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# A COMPENDIUM OF PROVEN COMMUNITY-BASED PREVENTION PROGRAMS

*The New York Academy of Medicine (NYAM) is an independent organization advancing the health of the people in cities since 1847. NYAM addresses the health challenges facing the world's urban population through interdisciplinary approaches to policy leadership, innovative research, education, training and community engagement. Our current urban health agenda includes creating environments in cities that support healthy aging, strong systems to prevent disease and promote the public's health, and interventions to eliminate health disparities. We draw on the innovative ideas and expertise of diverse partners and more than 2,000 elected Fellows from across the professions affecting health.*

# FOREWORD

Heart disease, stroke, and diabetes account for 36.6% of deaths in the U.S.,<sup>1</sup> which can be significantly reduced by changing just three risk factors -- decreasing smoking, increasing exercise, and improving healthy eating. Despite the high rates of preventable death in the United States, investment in prevention has been historically modest, accounting for only 4% of all health care expenditures.<sup>2</sup> The good news is that community-based prevention programs work. An increasing body of evidence demonstrates that well-designed interventions can change behavior and reduce both the incidence and severity of disease.

In July 2008, Trust for America's Health published *Prevention for a Healthier America*, which demonstrated that modest investments in community-based preventions (\$10 per person) could result in dramatic health care savings (\$16.5 billion in five years). As part of that study, The New York Academy of Medicine conducted extensive literature reviews to identify high-quality studies evaluating the effectiveness of community-based prevention. Focusing only on community-based interventions designed to reduce tobacco use, increase physical activity, and/or improve eating habits, we located and reviewed 84 articles for inclusion in the return on investment model. The attached report summarizes a sample of these articles as well as some additional studies addressing other behaviors and preventable conditions (e.g., asthma, falls prevention, and sexually transmitted infections) that were not included in the original report.



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<sup>1</sup> CDC. Deaths: Leading Causes 2004. National Vital Statistics Report. November 20, 2007: 56(5).

<sup>2</sup> Blue Sky Initiative. A Transformative Approach to Health Reform. Undated. [www.blueskyhealthinitiative.org](http://www.blueskyhealthinitiative.org).

# COMMUNITY-BASED PREVENTION PROGRAMS

*Community-based prevention programs have been shown to improve health and prevent disease. The following sample of programs have all been proven to decrease participants' likelihood of developing preventable disease and the associated risk factors:*

## **Interventions That Reduce the Risk of Cardiovascular Disease, Stroke & Diabetes**

Cardiovascular disease is the leading cause of morbidity and accounts for 35% of all deaths in the U.S.<sup>3</sup> Interventions that reduce obesity, blood pressure, and cholesterol and increase physical activity and healthy eating have been proven effective in reducing risks for cardiovascular disease as well as diabetes and stroke.

- In Pawtucket, Rhode Island, the Pawtucket Heart Health Program conducted an intervention to educate 71,000 people about heart disease through a mass media campaign and community programs. Five years into the intervention, the risks for cardiovascular disease and coronary heart disease had decreased by 16 percent among members of the randomly selected intervention population. (See reference #1, Carleton et al. 1995)
- The Stanford Five-City Project used a mass media campaign and community programs to target a population of 122,800 people. At five years, risk for coronary heart disease had decreased by 16 percent, cardiovascular disease mortality risk had decreased by 15 percent, prevalence of smoking was down 13 percent, blood pressure was down 4 percent, resting pulse rates were down 3 percent, and cholesterol was down 2 percent among members of the randomly selected intervention population. (See reference #2, Farquhar et al. 1990)
- Researchers at Ohio State University recruited 60 women in their forties for a 12-week walking program that took place on the college's campus. At 3 months, the intervention group saw a 1 percent decrease in body mass index (BMI), a 3.4 percent decrease in hypertension, a 3 percent decrease in cholesterol, and a 5.5 percent decrease in glucose. (See reference #3, Haines et al. 2007)
- "Shape Up Somerville," a comprehensive effort to prevent obesity in high-risk first through third grade students in Somerville, Massachusetts, included improved nutrition in schools, a school health curriculum, an after-school curriculum, parent and community outreach, collaboration with community restaurants, school nurse education, and a safe routes to school program. After one year, on average the program reduced one pound of weight gain over 8 months for an 8 year old child. On a population level, this reduction in weight gain would translate into large numbers of children moving out of the overweight category and reducing their risk for chronic disease later in life. (See reference #4, Economos et al. 2007)
- A physical activity intervention targeting low-income adults in Oslo, Norway, provided individual counseling, walking groups, increased accessible areas for safe recreation, and information through leaflets and mass media. After 3 years, compared to the control group, the intervention group had an

