



MMWRTM

Morbidity and Mortality Weekly Report

Recommendations and Reports

August 10, 2007 / Vol. 56 / No. RR-7

The Effectiveness of Universal School-Based Programs for the Prevention of Violent and Aggressive Behavior

A Report on Recommendations of the Task Force on Community Preventive Services



DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

The *MMWR* series of publications is published by the Coordinating Center for Health Information and Service, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested Citation: Centers for Disease Control and Prevention. [Title]. *MMWR* 2007;56(No. RR-#):[inclusive page numbers].

Centers for Disease Control and Prevention

Julie L. Gerberding, MD, MPH
Director

Tanja Popovic, MD, PhD
Chief Science Officer

James W. Stephens, PhD
Associate Director for Science

Steven L. Solomon, MD
Director, Coordinating Center for Health Information and Service

Jay M. Bernhardt, PhD, MPH
Director, National Center for Health Marketing

Katherine L. Daniel, PhD
Deputy Director, National Center for Health Marketing

Editorial and Production Staff

Frederic E. Shaw, MD, JD
Editor, MMWR Series

Myron G. Schultz, DVM, MD
(Acting) Deputy Editor, MMWR Series

Suzanne M. Hewitt, MPA
Managing Editor, MMWR Series

Teresa F. Rutledge
Lead Technical Writer-Editor

Jeffrey D. Sokolow, MA
Project Editor

Beverly J. Holland
Lead Visual Information Specialist

Lynda G. Cupell
Malbea A. LaPete
Visual Information Specialists

Quang M. Doan, MBA
Erica R. Shaver
Information Technology Specialists

Editorial Board

William L. Roper, MD, MPH, Chapel Hill, NC, Chairman

Virginia A. Caine, MD, Indianapolis, IN

David W. Fleming, MD, Seattle, WA

William E. Halperin, MD, DrPH, MPH, Newark, NJ

Margaret A. Hamburg, MD, Washington, DC

King K. Holmes, MD, PhD, Seattle, WA

Deborah Holtzman, PhD, Atlanta, GA

John K. Iglehart, Bethesda, MD

Dennis G. Maki, MD, Madison, WI

Sue Mallonee, MPH, Oklahoma City, OK

Stanley A. Plotkin, MD, Doylestown, PA

Patricia Quinlisk, MD, MPH, Des Moines, IA

Patrick L. Remington, MD, MPH, Madison, WI

Barbara K. Rimer, DrPH, Chapel Hill, NC

John V. Rullan, MD, MPH, San Juan, PR

Anne Schuchat, MD, Atlanta, GA

Dixie E. Snider, MD, MPH, Atlanta, GA

John W. Ward, MD, Atlanta, GA

CONTENTS

Background	1
Introduction	3
Methods	3
Results	6
Discussion	8
Use of the Recommendation in States and Communities....	8
References	8

The Effectiveness of Universal School-Based Programs for the Prevention of Violent and Aggressive Behavior

A Report on Recommendations of the Task Force on Community Preventive Services*

Prepared by
 Robert Hahn, PhD¹
 Dawna Fuqua-Whitley, MA¹
 Holly Wethington, PhD¹
 Jessica Lowy, MPH¹
 Akiva Liberman, PhD²
 Alex Crosby, MD³
 Mindy Fullilove, MD⁴
 Robert Johnson, MD⁵
 Eve Moscicki, ScD⁶
 LeShawndra Price, PhD⁶
 Susan R. Snyder, PhD¹
 Farris Tuma, ScD⁶
 Stella Cory, MD¹
 Glenda Stone, PhD¹
 Kaushik Mukhopadhyaya, PhD¹
 Sajal Chattopadhyay, PhD¹
 Linda Dahlberg, PhD²

¹Division of Health Communication and Marketing, National Center for Health Marketing, CDC

²National Institute of Justice, Washington, District of Columbia

³Division of Violence Prevention, National Center for Injury Prevention and Control, CDC

⁴Columbia University, New York, New York, and Task Force on Community Preventive Services

⁵New Jersey Medical School, Department of Pediatrics, Newark, New Jersey, and Task Force on Community Preventive Services

⁶National Institute of Mental Health, Bethesda, Maryland

Summary

Universal school-based programs to reduce or prevent violent behavior are delivered to all children in classrooms in a grade or in a school. Similarly, programs targeted to schools in high-risk areas (defined by low socioeconomic status or high crime rates) are delivered to all children in a grade or school in those high-risk areas. During 2004–2006, the Task Force on Community Preventive Services (Task Force) conducted a systematic review of published scientific evidence concerning the effectiveness of these programs. The results of this review provide strong evidence that universal school-based programs decrease rates of violence and aggressive behavior among school-aged children. Program effects were demonstrated at all grade levels. An independent meta-analysis of school-based programs confirmed and supplemented these findings. On the basis of strong evidence of effectiveness, the Task Force recommends the use of universal school-based programs to prevent or reduce violent behavior.

* Points of view expressed are those of the contributors and the Task Force on Community Preventive Services and do not necessarily reflect those of CDC, the National Institutes of Health, the National Institute of Justice, the U.S. Department of Justice, or the U.S. Department of Health and Human Services. Author affiliations reflect author's location while this research was being conducted.

The material in this report originated in the National Center for Health Marketing, Jay M. Bernhardt, PhD, Director; and the Division of Health Communication and Marketing, Cynthia E. Baur, PhD, Director.

Corresponding preparer: Robert A. Hahn, PhD, National Center for Health Marketing, 1600 Clifton Road, MS E-69, Atlanta, GA 30333. Telephone: 404-498-0958; Fax: 404-498-0989; E-mail: rah1@cdc.gov.

Background

Youth violence is a substantial public health problem in the United States. In a representative national survey conducted in 2003, U.S. adults reported approximately 1.56 million incidents of victimization by perpetrators estimated to be aged 12–20 years, representing a rate of approximately 4.2 incidents per 100 persons in this age group (1,2). Two thirds of reports by victims concerned “simple assaults” (i.e., attacks without a weapon and not resulting in an injury requiring >2 days of hospitalization). The remaining victimizations were “serious violent crimes” (i.e., rape, sexual assault, robbery, or aggravated assault).

Because survey respondents were crime victims, murder was not included. Since the 1980s, youths aged 10–17 years, who constitute <12% of the U.S. population, have been involved as offenders in approximately 25% of serious violent victimizations (3). Homicide and suicide are the fourth and fifth leading causes of death respectively among children aged 5–14 years and the second and third leading causes of death among persons aged 15–24 years (4).

