, child abuse and neglect, and crime-prevention dollars. Communities have been willing to invest in the program from these sources because of evidence that the program affects individual functioning in the areas covered by these programs and because of the evidence that the program will reduce government costs in these budgets later on.

Resources Necessary

The nursing staff must have individual copies of the program protocols including record keeping forms. The program administrators commit to employing the program record keeping forms, to entering key pieces of program implementation data into an Access data set, and sending the data regularly to the Prevention Research Center for Family and Child Health at the University of Colorado (PRC). These data are processed and returned to program administrators and staff at regular intervals to inform them about key features of program implementation.

In addition to standard nursing tools, such as blood pressure cuffs, Otoscopes for examining babies ears, and baby scales, the program employs a number of commercial educational tools and materials (all included in the cost of the program outlined above). These are purchased in addition to the training and technical assistance provided by the PRC. Staff nurses are trained in the NCAST assessment procedures and the Keys to Caregiving materials developed at the University of Washington School of Nursing. Nurses purchase the Partners in Parenting Education (PIPE) program, the Bavolek nurturing program, and developmentally appropriate toys for the children.

We strongly recommend a single administrative home for the program. From this central office, nurses receive supervision, communicate their whereabouts for safety reasons, have opportunities to meet with and talk to one another to share ideas and experiences in using the program protocols, keep client records, and turn in data for the management information system. By creating a program home base, nurses become effective more quickly at implementing the program with families, they are more likely to receive the support they need to function well and stay safe on the job, and families know where to turn for backup.

Staffing and Supervision

The successful selection of home visitors and supervisors is critical to the successful implementation of this program. The program employs full-time nurses as home visitors, and the nurses should be women. Nurses who have completed a bachelor's degree in nursing and who have previous experience in maternal, child, or community nursing are best prepared to conduct this work. Some sites, because they do not have enough bachelors' trained nurses available for hire, are hiring and providing additional training to nurses with a diploma or associate's degree.

Formal training, while important, is insufficient to ensure success. Nurses who simultaneously display a capacity for empathy, caring, and an ability to maintain appropriate boundaries in the context of a therapeutic relationship are best suited to this work. They should enjoy the prospect of developing a relationship with a new mother and her family for a two-and-a-half-year period. They must be capable of efficiently organizing their work lives while being sufficiently flexible to adapt their schedules to accommodate the shifting availability of families to complete home visits. The nurses must have a reliable car, a driver's license, and car insurance that meets the requirements of the agency administering the program.

In order to make good clinical decisions, nurses need the opportunity to reflect on their complex, high-risk case load in a situation that is free from the full range of stressors present in the field. The nursing supervisor is responsible for assuring that this clinical supervision occurs on a regularly scheduled basis in a non-threatening environment. Nurse visitors are provided an opportunity to

discuss individual cases in depth and obtain the input of team members and other professionals in related fields such as obstetrics, pediatrics, mental health, social work, and child development. In addition to promoting visitor accountability and thoughtful management of their caseloads, clinical supervision supports the visitors in maintaining professional boundaries and dealing with transference and countertransference issues that inevitably arise in the course of long-term therapeutic relationships. Clinical supervision takes place in the form of weekly case conferences for 1-1/2 hours and weekly individual meetings between the home visitors and the nursing supervisor for one hour.

Because the nursing supervisor is responsible for program management as well as clinical supervision, she should have a Master's Degree in maternal, child, community health, or mental-health nursing. She should demonstrate considerable experience in working with at-risk families in home-based settings. Since she is responsible for maintaining fidelity to the model, it is essential that she participate fully in the training program and that she fully embrace the theoretical and clinical underpinnings of the program.

In general, the quality of supervision and peer and/or multidisciplinary team support to the nurses is key to both learning the program model and preventing burnout. It is also important to try to make sure that each nurse's caseload is a balance of more and less-challenging clients. Hiring experienced, mature nurse home visitors, compensating them adequately, and managing and supporting the nurses' work promotes stability in the nursing staff.

Training of Staff

Training begins with an initial one-week session for the nurse home visitors and their supervisor, offered by the staff of the PRC in Denver, Colorado. This session is followed by a three-day and two-day follow-up training offered on site at times that coincide with the nurses' need to begin using the infancy and then toddler protocols with families. In addition to the group training sessions, the PRC staff are available for technical assistance by phone as needed.

The first training session is offered prior to the initiation of the program. It covers:

- the history of the program,
- the research evidence to support its efficacy,
- the theoretical and clinical foundations of the program,
- the principles of forming effective therapeutic relationships with family members,
- solution focused therapies,
- understanding women's stages of readiness for change,
- issues related to ethnic and racial diversity,
- the prenatal content,
- safety issues related to home visiting,
- the program protocols, and
- record keeping system.

The second and third training sessions reinforce the theories and clinical strategies introduced in the first session, cover the content of the infancy and toddler programs, train nurses in the P.I.P.E. program, and review selected cases that have been served in the program to date with the entire staff to ensure fidelity of program implementation. The cost of this training and technical assistance to

date has been subsidized by a federal grant from the Department of Justice so the actual cost for new communities has yet to be estimated. (Appendix C provides a cost estimate of $50,000 for training and technical assistance over a three-year period.) Provisions for training new staff within an existing community are currently being developed.

Recruitment/Selection of Target Population and Retention Strategies

The evidence generated from randomized trials indicates that this program is most effective with women who are unmarried and from low-income households. Moreover, subgroups found to benefit even more are women who smoke cigarettes during pregnancy and who are poor, unmarried teenagers. Local communities will need to decide for themselves how they want to focus these services.

The program is most effective with women who are:

- ***unmarried, especially teenagers;***
- ***poor; and who***
- ***smoke cigarettes during pregnancy.***

This program is voluntary. Women's interest in participating will be affected by their desire to have questions answered about their pregnancy, the health of their baby, and to find needed resources in the community. In the randomized trials, 80-95 percent of the women who were offered the opportunity to participate accepted. More Whites than African Americans declined; and more smokers than non-smokers declined. There were substantial and statistically adequate numbers of women in the study programs representing the range of risk characteristics, and there were no significant differences between women who dropped out of the program and women who remained enrolled for the duration.

Recruitment of families typically takes place in prenatal care settings such as obstetric clinics and the offices of private obstetricians. While some sites have chosen to conduct their own case finding work through community workers, studies of case-finding for prenatal care patients in some communities have found that such procedures are not cost effective. Moreover the proportion of women who register for prenatal care very late in pregnancy in most communities is actually very small, in spite of clinical reports to the contrary.

Many home visitation programs for at-risk families take the position that if families (or women) miss a predetermined number of visits, it is an indication that they do not really want the service, and the nurses should focus their energies on families who do want the service. Given that we have found that the families who benefit the most are those in greatest need, we have taken the position that unless a mother explicitly asks to be dropped from the program, she is retained on the program caseload. It has been our clinical experience that women often miss scheduled appointments because there are crises in their lives that make keeping the appointments a lower priority. Moreover, especially at the beginning of the program, before women have established a relationship with the nurse, many have not developed a routine for visitation and have not had a chance to realize the rewards and value of full program participation. In these cases, the nurses must often make extraordinary efforts to complete the visits (e.g., dropping by when they are in the neighborhood, gaining the trust of distrustful and skeptical families members and friends, and arranging to be at the clinic site when the mother is scheduled for a prenatal care appointment). While this may border on being intrusive, it is our experience that many mothers later thank the nurses for persisting with them during their crises or through their early days of distrust. Many acknowledge that the persistence reflected the nurse's commitment to them.

Setting

This is a program that is usually delivered in families' own homes. In situations in which privacy is required and the mother and nurse are unable to find privacy in the home, visits can take place in local fast-food restaurants, health clinics, or other community-service settings.

Sequence of Intervention Activities

Women are typically recruited for the program at their first prenatal visit. Mothers may not be able to make an informed decision about participating until they have discussed the program with other family members, the baby's father, or their husband or partner. While these other individuals should not have the final say about the mother's participation, it is almost always wise to inform and engage them in the program and explain what it can offer the mother, the baby, and the family. For under-age mothers, permission from parents or guardians may be required in certain states. This should be determined when planning the recruitment strategy.

After the mother has agreed to participate, the nurse should conduct her first home visit just as soon as it is possible to schedule it. After explaining the program in greater detail to the mother and conducting initial assessments, the nurse should obtain written permission to communicate with the office staff who provide the mother's prenatal care, and if necessary, with other health and human service providers whose services the mother may need.

The program of home visits continues through the child's second birthday. If it is at all possible, the nurses should make an effort to visit the mother in the hospital at the time of delivery and to be present for the discharge exam so that the nurse can reinforce and clarify the physician's instructions.

If needed, the nurse may call for interagency case conferences to address the needs of her most challenging cases. In this way, formal service providers can share observations and thoughts about the most effective way to serve those families in greatest need.

Implementing the Intervention

The nurses are scheduled to visit families once a week for the first four weeks after registration in the program and then once every other week until delivery. After delivery the nurses visit once a week for the first six weeks after delivery, and then every other week through the 20th month postpartum. From the 21st to 24th month postpartum, the nurses visit once a month. It has been our experience in the randomized trials that the nurses were able to complete roughly half of the scheduled visits, or approximately 29 face-to-face visits with families from their first visit during pregnancy through the child's 24th month. These calculations included women who miscarried, babies who died, and families who moved from the community. Once adjustments for these untoward events were entered into the calculation, the rates of completion for expected home visits increased to 65-70 percent.

As noted above, the nurses are encouraged to visit more frequently when families are experiencing crises with which the nurses are able to help, or when particular family needs (such as the birth of a special needs child) may demand more frequent visits for a period of time. Data collected from the Elmira and Memphis studies showed that the nurses indeed adjusted the frequency of visits to accommodate the needs of the families they served.

Extending the program through age three could have added benefits such as enhancing parenting skills and assuring a smoother transition to other family support services (such as Head Start). However, we designed the program to occur in what we believed was the shortest amount of time possible to achieve strong and durable program effects. This increases the likelihood that a program will be able to serve more families, more cost-effectively, over time. In practice, some programs may seek additional funding to serve some families for a longer period of time.

Changes/Modifications in Program in Response to Family Needs

Although there are visit-by-visit protocols to guide the nurses in the conduct of each visit, they are designed to be adapted to the individual needs of each mother and her family. The nurses are going to focus considerably more time on the consequences of prenatal cigarette smoking and strategies for reducing smoking for women who smoke than for women who do not. Similarly, considerably more time will be spent on the promotion of alternatives to physical punishment and yelling as a means of disciplining toddlers in a household where yelling and slapping are the mode for dealing with young children. These individual adaptations are invoked on the basis of individual assessments conducted in the course of completing home visits. Specific educational and behavioral change strategies are set in motion on the basis of the individualized assessments, and referrals to other community services are tied to the specific needs of families and their assessed readiness to take advantage of such services.

