

Public Health Campaigns in the Age of Ubiquitous Media:

Promise and Peril

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National Institutes of Health Lecture in Honor of Dr. Matilda White Riley

[SLIDE 1]

I'm honored that you have asked me to deliver this lecture, one in a series recognizing the accomplishments of Dr. Matilda White Riley and her efforts to promote the role and importance of the social and behavioral sciences in biomedical and health research.

[SLIDE 2]

My theme is media communication and public health campaigns – specifically, what lessons have we learned from our research, and what new issues may be posed by dramatic changes in the global media system that we

have been experiencing during the past 20 years? When you invited me to deliver this lecture several months ago, the events of September 11 had not yet transpired. If we ever required evidence of the magnitude and importance of media communication on behalf of the public's health, we have certainly received it during the past two months, both the good and the bad, certainly, and perhaps even the ugly as well. Consider this: for five days following the events of September 11, American television networks broadcast news around the clock without commercial interruption. That is unprecedented in the relatively brief history of television which began commercially in this country a little more than a half-century ago in 1946. The only other event that comes close is the four days of round-the-clock coverage that followed the shocking events of November 22, 1963. The U.S. and global media systems were far less developed and complex in those days. Telstar, the first commercial telecommunications satellite in history, had been in space broadcasting television and phone signals for just 14 months. Subsequently, studies (Greenberg, 1964) demonstrated that an overwhelming majority of American adults knew of these events within 90 to 120 minutes of their occurrence. The media, particularly television, were key in starting this amazingly fast diffusion of information. They stimulated word of mouth communication that then influenced many to seek a

television or radio. I suspect that when researchers complete fuller study of the events of September 11, the diffusion curve will turn out to have been quite a bit faster. Not only did the television audience surge in the minutes after the initial events of September 11, major Internet portals like Google reported experiencing a surge of more than 6,000 searches per minute (Wiggins, 2001; <http://www.firstmonday.dk/issues/issue6>). CNN.com in the month of September experienced a 141 percent increase in its site usage over the previous month – amounting to about 25 million unique visitors at this single site alone (Jupiter Media Metrix, 2001). But in these events, we learned that while sudden surges in TV audiences do not affect broadcast, satellite or cable television transmission technology, the same is not true of the Internet. Every added user exacts a price on its technological capacity and tens of millions using it simultaneously can reach and exceed its capacity. This is a key difference between a mass medium like TV and a personal, interactive medium like the Internet and the phone system.

I will speak a little more about the events of September 11 and their potential impact on public health, a little later.

What I would like to do during our hour together is to review with you some of the lessons we have learned about the role and effects of media communication as a vital constituent of public health campaigns. I will try

to interweave these lessons in the context of media system changes and discuss both the opportunities and disadvantages these changes pose – the promises and the perils.

I am, as always, deeply indebted to my collaborator, Dr. K. Viswanath, formerly of Ohio State University and currently a senior project officer at the National Cancer Institute (NCI). Vish and I have researched communication and health issues together for almost 20 years. Our perspective focuses on media and community social systems and how they interact to stimulate or to retard change, whether in population health, public health issue agendas, or public policies affecting community health. In taking this approach, we owe a great deal to University of Minnesota Professors Emeriti Phillip Tichenor, George Donohue and Clarice Olien. More than 30 years ago, they pioneered an important communication research perspective on the role of media in communities. This became known popularly as the Knowledge Gap Theory, an extension of community, rural and conflict sociology. They and we are interested in information flow into communities – in our case stimulated by public health campaigns – and how information flow effects accrue differentially across population subgroups. This perspective has taken on increasing importance

in light of national concerns about health disparities among different groups and how they may be bridged and reduced (Healthy People 2010).

In this context, Vish and I and many others have looked at the role and effects of campaigns and whether they can bridge exposure and knowledge gaps about health. These may be one important root cause exacerbating health disparities.

The importance of this perspective may become clearer by recalling a seminal article published by Tichenor, Donohue and Olien in 1970. They summarized their empirical observations about information flow this way (I paraphrase):

[SLIDE 3]

The more information that flows into a community about an issue or problem, the greater the disparities that will exist among population subgroups especially based on socioeconomic differences (Tichenor, Donohue & Olien, 1970).

Although the observation related mainly to politics and knowledge of science and whether the nation really had an informed electorate, this was a startling finding. In brief, it called into question the effectiveness of campaigns of all kinds even those seeking to improve public health. It suggested that they would essentially enrich the already information-rich,

and impoverish or leave unaffected the already information-poor. This was not a pleasant prospect for campaign planners. However, the Minnesota researchers thereby opened new avenues of communication study. Were exposure and knowledge gaps inevitable and intractable? Were there social conditions or individual differences that might bridge them, or at least not worsen them? Would expanding availability and access to media, and now digital information technology, narrow exposure and information disparities or not? And, importantly for public health, what conditions manipulated as part of public intervention strategies would produce more benefit across a wide swath of socioeconomic groups in communities?

