

Module 1 Unit 1

This is a **OPTIONAL READING**.

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Public Health Education and Communication as Policy Instruments for Bringing About Changes in Behavior

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ABSTRACT

This chapter outlines selected evidence that public health education and communication have affected important health behavior. Three questions are addressed: What programs are public health communication interventions? What are their effects on behavior? Under what conditions are such programs effective? This is an exemplary rather than a comprehensive review that should not be read as suggesting that such efforts always or usually have such effects. The nature of the available evidence precludes any such conclusion. Rather, it shows that at least in some cases there have been effects.

The investigation begins by contrasting the Stanford Five City Project and the National High Blood Pressure Education Program. The first is a landmark, a well-controlled, carefully developed program that may have had only small or no effects on behavior. The second is a national multi-component program with an uncontrolled evaluation that probably produced a massive reduction in stroke mortality. It goes on to review other apparently successful cases (e.g., AIDS campaigns in Netherlands and Switzerland, Reye's Syndrome, Sudden Infant Death Syndrome, smoking, immunization in the Philippines). The chapter closes with an analysis of the conditions of success: when the recommended behavior is supported by the health system, when much of the audience is reached repeatedly, when sponsors expect the process of change to reflect slow social norm change rather than individual effects of direct message exposure, and when new behaviors fit easily with the existing pattern of behavior.

There are contradictions in the way the medical world thinks about public health communication. On the one hand, an image of powerful advertising promises rapid changes in health behavior. This image is reflected in an ambivalent admiration for commercial advertisers: "If Coca Cola can do it why can't we?" On the other hand, the failure of some people who "know" healthy behavior to do healthy behavior leaves other observers skeptical about the utility of public education as an intervention tool. Most people know about the transmission of HIV, for instance, but many still engage in high risk behavior.

Both of these contradictory views grow out of the same naive expectation of effects. The fact is that despite Coca Cola's massive promotion budgets, changes in market share are only slowly achieved: a 1% or 2% add-on to market share would be an extraordinary success. Few health promotion activities have been capable of measuring so small a change, never mind being ready to accept it as a sufficient outcome of a campaign. However, such small declines may have immense consequences for public health status, even if they do not represent complete success.

There is a thoroughgoing contradiction in the available evidence about the role of public health communication in affecting health status. On the one hand, there is possibly the best-known project in the field, the Stanford Five City Project. This program features a well-defined implementation and a careful evaluation. However, the evaluation so far suggests only limited effects, effects that may not be large compared to the secular trend. On the other hand, there are some activities (difficult to call them projects) that have relied heavily on public health communication, and are associated with quite substantial changes in behavior. However, the evaluations of these activities are much less controlled and the attribution of their effects is much more problematic.

It is tempting to attend only to well-controlled studies and suggest that if the latter evaluations had been done with better controls, then they would also have been unconvincing as to the power of public health communication. However, there is an alternative view about such programs: The circumstances in which public health communication has a large success make it exceedingly difficult to do definitive evaluation.

Any program that makes use of mass communication in a major way and that does or is meant to affect health behavior falls into this discussion. This includes many different programs. Some use mass media alone. Others add complementary efforts with and through health professionals. Yet others include direct outreach to communities. Some programs stimulate demands on the health system such as increasing immunization visits, whereas others address autonomous behavior such as quitting smoking. Some programs are focused on a single behavior like obtaining a mammography; others address a set of related behaviors or behaviors that have to be maintained over time

such as quitting smoking, engaging in exercise, or changing one's diet. Some work in a focused geographic area and others include the entire nation. Some use the mass media as a channel for broadcast of prepared materials; others use the media by encouraging attention to issues by existing news and other shows so as to either discourage unacceptable behavior or encourage desired behavior. Still others use the media as an element of a program of public advocacy, to stimulate legal or policy change by influencing and organizing the climate of public opinion.

EVIDENCE FROM CONTROLLED EVALUATIONS

First, consider the Stanford program, which has been a central model of public health campaigns. The Stanford Five City Project provided 5 years of mass media and community organization cardiovascular risk reduction education to two small cities in Northern California. The "treatment" cities were compared with two roughly similar control cities on their rates of change on relevant risk factors. This project and its predecessor, the Stanford Three Community Study, have been the catalyst for many other projects and for the growth of the community health education approach. The educational efforts have been serious, based in a theory of behavior change, and have incorporated the careful development and implementation of educational programs, including television and radio spots, printed materials, classes, contests, and correspondence courses. The project estimates that each adult in the treatment communities would have been exposed to around 5 hours of education each year (Farquhar et al., 1990).