Risk factors for youth violence include low socioeconomic status (SES), poor parental supervision, harsh and erratic discipline, and delinquent peers (3). Delinquent youths commonly have additional problems (5), including drug abuse, difficulties at school, and mental health problems (as indicated by being in the top 10% of the distribution of externalizing and internalizing symptoms in the Child Behavior Checklist) (6). These youths are threats not only because of the direct harm they cause but also because of the role they might play in the socialization of other potential delinquents (7).

The prevention of youth violence and aggression is of value in itself and also because early violent and aggressive behavior is a precursor of later problem behaviors (8). Researchers categorize risk factors for early childhood delinquency, including violent behavior, as individual, family, peer, school, neighborhood, and media. Factors in all categories are thought to contribute to the development of early and chronic violent behavior, and all are thought to provide opportunities for intervention to reduce the development of these behaviors (9).

The most serious forms of violent crime (i.e., rape, sexual assault, robbery, aggravated assault, and homicide) rarely occur in schools (10). During July 1992–June 2000, an annual average of 29 homicides and five suicides occurred throughout U.S. schools, representing <1% of the homicides among youths aged 5–19 years and <0.5% of suicides among youths away from schools during the same period (10). However, a disproportionate amount of non-fatal crime occurred in school facilities or on the way to or from school. Although rates of violent crime declined during 1993–2003, in 2003, approximately 740,000 violent crimes were committed at schools against adolescents aged 12–18 years (rate: 1.3 per 100 persons) (10). Of these crimes, approximately 150,000 (20.3%) were classified as “serious.”

The Task Force review assessed the effectiveness of universal school-based programs in reducing or preventing violent and aggressive behavior among children and adolescents. These programs teach all students in a school or school grade about the problem of violence and its prevention or about one or more of the following topics or skills intended

to reduce aggressive or violent behavior: emotional self-awareness, emotional control, and self-esteem; positive social skills; social problem solving; conflict resolution; and team work.

As used in this report, “universal” means that programs are administered to all children in classrooms regardless of individual risk, not only to those who already have manifested violent or aggressive behavior or risk factors for these behaviors. Although meriting separate review because youths who manifest violence or aggressive behavior at young ages are at greater risk for later violence, programs that target youths who already have manifested problems of violence or are considered at high risk for violence were not evaluated in this review.

Universal programs might be targeted by grade or school in high-risk areas (defined by residents’ low SES, commonly indicated by the proportion of school children receiving subsidized lunches, or high crime rates, as noted by study authors describing the school community). Programs are delivered to all children in those settings. Programs also might be implemented in special schools (e.g., schools for children with specific disabilities). Prekindergarten, kindergarten, elementary, middle, and junior and senior high school settings were included in this review.

Universal school-based programs are founded on multiple theoretical approaches (11,12). Theories of behavior change vary in their focus on individuals; interpersonal relations; the physical and social environment, including social norms; and combinations of these. Certain programs focus on providing information about the problem of violence and approaches to avoiding violence, on the assumptions that providing this information to students will lead to its application and subsequently to reduced violence and that information is necessary, if not sufficient, to change behavior. For example, the Violence Prevention Curriculum for Adolescents (13) is designed to teach students about the causes of violence; knowledge of violence resistance skills is taught through discussion. Other programs (14) assume that self-concept and self-esteem derive from positive action and its rewards, so if children’s behavior can be made more positive and sociable, they will develop better attitudes toward themselves and then continue to make positive choices. In the Second Step program (15), teaching and discussion are accompanied by role playing, modeling, skill practice, feedback, and reinforcement.

Certain programs (e.g., Responding in Peaceful and Positive Ways [16] and Students for Peace [17]) cite social learning theory (18) as the foundation for their intervention design. Other programs are founded on the theory that they will be most effective if they modify the broader

environment of the child. In the elementary school PeaceBuilders program, in addition to the classroom curriculum, the entire school is involved, both outside and inside the classroom, together with parents and the community; in the school setting, conditions that provoke aggressive behavior are mitigated, and the following of simple positive behavioral rules, such as “praise people” and “right wrongs,” is encouraged and rewarded (19). The Safe Dates Program includes a 10-session classroom curriculum, a theatrical production performed by students, a poster contest, community services for adolescents in abusive relationships (e.g., support groups and materials for parents), and training for community service providers (20). School antiviolence programs often are associated with manuals, which facilitate reliable implementation; manuals often are available commercially.

Introduction

The independent, nonfederal Task Force on Community Preventive Services leads work on the Guide to Community Preventive Services, a resource that includes multiple systematic reviews, each focusing on a preventive health topic. Work on the Community Guide is supported by the U.S. Department of Health and Human Services (DHHS) in collaboration with public and private partners. Although CDC provides staff support to the Task Force for development of the Community Guide, the recommendations presented in this report were developed by the Task Force and are not necessarily the recommendations of DHHS or CDC.

Community Guide findings are prepared and released as each is completed. Reports of systematic reviews have already been published on improving coverage with universally recommended and targeted vaccines, tobacco use prevention and reduction, reducing motor-vehicle-occupant injury, increasing physical activity, diabetes management, improving oral health, skin cancer prevention, other aspects of violence prevention, and the effects of the social environment on health. A compilation of Community Guide systematic reviews has been published in book form (22). Additional information regarding the Task Force and the Community Guide and a list of published articles are available on the Internet at <http://www.thecommunityguide.org>.

The interventions reviewed might be useful in reaching certain objectives specified in *Healthy People 2010* (23), which outlines the disease prevention and health promotion agenda for the United States. These objectives identify certain important preventable threats to health and focus

the efforts of public health systems, legislators, and law enforcement officials on addressing those threats. Universal school-based programs and their proposed effects on violence-related outcomes are relevant to multiple *Healthy People 2010* objectives regarding injury and violence prevention (Table 1).

Methods

Community Guide systematic reviews summarize evidence on the effectiveness of interventions in improving selected health-related outcomes. Positive or negative effects of the intervention other than those assessed for the purpose of determining effectiveness (including positive or negative health and nonhealth outcomes) also are considered (24,25). When an intervention is shown to be effective in changing a selected outcome, information also is included on the applicability of evidence (i.e., the extent to which available effectiveness data might apply to diverse population segments and settings), the economic impact of the intervention, and barriers to implementation.

As with other Community Guide reviews, the process used to conduct a systematic review of the evidence and to develop conclusions involved 1) forming a systematic review development team, 2) developing a conceptual approach to organizing, grouping, and selecting interventions, 3) selecting interventions to evaluate, 4) searching for and retrieving evidence regarding each intervention, 5) assessing the quality of and abstracting information from each study, 6) assessing the quality of and drawing conclusions about the body of evidence on effectiveness, and 7) translating the evidence on effectiveness into recommendations.