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<sup>3</sup> American Heart Association. Cardiovascular Disease Statistics. June 2009. Electronic article, <http://www.americanheart.org/presenter.jhtml?identifier=4478>, accessed June 26, 2009.

8-9 percent increase in physical activity, 14 percent fewer individuals gained weight, 3 percent more quit smoking, and significant decrease in blood pressure rates were reported. (See reference #5, Jennum et al. 2006)

- WISEWOMAN, a CDC-funded lifestyle intervention program, provides low-income uninsured women aged 40 to 64 with chronic disease risk factor screenings, lifestyle interventions, and referral services in an effort to prevent coronary heart disease and improve health. Over the course of a year, WISEWOMAN participants improved their 10-year risk of coronary heart disease by 8.7%, and there were significant reductions in the percent of participants who smoked (11.7%), had high blood pressure (15.8%), or had high cholesterol (13.1%). (See reference #6, Finkelstein et al. 2006)
- Hartslag Limburg is an integrative, community-based cardiovascular disease prevention program that promotes a healthy lifestyle. The 5-year follow-up for a cohort of over 2,400 participants who were compared with a control group found that Hartslag Limburg succeeded in reducing – and in some cases, preventing – age- and time-related increase in BMI, waist circumference, blood pressure, and, in women, non-fasting glucose concentration. (See reference #7, Schuit et al. 2006)
- The Rockford Coronary Health Improvement Project (CHIP) was a community-based lifestyle intervention program aimed at reducing coronary risk, especially in a high risk group. The intervention included a 40-hour educational curriculum delivered over a 30-day period with clinical and nutritional assessments before and after the educational component, in which participants were instructed to optimize their diet, quit smoking, and exercise daily (walking 30 minutes per day). At the end of the 30-day intervention period, stratified analyses of total cholesterol, LDL, triglycerides, blood glucose, blood pressure and weight showed highly significant reductions with the greatest improvements among those at highest risk. (See reference #8, Englert et al. 2007)
- A community-oriented, coronary heart disease prevention program conducted in six regions of former West Germany included activities that emphasized healthy nutrition and increased physical activity, in addition to the reduction of smoking, hypertension, and hypercholesterolemia. Over a seven year period, the intervention saw a net reduction in the mean values of systolic (-2.0%) and diastolic (-2.0%) blood pressure, total serum cholesterol (-1.8%), as well as the percentage of smokers (-6.7%), compared with the nationwide trend. (See reference #9, Hoffmeister et al. 1996)
- A study that followed Diabetes Prevention Program participants randomized to an intensive lifestyle intervention found that weight loss was the dominant predictor of reduced diabetes incidence. Participants experienced a 16 percent reduction in their diabetes risk for every kilogram of weight that they lost after a 3.2 year mean follow-up period. (See reference #10, Hamman et al. 2006)
- EPODE, a multisectoral, 5-year plan to improve nutrition among 5 to 12 year old youths in 10 French towns, involved parents and families, medical providers, school nurses, teachers, towns, businesses, and media campaigns in the intervention. In the targeted towns, obesity rates have remained consistent while they have doubled in control areas, making youths who experienced the intervention less likely to develop obesity-related health conditions in the future. Mothers in the intervention towns have reported weight loss as well. (See reference #11, EPODE 2004)