The evaluation, done with great care, is still a messy affair. The treatment and control cities were not equivalent beforehand and two different methods of evaluation give quite different results. However, a reader disposed to take a skeptical view would conclude that the effects of the program were either small or not established. A look at differences between the independent, rather than cohort, samples of the first and last measurement waves finds that only two of six risk factors showed a significantly ($p < .05$) larger effect for the treatment cities than the control cities. In addition, the cumulative rates of change for estimated all-cause mortality risk, or coronary heart disease risk, were not different for the treatment and control cities. Other ways of framing the data can give a more optimistic view. Not-yet-reported follow-up data gathered in each community 4 years after the end of the formal educational activity and estimates of changes in morbidity and mortality may give still a different picture. However, for the moment, the evaluation suggests uncertainty as to outcomes and allows room to doubt the significance of a treatment-city advantage.

The best light to put on such results is to ask: Even if the effects were small, were they worthwhile? Will the likely benefit outweigh the cost?

Farquhar et al. (1990) revealed that the cost "to our group" was about \$4 per person per year, excluding research costs and, assumedly, donated media time and volunteer time, crucial elements in the project's operation (p. 364). At that rate, if a continuing high quality program could be delivered, even a small benefit could justify continuation.

However, the smallness of any treatment-attributable changes appears in the context of some substantial secular trends, either estimated from the control group or from external sources. For example, the treatment cities were declining at the rate of .016 mmol/L per year in cholesterol level, which was quicker than the decline in the control cities. However, in the 4-year period after the post survey reported here, the two control cities declined at the rate of about .05 mmol/L per year, three times the rate during the treatment period. That was a period when cholesterol presumably increased its presence on the national media agenda (Frank, Winkleby, Fortmann, Rockhill, & Farquhar, 1992).

Other, similar studies show equally mixed results. The earlier Stanford Three Community Study and a parallel project in Finland show somewhat larger effects than did the Five City Study. The Finnish study demonstrated a sharper rate of decline in mortality in the treatment community of North Karelia than was shown elsewhere in the country (Puska et al., 1989). Another U.S. program, Minnesota Heart Health (a heir to the Stanford effort), has also failed to show substantial community effects (Luepker et al., 1994).

These projects are perhaps more important for the community health promotion movement they have catalyzed than as models for replication. They require talent and concentrated effort on a scale not easily reproduced. Thus, even if the benefit-cost ratio justified their operation despite small effects, the securing of even limited funds for regional or national versions of these programs, and the organization and maintenance of the community efforts they require may put them beyond feasibility.

EVIDENCE FROM UNCONTROLLED EVALUATIONS

The National High Blood Pressure Education and Control Program (NHBPEP) contrasts with the Stanford model. If Stanford is a carefully constructed, carefully evaluated, and geographically focused program associated with small effects, the NHBPEP has been a kitchen sink sort of program that has been associated with massive effects.

The decline in stroke mortality has been an "extraordinary public health achievement" (McGovern et al., 1992). However, attribution of the decline remains controversial (Casper, Wing, Strogatz, Davis, & Tyroler, 1992; Jacobs, McGovern, & Blackburn, 1992; Kannel & Wolf, 1992; McGovern et

al., 1992). Nonetheless, the consistency of evidence from controlled trials and the matched timing of stroke mortality decline, increasing control of hypertension, and initiation of the National High Blood Pressure Education and Control Program in 1972 does draw attention. Although the decline in stroke mortality had begun before 1972, the rate of decline accelerated rapidly for the decade after the beginning of the NHBPEP. Between 1960 and 1972, the age-adjusted stroke mortality rate declined at 1.6% per year for all U.S. Whites; from 1972 to 1984, the rate was 5.9% per year (McGovern et al., 1992).

Whether one definitively attributes all or only some of the decline in stroke mortality to changing patterns of treatment of high blood pressure, there was massive change in attention to and treatment of hypertension after the launch of the NHBPEP. Eighteen percent of 25- to 59-year-old male hypertensives in the Minnesota Heart Survey were under treatment in 1973–1974, but 41% were under treatment in 1980–1982. For women, comparable numbers were 36% growing to 56% (McGovern et al., 1992). Evidence from other sources about the United States as a whole is consistent with these findings (Casper et al., 1992).