The present review was produced by the systematic review development team (the team) and a multidisciplinary team of specialists and consultants representing various perspectives on violence. This review included studies that assessed directly measured violent outcomes, specifically self- or other-reported or observed aggression or violence, including violent crime. The review also included studies that examined any of five proxies for violent outcomes that include not only clearly violent behavior but also behavior that is not clearly violent:

- measures of conduct disorder (the psychiatric condition, in which the rights of others or major societal norms or rules are violated) (26);
- measures of externalizing behavior (i.e., rule-breaking behaviors and conduct problems, including physical and verbal aggression, defiance, lying, stealing, truancy, delinquency, physical cruelty, and criminal acts) (27);

TABLE 1. Selected *Healthy People 2010 objectives related to school-based violence prevention programs**

Objective no.	Population	Baseline		2010 objective
		No.	Year	
Injury Prevention				
15-1: Reduce hospitalization for nonfatal head injuries per 100,000 population	All	60.6 [†]	1998	45.0
15-2: Reduce hospitalization for nonfatal spinal cord injuries per 100,000 population	All	4.5 [†]	1998	2.4
15-3: Reduce firearm-related deaths per 100,000 population	All	11.3 [†]	1998	4.1
15-5: Reduce nonfatal firearm-related injuries per 100,000 population	All	24.0 [†]	1997	8.6
15-12: Reduce hospital emergency department visits per 1,000 population	All	131.0 [†]	1997	126.0
Violence and Abuse Prevention				
15-32: Reduce homicides per 100,000 population	All	6.5 [†]	1998	3.0
15-33a: Reduce maltreatment of children per 1,000 children aged <18 years	Children	12.9 [§]	1998	10.3
15-33b: Reduce child maltreatment fatalities per 100,000 children aged <18 years	Children	1.6 [§]	1998	1.4
15-34: Reduce rate of physical assault by current or former intimate partners per 1,000 persons aged ≥12 years	Adolescents/adults	4.4	1998	3.3
15-35: Reduce annual rate of rape or attempted rape per 1,000 persons aged ≥12 years	Adolescents/adults	0.8	1998	0.7
15-36: Reduce sexual assault other than rape per 1,000 persons aged ≥12 years	Adolescents/adults	0.6	1998	0.4
15-37: Reduce physical assaults per 1,000 persons aged ≥12 years	Adolescents/adults	31.1	1998	13.6
15-38: Reduce physical fighting among adolescents (students in grades 9–12) during previous 12 months	Adolescents	36.0	1999	32.0
15-39: Reduce weapon carrying by adolescents (students in grades 9–12) on school property during past 30 days	Adolescents	6.9	1999	4.9

* **Source:** US Department of Health and Human Services. *Healthy people 2010*. 2nd ed. With understanding and improving health and objectives for improving health (2 vols.). Washington, DC: US Department of Health and Human Services; 2000.

[†] Age-adjusted to year 2000 standard population.

[§] Target rate objective 15-33a is expressed per 1,000 children aged <18 years, compared with 100,000 children aged <18 years for objective 15-33b. Comparable objectives would be reduction of child maltreatment to 1,290 per 100,000 children aged <18 years and reduction of child maltreatment fatalities to 1.6 per 100,000.

^{||} Per 100 adolescents.

- measures of acting out (i.e., aggressive, impulsive, or disruptive class behaviors) or conduct problems (includes talking in class, stealing, fighting, lying, not following directions, teasing, and breaking things);
- measures of delinquency (which might include violent behavior and behavior not regarded as violent); and
- school records of suspensions or disciplinary referrals.

The purpose of this review was to assess the effectiveness of school-based programs in reducing or preventing violent behavior. Thus, studies of school-based programs were included only if they assessed violent outcomes or proxies for violent outcomes and if the reduction of violent or aggressive behavior was an objective of the program (although it need not have been the only or principal objective). The effects on other outcomes were not systematically assessed, but are reported if they were addressed in the studies reviewed.

Electronic searches for literature on universal school-based programs were conducted during June–July 2002 and updated in December 2004. Databases searched included MEDLINE, EMBASE, Education Resources Information Center (ERIC), Applied Social Sciences Index and Abstracts, National Technical Information Service (NTIS), PsycINFO, Sociological Abstracts, National Criminal Justice Reference Service (NCHRS), and Cumulative Index to Nursing and Allied Health Literature (CINAHL).[†]

The team also reviewed the references listed in retrieved articles, and specialists on the systematic review development team and elsewhere were consulted. Studies reported in journal papers, governmental reports, books, and book chapters were eligible for review.

Articles published before December 2004 were considered for inclusion in the systematic review if they evaluated a universal school-based program, assessed at least one of the violent outcomes specified previously, were conducted in countries with high-income economies,[§] and compared persons exposed to the intervention with persons who had

[†] These databases can be accessed as follows: MEDLINE: <http://www.ncbi.nlm.nih.gov/sites/entrez>; EMBASE: [DIALOG http://www.embase.com](http://www.embase.com) (requires subscription); ERIC: <http://www.eric.ed.gov>; Applied Social Sciences Index and Abstracts: <http://www.csa.com> (requires subscription); NTIS: <http://www.ntis.gov>; PsycINFO: <http://psycinfo2.apa.org/psycinfo> (requires subscription); Sociological Abstracts: <http://www.csa.com> (requires subscription); NCJRS: <http://www.ncjrs.gov/index.html>; and CINAHL: <http://www.cinahl.com> (requires subscription).

[§] High-income economies as defined by the World Bank are Andorra, Antigua & Barbuda, Aruba, Australia, Austria, The Bahamas, Bahrain, Barbados, Belgium, Bermuda, Brunei, Canada, Cayman Islands, Channel Islands, Cyprus, Denmark, Faeroe Islands, Finland, France, French Polynesia, Germany, Greece, Greenland, Guam, Hong Kong (China), Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Republic of Korea, Kuwait, Liechtenstein, Luxembourg, Macao (China), Malta, Monaco, Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Norway, Portugal, Puerto Rico, Qatar, San Marino, Singapore, Slovenia, Spain, Sweden, Switzerland, Taiwan (China), United Arab Emirates, United Kingdom, United States, and U.S. Virgin Islands.

not been exposed or who had been less exposed. Studies with a sample size <20 students were excluded because results from such studies were not considered reliable. While searching for evidence on violent outcomes, the team also sought information about effects on other outcomes not related to violence (e.g., changes in school performance and drug abuse).