## **Interventions That Reduce the Use of Tobacco**

Smoking harms almost every organ of the body, and the adverse health effects from cigarette smoking account for nearly 1 of every 5 deaths each year in the United States. The risk of dying from lung cancer is more than 23 times higher among men who smoke cigarettes, and about 13 times higher among women who smoke cigarettes, compared with individuals who have never smoked. Cigarette smokers are 2–4 times more likely to develop coronary heart disease than nonsmokers, and smoking approximately doubles an individual's risk for stroke. In addition, smoking causes cancers of the bladder, oral cavity, pharynx, larynx (voice box), esophagus, cervix, kidney, lung, pancreas, and stomach. More deaths are caused each year by tobacco use than by all deaths from human immunodeficiency virus (HIV), illegal drug use, alcohol use, motor vehicle injuries, suicides, and murders combined.<sup>4</sup> Reducing tobacco use has been proven effective in reducing risks for cardiovascular disease, lung cancer, and a range of other cancers.

- A worksite intervention program targeting approximately 800 high-risk employees who smoked provided the individuals with worksite health promotion, cardiovascular risk factor screenings, and individualized counseling. At 3.7 years, the intervention group realized a 12.6% decrease in the amount smoked, a 3.3% decrease in diastolic blood pressure, and a 7.8% decrease in cholesterol, decreasing the individuals' risks for developing cardiovascular disease. (See reference #12, Prior et al. 2005)
- A community health education program targeting both French- and German-speaking towns in Switzerland found a mass media campaign and community programs to be effective in helping smokers quit. Four years into the intervention, 8% more smokers had quit the habit in intervention towns as compared with comparison towns. (See reference #13, Gutzwiller et al. 1985)
- A multifactorial intervention designed to prevent coronary heart disease targeted male factory workers in the United Kingdom, Belgium, Italy, and Poland. At 4 years, the average participant had decreased the number of cigarettes he smoked daily by 8.4%, and the average high risk participant had decreased the number of cigarettes smoked daily by 13.9%. (See reference #14, World Health Organization 1982)
- A study of the California Tobacco Control Program examined the impact of a \$0.25 increase on the price of cigarettes that allocated \$0.05 of the net tax for an anti-tobacco educational campaign. At 3 years, coronary heart disease mortality had decreased by 2.93 deaths per year for every 100,000 members of the California population, and the amount Californians smoked decreased by 2.72 packs per person per year. (See reference #15, Fichtenberg and Glantz, 2000)

## **Interventions That Control Asthma**

Asthma is a leading chronic illness among children and youth in the United States. On average, in a classroom of 30 children, about 3 are likely to have asthma, and it is one of the leading causes of school

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<sup>4</sup> CDC. Health Effects of Cigarette Smoking. May 2009. Electronic document, [http://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/health\\_effects/effects\\_cig\\_smoking/](http://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/), accessed June 26, 2009.

absenteeism. Asthma is the third-ranking cause of hospitalization among children under 15.<sup>5</sup> Asthma can be controlled with proper diagnosis, appropriate asthma care, and management activities, which makes community-based asthma prevention programs extremely important in reducing hospitalizations and absenteeism caused by asthma.

- A study of almost 1,000 children with asthma in seven major U.S. cities provided environmental interventions tailored to each child's allergic sensitization and environmental risk factors in an effort to improve asthma-related outcomes. The one-year intervention included education and remediation for exposure to both allergens and environmental tobacco smoke, with home environmental exposure assessments every six months. For every two-week period, the intervention group had significantly fewer days with symptoms than did the control group, both during the intervention year (3.39 vs. 4.20 days) and the year afterward (2.62 vs. 3.21 days), as well as greater declines in the levels of allergens at home. Reductions in the levels of cockroach allergen and dust-mite allergen on the bedroom floor were significantly correlated with reduced complications of asthma. (See reference #16, Morgan et al. 2004)
- The New York State Healthy Neighborhoods Program conducted an asthma intervention in which outreach workers conducted home visits and provided education about asthma, referrals, and controls for asthma triggers. During the program's 1997-1999 funding cycle, the average hospitalization (hospital admissions and ER visits) rate decreased by 23%. (See reference #17, Lin et al. 2004)