How is such a large change in behavior to be explained? The NHBPEP involved many activities: institutional consensus building, education of health professionals, some public education through community organizations, and major efforts in mass media education. These media efforts included distribution of public service announcements for broadcast on radio and television and stimulation of coverage of hypertension by various media outlets. This has been a multicomponent program, and it may well have been its scale that has made it successful. It is beyond any evaluation to sort out just which elements of the program were effective. More important, it is likely to be misleading to attribute to a particular focused set of actions what may well have been a massive norm change within a society.

One can imagine how the process of change occurs: A person sees some public service announcements and a local TV health reporter's feature telling her about the symptomless disease of hypertension. She checks her blood pressure in a newly accessible shopping mall machine, and those results suggest a problem. She tells her spouse who has also seen the ads and encourages her to have it checked. She goes to a physician who confirms the presence of hypertension, encourages her to change her diet, and then return for monitoring. Meanwhile, the physician has become more sensitive to the issue because of a recent article in the *Journal of the American Medical Association*, some recommendations from a specialist society, and a conversation with a drug detailer, as well as informal conversations with colleagues and exposure to television discussion of the issue. The patient talks with friends at work or family members about her experience. They also increase their concern and go to have their own pressure

checked. She returns for another checkup and her pressure is still elevated although she has reduced her use of cooking salt. The physician decides to treat her with medication. The patient is ready to comply because all the sources around her—personal, professional, and mediated—are telling her that she should.

The program is effective in this explanation not because of a PSA or a specific program of physician education. It is successful because the NHBPEP has changed the professional and public environment as a whole around the issue of hypertension. There is some evidence that the National Cholesterol Education Program similarly affected consumption of high cholesterol foods.

If the best public communication has its effect because it changes the public environment as a whole, then controlled evaluation may be difficult. Even the multifaceted Stanford program and its successors, which do reach their communities in many of the ways just described, must maintain control areas. Thus, they can only change a part of the environment, that part isolated from the regional and national media and professional worlds. For the residents of their treatment cities, the 5 hours of annual exposure may only be a fraction of all their exposure to relevant information on the national media. For the health professionals of their communities, the local education may come in the context of a larger dose of national or regional information. In this context, it may be no surprise to see the experimental and control cities changing at only slightly different rates.

There are other examples of large observed changes in behavior associated with the operation of public communication programs, but also in a context where there can be no definitive attribution of cause and effect. The Swiss Stop AIDS campaign and the Netherlands AIDS program used mass media heavily to reach audiences believed to be at risk of infection with HIV (deVroome et al., 1990; Dubois-Arber, Lehmann, Hausser, Gutzwiller, & Zimmermann, 1989). There were two sides to the mass media activity. Government authorities carefully developed television and radio advertisements, billboards, and newspaper inserts whose content was quite explicit in encouraging the use of condoms for protection. At the same time, as in much of the rest of the world, mass media were full of coverage of AIDS. In both countries, the operation of the programs was associated with a period of substantial change in use of condoms. Self-reported use of condoms with all "casual" partners in the previous 6 months increased from 8% to 48% in Switzerland and from 9% to over 40% in the Netherlands between early 1987 and late 1989. These are self-reported behaviors with the risks of such indirect measurement. However, the growth in usage rates was supported in a general way by evidence about condom sales.

From a policy view, one would hope to be able to separate the effects of the deliberate educational efforts from the massive natural media cov-

erage of AIDS. Would the natural coverage have produced these effects without the deliberate campaign? Would the deliberate campaign have had these effects without the natural coverage? An answer can only be speculative. However, patterns of behavior in other countries where the natural coverage was also heavy, but where the educational campaign was less intense and less explicit, are suggestive. The rates of change in behavior were apparently less (Brorsson & Herlitz, 1988; Forrest & Singh, 1990; Moran, Janes, Peterman, & Stone, 1990; Sonenstein, Pleck, & Ku, 1989). The natural coverage alone seems insufficient to explain the Swiss and Dutch rates of change. On the other hand, it is sensible to speculate that the deliberate educational campaign, with its explicit action recommendations, was successful because of the context of AIDS consciousness and fears engendered by natural coverage. Such coverage made people susceptible to such recommendations.