Each study that met the initial inclusion criteria became a candidate for the review and was read by two reviewers who used standardized criteria (available at <http://www.thecommunityguide.org/methods/abstractionform.pdf>) to assess the suitability of the study design and threats to validity (24,25). Disagreements between the reviewers were reconciled by consensus of the development team members. The team's classification of the designs of studies reviewed is in accord with standards of the Community Guide review process and sometimes differs from the classification used in the original studies. Studies with the greatest design suitability are those in which data on exposed and control populations are collected prospectively. Studies with moderate design suitability are those in which data are collected retrospectively or that have multiple pre- or postmeasurements but no concurrent comparison population. Studies with least suitable designs are those with no separate comparison population and only a single pre- and postmeasurement in the intervention population. On the basis of the number of threats to validity, studies were assigned a number of penalties and characterized as having good, fair, or limited execution for the purposes of this review (24). Studies with good or fair quality of execution and any level of design suitability (greatest, moderate, or least) were included in the body of evidence.

Baselines and relative percentage change were calculated using the following formulas:

- For studies with before-and-after measurements and concurrent comparison groups:

$$\text{Effect size} = (I_{\text{post}} / I_{\text{pre}}) / (C_{\text{post}} / C_{\text{pre}}) - 1$$

where: I_{post} = last reported outcome rate in the intervention group after the intervention, I_{pre} = reported outcome rate in the intervention group before the intervention, C_{post} = last reported outcome rate in the comparison group after the intervention, and C_{pre} = reported outcome rate in the comparison group before the intervention.

- For studies with post measurements only and concurrent comparison groups:

$$\text{Effect size} = (I_{\text{post}} - C_{\text{post}}) / C_{\text{post}}$$

- For studies with before-and-after measurements but no concurrent comparison:

$$\text{Effect size} = (I_{\text{post}} - I_{\text{pre}}) / I_{\text{pre}}$$

To report effect sizes from multiple studies, the team used the median and, if seven or more effect sizes existed, the lower quartile, Q_1 (the 25th percentile), and the upper quartile, Q_3 (the 75th percentile). Q_1 and Q_3 provide information on the range of the middle 50% of the study effect sizes and therefore can be interpreted as reflecting the range of typical effects.

The strength of the body of evidence was summarized on the basis of the number of available studies, the strength of their design and execution, and the size and consistency of reported effects (24). When the number of studies and their design and execution quality were sufficient by Community Guide standards to draw a conclusion on effectiveness, the results were summarized statistically and graphically.

If an intervention was determined to be effective, evidence was assessed regarding its applicability in diverse settings, populations, and circumstances, noting whether it had been applied specifically in different conditions (e.g., to white and minority populations or to younger and older children). The goal of this assessment was to determine the conditions under which the intervention was effective and thus the known limits of its application.

As noted, this review did not systematically assess the effects of a violence prevention intervention on other outcomes (e.g., drug abuse, school achievement, truancy, or psychological adjustment). However, some of the benefits of the intervention mentioned in reviewed studies are noted. The potential harms of school-based violence prevention programs also are noted if these harms were mentioned in the effectiveness literature or were judged by the team to be of importance.

Barriers to implementation are summarized only if an intervention was demonstrated to be effective. Similarly, economic evaluations of interventions were conducted only when evidence of effectiveness was identified. Methods used in Community Guide economic evaluations have been described previously (28,29).

Systematic reviews in the Community Guide identify existing information on which to base public health decisions about implementing interventions. An additional benefit of these reviews is identification of areas in which information is lacking or of poor quality. To summarize these research gaps, the team identifies remaining research questions for each intervention evaluated.

Results

The team identified 53 studies (14,15,20,30–79) of universal school-based programs that met the criteria to be included in the review. Of these, seven (32,41,45,49,50,52,64) were of greatest design suitability and good execution, 32 (15,20,30,31,34–40,43,46–48,51,53–56,59,60,63,65,66,70,71,74,75,77–79) were of greatest design suitability and fair execution, five (14,33,44,68,76) were of moderate design suitability and fair execution, one (42) was of least suitable design and good execution, and eight (57,58,61,62,67,69,72,73) were of least suitable design and fair execution. This intervention was well-suited for an experimental design, in certain cases using randomization of classes, grades, or schools to the antiviolence program or to a control condition. The comparison population often received no intervention rather than an alternative intervention. Study sample sizes varied widely (range: 21–39,168 students; median: 563). Follow-up time from the conclusion of the intervention to the final assessment ranged from none (i.e., assessment was conducted immediately after the end of the intervention) to 6 years (median: 6 months).

Characteristics of school programs differed by school level. In lower grades, programs focus on disruptive and antisocial behavior. At higher grade levels, the focus shifts to general violence and specific forms of violence (e.g., bullying and dating violence). The intervention strategy shifts from a cognitive affective approach designed to modify behavior by changing the cognitive and affective mechanisms linked with such behavior to greater use of social skills training. With increasing grade level, interventions might focus less on the teacher as the primary program implementer than on other personnel (e.g., student peers or members of the team conducting the research study). Because this review assessed only universal programs, the classroom was the principal setting of these programs at all grade levels. No clear trends in frequency and duration of programs were apparent by school level.

Comparison of program characteristics and populations served at different school levels indicated substantial heterogeneity by level and intercorrelation among characteristics. For this reason, bivariate analysis of program effects by program characteristics might suggest incorrectly a causal association of these characteristics with effect size differences when the associations actually are confounded by other associations. Recognizing the potential for other program characteristics to confound apparent associations, the team provided bivariate associations of program characteristics with effect sizes.

For all grades combined, the median effect was a 15.0% relative reduction in violent behavior among students who received the program (interquartile interval [IQI]: -44.1%, -2.3%). The effects of school programs were identified at all school levels, from a 7.3% relative reduction in violent behavior (i.e., an effect size of -7.3%) among middle school students who received the program (15 study data points; IQI: -35.2%, 2.3%) to a median effect size of -32.4% in prekindergarten and kindergarten programs (six study data points; percentiles not calculated). In elementary school programs, the median reduction of violent behavior was 18.0% (34 study data points; IQI: -44.8%, 2.5%). Among high school students, the median reduction in violent behavior was 29.2% (four study data points; percentiles not calculated) (Table 2). The team next explored associations between various program characteristics and effect size to develop hypotheses that might explain the heterogeneity of program effects. Because of the intercorrelation of program characteristics noted previously, this bivariate presentation should be regarded as simply reporting empirical associations rather than the assessment of causal explanations for effect variability.

All school antiviolence program strategies (e.g., informational, cognitive/affective, and social skills building) were associated with a reduction in violent behavior. All program foci (e.g., disruptive or antisocial behavior, bullying, or dating violence) similarly were associated with reduced violent behavior. With the exception of programs administered by school administrators or counselors, a reduction in violent behavior was reported in programs administered by all personnel, including students and peers; however, certain effect sizes were based on a small number of study data points.