Implementation Problems

Recruiting Competent Nurses and Supervisors. One of the most critical influences on the success of this program is the availability of competent staff to conduct the program. As indicated above, the program requires nurses who not only meet particular standards with respect to formal training and experience, but also personal characteristics that enable them to establish trust and to set firm limits when the health and safety of the mother and child are jeopardized. It has been our experience that it is important to recruit nurses who have some experience with or very clear understanding of home visiting, low-income pregnant women, and parents of young children. On the other hand, it has been our experience that some nurses believe they have so much experience conducting this kind of work that they do not need to learn this particular model of visitation. The old models of visitation under which these nurses worked appear to have created expectations about home visitation that interfere with their completely assimilating this new model. When this program is established in new communities, there often are limited numbers of nurses with just the right set of experiences and qualifications. The Memphis trial, for example, was conducted in the midst of a major nursing shortage, limiting the numbers of qualified nurses for the job and contributing to substantial rates of staff turnover. Given this significant problem with the recruitment and retention of nurses in Memphis, it is important to note that many of the major goals of the program were accomplished (discussed in the Evaluation section), even under these less than desirable circumstances.

Integrating the Program into Existing Health and Human Services. As noted above, this program requires the active participation of other health and human services for its success. It requires considerable local leadership and commitment to create a niche for the program so that services are offered to the appropriate target population, the integrity of the model is retained, and strong linkages are established to related family services. Local program adaptations that require the investment of professionals from different disciplines and different agencies may be necessary to implement the program effectively. For example, the nursing supervisor may benefit from regular consultation

with a mental health professional if her own experience and training does not include psychiatric nursing, given the psychosocial complexities of high-risk families. Multidisciplinary case conferencing is always beneficial, and can augment the initial training provided to the home-visiting staff.

An even greater challenge may be integrating the program into a service system that includes existing programs serving young families whose models differ from ours and whose funding may be threatened by the financial support demands of this model. Community ill will can substantially threaten the relationships needed for the model's success. We recommend allowing adequate time for existing service providers from across disciplines and agencies to learn about the model and the evidence for its effectiveness, to consider what the research literature says about the effectiveness of other models, and to consider the kinds of services that are really needed to meet the needs of higher-risk families in the community.

Given the strength of the evidence for this model's effectiveness, communities may well have to struggle with extremely difficult choices such as the elimination or transformation of certain programs that evidence suggests do not work. These changes are possible, and can be accomplished in a participatory way that minimizes damage to professional relationships, and enhances the strength of a community service-delivery system for families. Alternatively, the planning process described here might lead community leaders to the conclusion that our program requires certain augmentations to best serve families in the target area, or that the community will coordinate services in a different way to make family referrals on assessed family risk or other criteria.

These issues should all be discussed through the technical assistance and planning process. This will help ensure a proper balance between the requirement that our program be implemented with integrity to its original design in order to assure that a community will find it works effectively, and the need for local adaptation and investment in the community integration and program implementation process.

Monitoring Implementation and Treatment Integrity

We are quite concerned about the possibility that this program will be watered down and compromised in the process of being scaled up. We therefore have set in motion a series of formative evaluation strategies that will enable us to monitor the degree to which the program is being conducted with fidelity to the original model and to understand those features of communities and organizations that are associated with successful implementation. First, we examine the extent to which the basic structure of the program adheres to the model. Have the communities employed nurses who meet the program standards? Do they carry caseloads that do not exceed 25 families? Do they serve low-income, at-risk families bearing first-born children? Have they engaged other health and human services in the planning and implementation of the program? Have they worked out effective arrangements for recruitment and for service coordination? What is the quality and frequency of supervision?

On the implementation side, we have made arrangements with each new site to use the program Management Information System (MIS) that is founded in the nurses' record keeping system. The MIS enables us to monitor the extent to which:

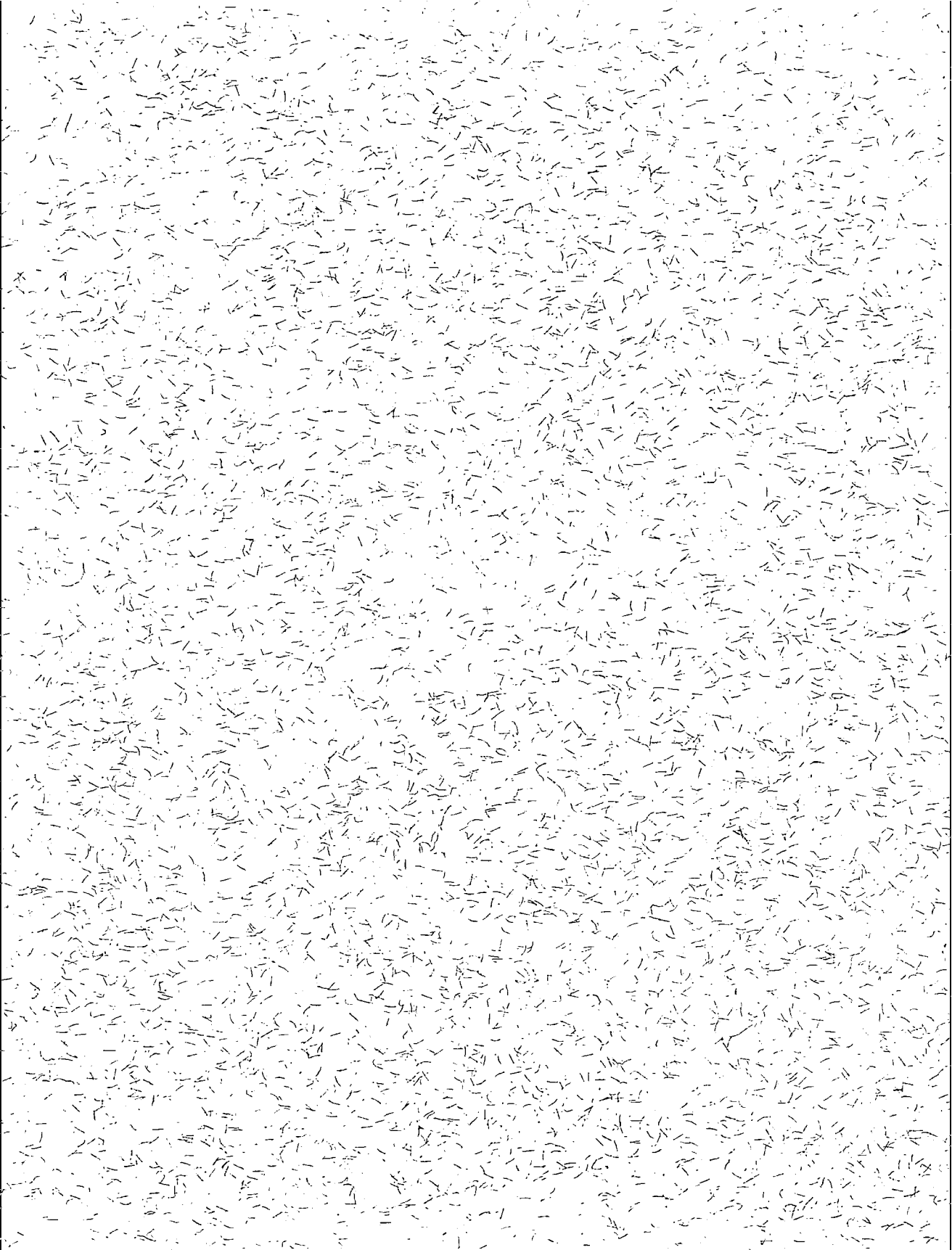
- the nurses complete visits according to the visit schedule,
- the program content is covered as needed, and

- the quality of program implementation (primarily the nurses' relationships with the mother and other family members) is being conducted in accordance with the established standards.

The MIS is designed to produce reports on the program as a whole, on individual nurses, and on individual families at various stages of the program (e.g., end of pregnancy, end of the first year of life, etc.). We have intended that the reports produced by the MIS would help program supervisors and administrators in their responsibilities for report-writing, monitoring local program implementation, and accountability to local funding sources.

In addition to these formative evaluation procedures, each new site monitors the functioning of the families enrolled in the program according to standard indicators of well-being. These include rates of low birthweight and preterm delivery, rates of state-verified cases of child abuse and neglect, subsequent pregnancy, participation in the workforce, and use of welfare. These outcome data can be used to report on the functioning of the program to state and local funding organizations.

CHAPTER THREE
Evaluation



EVALUATION

Overview of Research Designs and Methods and Findings

In each of the two studies of the program described above, women were randomized to receive either home visitation services during pregnancy and the first two years of the children's lives or comparison services. While the nature of the home visitation services was essentially the same in each of the trials, the comparison services were slightly different in each study. The designs and methods employed in each of the trials are outlined below. Table 1 summarizes the findings from the two studies discussed below.

Elmira Design and Methods

The first trial of the program was begun in Elmira, New York, in 1977. In the original study, 400 women were recruited during pregnancy and followed, to date, through the child's 15th birthday. In evaluating the results of the Elmira trial, it is important to note that this was an efficacy trial, given that the investigators were intensely involved in monitoring the implementation of the program. Additionally, the same set of nurses worked with their families for the duration of the program (2½ years). This means that the results obtained in Elmira are probably the "best you can expect" with a program like this if it were disseminated on a large scale.

Context and Sample

The study was conducted in a small, semi-rural county of approximately 100,000 residents in the Appalachian region of New York State. At the time the study began, the local community was well served from the standpoint of both health and human services. In spite of this abundance of services, the community consistently exhibited the highest rates of reported and confirmed cases of child abuse and neglect in the state between 1972 and 1982. Moreover, the community was rated the worst Standard Metropolitan Statistical Area in the country in terms of its economic conditions.

Pregnant women were actively recruited for the study from offices of private obstetricians and a free antepartum clinic if, at intake, the women had:

- no previous live births,
- were at less than 26 weeks of gestation, and
- had any one of the following characteristics that predispose to infant health and developmental problems: young age (less than 19 years), single parent status, and low socioeconomic status.

As noted above, any woman who asked to participate was enrolled, regardless of her age, marital status, or income, if she had no previous live births. This approach avoided creating a program that was stigmatized as being exclusively for the poor. Also, by creating sample heterogeneity, it enabled us to determine if the effects of the program were greater for families at higher risk. Approximately 80 percent of the women invited to participate enrolled in the study. We enrolled 400 women, of whom 85 percent were either low-income, unmarried, or teenaged, and none had a previous live birth. Eighty-nine percent of the sample was White. The sample was stratified on a number of demographic factors and then participating women were randomly assigned to one of four treatment groups.

- Treatment 1 (n=94). Families were provided sensory and developmental screening for the child at 12 and 24 months of age. Based upon these screenings, children were referred for further clinical evaluation and treatment when needed.

- Treatment 2 (n=90). Families were provided the screening services offered those in Treatment 1, plus free transportation (employing a taxicab voucher system) for prenatal and well-child care through the child's second birthday. There were no differences between Treatments 1 and 2 in their use of prenatal and well-child care (both groups had high rates of completed appointments). Therefore, these two groups were combined to form a single comparison group.