Two other cases are parallel to both the NHBPEP and the AIDS campaigns in that they show large effects associated with the initiation of deliberate educational efforts as well as natural media coverage of issues, but concern less common diseases: Reye's Syndrome and the use of aspirin, and SIDS and placing infants to sleep on their backs.

Soumerai, Ross-Degnan, and Kahn (1992) tell the story of the virtual disappearance of Reye's Syndrome over a short period. Their narrative shows how debate in the scientific community and the health policy community was played over media outlets. The attention over both professional and, particularly, public communication channels were closely associated with the decline in disease incidence. They make a convincing case that the decline was not primarily associated with the timing of declared changes in policy or particular recommendations made to physicians, or even with the warnings placed on aspirin bottles. Rather, the decline followed immediately on increased coverage on these issues in the mass media. This is sensible, because much use of aspirin was independent of visits to physicians, and thus would be most sensitive to sources of change in public knowledge.

A parallel pattern is the rapid decline in Sudden Infant Death Syndrome (SIDS) associated with publicity about the risk of the prone sleeping position for infants. Thus far, the evidence comes from other countries, but perhaps it will soon be repeated in the United States. There is credible evidence that publicity has produced rapid change in the frequency of the prone sleeping position. An earlier campaign in the Netherlands that favored the prone position had produced an increase in its use from 10% to 55%–65%; this fell to 27% within a year of antiprone publicity (Engelberts, de Jonge, & Kostense, 1991). In the Otago District of New Zealand, the use of the prone position fell from 44% to 3% after 3 years of publicity (Taylor, 1991).

Available reports do not detail the nature of the publicity, but programs seem to include both media coverage of health authority announcements on the issue and, in some cases, deliberate publicity efforts and advice to health professionals. Guntheroth and Spiers (1992) noted that such publicity has been "associated with reduction in SIDS by 20% to 67%, paralleling the reduction in use of the prone position" (p. 2359).

The Reye's Syndrome and SIDS examples have at least one feature in common that may explain why the relevant behaviors have changed so rapidly with only low to moderate amounts of publicity. In both cases, the original behavior (aspirin use and the use of the prone position) was replaced by a roughly equivalent substitute (the adoptions of aspirin substitutes and the side or back position). The changes demanded little from the changer and promised a large benefit. In that context, knowledge gained from public communication is rapidly turned into behavior.

Each of the previously described programs involved some mix of mass media promotion and coverage, but usually there was simultaneous professional education and outreach and other activities. A common question is then whether mass communication without use of complementary activities can be successful. Obviously, no mass media campaign would influence behavior without required support from a health professional. Increased demand for mammograms without a ready mammography clinic to supply them will not produce any behavior change. However, it is still pertinent to ask whether mass media can influence the rate of behavior change. In some cases, healthier behavior does not require health system action. In others, the health system is ready to meet any demand created by mass media promotion. There are at least some major media efforts whose effects appear to be independent of other organized efforts.

With this in mind, health communication programs can be seen in terms of two types. One type of program intends to animate changes in autonomous health behavior (e.g., quitting smoking or reducing salt intake). The other seeks to increase demand for specific health services such as immunization, high blood pressure testing, or mammograms. Both these types of programs have shown success in some instances.

A well-known program aimed at individual behavior is the televised smoking counteradvertising campaign between 1967 and 1970. It can be argued that this campaign is among those offering the greatest public health benefit of any U.S. health communication effort. The television networks were required by the "Fairness Doctrine" then in force to match cigarette manufacturers' commercials with antismoking commercials. The period of broadcast of frequent antismoking commercials was associated with a reduction of 10% in per capita projected use of cigarettes. Attribution of this change to the counteradvertising effort is strengthened by the finding that when the counteradvertising effort was eliminated, per capita consumption

increased 5%, returning to a trend present before the counteradvertising began (Erickson, McKenna, & Romano, 1990; Warner, 1981).