The team compared the effects of programs delivered in school environments defined by the presence of lower SES or high rates of crime or both with environments that did not have these characteristics. For 14 studies, these characteristics were not described. In environments with lower SES or high crime rates or both, effectiveness was consistent with overall study results (15 studies; median: -29.2%; IQI: -42.5%, -6.7%). These programs appeared to be similarly effective in settings in which lower SES or high crime rates or both were noted to be absent (24 studies; median: -21.0%; IQI: -50.0%, -5.2%). Nonreporting of class and crime characteristics in certain studies might have occurred because these characteristics were not remarkable (i.e., in neighborhoods that have low crime and higher SES). If results from these studies are combined with those for which

TABLE 2. Effect sizes* and number of study data points,† by population and program characteristics

Characteristic	25th and 75th	
	Median	percentiles
Grade		
All grades combined (65)	-15.0	-44.1, -2.3
Prekindergarten/Kindergarten (6)	-32.4	— [§]
Elementary (34)	-18.0	-44.8, -2.5
Middle (21)	-7.3	-35.2, 2.3
High (4)	-29.2	—
Intervention strategy		
Information conveyed (10)	-8.6	-22.9, 18.3
Cognitive/affective (6)	-14.0	—
Social skills (30)	-19.1	-35.2, -2.1
Environmental change, classroom (3)	-15.0	—
Environmental change, school (12)	-11.7	-63.6, -1.7
Peer mediation (2)	-61.2	—
Behavior modification (0)	—	—
Program focus		
General violence (19)	-10.3	-50.0, -1.7
Disruptive or antisocial behavior (33)	-19.1	-44.3, -2.8
Bullying (10)	-6.7	-64.8, 17.2
Gang activity (2)	-5.3	—
Dating violence (1)	-29.2	—
Primary program personnel		
Students/peers (4)	-41.6	—
Teachers (49)	-17.5	-44.3, -2.3
Administrators/counselors (3)	34.4	—
Nonschool personnel (2)	-5.3	—
Researchers (7)	-7.3	-42.5, 2.3
Community environment		
Not stated (14)	-1.6	-10.3, -3.3
Not low SES [¶] /not high crime (24)	-21.0	-50.0, -5.2
Not stated and not low SES/not high crime (38)	-11.2	-44.4, -1.4
High crime/low SES (15)	-29.2	-42.5, -6.7
Majority race/ethnicity		
Black (15)	-16.8	-44.3, -5.2
White (22)	-20.4	-40.2, -5.0
Hispanic (6)	-0.5	—
No information provided (13)	-30.9	-44.4, 8.0
No clear majority (8)	-10.3	-87.5, -1.4

* Relative % change in intervention compared with control population.

† Number of outcomes assessed for each characteristic.

§ Interquartile intervals not calculated with six or fewer studies.

¶ Socioeconomic status.

crime is specified as low and/or SES as higher, the combination is associated with a relative reduction of 11.2% (38 studies; IQI: -44.4%, -1.4%), which is still consistent in direction with overall study results.

Finally, the team explored the effects of universal school programs by predominant race and ethnicity of the study school population. In schools in which the population was >50% black, the median reduction in violent behavior was 16.8% (11 studies; IQI: -44.3%, -5.2%), compared with 20.4% in schools in which the population was >50% white (22 studies; IQI: -40.2%, -5.0%) and 0.5% in schools in which the population was >50% Hispanic (six studies; percentiles not calculated). Given the limited number of

studies, the last estimate might not be reliable. To determine whether the magnitude of the reduction in violent behavior diminished with longer intervals following the end of the intervention, the team assessed the association between length of follow-up time and effect size (data not presented). Longer follow-up was associated with smaller effect size.

Universal school-based programs were determined to be effective at all school levels and across different populations. The reviewed studies assessed the effects of programs in communities characterized by the presence of lower SES or high rates of crime or both, compared with communities characterized by the absence of both of these factors.

Other benefits of universal school-based programs have been noted, with supporting evidence for some of these effects (15,46,49). Improvements were reported for social behavior more broadly, including reductions in drug abuse, inappropriate sexual behavior, delinquency, and property crime. Substantial improvements in school attendance and achievement also were reported (54,80,81).

The majority of economic studies identified in this review reported the costs of programs, but only one study reported economic summary measures based on both costs and benefits. Cost estimates ranged from \$15–\$45 per student for the PATHS program (30,82) to <\$200 per student for the PeaceBuilders program (81). The only study that estimated both costs and benefits (83) was based on the Seattle Social Development Project (31). This study was rated as good according to the Community Guide's quality assessment criteria for economic studies. The average effect size for this program, which focused on elementary schools in a high-crime urban area, was a relative decrease of 13% in basic crime outcomes. The total benefits per project participant, including cost savings to taxpayers because of reduced expenses for the criminal justice system and reduced personal and property losses for crime victims, were estimated to be \$14,426 in 2003 dollars. Net savings per participant amounted to \$9,837. In terms of cost-benefit ratio, this program indicated a benefit of \$3.14 for every dollar invested in the program. Although the effect size found in the study is near the median effect size of other school programs, this program is more comprehensive, more intensive, and of longer duration than many programs, in addition to being more costly. Thus, the cost benefit of other programs might differ from that determined for the Seattle Social Development Project.

Schools and their curricula are subject to multiple requirements and demands. Because schools might not recognize the need for instruction in the reduction of violence

and aggression, introducing effective programs into school curricula and schedules might be difficult. The need for teacher training for these programs also might make acceptance and implementation difficult. However, the benefits of many programs for traditional academic outcomes such as attendance and school performance might enhance the interest of school policy makers, administrators, and teachers in these programs.

In summary, study results consistently indicated that universal school-based programs were associated with decreased violence. Beneficial results were found across all school levels examined. On the basis of the limited amount of available economic data, universal school-based programs also appear to be cost-effective.

Discussion

The findings of this review were compared with a recently updated meta-analysis (84) with a similar approach to intervention definition and outcomes assessed, although certain differences existed in the literature and methods used. Expanded versions of both reviews, including a detailed exploration of similarities and differences, have been published (85). The meta-analysis indicated that the associations reported in the present review were not greatly confounded. School-based programs for the prevention of violence are effective for all school levels, and different intervention strategies are all effective. Programs have other effects beyond those on violent or aggressive behavior, including reduced truancy and improvements in school achievement, "problem behavior," activity levels, attention problems, social skills, and internalizing problems (e.g., anxiety and depression).

Although this review established the effectiveness of universal school-based programs for the prevention of violent and aggressive behavior, important research issues remain. These include determining 1) whether the characteristics of the programs, or perhaps of the settings in which they are implemented, differentiate those programs that are more effective from those that are less effective; 2) whether school programs are equally effective and cost effective for high- and low-risk children, and in high- and low-risk environments; and 3) how to address cultural and social differences in diverse populations to improve program implementation effectiveness.