- Treatment 3 (n=100). Families were provided the screening and transportation services offered Treatment 2, but in addition were provided a nurse who visited them at home during pregnancy.

- Treatment 4 (n=116). Families were provided the same services as those in Treatment 3, except that the nurse continued to visit through the child's second birthday.

For assessment of the prenatal phase of the program, Treatments 1 and 2 were combined and compared to the combination of Treatments 3 and 4. For assessment of the postnatal phase of the program, Treatments 1 and 2 were combined and compared to Treatment 4.

Five registered nurses were hired through a non-profit private agency (Comprehensive Interdisciplinary Developmental Services, Inc.) expressly for this experimental program. Each nurse had a caseload of 20-25 families and received regular clinical supervision.

Measures

We examined the extent to which the program achieved its goals and objectives by interviewing women at regular intervals throughout pregnancy and the first four years of the child's life. Women were assessed on:

- health-related behaviors,
- qualities of care they provided to their children,
- rates, timing, and outcomes of subsequent pregnancy,
- educational achievements,
- participation in the workforce,
- levels of informal social support, and
- use of other health and human services.

Similar interview questions were completed more recently at a 15-year follow-up study. In addition to these maternal interviews, observations were conducted of conditions in the home using the Caldwell and Bradley Home Inventory, and observations of home safety using a locally developed measure. In addition, the mothers' and children's health and social service records were reviewed to ascertain the extent to which the program improved the outcomes of pregnancy, reduced children's injuries, reduced state-verified cases of child abuse and neglect, and reduced families' use of welfare.

Elmira Results

The women in the four treatment conditions were essentially equivalent on various measures after randomization. Moreover, at the 15-year follow-up study, assessments were conducted on over 90 percent of the women originally assigned to treatment conditions for those cases where the mother or child had not died. These features of the study increase our confidence that the differences in maternal and child functioning reported after randomization are not due to pre-existing differences between the treatment and comparison groups at the stage of randomization or to different patterns of attrition between the groups over time. For all of the results presented below, the treatment-comparison differences were statistically significant at the .05 probability level or better, unless otherwise specified.

Prenatal Results

During pregnancy, in contrast to women in the comparison group, nurse-visited women:

- improved the quality of their diets to a greater extent.

By the end of pregnancy, in contrast to women in the comparison group, nurse-visited women:

- had fewer kidney infections,
- experienced greater informal social support, and
- made better use of formal community services.

Among women who smoked, those who had nurse visitors:

- smoked 25 percent fewer cigarettes than did their counterparts in the comparison group,
- had 75 percent fewer preterm deliveries, and
- among very young adolescents (aged 14-16), had babies who were nearly 400 grams (14 ounces) heavier, in contrast to their counterparts assigned to the comparison group (Olds, Henderson, Tatelbaum, & Chamberlin, 1986).

Though data were collected on post-partum cigarette smoking, there were no treatment effects.

Caregiving and Child Development

After delivery, 19 percent of the poor, unmarried teens in the comparison group abused or neglected their children during the first two years after delivery as opposed to four percent of the poor, unmarried teens visited by a nurse (p=.07) (Olds, Henderson, Chamberlin, & Tatelbaum, 1986). This result was corroborated by independent measures of mothers' interactions with their children, observations of conditions in the home using the HOME scale, medical records, and children's developmental status at 12 and 24 months of age.

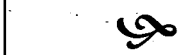
The impact of the program on child maltreatment was further moderated by women's sense of control (or mastery) over their life circumstances, measured when they registered in the program during pregnancy. For poor, unmarried teenagers, as their sense of control declined, the rates of child maltreatment increased substantially in the comparison group, but not in the nurse-visited group. For the sample as a whole, the same pattern of results existed for emergency department encounters during the second year of the children's lives. (As indicated below, because of this pattern of results in the Elmira trial, maternal psychological resources were hypothesized to moderate program impact in the Memphis replication.)

The concentration of effects in the second year of the child's life makes sense given the dramatic increase in injuries at that time, when children become more mobile and the rates of injuries increase.

Overall, the children of nurse-visited women were less likely to receive emergency room treatment and to visit a physician or emergency department for injuries and ingestions from their 12th to 48th month of life than were their comparison group counterparts (Olds, Henderson, Kitzman, 1994; Olds, Henderson, Chamberlin, & Tatelbaum, 1986).

The program produced no enduring treatment differences between the nurse-visited and comparison women with regard to *state-verified* cases of child abuse and neglect during the two-year period following the end of the program—probably due to increased surveillance for child abuse and neglect in the nurse-visited group. However, an examination of the living conditions and emergency department encounters for the groups of "maltreated" children showed that injuries to children who were visited by nurses were substantially less serious. Nurse-visited maltreated children lived in homes that were more conducive to children's intellectual and socioemotional development, the homes of nurse-visited maltreated children were substantially safer, and the children themselves had far fewer emergency-department encounters and physician visits in which injuries were detected. We have interpreted these differences as a reflection of greater surveillance for child abuse and neglect in the nurse-visited conditions, leading to more frequent identification of less serious forms of child abuse and neglect in the nurse-visited condition (Olds et al., 1995).

This interpretation has been reinforced with results from the15-year follow-up. During the 15-year period after delivery of their first child, in contrast to women in the comparison group, those who were visited by nurses during pregnancy and infancy were identified as perpetrators of child abuse and neglect in 0.21 versus 0.46 verified reports. This effect was greater for women who were unmarried and from low socioeconomic households at registration. The effect of the program on the number of verified reports was especially strong for the four to fifteen-year period after the birth of the child.



During the 15-year period after delivery of their first child, in contrast to women in the comparison group, those who were visited by nurses during pregnancy and infancy were identified as perpetrators of child abuse and neglect in 0.21 versus 0.46 verified reports.

Prenatal Tobacco Exposure, Prenatal Home Visitation, and Mental Development in the First Four Years of the Child's Life

Nurse-visited women who were moderate to heavy smokers when they began the program had children whose IQ scores at three and four years of age were higher than their counterparts' scores in the comparison group. Smokers in the control group had children whose mental development scores declined over the first four years of their lives. In contrast, the IQ scores of the children of nurse-visited moderate to heavy smokers were as good as the IQ scores of children of mothers who were non- or light smokers. It is important to note that these differences were not explained by aspects of the postnatal environment, and held even for the group of women who were visited only during pregnancy. The most likely explanation for this beneficial effect of the program is the effect on neurodevelopment of reduction in cigarette smoking and the improvement in diet during pregnancy noted above in the "Prenatal Results" section.

Maternal Life-Course

During the four year period after delivery of the first child, among low income, unmarried women, the rate of subsequent pregnancy was reduced by 42 percent, and the number of months that nurse-visited women participated in the work force was increased by 83 percent. It is important to note that by the first-born's second year of life, the rate of subsequent pregnancy was reduced by 33 percent. Moreover, much of the impact of the program on work force participation among the adolescent portion of the sample did not occur until the two-year period after the program ended, when the teens were old enough to obtain jobs (Olds, Henderson, Tatelbaum, et al., 1988).

The 15-year follow-up study provides even more compelling results. Among women who were unmarried and from low socioeconomic households at initial enrollment, in contrast to those in the comparison group, women who were visited by nurses during pregnancy and infancy had:

	Nurse-visited Women	Control Group
Subsequent births	1.1	1.6
Months between birth of 1st & 2nd child	65	37
Months on Welfare	60	90
Behavioral Impairments due to Substance Abuse	0.41	0.73
Self-reported Arrests	0.18	0.58
Official Arrests	0.16	0.90

Antisocial Behavior among the 15-Year-Old Children

In contrast to adolescents born to poor, unmarried women in the comparison group, those visited by nurses reported 60 percent fewer instances of running away, 56 percent fewer arrests, 81 percent fewer convictions/violations of probation, 63 percent fewer life-time sex partners, 40 percent fewer cigarettes smoked per day, and 56 percent fewer days of alcohol consumption. Parents of nurse-visited children reported that their children had 56 percent fewer behavioral problems due to their use of drugs and alcohol (Olds, Henderson, Cole, et al., 1998).

	Nurse-visited Women	Control Group
Times ran away	0.24	0.60
Self-reported arrests	0.20	0.45
Convictions/probation violations	0.09	0.47
Life-time sex partners	0.92	2.48
Cigarettes smoked/day	1.50	2.50
Days consumed alcohol	1.09	2.49
Behavioral problems due to use of alcohol/drugs	0.15	0.34

Net Cost Analysis

The impact of the program on families' use (and corresponding cost) of other government services in relationship to the initial investment in the service was examined (Olds et al., 1993). In 1980 dollars, the program cost $3,173 for 2 ½ years of intervention per family. We conceived of government savings as the difference between the group that received postnatal home visitation and the comparison group in government spending for these other services. Savings also were expressed in 1980 dollars and were adjusted using a three percent discount rate. By the time the children were four years of age, low income families who received a nurse during pregnancy and through the second year of the child's life cost the government $3,313 less than did their counterparts in the comparison group. Thus, when focused on low-income families, the investment in the service was recovered with a dividend of about $180 within two years after the program ended. More recently, the Rand Corporation has conducted an economic evaluation of the program that extends the estimate of cost savings through the children's entire lifetime and that considers savings to society as well as government (Karoly et al., 1998). While there are no net savings to government or society for serving low-risk families, the savings to government and society for serving high-risk families, that is, those where the mother is low-income and unmarried, exceed the cost of the program by a factor of 4:1.

Memphis Design and Methods

The Memphis trial was designed to determine if the effects of the Elmira program could be replicated through an existing health department with a large sample of low-income African American women, children, and their families living in a major urban area. Unlike the Elmira trial, the Memphis replication study was more of an effectiveness study. Efficacy trials test interventions under optimal conditions, while effectiveness trials test interventions in contexts that are closer to real-life conditions. In the Memphis trial, the investigators were less involved in the administration of the program. Moreover, the study was conducted during a nursing shortage, which led to fairly high rates of staff turnover, given that nurses could earn substantially more in competing hospitals than they could as home visitors in this grant-funded program through the local health department. Given that these are the kinds of factors that are likely to buffet the program if it were administered as an ongoing program in new sites, it is useful to have the Memphis replication study to examine in relation to the Elmira trial.

Context and Sample

The program was conducted through the Memphis/Shelby County Health Department. From June 1990 through August 1991, 1,139 low-income women who were less than 29 weeks of gestation were recruited from the obstetrical clinic at the Regional Medical Center in Memphis. Eighty-eight percent of the women invited to participate enrolled in the study. Women were recruited if they had:

- no previous live births,
- no specific chronic illnesses thought to contribute to fetal growth retardation or preterm delivery, and
- at least two of the following sociodemographic risk conditions: unmarried, less than 12 years of education, or unemployed.