Another frequent use of mass media is to stimulate demand for services provided by the health system. The 1989–1990 Communication for Child Survival campaign in the Philippines used heavy television and radio advertising to encourage early immunization. Children with timely complete coverage increased from 32% to 56% in 1 year (Zimicki et al., 1994). There was evidence that the mass media programming was essential in this shift. Despite some outreach efforts to vaccination providers, service practice changes were insubstantial. Also, better vaccination rates were substantially associated with caretakers' knowledge levels, which, in turn, were closely associated with their exposure to the mass media materials. Much of the effect of this program was to reduce delay in coming in for vaccination with a smaller effect in reaching children who otherwise would have remained unvaccinated.

Other demand stimulation programs have encouraged mammography, blood pressure screening, and early visits to emergency rooms with heart attack symptoms. For example, the percentage of women over 49 who had a screening mammogram within the last year increased from 26% to 38% during 1987. A small part of that increase was associated with the American Cancer Society's spring media campaign; the larger part with fall press coverage of Nancy Reagan's breast cancer diagnosis (MMWR, 1989).

A final type of health communication program focuses attention less on addressing health behavior directly than on efforts to use mass media to organize public opinion. Media advocacy programs like Mothers Against Drunk Driving hope to change individual decisions, such as the one to drink and drive. However, they also want to influence the policy environment around drunk driving. They intend to ready legislatures to add tough laws, encourage strict enforcement by police and influence judges to give more severe punishments for drunk driving offenses. Programs such as this, which often incorporate events created to gain media attention, serve to catalyze public opinion around an issue or at the least raise the image of public concern about an issue.

WHAT IS ASSOCIATED WITH PROGRAM SUCCESS?

Many of the cases presented are successes. Nonetheless, this presentation does not lend itself easily to definitive policy conclusions about the worth of public health communication. Three issues get in the way. First, the cases examined cannot be said to be entirely representative. The universe of published results from which the sample of cases is chosen is biased toward successful programs and the cases selected from that universe were

purposefully chosen. Second, it is difficult to attribute changes in behavior to specific aspects of education and communication campaigns. The claims of successes rely on the chronological association of the introduction of public communication interventions and changes in health behaviors and/or morbidity. Also, the communication interventions are sometimes intertwined with other elements of programs so that their independent effects cannot be estimated. Third, the cases examined here have only their use of mass media in common. They are very different in other aspects, including how they operate and the type of behavior they seek to influence. A single conclusion about public communication could not have much specificity.

Nonetheless, the pattern of results does suggest a useful operating assumption. At least some of the time, public communication programs have been able to influence behavior. On that ground, their applicability to specific behaviors, in specific contexts, is worth some consideration. Some speculation about the elements of programs that may enhance success, based on these experiences and others, may enrich this operating assumption:

1. Programs that stimulate demand on the medical system, or assume that the medical system will provide support for the messages of a public education effort, must assure that such support is available. The NHBPEP had its success, if it did, because all elements of the system were offering coordinated messages. The Philippines vaccination campaign improved timely immunization because the health system had adequate supplies and trained staff available in its clinics.

2. **Reach** and frequency are vital. A basic principle of advertising is that, all else being equal, the more people who are reached with a message and the more frequently they hear it, the more likely they are to respond. Health programs that intend to influence behavior, but then choose to rely on unpaid public service announcements that are broadcast rarely and in late-night hours, should not be surprised at failure. The Defense Department has spent upward of \$120 million in a year to locate recruits. Health and Human Services is usually expected to make do with air time contributed by broadcasters. Public and private health agencies have had to become adept at gaining media attention through provision of press releases and video materials and other means of encouraging coverage of their concerns. However, the budgets to buy media time might increase their ability to gain public attention.

3. There are two **complementary models of behavior change** implicit in many public health education campaigns. One focuses on individuals as they improve their knowledge and attitudes and assumes that individual exposure to messages affects individual behavior. The complementary model focuses on the process of change in public norms, which leads to

behavior change among social groups. The models contrast direct effects of seeing mass media materials from indirect effects. The first assumes a viewer sees a public service announcement (PSA) about the role of condoms in safe sex, for instance, and then decides to follow the advice. The second assumes that discussion within a social network is stimulated by PSAs or media coverage of an issue and that discussion may produce changed social norms about appropriate behavior, which affects the likelihood that each member of the social network will adopt the new behavior. If the second model is most correct, if a social process dominates the process of a behavior change, then individuals' detailed knowledge about the benefits of a new health behavior may be less important than their belief that it is an expected behavior. In that case, substantial attention in the public environment, with multiple channels saying the same thing (as in the NHBPEP), may be central to success.