### **Interventions That Reduce Falls Among the Elderly**

For people aged 65 and older, falls are the leading cause of injury death, and two-thirds to one-half of falls occur in or around the home. Falls are also the underlying cause of a large proportion of fatal traumatic brain injuries among this population. The risk of falling increases exponentially with age, and older adults who have fallen previously or who stumble frequently are two to three times more likely to fall within the next year. As the population ages, fall-related death rates and hip fracture hospitalization rates have been increasing.<sup>6</sup> For all of these reasons, it is important to try and prevent senior citizens from falling, and community-based interventions have proven successful in reducing falls among the older population.

- The Stay On Your Feet program, which targeted 80,000 residents aged 60 years and older on the North Coast of New South Wales, addressed factors contributing to falls among the older population such as footwear, vision, physical activity, balance and gait, medication use, chronic conditions, and home and public environmental hazards. The program employed a range of strategies, including awareness raising, community education, policy development (with both state and local governments), home hazard reduction, media campaigns, and working with clinicians and other health professionals. After four years, there was a 22% non-significant lower incidence of self-reported falls in the intervention compared to the control cohort, and this was supported by a statistically significant 20% lower fall-related hospitalization rate in target group residents from

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<sup>5</sup> DeFrances CJ, Cullen KA, Kozak LJ. National Hospital Discharge Survey: 2005 Annual Summary with Detailed Diagnosis and Procedure Data. National Center for Health Statistics. Vital Health Statistics 13 (165). 2007.

<sup>6</sup> National Center for Injury Prevention and Control. Falls Among Older Adults: Summary of Research Findings. September 7, 2006. Electronic document, <http://www.cdc.gov/ncipc/pub-res/toolkit/SummaryOfFalls.htm>, accessed June 30, 2009.

intervention compared to control areas. Increased falls knowledge, physical activity, and safe footwear were also observed in the intervention cohort, as were improved balance and reduced intake of fall related medications. (See reference #18, Kempton et al. 2000)

- Stepping On, a multifaceted, community-based falls prevention program in Sydney, Australia, aimed to improve fall self-efficacy, encourage behavioral change, and reduce the incidence of falls among the elderly. Stepping On targeted community residents aged 70 or older who had had a fall in the previous 12 months or were concerned about falling. The program used a small-group learning environment focused on improving lower-limb balance and strength, improving home and community environmental and behavioral safety, encouraging regular visual screening, making adaptations to low vision, and encouraging medication review. The intervention group experienced a clinically meaningful 31% reduction in falls over a median period of 429 days, demonstrating that the Stepping On program is effective for community-residing elderly people. Secondary analysis of subgroups showed that the program proved particularly effective for men. (See reference #19, Clemson et al. 2004)

### **Interventions That Reduce the Spread of Sexually Transmitted Infections**

Sexually transmitted infections remain a major public health challenge in the United States. CDC estimates that approximately 19 million new infections occur each year, and more than 65 million people are currently living with an incurable sexually transmitted disease.<sup>7,8</sup> HIV, which attacks the immune system and causes AIDS, remains highly prevalent in the United States, and while the virus has historically affected more men than women, the proportion of new HIV infections occurring in women continues to increase.<sup>9</sup> Latex condoms, when used consistently and correctly, are highly effective in preventing the sexual transmission of HIV, and consistent and correct use of latex condoms also reduces the risk of other sexually transmitted infections.<sup>10</sup> Community-based interventions that promote condom use and address additional risk factors, such as having multiple partners, have been shown to reduce the spread of HIV and other sexually transmitted infections.