Ninety-two percent of the women were African American, 97 percent were unmarried, 65 percent were aged 18 or younger at registration, 85 percent came from households with incomes at or below

the federal poverty guidelines, and 22 percent smoked cigarettes at registration. After completion of informed consent and baseline interviews, identifying information on the participants was transmitted via modem to Rochester, New York, and entered into a computer program that randomized women to one of four groups:

- Treatment 1 (n = 166). Families were provided free round-trip taxicab transportation for scheduled prenatal care appointments; they did not receive any postpartum services or child developmental assessments/screening.
- Treatment 2 (n = 515). Families were provided the free transportation for scheduled prenatal care plus developmental screening and referral services for the child at 6, 12 and 24 months of age.
- Treatment 3 (n = 230). Families were provided the free transportation and screening offered those in Treatment 2 plus intensive nurse home visitation services during pregnancy, one postpartum visit in the hospital before discharge, and one postpartum visit in the home.
- Treatment 4 (n = 228). Families were provided the same services as those in Treatment 3; in addition, they continued to be visited by nurses through the child's second birthday.

For the evaluation of the prenatal phase of the program, Treatments 1 and 2 were combined to form a single comparison group and then contrasted with Treatments 3 and 4, a group that had nurse visitors during pregnancy. For the postnatal phase of the study, Treatment 2 was contrasted with Treatment 4.

Measures

We examined the extent to which the program achieved its goals and objectives by interviewing women at regular intervals throughout pregnancy and the first two years of the child's life. Women were assessed on:

- health-related behaviors,
- qualities of care they provided to their children,
- rates, timing and outcomes of subsequent pregnancy,
- educational achievements,
- participation in the workforce,
- levels of informal social support, and
- use of other health and human services.

In addition to these maternal interviews, observations were conducted of conditions in the home using the Caldwell and Bradley Home Inventory. Mothers' and children's health and social-service records were reviewed to ascertain the extent to which the program improved the outcomes of pregnancy, reduced children's injuries, and reduced families' use of welfare. We explicitly chose not to hypothesize that the program would affect the rates of state-verified cases of child abuse and neglect as reflected in child protective service records. Pretest and pilot work in Memphis, prior to the beginning of the study, indicated that the rates of state-verified cases in low-income African American children less than two years of age in Memphis were too low (about three to four percent) to detect program effects that would be statistically significant.

To date, results have been published on the children and families through the first child's second year of life. A follow up study of this program is currently underway to determine the long-term influence of the program on maternal life course, parenting, and child functioning when children complete kindergarten (approximately age six).

Memphis Results

Groups assigned to nurse-visited and comparison conditions did not differ on background characteristics that could have affected results. Moreover, as in the Elmira study, assessments were conducted on a large portion of the women originally assigned to treatment conditions. For example, office-based assessments were completed at 24 months postpartum on 96 percent of the cases where there was no fetal or child death. These features of the study increase our confidence that the differences in maternal and child functioning reported are not due to pre-existing differences between the treatment and comparison groups at the stage of randomization or to different patterns of attrition between the groups over time. For all of the results presented below, the treatment-comparison differences were statistically significant at the .05 probability level or better, unless otherwise specified.

Prenatal Findings

There were no treatment main effects for birthweight, length of gestation, low birthweight, spontaneous preterm delivery, indicated preterm delivery, or Apgar scores. Nevertheless, by the 36th week of pregnancy, nurse-visited women were more likely to use other community services than were women in the control group. They also were more likely to be working ($p=.06$), an effect that was particularly strong among women who were not in school when they were randomized (14 percent vs. 8 percent, and 8 percent vs. 2 percent, for the 28th and 36th weeks respectively). There were no program effects on women's use of standard prenatal care or obstetrical emergency services after registration in the study.

In contrast to women in the comparison group, nurse-visited women had fewer instances of Pregnancy-Induced Hypertension (PIH). Among women with PIH, in contrast to those in the comparison group, those who received a nurse home visitor had mean arterial blood pressures during labor that were 3.5 points lower, although there were no treatment differences in birthweight, length of gestation, or Apgar scores for those with PIH.

Dysfunctional Caregiving and Child Development

During the first two years of their lives, nurse-visited children had fewer health-care encounters in which injuries and ingestions were detected than did children in the comparison condition, an effect that was accounted for primarily by a reduction in outpatient encounters. Nurse-visited children also were hospitalized for fewer days with injuries and/or ingestions than were children in the comparison condition. These program effects on both total health-care encounters and number of days hospitalized with injuries and ingestions were greater for children born to women with few psychological resources (.41 versus .67, and .02 versus .26, respectively).

An explanation for the difference in the number of days that children were hospitalized can be found in the pattern of problems uncovered. In general, nurse-visited children were hospitalized at older ages and for substantially less serious reasons. The three nurse-visited children who were hospitalized with injuries and ingestions were admitted when they were greater than twelve months of age

(and thus mobile), while six (43 percent) of the fourteen comparison children were hospitalized when they were less than six months of age (and thus immobile). Eight (57 percent) of the fourteen comparison-group hospitalizations involved either fractures and/or head trauma, while none of the nurse-visited ones did. Two of the three nurse-visited children were hospitalized with ingestions.

During the first two years of their lives, nurse-visited children had fewer health-care encounters in which injuries and ingestions were detected than did children in the comparison condition.

Nurse-visited mothers reported that they at least attempted breast feeding more frequently than did women in the comparison group, although there were no differences in duration of breast feeding. By the 24th month of the child's life, in contrast to comparison-group counterparts, nurse-visited women held fewer beliefs about childrearing associated with child abuse and neglect—lack of empathy, belief in physical punishment, unrealistic expectations for infants. Moreover, the homes of nurse-visited women were rated as more conducive to children's development using the HOME scale. There was no program effect on maternal teaching behavior, but children born to nurse-visited mothers with low psychological resources were observed to be more communicative and responsive toward their mothers than were comparison-group counterparts. There were no program effects on the children's use of well-child care, immunization status, mental development, or reported behavioral problems.

Children born to nurse-visited mothers with limited psychological resources were observed to be more responsive to their mothers and to communicate their needs more clearly than did children born to low resource mothers in the comparison group. We have interpreted the children's behavior as a reflection of the enduring nature of their relationships with their mothers, with more responsive children indicating relationships in which their mothers were more sensitive and responsive to their children's needs and less intrusive and hostile (Kitzman, Olds, Henderson, et al., 1997). There were no program effects on the children's rates of immunization, mental development, or reported behavioral problems. The failure to affect immunization rates calls for a closer examination of the clinical protocols employed in promoting well-child care as the program is tested in new settings. Immunization rates approaching 100 percent could easily be reached simply by including immunization among the nurses' responsibilities.

Maternal Life Course

At the 24th month of the first child's life, nurse-visited women reported 23 percent fewer second pregnancies and 32 percent fewer subsequent live births than did women in the comparison group. The program-control difference in subsequent live births was limited to women with high levels of psychological resources, for whom the rates were 14 percent versus 31 percent, respectively. Nurse-visited women and their first-born children relied upon AFDC for fewer months during the second year of the child's life (13-24 months) than did comparison group women and children. There were no program effects on reported educational achievement or length of employment. The program was able to help those women with fewer mental health symptoms, higher IQs, and more active coping styles in becoming less dependent upon welfare, but was unable to do so with women with fewer psychological resources (Kitzman, Olds, Henderson et al., 1997).

Comparing Two Clinical Trials: Comment

Summary. This program of prenatal and early childhood home visitation by nurses has achieved two of its most important goals—the reduction in dysfunctional care of children and the improvement of maternal life course. The impact of the program on a third goal, the improvement of pregnancy outcomes (in particular the reduction of preterm delivery and low birthweight), is equivocal.

Pregnancy Outcomes. In the Elmira trial, the program produced the anticipated reduction in cigarette smoking, improvement in diet, and increase in women's use of needed social services and informal social support. There was an increase in the birthweight of infants born to women who were very young (i.e., less than 17 years of age at registration) and a reduction in the rates of preterm delivery from 10 percent to 2 percent among women identified as smokers (those who smoked five or more cigarettes per day at registration). It is important to note that 55 percent of the White women in the Elmira trial smoked cigarettes during pregnancy.

This impact on preterm delivery and birthweight among young adolescents and women identified as smokers was not replicated in the Memphis trial, although the program did produce anticipated effects on women's use of other human services and on the rates of Pregnancy Induced Hypertension (PIH). The absence of corresponding effects on the rates of preterm delivery among smokers in Memphis is probably a reflection of the very low rates of cigarette smoking among African Americans. Ten percent of the Memphis sample smoked cigarettes overall, and seven percent of the African Americans smoked. Moreover, the rates of heavy smoking among pregnant African American women, in Memphis, as elsewhere, is especially low compared to their White counterparts. Reproductive-tract infections (another major risk for preterm delivery), on the other hand, were much higher among African Americans. The program did produce a reduction in the rates of Pregnancy-Induced Hypertension (PIH), an effect that was predicted on the basis of a pattern of results found for the Whites in Elmira. The prevalence of PIH among Whites in the Elmira trial was too low, however, to be statistically significant. We predicted a corresponding pattern of results among the African Americans in Memphis, given that the prevalence of PIH among African American women is very high.

This lack of correspondence between the results of the two trials emphasizes the importance of basing preventive interventions on sound epidemiologic evidence—that is, a clear understanding of the modifiable risks for the disorder that one wishes to prevent. In this case, the pattern of risks was quite different for Whites in Central New York State than for African Americans in Memphis. While the program could have an effect on the rates of cigarette smoking, it was more of a challenge to affect reproductive tract infections, given that many begin prior to pregnancy and are not easily detected outside of standard medical settings after pregnancy has already progressed.

There is some suggestion in the Elmira trial that the program may have reduced the rates of neurodevelopmental impairment associated with cigarette smoking during pregnancy. Given the simultaneous impact of the program on the rates of dysfunctional care and compromised maternal life-course, the program has reduced major risks for early-onset conduct disorder.

Caregiving. The impact of the program on the rates of dysfunctional caregiving was substantially replicated. Recall that the beneficial effects of the program in Elmira on dysfunctional care (reflected in rates of state-verified cases of child abuse and neglect and on health-care encounters in which injuries were detected) were concentrated on women who were unmarried and from low-SES households. Most were

teenagers. Corresponding effects were found in Memphis (where 97 percent of the sample was unmarried, all from low-SES families, and over two-thirds less than 19 years of age) for health-care encounters in which injures were detected, for observations of the home environments, and for parents' reports of caregiving and childrearing beliefs. The beneficial effects of the program on caregiving were concentrated among women with few psychological resources measured at registration.

For example, in contrast to counterparts in the comparison group, the children of nurse-visited mothers in Memphis who had few psychological resources were observed to be more responsive and communicative toward their mothers. Infant-attachment research suggests that toddlers' behavior toward their mothers reveals the extent to which their mothers are sensitive and responsive rather than hostile, intrusive, or neglectful toward them, with toddlers' behavior a better indication of the quality of the parent-child relationship over time than currently observed behaviors of parents.