4. Straightforward substitution of behaviors, when possible, may allow more rapid change than attempts to introduce new behaviors. Both the Reye's Syndrome and SIDS cases testify to the success of direct substitution programs. In both cases, rapid acceptance of a new behavior occurred. However, they were very easy behaviors to change and adoption of the new behavior sharply reduced the risk of a rare but devastating event. In contrast, new behaviors like regular exercise and seat belt use have been resistant to public promotion efforts.

This is a specific instance of a more general principle. Programs flounder unless recommendations for behavior change fit with the circumstances and the world view of the target audience. Thus, the Philippines program worked through increasing knowledge about the appropriate age for measles vaccination; knowledge about the dangers of measles was already prevalent.

5. Public promotion efforts require reasonable goals. The benefit-cost ratio can be quite large even though the absolute number of people who benefit may be only a small portion of those who might benefit. For example, cigarettes per capita now declines at 1.5% per year. Assume that \$50 million per year advertising could move that to 2.5% per year for 10 years. Given the strong association between smoking and morbidity, the likely return on investment in extended life and lowered health costs would be large.

If expectations for change are large, and measurement tools are only able to detect quite substantial effects, it is likely that many mass educational interventions with worthwhile effects would be rejected as unsuccessful, effects comparable to benefits achieved by other interventions.

A final issue is cost. Early in a public epidemic, as for HIV, or if there is a need for short-term immediate action only, as for the swine flu immunization, it may be possible to shift substantial costs to private agencies.

In the case of HIV, television stations were willing to broadcast public service announcements at prime time; their news programs were full of information (as well as some hysteria) about risks for HIV transmission. In this kind of context, some of the cost of public health education can be borne by in-kind contributions by private agencies. However, as time goes on, and as the health issue loses its hold on public attention, although not its need for educational intervention, in-kind contributions are reduced. In the broadcast arena, PSAs are relegated to late-night, less valuable broadcast time and much of the audience will be lost without the direct purchase of advertising time. A similar problem occurs with other forms of public health education: Programs that rely on in-kind contributions through mobilizing volunteer efforts, on unpaid peer educators at work places, or on outreach workers going house to house may find volunteer enthusiasm difficult to maintain. The in-kind contributions may have to be replaced by direct expenditures, or else the outreach will fade well before the need for it is gone.

CONCLUSIONS

There have been some successes in public health education as well as a largely undocumented number of likely failures. This chapter describes some important cases. There are others that could be cited, although they are few in number.

The idea that public education is a potent policy strategy for affecting adult health can be supported. Some of the principles that make success more likely were detailed earlier. They include assuring that the recommended behavior is supported by the health system, reaching much of the audience repeatedly, expecting individual change to be related to social norm change rather than to direct message exposure, and expecting larger changes when new behaviors fit with the existing pattern of behavior and world view.

This chapter also recognizes that, in general, natural media coverage and media advocacy may play no less a role in the process of behavior change than do formal efforts at influencing behavior through deliberate educational efforts.

Finally, successful programs may require substantial expenditures and particularly, well-organized institutional foundations and skilled personnel. It should be noted that this has some special policy implications for campaigns in developing countries. Institutional and financial efforts may well pay off in improved health; however, in many developing countries, major efforts in the child survival area have been maintained only through foreign funding. Certainly, it will be appropriate to make an assumption that many

developing countries will be slow to absorb the costs of large-scale public health education for adults into domestic budgets.

A final caveat is implied by the fact that this is a restricted review. By and large it stays with the published literature, although that literature tends to ignore failed programs. It examines programs that are relatively coherent entities, thus leaving out what is surely the greatest portion of such health education: the individual efforts of health professionals counseling patients. It considers programs with mass audiences, but ignores pilot or small-scale efforts with focused audiences, even though many published studies, particularly those with only face-to-face education, are eliminated by this criterion. Thus, de facto, it becomes a review of programs that made some use of mass media. It also includes only programs for which there is evidence about behavior change, ignoring studies restricted to evidence about knowledge or attitude change. The representativeness of the sample of studies examined is further limited by the subjectivity in with which the cases within these criteria were chosen. The chosen cases seemed particularly intriguing or unusually suggestive. An evaluation of the arguments presented here needs to take into account the nature of the programs examined.

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