Use of the Recommendation in States and Communities

U.S. schools provide a critical opportunity for changing societal behavior because almost the entire population is engaged in this institution for many years, starting at an early and formative period. With approximately 71 million children in primary and secondary schools in 2003 and an overall high school graduation rate of 85% (86), this opportunity is difficult to overestimate. The potential benefits of improved school function alone are notable. The broader and longer term benefits in terms of reduced delinquency and antisocial behavior are yet more substantial. Universal school-based violence prevention programs represent an important means of reducing violent and aggressive behavior in the United States. The findings of this review suggest that universal school-based violence prevention programs can be effective in communities with diverse ethnic compositions and in communities whose residents are predominantly of lower SES or that have relatively high rates of crime.

References

1. Maguire K, Pastore AL. Sourcebook of criminal justice statistics 2003. Washington, DC: US Department of Justice, Bureau of Justice Statistics, US Government Printing Office; 2005.
2. US Census Bureau. Monthly postcensal resident population, by single year of age, sex, race, and Hispanic origin (1/1/2003–6/1/2003). Washington, DC: US Census Bureau; 2006.
3. Snyder HN, Sickmund M. Juvenile offenders and victims: 1999 national report. Washington, DC: Office of Juvenile Justice and Delinquency Prevention; 1999.
4. CDC. Health, United States, 2005. Hyattsville, MD: US Department of Health and Human Services, CDC, National Center for Health Statistics; 2005.
5. Wasserman G, Keenan K, Tremblay R, et al. Child delinquency bulletin series: risk and protective factors of child delinquency. Washington, DC: US Department of Justice, Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs; 2003.
6. Achenbach TM, Edelbrock C. Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington, VT: University of Vermont, Department of Psychiatry; 1983.
7. Patterson G, Dishion T, Yoerger K. Adolescent growth in new forms of problem behavior: macro and micro peer dynamics. *Prev Sci* 2000; 1:3–13.
8. US Department of Health and Human Services. Youth violence: a report of the Surgeon General. Washington, DC: US Department of Health and Human Services; 2001.
9. Loeber R, Farrington DP, Petechuk D. Child delinquency: early intervention and prevention. Washington, DC: US Office of Juvenile Justice and Delinquency Prevention: Child Delinquency Bulletin Series; 2003.

10. DeVoe J, Peter K, Noonan M, Snyder T, Baum K. Indicators of school crime and safety: 2005 (NCES 2006-001/NCJ 210697). Washington DC: US Government Printing Office; 2005.
11. Goleman D. Emotional intelligence. New York, NY: Bantam Books; 1994.
12. Glanz K, Rimer B, Lewis F, eds. Health behavior and health education: theory, research, and practice. 3rd ed. San Francisco, CA: Jossey-Bass, Inc.; 2002.
13. Prothro-Stith D. Violence prevention curriculum for adolescents. Newton, MA: Education Development Center; 1987.
14. Flay BR, Allred C. Long-term effects of the Positive Action Program. *Am J Health Behav* 2003;27(Suppl 1):S6–S21.
15. Grossman DC, Neckerman HJ, Koepsell TD, et al. Effectiveness of a violence prevention curriculum among children in elementary school: a randomized controlled trial. *JAMA* 1997;277:1605–11.
16. Meyer A, Farrell A, Northup W, Kung E, Plybon L. Promoting non-violence in early adolescence: responding in peaceful and positive ways. New York, NY: Kluwer Academic Publishers; 2000.
17. Kelder SH, Orpinas P, McAlister A, Frankowski R, Parcel GS, Friday J. The Students for Peace Project: a comprehensive violence-prevention program for middle school students. *Am J Prev Med* 1996;12:22–30.
18. Bandura A. Social learning theory. Englewood Cliffs, NJ: Prentice Hall; 1977.
19. Embry D, Flannery DJ, Vazsonyi AT, Powell KE, Atha H. PeaceBuilders: a theoretically driven, school-based model for early violence prevention. *Am J Prev Med* 1996;12(Suppl 5):91–100.
20. Foshee VA, Bauman KE, Greene WF, Koch GG, Linder GF, MacDougall JE. The Safe Dates Program: 1-year follow-up results. *Am J Public Health* 2000;90:1619–22.
21. Truman BI, Smith-Akin CK, Hinman AR, et al. Developing the Guide to Community Preventive Services—overview and rationale. *Am J Prev Med* 2000;18(Suppl 1):18–26.
22. Task Force on Community Preventive Services. The guide to community preventive services. What works to promote health? New York, NY: Oxford University Press; 2005.
23. US Department of Health and Human Services. Healthy people 2010. 2nd ed. With understanding and improving health and objectives for improving health (2 vols.). Washington, DC: US Department of Health and Human Services; 2000.
24. Briss PA, Zaza S, Pappaioanou M, et al. Developing an evidence-based guide to community preventive services: methods. *Am J Prev Med* 2000;18(Suppl 1):35–43.
25. Zaza S, Wright-de Aguero L, Briss PA, et al. Data collection instrument and procedure for systematic reviews in the Guide to Community Preventive Services. *Am J Prev Med* 2000;18(Suppl 1):44–74.
26. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-IV-TR. 4th ed. Washington, DC: American Psychiatric Association; 2000.
27. Hann DM, Borek N, eds. Taking stock of risk factors for child/youth externalizing behavior problems. Bethesda, MD: US Department of Health and Human Services, Public Health Service, National Institute of Mental Health/National Institute of Health; 2001.
28. Carande-Kulis VG, Maciosek MV, Briss PA, et al. Methods for systematic reviews of economic evaluations for the Guide to Community Preventive Services. *Am J Prev Med* 2000;18(Suppl 1):75–91.
29. Community Guide Economic Review Team. Economic evaluation abstraction form, Version 3.0. Atlanta, GA: US Department of Health and Human Services, CDC; 2001. Available at <http://www.thecommunityguide.org/methods/econ-abs-form.pdf>.
30. Greenberg MT, Kusche C. Preventive intervention for school-aged deaf children: the PATHS curriculum. *J Deaf Stud Deaf Educ* 1998;3:49–63.
31. Hawkins JD, Catalano RF, Kosterman R, Abbott R, Hill KG. Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Arch Pediatr Adolesc Med* 1999;153:226–34.
32. Ialongo N, Werthamer L, Kellam SG. Proximal impact of two first-grade preventive interventions on the early risk behaviors for later substance abuse, depression and antisocial behavior. *Am J Community Psychol* 1999;27:599–641.
33. Olweus D. Bully/victim problems in school: facts and intervention. *Eur J Psychol Educ* 1997;12:495–510.
34. Reid JB, Eddy JM, Fetrow RA, Stoolmiller M. Description and immediate impacts of a preventive intervention for conduct problems. *Am J Community Psychol* 1999;27:483–517.
35. Shure MB, Spivack G. Interpersonal problem-solving in young children: a cognitive approach to prevention. *Am J Community Psychol* 1982;10:341–55.
36. Aber JL, Jones SM, Brown JL, Chaudry N, Samples F. Resolving conflict creatively: evaluating the developmental effects of a school-based violence prevention program in neighborhood and classroom context. *Dev Psychopathol* 1998;10:187–213.
37. Alsaker FD, Valkanover S. Early diagnosis and prevention of victimization in kindergarten. In: Juvonen J, Graham S, eds. Peer harassment in school: the plight of the vulnerable and victimized. New York, NY: The Guilford Press; 2001:175–95.
38. Battistich V, Schaps E, Watson M, Solomon D, Lewis C. Effects of the Child Development Project on students' drug use and other problem behaviors. *J Prim Prev* 2000;21:75–99.
39. Bosworth K, Espelage D, DuBay T, Daytner G, Karageorge K. Preliminary evaluation of a multimedia violence prevention program for adolescents. *Am J Health Behav* 2000;24:268–80.
40. Boulton MJ, Flemington I. The effects of a short video intervention on secondary school pupils' involvement in definitions of and attitudes towards bullying. *Sch Psychol Int* 1996;17:331–45.
41. Conduct Problems Prevention Research Group. Evaluation of the first 3 years of the Fast Track prevention trial with children at high risk for adolescent conduct problems. *J Abnormal Child Psychol* 2002;30:19–35.
42. DuRant RH. Comparison of two violence prevention curricula for middle school adolescents. *J Adolesc Health* 1996;19:111–7.
43. DuRant RH, Barkin S, Krowchuck DP. Evaluation of a peaceful conflict resolution and violence prevention curriculum for sixth-grade students. *J Adolesc Health* 2001;28:386–93.
44. Elias MJ, Gara MA, Schuyler T, Branden-Muller LR, Sayette MA. The promotion of social competence: longitudinal study of a preventive school-based program. *Am J Orthopsychiatry* 1991;61:409–17.
45. Esbensen FA, Osgood DW, Taylor TJ, Peterson D, Freng A. How great is G. R. E. A. T.? Results from a longitudinal quasi-experimental design. *Criminol Public Policy* 2001;1:87–118.
46. Farrell AD, Meyer AL. The effectiveness of a school-based curriculum for reducing violence among urban sixth-grade students. *Am J Public Health* 1997;87:979–84.