It is important to note, in this regard, that the program was designed to decrease risks posed by limited intellectual functioning, mental health, and mastery on the part of caregivers. The program provided a detailed educational protocol related to maternal and child health and was designed to help parents understand and respond appropriately to their children's unique temperament and communicative style using educational materials adapted to the intellectual levels of the mothers. Given that limited knowledge and capacity to anticipate children's needs can compromise parents' ability to care for their children, it is reasonable that this program would reduce risks imparted by limited intellectual functioning, even in the absence of an effect on maternal intellectual functioning.

While the program produced no effect on mothers' mental health, it may have reduced psychological distress related to parents' care of their children, which is affected by parents' depression and sense of competence. Moreover, by the end of the program at the children's second birthday, there were significant treatment effects in Memphis on women's sense of mastery. Mastery is a general psychological attribute that affects parents' ability to cope effectively with a wide range of challenges, and a deficit in mastery has been associated with child abuse and neglect. Thus, the program was designed to reduce risks posed by limited intellectual functioning, psychological distress, and impaired sense of mastery, and the evidence reported here indicates that it indeed diminished the influence of those risks.

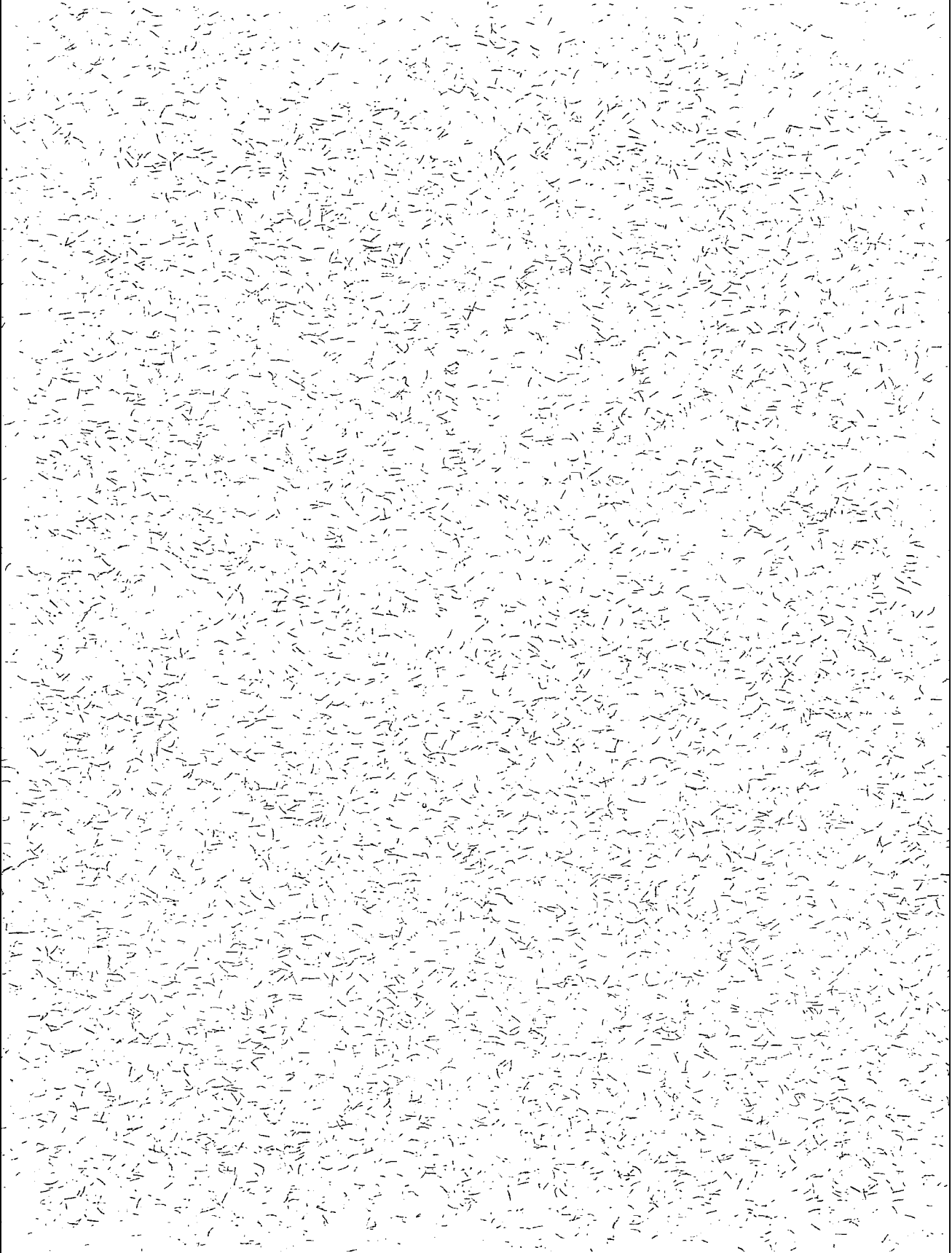
Life Course. Finally, the Elmira program has produced dramatic effects on a host of maternal life-course outcomes from the birth of their first child to that child's fifteenth birthday. Among women who were unmarried and from low-SES households at registration, those who were visited by nurses during pregnancy and infancy had fewer subsequent children, months on welfare and food stamps, behavioral impairments from use of alcohol and drugs, arrests, convictions, and number of days jailed during the 15-year period after birth of their first child. Moreover, the program has reproduced the most important outcome with respect to maternal life-course in the Memphis replication—a reduction in the rates of subsequent pregnancy. We should note that the beneficial effects of the program on life-course outcomes for teens in the Elmira trial were not reflected in increased rates of employment, greater educational achievements, or in reduced welfare dependence while the program was in operation (two years postpartum). It was reflected in reduced rates of subsequent pregnancy, however, which positioned the teen mothers to eventually find work, become economically self-sufficient, and avoid substance abuse and criminal behavior. At the end of the Memphis program, nurse-visited women had 32 percent fewer subsequent live births than did their counterparts in the comparison group. While this gives us optimism that we will eventually see corresponding long-term effects with the African American women in Memphis, there are two reasons to be

cautious. First, the opportunities for labor-force participation among African Americans in Memphis may be different than for Whites in Elmira. Second, the program effect on rates of subsequent pregnancy in Memphis was limited to women with *higher* levels of psychological resources. This suggests that the program effect on maternal life-course may be limited to those women who have the personal resources to manage the care of their children and the demands of employment simultaneously. Only additional follow-up research will allow us to determine the extent to which the Elmira effects on maternal life-course are fully reproduced in Memphis.

Table 1. Evaluation Outcomes

Location	n	Comparison/Control Group	Assignment Procedure	Followup Period	Risk/Protective Factors	Outcomes	References
Elmira, NY	400 women with no previous live births and < 30 weeks pregnant	1. Screenings (n=94); 2. Screenings plus transportation (n=90); 3. Screening & transportation plus nurse visitor during pregnancy (n=100); 4. Same as 3, except that nurse visited through child's second birthday (n=116). Treatments 1 and 2 combined and compared with 3 and 4 for the prenatal phase. Treatments 1 and 2 combined and compared with 4 for the postnatal phase.	Random assignment after stratification on demographic variables	Treatment delivered to 24th month post-partum; Longer-term followup 15 years	**PRENATAL:** Exposue to tobacco; inadequate diet; inadequate use of prenatal care. **CHILD DEVELOP-MENT:** Mother's psychological immaturity; unemployment; poor housing and household conditions; marital discord; lack of supportive networks; abused and neglected as a child. **MATERNAL LIFE COURSE:** Lack of self-efficacy and control; limited psychological resources.	**Women and children of nurse-visited women, compared to those not nurse-visited, had:** **PRENATAL:** . improved diets . fewer kidney infections . greater informal support including community services Among nurse-visited women who smoked, compared to those not visited who smoked: . smoked 25% fewer cigarettes . had 75% fewer preterm deliveries . had heavier babies at birth (among 14-16 year olds) **CHILD DEVELOPMENT:** . less abuse and neglect during first two years (marginally significant); significantly less abuse in the 15-year followup . fewer injuries and ingestions . fewer arrests by child's 15th birthday Among women who smoked: . had children with higher IQ scores at ages 3 and 4 **MATERNAL LIFE COURSE:** Among low-income, unmarried women: . subsequent pregnancies reduced . increased workforce participation . fewer months on welfare	Olds, Henderson, Chamberlin, & Tatelbaum, 1986; Olds, Henderson, Tatelbaum, & Chamberlin, 1986; Olds, Henderson, Kitzman, 1994; Olds et al., 1995; Olds, Henderson, Tatelbaum et al., 1988; Olds et al., 1997
Memphis	1,139 women with no previous live births	1. Free transportation (n=166); 2. Free transportation plus screenings (n=515); 3. Free transportation & screenings plus prenatal home visits (n=230); 4. Same as 3, plus home visits through child's second birthday (n=223). Treatments 1 and 2 combined and compared with 3 and 4 for the prenatal phase. Treatment 2 compared with 4 for the postnatal phase.	Random assignment	To date, results are through child's second year of life	See list above.	**Women and children of nurse-visited women, compared to those not nurse-visited, had:** **PRENATAL:** . greater use of community services . were more likely to be working (p=.06) . fewer instances of pregnancy induced hypertension **CHILD DEVELOPMENT:** . fewer injuries and ingestions and days hospitalized due to injuries and ingestions . homes more conducive to child development **MATERNAL LIFE COURSE:** . subsequent pregnancies reduced . fewer months on welfare	Kitzman, Olds, Henderson et al., 1997

CHAPTER FOUR
Program Replication



PROGRAM REPLICATION

Overview

When the results of the Elmira study were first reported in 1986, many program advocates took the position that the program should be disseminated nationally. We, on the other hand, took the position that we needed to determine the extent to which the results from the Elmira program could be replicated in a major urban area with a minority sample and under less than optimal conditions. This led to our Memphis replication study. Moreover, at the time, we had no data on the extent to which the beneficial effects of the program would endure, given that the effects of many preventive interventions that began during infancy eventually washed out after the program ended.

While we decided to wait to determine the endurance and replicability of the Elmira findings, a number of major policy bodies used the data from early phases of the Elmira trial to promote a wide variety of home visitation programs. The problem with the recommendations of these advisory bodies, however, is that the programs recommended had little resemblance to the program tested in the Elmira randomized trial. The National Commission to Prevent Infant Mortality, for example, recommended that home visitation services be made available to low-income pregnant women in an effort to improve their health-related behaviors, reduce the rates of low birthweight, and reduce the rates of infant mortality and morbidity. The Infant Mortality Commission promoted the dissemination of the South Carolina Resource Mothers program, a prenatal home visitation program delivered by paraprofessionals that has little resemblance to the program studied in Elmira and Memphis.