- The Healthy Living Project aimed to reduce the risk of transmission among people living with HIV through behavioral intervention. More than 450 individuals each participated in a 15-session, individually delivered, cognitive behavioral intervention that included modules on stress, coping, and adjustment; safer behaviors; and health behaviors. The participants and the members of a control group completed follow-up assessments at 5, 10, 15, 20, and 25 months after randomization. Overall, a significance difference in mean transmission risk acts was shown between the intervention and control arms over 5 to 25 months. The greatest reduction occurred at the 20-month follow-up, with a 36% reduction in the intervention group compared with the control group. This study demonstrates that cognitive behavioral intervention programs can effectively reduce the potential of HIV transmission to others among people living with HIV who report significant transmission risk behavior. (See reference #20, Healthy Living Project Team 2007)

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<sup>7</sup> CDC. Trends in Reportable Sexually Transmitted Diseases in the United States, 2006. November 2007.

<sup>8</sup> Sexuality Information and Education Council of the United States. Fact Sheet: Sexually Transmitted Diseases in the United States. Oct./Nov. 2001. Electronic document, <http://www.thebody.com/content/prev/art2447.html>, accessed June 30, 2009.

<sup>9</sup> CDC. HIV/AIDS and Women. March 9, 2009. Electronic document, <http://www.cdc.gov/hiv/topics/women/index.htm>, accessed June 30, 2009.

<sup>10</sup> CDC. Condoms and STDs: Fact Sheet for Public Health Personnel. March 26, 2009. Electronic document, <http://www.cdc.gov/condomeffectiveness/latex.htm>, accessed June 30, 2009.

- A social marketing campaign conducted in Louisiana between 1994 and 1996 made over 33 million condoms freely available in over 1,000 public and commercial sites throughout the state. Fifty five percent of the condoms were taken by African Americans, a priority population. Surveys among 275,000 African Americans showed that condom use increased by 30%. The program was estimated to prevent 170 HIV infections and save 1909 quality-adjusted life years. These findings indicate that condom distribution is a community-level HIV prevention intervention that has the potential to reach large segments of the general population, thereby averting significant numbers of HIV infections. The intervention is easy to scale up to large populations or down to small populations. (See reference #21, Bedimo et al. 2002)
- A community-level intervention aimed at lowering the risk of HIV infection focused on men patronizing gay bars in eight small U.S. cities, four of which served as intervention cities and four of which served as control cities. In the control cities, HIV educational materials were placed in the bars. In the intervention cities, popular homosexual men in the community were recruited and trained to spread behavior-change endorsements and recommendations to their peers through conversation. Population-level rates of risk behavior decreased significantly in the intervention cities compared with the control cities at 1-year follow-up. In the intervention cities there was a reduction in the mean frequency of unprotected anal intercourse during the previous 2 months, from 1.68 occasions at baseline to 0.59 occasions at follow-up, and an increase in the mean percentage of occasions of anal intercourse protected by condoms, from 44.7% at baseline to 66.8% at follow-up. This intervention demonstrates that popular and well-liked members of a community who systematically endorse and recommend risk-reduction behavior can influence the sexual-risk practices of others in their social networks. (See reference #22, Kelly et al. 1997)
- A randomized, community-level intervention aimed at preventing high-risk women from contracting HIV targeted women living in low-income housing developments in 5 U.S. cities. In the 9 intervention condition housing developments, intervention activities included HIV risk reduction workshops and community HIV prevention events implemented by women who were popular opinion leaders among their peers. At the 12-month follow-up, the proportion of women in the intervention developments who had any unprotected intercourse in the past 2 months declined from 50% to 37.6%, and the percentage of women's acts of intercourse protected by condoms increased from 30.2% to 47.2%. Among women exposed to intervention activities, the mean frequency of unprotected acts of intercourse in the past 2 months tended to be lower at follow-up (mean = 4.0) than at baseline (mean = 6.0). These changes were corroborated by changes in other risk indicators. This study demonstrates that community-level interventions that involve and engage women in neighborhood-based HIV prevention activities can bring about reductions in high-risk sexual behaviors. (See reference #23, Sikkema et al. 2000)

*More information about effective community-based prevention interventions can be found in the CDC Guide to Community Preventive Services, available in print or at <http://www.thecommunityguide.org/index.html>. More information about HIV-specific community-based prevention programs is available on the Diffusion of Effective Behavioral Interventions (DEBI) website, <http://www.effectiveinterventions.org/go/about-debi>.*

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