47. Farrell AD, Meyer AL, White KS. Evaluation of Responding in Peaceful and Positive Ways (RIPP): a school-based prevention program for reducing violence among urban adolescents. *J Clin Child Psychol* 2001;30:451–63.
48. Farrell AD, Valois RF, Meyer AL. Evaluation of the RIPP-6 violence prevention program at a rural middle school. *Am J Health Ed* 2002;33:167–72.
49. Farrell AD, Valois RF, Meyer AL, Tidwell RP. Impact of the RIPP violence prevention program on rural middle school students. *J Prim Prev* 2003;24:143–67.
50. Flay BR, Graumlich S, Segawa E, Burns JL, Holliday MY. Effects of 2 prevention programs on high-risk behaviors among African-American youth: a randomized trial. *Arch Pediatr Adolesc Med* 2004;158:377–84.
51. Sandy SV, Boardman SK. The Peaceful Kids Conflict Resolution Program. *Int J Conflict Manag* 2000;11:337–57.
52. Sawyer MG, MacMullin C, Graetz B, Said JA, Clark JJ, Baghurst P. Social skills training for primary school children: a one-year follow-up study. *J Paediatr Child Health* 1997;33:378–83.
53. Flannery DJ, Liau AK, Powell KE, et al. Initial behavior outcomes for the PeaceBuilders universal school-based violence prevention program. *Dev Psychol* 2003;39:292–308.
54. Flay BR, Allred CG, Ordway N. Effects of the Positive Action Program on achievement and discipline: two matched-control comparisons. *Prev Sci* 2001;2:71–89.
55. Gesten EL, Rains MH, Rapkin BD, et al. Training children in social problem-solving competencies: a first and second look. *Am J Community Psychol* 1982;10:95–115.
56. Hindley P, Reed H. Promoting alternative thinking strategies (PATHS): mental health promotion with deaf children in school. In: Decker S, Kirby S, Greenwood A, et al., eds. *Taking children seriously: applications of counseling and therapy in education*. London, UK: Cassell Publishers; 1999:113–30.
57. Johnson DW, Johnson RT, Dudley BS. Effects of peer mediation training on elementary school students. *Mediation Q* 1992;10:89–99.
58. Johnson DW, Johnson RT, Dudley BS, Ward M, et al. The impact of peer mediation training on the management of school and home conflicts. *Am Educ Res J* 1995;32:829–44.
59. Kenney DJ, Watson TS. Reducing fear in the schools: managing conflict through student problem solving. *Educ Urban Soc* 1996;28:436–55.
60. Lynch KB, Geller SR, Schmidt MG. Multi-year evaluation of the effectiveness of a resilience-based prevention program for young children. *J Prim Prev* 2004;24:335–53.
61. McMahon SD, Washburn JJ. Violence prevention: an evaluation of program effects with urban African-American students. *J Prim Prev* 2003;24:43–62.
62. McMahon SD, Washburn J, Felix ED, Yakin J, Childrey G. Violence prevention: program effects on urban preschool and kindergarten children. *Appl Prev Psychol* 2000;9:271–81.
63. Nelson G, Carson P. Evaluation of a social problem-solving skills program for third- and fourth-grade students. *Am J Community Psychol* 1988;16:79–99.
64. O'Donnell L, Stueve A, Doval AS, et al. Violence prevention and young adolescents' participation in community youth service. *J Adolesc Health* 1999;24:28–37.
65. Orpinas P, Parcel GS, McAlister A, Frankowski R. Violence prevention in middle schools: a pilot evaluation. *J Adolesc Health* 1995;17:360–71.
66. Orpinas P, Kelder S, Frankowski R, Murray N, Zhang Q, McAlister A. Outcome evaluation of a multi-component violence-prevention program for middle schools: the Students for Peace project. *Health Educ Res* 2000;15:45–58.
67. Orpinas P, Horne A. School bullying: changing the problem by changing the school. *Sch Psychol Rev* 2003;32:431–44.
68. Pepler DJ, Craig WM, Ziegler S, Charach A. An evaluation of an anti-bullying intervention in Toronto schools. *Can J Commun Ment Health* 1994;13:95–110.
69. Palumbo DJ, Ferguson JL. Evaluating Gang Resistance Education and Training (GREAT): is the impact the same at that of Drug Abuse Resistance Education (DARE)? *Eval Rev* 1995;19:597–619.
70. Renfro J, Huebner R, Ritchey B. School violence prevention: the effects of a university and high school partnership. *J Sch Violence* 2003;2:81–99.
71. Rickel AU, Eshelman AK, Loigman GA. Social problem solving training: a follow-up study of cognitive and behavioral effects. *J Abnorm Child Psychol* 1983;11:15–28.
72. Roland E. Bullying: a developing tradition of research and management. In: Tattum D, ed. *Understanding and managing bullying*. Oxford, UK: Heinemann Education; 1993:15–30.
73. Roush G, Hall E. Teaching peaceful conflict resolution. *Mediation Q* 1993;11:185–91.
74. Shapiro J, Burgoon JD, Welker CJ, Clough JB. Evaluation of The Peacemakers Program: school-based violence prevention for students in grades four through eight. *Psychol Sch* 2002;39:87–100.
75. Stevens V, De Bourdeaudhuij I, Van Oost P. Bullying in Flemish schools: an evaluation of anti-bullying intervention in primary and secondary schools. *Brit J Educ Psychol* 2000;70:195–210.
76. Taylor CA, Liang B, Tracy AJ, Williams LM, Seigle P. Gender differences in middle school adjustment, physical fighting, and social skills: evaluation of a social competency program. *J Prim Prev* 2002;23:261–73.
77. Weissberg RP, Gesten EL, Carnrike CL, et al. Social problem-solving skills training: a competence building intervention with 2nd–4th grade children. *Am J Community Psychol* 1981;9:411–24.
78. Whitney I, Rivers I, Smith P, et al. The Sheffield project: methodology and findings. In: Smith P, Sharp S, eds. *School bullying: insights and perspectives*. London, UK: Routledge; 1994:20–56.
79. Winer JI, Hilpert PL, Gesten EL, Cowen EL, Schubert WE. The evaluation of a kindergarten social problem solving program. *J Prim Prev* 1982;2:205–16.
80. Conduct Problems Prevention Research Group. Initial impact of the fast track prevention trial for conduct problems: II. Classroom effects. *J Consult Clin Psychol* 1999;67:648–57.
81. Vazsonyi A, Belliston L, Flannery D. Evaluation of a school-based, universal violence prevention program: low-, medium-, and high-risk children. *Youth Violence and Juvenile Justice* 2004;2:185–206.
82. Greenberg MT, Kusche C, Mihalic SF. *Blueprints for violence prevention, Book Ten: Promoting Alternative Thinking Strategies (PATHS)*. Boulder, CO: Center for the Study and Prevention of Violence; 1998.