An analogous process occurred with home visitation services to prevent child abuse and neglect. In 1991, the U.S. Advisory Board on Child Abuse and Neglect identified child abuse and neglect as a national emergency. They identified home visitation services as the most promising method of preventing child maltreatment, again relying on the results of the Elmira trial to support a recommendation that home visitation services be made available to parents of all newborns. The program that they promoted was Hawaii's Healthy Start program, a program of paraprofessional home visitation that begins in the newborn period. As with the Resource Mothers program, there was no evidence from randomized trials to support the efficacy of this particular program, which had little resemblance to the program tested in the Elmira trial. As a result of the recommendations of these two groups, hundreds of home visitation programs have been spawned in the U.S. in the 1990's, with little evidence to regarding their efficacy.

At about the time these recommendations were made, we reviewed the randomized trials of home visitation services for pregnant women and parents of young children (Olds & Kitzman, 1990, 1993). These reviews indicated that home visitation services vary enormously and that those few programs that produced the largest and most broad-based effects were those that resembled the Elmira program (e.g., focused on at-risk families bearing first children, began during pregnancy, used nurses, followed comprehensive service strategies). Simply sharing one of these characteristics was insufficient.

Our analysis of the literature on home visitation for pregnant women and parents of young children suggested that paraprofessional programs almost always failed to produce the kinds of effects that comprehensive programs of nurse home visitation had produced. It was not clear, however, whether the failure of paraprofessional home visitation programs was due to the limited training on the part of paraprofessional visitors or whether it was due to the limited program designs and protocols that they were asked to follow. We chose to address this issue by conducting a third randomized trial in Denver.

Moreover, even when communities choose to develop programs based on models with good scientific evidence, all too often the programs are watered down and compromised in the process of being scaled up. We have begun to study this problem under an initiative sponsored by the U.S. Department of Justice to disseminate the program in high crime communities around the country in its Weed and Seed program.

Description of Program Replications

Denver Trial

The Denver trial was designed to gain insight into the reasons that previous trials of home-visitation programs that employed paraprofessionals either failed or produced very modest effects (Olds et al, 1993; Korfmacher et al, 1998). In the Denver trial, the paraprofessionals hired as home visitors were required to have a high school education, but no advanced training in the helping professions. We set this requirement because many programs employ paraprofessionals who come from the communities they serve on the premise that shared backgrounds and experiences will increase the visitors' ability to form effective relationships and promote adaptive functioning among the visited families. To further enhance the test of this theory, all of the paraprofessional visitors in Denver were required to be parents themselves. The nurses, on the other hand, all had bachelors degrees in nursing and were not required to be parents, although many were. Both groups were provided essentially the same training and program protocols, although, as one would expect, the nurses were provided more in-depth training regarding physical health and were expected to deal with health issues more extensively (Korfmacher et al, 1998).

In order to provide the fairest test of these two types of home visitors, we needed to find qualified nurses and paraprofessional visitors to staff these two programs. We addressed this problem by creating a community consortium of health-care providers that was responsible for the administration of the program. Many of these agencies developed contracts with us to hire their nurses or recommended paraprofessional visitors from their existing staffs identified as good candidates for this role. This enabled these new experimental programs to find the most qualified people possible for these roles.

Denver Design and Methods

From March, 1994 through June, 1995, 1,178 consecutive low-income pregnant women with no previous live births were invited to participate from 21 antepartum clinics in the Denver metropolitan area. Low-income status was operationalized by the women's having no private insurance or their qualifying for Medicaid. Medicaid status at the time extended to women at or below 133 percent of the federal poverty guidelines.

Compared to women who either actively refused (n=244) or were invited but not contacted before delivery (n=199), those who accepted (n=735) were more likely to be of Mexican-American descent and were less likely to smoke cigarettes. These groups were equivalent on other major sociodemographic characteristics, such as maternal age, language preference (English versus Spanish), and marital status. The rates of acceptance into the research was lower than in Elmira and Memphis, probably because of the large number of prenatal clinics involved, which meant that many women were invited in writing but did not have the study explained to them in a face-to-face interview, where their questions about the study might be answered.

84 percent of those enrolled were unmarried, 45 percent Mexican American, 34 percent Anglo non-Mexican American, 16 percent African-American, and 5 percent American Indian/Asian. The average age at registration was 19.8 years. The women were randomly assigned to treatment and control conditions using a computer program that stratified women by sociodemographic characteristics prior to allocation.

Women in Treatment 1 (n = 255) were provided developmental screening and referral services for the child at 6, 12 and 24 months of age. Those in Treatment 2 (n = 236) were provided the free screening services offered those in Treatment 1 plus intensive nurse home-visitation during pregnancy and the first two years of the child's life. Women in Treatment 3 (n = 244) were provided the free screening services offered those in Treatments 1 and 2 plus intensive home-visitation during pregnancy and the first two years of the child's life delivered by well-trained and supervised paraprofessionals.

Both groups of visitors were provided extensive pre-service and on-going training in the program model and were provided updated visit-by-visit protocols previously tested in Elmira and Memphis. They also were provided excellent clinical supervision, with the 10 nurses having a single full-time supervisor (a 1:10 supervisor to staff ratio) and the paraprofessionals having two full-time licensed clinical social workers as supervisors (for a 1:5 ratio).

As in earlier phases of this program of research, the program model has been further refined, while adhering to its essential elements. For example, in order to further elaborate the clinical methods employed to promote women's self-efficacy, in the Denver trial, the program model has employed solution-focused methods that emphasize the competence of family members and that are focused on parents' successes. Similarly, a curriculum has been incorporated explicitly to promote parents' emotional availability and joy in interacting with their children as a means of further enhancing parents' care of their children. Known as the Partners in Parenting Education (PIPE), the program was designed originally for adolescents in classroom settings, but has been adapted for home visitors in the Denver trial. Like Partners for Learning used in the Memphis study, it uses recommended activities for caregivers and children. One of the key differences is its focus on shared positive emotions as the goal of the activity. We have only preliminary feedback from staff supporting the value of this component of the program. We have reflected on the development and shortcomings of the home visitation program, and we are increasingly convinced that the emphasis on the emotional features of the relationship is fundamental.

Although outcome data on the mothers and children are not yet available, differences between nurses and paraprofessionals in the nature and quantity of program implementation have been reported. Data on program implementation were derived from encounter forms that the nurses and paraprofessionals completed after every home visit, and from administrative records (Korfmacher et al, 1998).

Differences between Nurses and Paraprofessionals in Program Implementation

Nurses and paraprofessionals completed essentially the same number of visits during pregnancy (approximately 6.5 visits), but the nurses completed an average of 5 more visits from birth to the child's second birthday (22 versus 17). This may be accounted for by a higher rate of staff turnover among the paraprofessionals (17 paraprofessional visitors hired over the life of the study), compared to no staff turn-over among the 10 nurses. The average visit by the paraprofessionals was

about 7 minutes longer (81 minutes compared to 74 minutes). The nurses spent a slightly larger portion of their time during the visits addressing the mothers' and children's physical health (23 percent versus 20 percent) while the paraprofessionals spent more time on the mothers' life course development (18 percent versus 16 percent), their friends and family relationships (19 percent versus 15 percent), and on the health and safety of the environment (15 percent versus 8 percent). We did not expect to find that the nurses would spend more time on promoting parents' care of their children, but they did (39 percent versus 28 percent)(Korfmacher et al, 1998).

We expect that these differences in program implementation will affect the visitors' influence on maternal and child functioning, which will be the subject of additional reports in the near future.

The results of the Denver trial will be available in late 1998.

Justice Department Weed and Seed Initiative

In 1995 we were invited by the U.S. Department of Justice to disseminate the program in several high-crime neighborhoods around the country. We accepted the invitation because the results from the Memphis replication trial and the Elmira follow-up study were producing promising results. We intended to use the Justice Department initiative to learn more about what it will take to develop the program in new communities with fidelity to its essential elements. Under the Justice Department initiative we are establishing the program in six communities in the country, and have completed the initial training of nurses in Oklahoma City; Clearwater, Florida; Fresno, California; Los Angeles, California; Oakland, California; and Saint Louis, Missouri.

Additional Demonstration Sites

We are now moving into a phase of limited program dissemination in an effort to demonstrate that this program can indeed be developed effectively in new communities beyond those supported by the Justice Department Weed and Seed Initiative. To help us strategize about ways of ensuring program integrity as we move into this phase of program dissemination, we have developed a partnership with David Racine, President of Philadelphia-based Replication and Program Strategies, Inc (RPS). Racine and his colleagues have played a fundamental role in shaping our strategies for translating our research findings into effective policies and practices.

Based upon our work with RPS, we now believe that it makes sense to begin developing a larger number of demonstration sites once we learn from our first set about how to develop the program well in a variety of new contexts. In this next phase of this work, we are building in provisions for learning about the new implementation efforts so we can disseminate the program to an even larger number of sites as quickly as possible without losing program effectiveness.

In addition to the six Weed and Seed sites, we have developed program operations in Omaha, Nebraska; Dayton, Ohio; four counties in Wyoming, and four counties in Oklahoma. We intend to develop the program in an additional fifteen sites over the next three years in order to have a good sampling of communities and organizations with which we hope to learn about how to effectively disseminate the program model.

Evaluation of Dissemination

In this next phase of work, we are not conducting additional randomized trials of program effectiveness, but rather are focusing on the formative evaluation of program dissemination itself. This is because we are concerned about the possibility that the program will be compromised in the process of being scaled up. Our primary focus of this formative evaluation is to learn more about characteristics of communities and organizations that are associated with implementation of the program that reflects fidelity to the original model. We intend to use this information to guide dissemination efforts at later stages in order to ensure greater likelihood of effective implementation.

We wish to emphasize that we do not believe that we can scale up this program on a large scale in a short period of time without compromising its effectiveness. One state, for example, has chosen to invest heavily in this program model, with its legislature moving to develop the program in all of its counties within a two-year period. We are concerned that rapid dissemination without adequate planning and capacity building will compromise the quality of program implementation.

Funding the Program in Weed and Seed and Demonstration Communities

In all of these sites (Weed and Seed as well as the additional demonstration communities), state and local governments are securing financial support for the program out of existing sources of funds, such as Medicaid, maternal and child health, welfare-reform, and child-abuse and crime prevention dollars. Local leaders are making an investment in the program, in part, because the evidence indicates that expenditures in these budgets will be reduced later on. This means that the cost of this program, which in 1997 dollars is about $7,000 per family for two and a half years of service (after the start-up phase), can be shared by a variety of government agencies. This reduces the strain on any one budget.

In general, we believe that policies and practices for young children and their families ought to be based upon the best scientific evidence available. There is a lot of enthusiasm these days about the promise of early preventive intervention programs that the evidence unfortunately cannot support. Public hope and confidence in the promise of such programs is a scarce commodity that we dare not squander on approaches that are not likely to work. As health and social welfare policy is redesigned in the near future, we believe that it makes sense to begin with programs that have been tested, replicated, and found to work.

Changes and Modifications in Program

Background of Visitors

Our formal dissemination efforts have focused exclusively on communities that commit to employing nurse home visitors. In most sites this has meant that the nurses must have a bachelor's degree in nursing, although there are some sites that have had to employ nurses with diploma degrees because of the limited availability of nurses with BSN's.