83. Aos S, Lieb R, Mayfield J, et al. Benefits and costs of prevention and early intervention programs for youth. Olympia, WA: Washington State Institute for Public Policy; 2004. Available at <http://www.wsipp.wa.gov/rptfiles/04-07-3901.pdf>.
 84. Wilson S, Lipsey M. Update of a meta-analysis of school-based intervention programs. *Am J Prev Med.* 2007;33(Suppl):S130–S143.
 85. Hahn R, Fuqua-Whitley D, Wethington H, et al. and the Task Force on Community Preventive Services. Effectiveness of universal school-based programs to prevent violent and aggressive behavior: a systematic review. *Am J Prev Med* 2007;33(Suppl):S114–S129.
 86. US Census Bureau. Statistical abstract of the United States. Washington, DC: US Census Bureau; 2001.
-

Task Force on Community Preventive Services***June 1, 2007**

Chair: Jonathan E. Fielding, MD, Los Angeles County Department of Health Services, Los Angeles, California.

Vice-chair: Barbara K. Rimer, DrPH; School of Public Health, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

Members: Ana Abraido-Lanza, PhD, Mailman School of Public Health, Columbia University, New York, New York; Ned Calonge, MD, Colorado Department of Public Health and University of Colorado Health Sciences Center, Denver, Colorado; John Clymer, Partnership for Prevention, Washington, District of Columbia; Kay Dickersin, PhD, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland; Karen Glanz, PhD, Rollins School of Public Health, Emory University, Atlanta, Georgia; Ron Goetzel, PhD, Cornell University Institute for Health and Productivity Studies, Thomson Medstat, Washington, District of Columbia; Robert L. Johnson, MD, New Jersey Medical School, University of Medicine and Dentistry of New Jersey, Newark, New Jersey; Nicolaas P. Pronk, PhD, HealthPartners Research Foundation, Minneapolis, Minnesota; Gilbert Ramirez, DrPH, Charles R. Drew University, Los Angeles, California; Dennis L. Richling, MD, Matria Healthcare, Chicago, Illinois; and Steven M. Teutsch, MD, Merck & Company, Inc., West Point, Pennsylvania.

Consultants: Robert S. Lawrence, MD, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland; J. Michael McGinnis, MD, Institute of Medicine of the National Academies, Washington, District of Columbia.

*The following persons also served on the Task Force while the recommendations were being developed: Mindy Thompson Fullilove, MD, New York State Psychiatric Institute and Columbia University, New York, New York; Alan R. Hinman, MD, Task Force for Child Survival and Development, Atlanta, Georgia; George J. Isham, MD, HealthPartners, Minneapolis, Minnesota; Garland H. Land, MPH, Center for Health Information Management and Epidemiology, Missouri Department of Health, Jefferson City, Missouri; Patricia Dolan Mullen, DrPH, University of Texas–Houston School of Public Health, Houston, Texas; Patricia A. Nolan, MD, Rhode Island Department of Health, Providence, Rhode Island; and Alonzo L. Plough, PhD, Public Health–Seattle and King County, Seattle, Washington. Lloyd F. Novick, MD, East Carolina University, Greenville, North Carolina, also was a consultant to the Task Force during that time.

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, send an e-mail message to listserv@listserv.cdc.gov. The body content should read *SUBscribe mmwr-toc*. Electronic copy also is available from CDC's Internet server at <http://www.cdc.gov/mmwr> or from CDC's file transfer protocol server at <ftp://ftp.cdc.gov/pub/publications/mmwr>. Paper copy subscriptions are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone 202-512-1800.

Data in the weekly *MMWR* are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the following Friday. Data are compiled in the National Center for Public Health Informatics, Division of Integrated Surveillance Systems and Services. Address all inquiries about the *MMWR* Series, including material to be considered for publication, to Editor, *MMWR* Series, Mailstop E-90, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30333 or to www.mmwrq@cdc.gov.

All material in the *MMWR* Series is in the public domain and may be used and reprinted without permission; citation as to source, however, is appreciated.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

References to non-CDC sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of these sites. URL addresses listed in *MMWR* were current as of the date of publication.