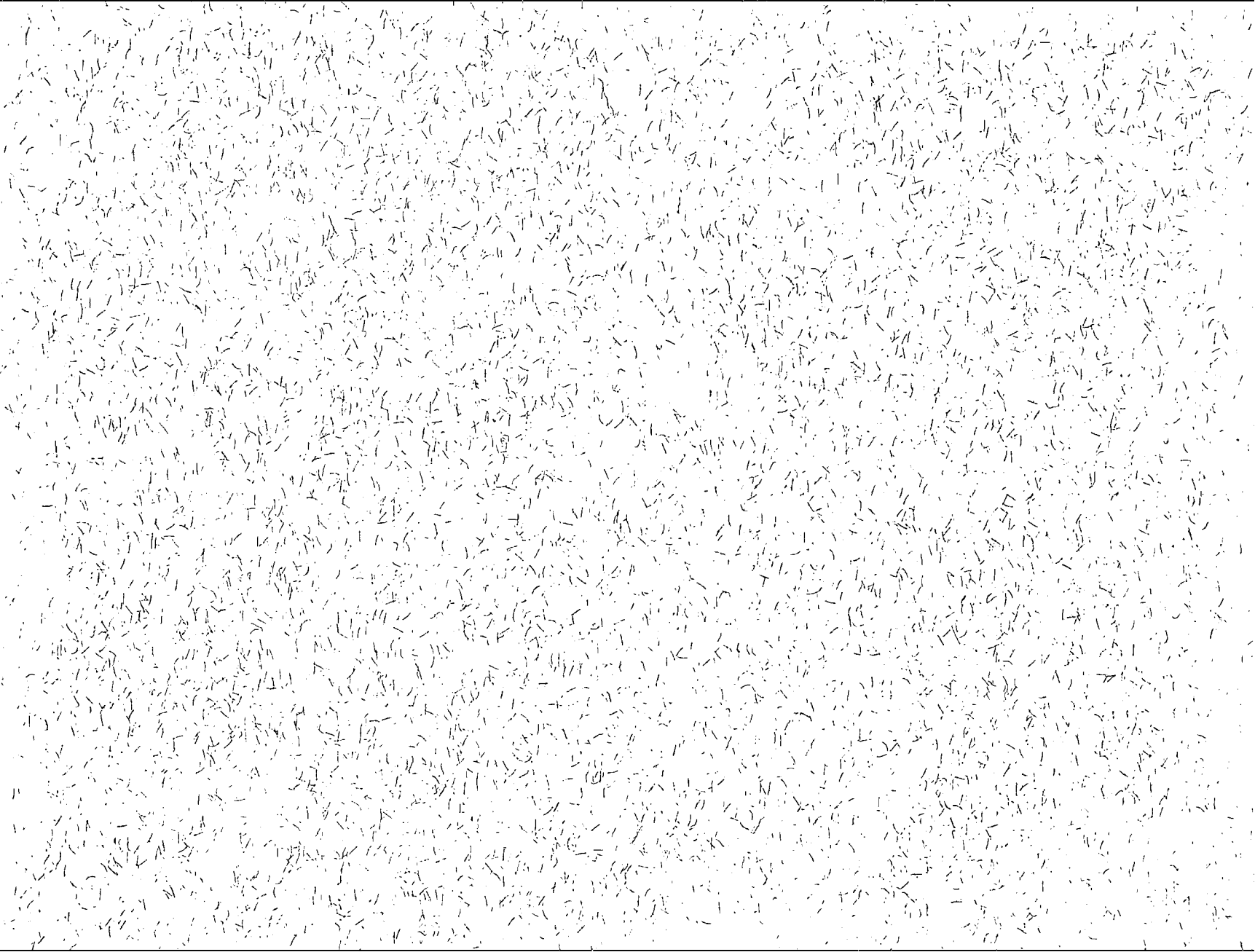
In the Denver trial, we are systematically comparing the relative effectiveness of nurse versus paraprofessional home visitors. In this trial, a paraprofessional is defined as someone with no college-level education in nursing, social work, education, psychology, or human services. All of the paraprofessionals must have a high-school diploma and must have demonstrated a strong capacity

for forming relationships. In Denver, we have increased the supervisor-to-staff ratio to one-to-five for the paraprofessional program. We will not know about the effectiveness of the paraprofessionals until late 1998.

Modifications for Hispanic/Latino and African American Families

As the program has been moved from Elmira, New York, to Memphis, Tennessee, Denver, Colorado, and now a variety of new dissemination sites, the program has been modified to serve populations with greater ethnic and racial diversity. In order to do so, we have established local advisory committees that have reviewed the program content and materials to ensure their relevance and sensitivity to the new populations to be served. The essential program design has been firmly endorsed as culturally competent by the advisory committees in Memphis and Denver. In large part, this is because of the program emphasis on engaging other family members and friends in the program so that their views can be incorporated with respect in the context of the visits. In addition, all of the nurses go through systematic training regarding racial and ethnic diversity. In all of the programs, we have chosen not to completely match the race and ethnicity of the nurse with the race and/or ethnicity of the mother. From a research standpoint, confounding race of visitor with race of mother would compromise our ability to understand any moderating influence that race/ethnicity may have on program effects. Moreover, in most communities, there are fewer Hispanic/Latino and African American nurses available to serve in these roles. We have been quite successful, however, in recruiting large portions of racial and ethnic minorities as nurse home visitors and in creating considerable diversity at the level of home visiting teams. We typically have assigned visitors of a particular race or ethnicity to serve those neighborhoods or regions of a metropolitan area that have larger portions of families with the same race or ethnicity. This has increased the likelihood that the race and ethnicity of the mother would be matched with that of the visitor.

Appendices



APPENDIX A

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APPENDIX B

Protocol for Postpartum Visit 1

POSTPARTUM VISIT 1

Infant Age: 1 Week

OVERVIEW OF VISIT

OBJECTIVES:

⇒ **Monitor the postpartum physical health and well-being of the client and her baby.**
⇒ **Encourage the client to share her labor and birth experience.**
⇒ **Reinforce and support the client's caregiving knowledge and skills.**

GREETINGS

A. Acknowledge any important events that have occurred since you last visited client either before delivery or in the hospital.
B. Recognize the new roles of other family members present at the visit.
C. During this visit, acknowledge the infant, and focus your attention on the client as she may be going through many physical and emotional changes.

ISSUES & CONCERNS

A. How are you getting along?
B. Are there particular ways you had hoped I could help you today?
C. Acknowledge or address client's additional concerns as appropriate. (Answer questions that do not require additional assessment or extensive teaching. For those that do, indicate when they will be addressed.)
D. Adjust visit length to accommodate client's energy level and need for support and information.

ASSESSMENT OF CURRENT STATUS	PLANNED GUIDANCE
1. PERSONAL HEALTH	**1. PERSONAL HEALTH**
1.0 Health Maintenance Practices	**1.0 Health Maintenance Practices**
⇒ If you did not see client when she was in the hospital, use this opportunity to let her tell you about her labor and delivery experience. Below is a list of questions that you may want to use to prompt discussion. a. How did your *actual experience* compare with how you *thought* it would be? b. What was your first sign of labor? c. What bothered you during labor? d. Who did you find helpful? e. What were your feelings or thoughts when you first saw and held your baby? f. What was your support person/partner's response?	⇒ Allowing the client to share her labor & delivery experience with you is one way to help her resolve differences between what she expected and what actually occurred.
⇒ Complete Postpartum Health Checklist to monitor client and infant health.	⇒ Provide client information about what is expected for the coming weeks. (Refer to Labor and Birth A Guide for You, or any similar resource.) This should include a discussion of: a. The involutionary process. b. Vaginal discharge/bleeding (lochia) which can occur for up to six weeks after delivery c. After-birth contractions which can occur for
⇒ Check for danger signs in the early postpartum period:	

a. Take blood pressure and check vital signs
b. Ask about headaches, dizziness, and/or visual disturbance
c. Concentrate on symptoms that indicate difficulty with urinary and/or bowel function, and rest and ambulation.
d. Check for involutionary processes including characteristics of lochia, and evaluate discomfort from sutures.

⇒ Inquire about the condition of the breasts:
- If NOT nursing, ask about use of tight bra or towel wrap and ice packs.
- If nursing, examine the breast.

⇒ Determine whether earlier plans for contraception are being used.

1.1 Nutrition and Exercise

⇒ Ask about appetite, fluid and nutrient intake.

⇒ Inquire about client's activity level. Ask if she has been out of the house.

1.2 Substance Use

⇒ Ask about medications being taken; this is especially important if the client is breastfeeding or has had a C-section.
⇒ Ask about smoking, alcohol, legal and illegal drug consumption.

1.3 Mental Health

⇒ Assess for mood swings and screen for postpartum depression.

2. ENVIRONMENTAL HEALTH

2.0 Home

⇒ Asses the home for the presence of significant hazards that would compromise the well being of the newborn (lack of heat, safe water, infestations).

several days following delivery.
d. Hemorrhoid discomfort can be eased by using sitz baths, Tucks, drinking 6-8 glasses of water every day, eating more fiber, and doing Kegel exercises.
e. Vaginal stitches/episiotomy care includes sitz baths for 20 min. in very warm water, Tucks, pain medicine as recommended by primary care provider, Kegel exercises, anesthetic spray, squeezing buttocks together before sitting down, and sitting on a pillow or inflatable ring
f. Danger signs which require that client notify her midwife or physician are listed in handout Postpartum Danger Signs.

⇒ Discuss proper breast care. In addition, review with client what kinds of changes she should expect and identify for her the danger signs that she should look out for. Advise her to call her physician if she notices any of these danger signs.
⇒ Review instructions on when it is safe to resume sexual practices.

1.1 Nutrition and Exercise

⇒ Review dietary requirements and client's preferences during involutionary process. (Refer to First Year Baby Care, or any similar resource.)
⇒ Discuss activity level. Discuss the appropriate length and frequency of outings. Discuss fatigue and the need to manage it.

1.2 Substance Use

⇒ Discuss only if at risk.

1.3 Mental Health

⇒ Discuss these topics, making sure to differentiate postpartum depression from major depression. (Refer to Labor & Birth A Guide for You, or any similar resource.) If the infant was premature encourage the client to share her feelings regarding not having carried her baby to term. (Refer to, The Premature Birth Module, or any similar resource.)

2. ENVIRONMENTAL HEALTH

2.0 Home

⇒ Assist client with making plans to alleviate these unsafe conditions.

3. LIFE COURSE DEVELOPMENT

3.1 Education and Livelihood

⇒ Assess what client will need to do during coming week in order to avoid setback in school or work.

4. MATERNAL ROLE

4.0 Mothering Role

⇒ Assess client's adjustment to maternal role.

⇒ Ask about responsibilities she has at this point in addition to caring for herself and infant. Determine what activities can be on hold for another week or more.

4.1 Physical Care

⇒ Get information on:

a. Feeding including amount, frequency, content, and preparation.

b. Crying.

c. Sleeping.

d. Elimination - a newborn should have 6 - 10 diapers in a 24 hour period.

⇒ Complete an abbreviated physical assessment. (Pay particular attention to: general observations, alertness, hydration, skin, umbilical cord, and circumcision.) Weigh the baby.

a. Point out to client newborn physical characteristics. See if she wants more detailed information. (Remember, this is a new situation for her and she may not ask without signs from you that it is appropriate to do so.)

b. Demonstrate infant reflexes.

⇒ If history and abbreviated exam indicate potential problem, do a more complete assessment.

3. LIFE COURSE DEVELOPMENT

3.1 Education and Livelihood

⇒ Problem-solve as appropriate.

4. MATERNAL ROLE

4.0 Mothering Role

⇒ Focus on what it is like to be in new maternal role, and if it is what she expected. Assure client that her reaction is not unusual (if it is within normal limits). Evaluate and allow for ambivalence.

⇒ If client experienced a premature delivery. (Refer to The Premature Birth Module or any similar materials.)

⇒ Give and discuss the "Me & Mom Memo" - Newborn.

⇒ Help client problem-solve when she feels like demands on her are too great.

4.1 Physical Care

⇒ If client is breastfeeding, review positioning while nursing, how to prevent nipple soreness, breast care, attachment, fluid intake and nutrition for lactating mothers, and feeding frequency. If client is bottle feeding cover formula preparation and storage, positioning, and feeding amount and frequency. (Refer to First Year Baby Care or any similar resource.)

⇒ Using Keys to Caregiving "Infant States" and "Infant Cues", review ideal states for feeding and hunger and satiation cues.

⇒ Talk about infant weight gain and nutritional requirements.

⇒ Describe safe conditions for infant feeding and sleep, e.g. bottle propping and "Back to Sleep" position.

⇒ Provide any additional teaching about physical requirements of the infant.

a. Demonstrate any care taking techniques necessary (e.g. feeding, holding, diapering, sleeping, sponge baths, umbilical cord care).

b. Discuss infant temperature regulation - encouraging the client to avoid overdressing the baby and to include proper dressing for indoors and outdoors.

⇒ Assess newborn for jaundice.

⇒ Ask if the baby had the first Hepatitis B immunization before discharge.

⇒ Ask the client if she has made an appointment for the baby's second PKU test.

⇒ If newborn is jaundiced, explain the importance of frequent feedings of either breast milk or formula to promote the elimination of the excess bilirubin through baby's bowel movements.

⇒ Explain the Hepatitis B vaccine is the first in a series and will protect the baby from the hepatitis B virus that can cause liver damage and death if contracted through the blood.

⇒ Explain that the PKU test is taken at birth and again at the 2 week well-baby appointment. The second is taken to verify the results, as the initial test can be inaccurate. PKU is a metabolic disorder in which a person is unable to metabolize a protein call phyenylalanine. The buildup of phenylalanine in the bloodstream can cause serious retardation. If detected early, the infant can go on a special type of formula and later on a special diet to prevent damage to his/her brain's development.

4.2 Behavioral and Emotional Care

⇒ Asses client's ability to recognize infant states and respond to her baby appropriately.

4.2 Behavioral and Emotional Care

⇒ Continue to cover and reinforce content from PIPE Listen, Listen, Listen, Topic1 Cribside Communication.

⇒ Discuss infant's preference for black and white rather than colors.

⇒ Discuss infant's ability to recognize the shape of a human face and the parent's voices.

⇒ Discuss the importance of talking to the baby using an enface position.

⇒ Present client with an appropriate infant stimulation toy with directions for its use.

5. FAMILY AND FRIENDS

5. FAMILY AND FRIENDS

5.0 Personal Network Relationships

5.0 Personal Network Relationships

5.1 Assistance with Childcare

⇒ Ask the client who helps her with the baby and if that assistance is too much or too little.

5.1 Assistance with Childcare

⇒ Acknowledge concerns and start problem solving.

6. HEALTH AND HUMAN SERVICES

6. HEALTH AND HUMAN SERVICES

6.0 Service Utilization

⇒ Ask about client resources necessary to take care of self and baby. Particularly focus on availability of food and infant supplies. (Issues may include such things as client's ability to pay rent, gas and electric bills.)

⇒ Find out date of six week postpartum appointment for client and the two week well baby check up date for the infant.

6.0 Service Utilization

⇒ Assist client with problem solving in order to obtain needed resources.

GOAL SETTING AND NEGOTIATION FOR NEXT VISIT

A. Some suggested activities for client:
   ⇒ Client should schedule her six week appointment and should schedule the baby's wellness appointment at two weeks of age.
B. Some suggested content for Planned Guidance next visit:
   ⇒ Safety overview (Birth to Five Months)
   ⇒ Follow-up on use of soft pack infant carrier
   ⇒ Infant bathing
   ⇒ Infant signs of illness

HANDOUTS FOR VISIT

1) Postpartum Health Checklist
2) Postpartum Danger Signs
3) "Me and Mom Memo" - Newborn

PIPE

Listen, Listen, Listen, Topic 1 Cribside Communication

POSTPARTUM DANGER SIGNS

Call the clinic right away if you have any of the following:

- ✧ A headache that won't go away.
- ✧ Visual problems (spots before your eyes, blurred vision).
- ✧ Fainting.
- ✧ A foul-smelling vaginal discharge.
- ✧ Fever or chills.
- ✧ Clots passing from the vagina, or bleeding more than a menstrual period.
- ✧ Signs of a bladder or kidney infection:
  -burning or pain with urination (peeing)
  -having to urinate (pee) frequently.
- ✧ Pain or tenderness in your legs.
- ✧ A hard, red, painful area in your breast.
- ✧ Increasing or severe pain near the stitches in your vaginal area (bottom).
- ✧ Redness, increasing pain, or drainage from your Cesarean incision.

My health care provider's phone number _____

POSTPARTUM HEALTH CHECKLIST

(Birth to 6 Weeks)

CLIENT'S NAME: _____ DOB:

INFANT'S NAME: _____ DOB:

INTERVAL HISTORY & PHYSICAL EXAM CHECKLIST (INFANCY)

MATERNAL HEALTH

BREASTS	
LOCHIA	
PERINEUM	
UTERUS	
URINATION	
# STOOLS	
INCISION	
MEDICATIONS	
BP	

INFANT HEALTH

FEEDING		CRYING	
STOOL		IMMUNIZATIONS	
URINE		WELL BABY CHECK	
COLOR		WT	
TONE		LENGTH	
HYDRATION		HEAD CIRCUMFERENCE	
CORD		FONTANEL	
CIRCUMCISION		HEARING	
SLEEPING		SEEING	
		SMILING	

_____

NURSE SIGNATURE VISIT DATE

APPENDIX C

Budget

Prenatal and Early Childhood Nurse Home Visitation Program Illustrative Budget for First Three Years of Program Operation

		Base Salary	Fringe Benefits	Total	% Effort	Year 1	Year 2	Year 3	Total
Nurse Supervisor		$47,000	$12,220	$59,220	50%	$29,610	$31,091	$32,645	$93,346
Nurse 1		$36,500	$9,490	$45,990	100%	$45,990	$48,290	$50,705	$144,984
Nurse 2		$36,500	$9,490	$45,990	100%	$45,990	$48,290	$50,705	$144,984
Nurse 3		$36,500	$9,490	$45,990	100%	$45,990	$48,290	$50,705	$144,984
Nurse 4		$36,500	$9,490	$45,990	100%	$45,990	$48,290	$50,705	$144,984
Secretary		$21,486	$5,586	$27,073	50%	$13,537	$14,213	$14,924	$42,674
Total Personnel						$227,107	$238,462	$250,387	$715,956
Office Supplies	$100/month					$1,200	$1,200	$1,200	$3,600
Program Supplies	$145/per family					$13,500	$500	$500	$14,500
Postage	$50/month					$600	$600	$600	$1,800
Telephone	$100/month					$1,200	$1,200	$1,200	$3,600
Copier/Printing	$100/month					$1,200	$1,200	$1,200	$3,600
Computer with modem/Microsoft Office	$1,850					$1,850	$0	$0	$1,850
Computer Network Fees	$30/month					$360	$360	$360	$1,080
Cellular Phones (4)	$150/per phone					$600	$0	$0	$600
Cellular Phone Usage Fees	$75/month per Nurse					$3,600	$3,600	$3,600	$10,800
Liability Insurance	$100/month					$1,200	$1,200	$1,200	$3,600
Medical Supplies	$1,500 1st year, $250/year therafter					$1,500	$250	$250	$2,000
General Staff Development	$2,000 1st year. $1,500/year therafter					$2,000	$1,500	$1,500	$5,000
Mileage	(20 trips/per family @ 10 miles roundtrip @ $.21 per mile)/per year					$4,200	$4,200	$4,200	$12,600
Total						$260,117	$254,272	$266,197	$780,586

Training and Technical Assistance

Estimated Costs of Purchased Services and Materials
for Program Start-Up

Training (assumes a team of six staff)

Session I: Theoretical and Clinical Foundations / Using the Perinatal Protocols
Timing: Before services to families begin
Duration/Location: 4.5 days, in Denver
Cost: $3,000 (cost break due to the fact that we normally train more than one new site at each Session I training)

Session II: Infancy Protocols / Partners in Parenting Education
Timing: negotiated to occur approximately one month before the first mothers recruited begin delivering babies
Duration/Location: 3 days, on the program site
Cost: $4,500

Session III: Toddler Protocols
Timing: negotiated to occur 6-8 weeks prior to first children turning age 1
Duration/Location: 2 days, on the program site
Cost: $3,000

Nursing Child Assessment Satellite Training (Dr. Kathryn Barnard, University of Washington)

Timing: arranged by site administrators directly with the NCAST program to occur within the first three months of program operation
Duration/Location: determined in negotiation with NCAST
Cost: $2500 - $3500 trainer fee (does not include travel expenses)

Program Management and Evaluation System and Analytic Reports

Timing: At program startup, coincident with Training I
Cost: **$1,000** for initial MIS system program and manual
$5,200 per year for each of three years of initial program operation

Program Materials

Includes: Nurse Home Visitation Program Training Manuals & Protocols, Partners in Parenting Education program materials, NCAST materials for each team of nurses
Cost: $4,200

Technical Assistance

Includes: Planning support for site development, telephone follow-up and consultation throughout the 3-year program start-up period.
Cost: $2,000

Travel Cost Estimates

Site staff traveling to Denver for Training I: **$7500**
$600 airfare / person x 6 persons
$450 hotel costs / person x 6 persons
$200 per diem / person x 6 persons

Two PRC staff traveling to program site for Training I: **$2,500**

Two PRC staff traveling to program site for Training II: **$2,500**

** note that if no NCAST-certified trainer is available at the program site, the site may also have to pay for an NCAST trainer's travel to the site.

Estimated Total Costs for Training, Technical Assistance and Evaluation Services

Year One:	**$38,900**
Year Two:	**$ 5,200**
Year Three:	**$ 5,200**
	$49,300

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