Fortunately, public health campaign research has been building considerable evidence in relation to these questions and issues. The good news is that media strategies as part of public health interventions will NOT inevitably worsen knowledge or other effects gaps if due attention is paid to knowledge of audience, social conditions, and mediating variables. This is a key lesson learned from the application of community-based planning and social marketing techniques in public health campaigns.

The bad news is that while much public health campaign research demonstrates successful and significant reduction of socioeconomically based communication gaps, they are rarely completely eliminated but persist

in many areas of health. So while the information-poor benefit, they often benefit less than the information-rich. This part of the original Tichenor, Donohue and Olien hypothesis continues to be troublingly intact even in light of the explosion of digital media, and the convergence of media formats in the technology of the computer and the Internet -- at least so far, in this “buggy and whip” era of digital technology.

Let’s look at some specifics about campaign research and try to refine some of the insights we’ve gained. Then we’ll ask whether digital information technology offers promise or peril.

In the 1970s, the National Heart, Lung and Blood Institute (NHLBI) funded the first community studies to examine the feasibility of public health campaigns’ improving heart health in communities. The first of these was the Stanford Heart Disease Prevention Project (SHDPP) Three-City Study under the direction of Dr. Jack Farquhar and his colleagues (Stern, et al, 1976). This was followed in the 1980s and 1990s by the large community trials including the Stanford Five-City Project, and the Minnesota and Pawtucket Heart Health Programs (MHHP, PHHP).

[SLIDE 4]

These were well funded controlled community study designs utilizing multiple intervention strategies including the media and sought change

affecting heart health at two levels: behavioral change among groups and individuals; and change in the community itself in mobilizing leaders, institutions and resources to legitimize change and provide change opportunities (Farquhar, et al, 1985; Mittelmark, et al, 1986; Bracht, et al, 1986; Schooler, Sunder & Flora, 1996).

The model underlying these efforts was perhaps naïve but theoretically eclectic in its articulation of a series of connected variables and effects by which the change process was thought to occur.

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In brief, the programs sought widespread exposure to prevention messages that would lead to participation in prevention activities affecting behavior change, reducing community risk factor levels, and ultimately affecting morbidity and mortality.

The media's role was judged to be important overall, but especially in the early phases in getting out the message to the community and stimulating awareness, knowledge, and trial behavior. This was based partly in Professor Everett Rogers Diffusion of Information Theory and also in the experiences of commercial marketers.

[SLIDE 11]

The importance of media in the early stages of a campaign was in stimulating the first 25 percent of population awareness particularly among “Early Adopters.” They would then become “opinion leaders” stimulating word-of-mouth communication and attention to media and other intervention strategies among later adopters. If such occurred, one could expect the diffusion curve to take off. If not, one could expect a fizzled launch in reaching only Early Adopters but failing to connect with the majority.

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Early results were encouraging, but also demonstrated that achieving change was a more complex process than perhaps originally anticipated. Change was achievable, but expectations of change were perhaps too high given the rapid dissemination of heart health prevention information all over the nation and also community system and individual factors.

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As the sage of Baltimore perhaps best put it, “For every complex problem, there is a single solution that is simple, neat, and wrong.”

Let’s review a few of these studies.

[SLIDE 14]

The Stanford Three-City Study in the early 1970s involved three communities in California. One served as a reference; two received campaign interventions to improve heart health outcomes.

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It demonstrated five important insights: 1) that media intervention alone was capable of generating significant change on a number of heart health knowledge and risk factor variables; 2) that this effect could be amplified with the addition of other strategies (in this case, direct education of high-risk individuals); **[SLIDE 16]** 3) that information about heart disease prevention was salient to most people across the socioeconomic spectrum, in this case Latinos who were disproportionately represented among lower SES groups; **[SLIDE 17]** 4) that community reduction in coronary heart disease risk was possible in whole communities. But although lower SES groups would benefit greatly, they would benefit less than higher SES groups; and 5) that media generated effects in the absence of other strategies were more transient than multiple reinforcing intervention strategies (Stern, et al, 1976; Fortmann, et al, 1982). This was nevertheless promising that social system and motivational conditions were not intractable after all in seeking community health improvement and that the media could play an important role.

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In the Minnesota Heart Health Program, we took a close look at socioeconomic groups and community type and to learn more about how they interact to affect exposure to information sources. In this study, we used an open-ended survey method to ask what heart health messages people recalled from what media, group or interpersonal sources. We limited this analysis to the three reference communities that included a small town (25,000 population), a small city (100,000 population), and a suburb (75,000 population) of a large metropolitan area. From this ten-year longitudinal analysis, we learned several important lessons: 1) Over time there was a secular trend generating widespread awareness of heart health messages in our reference communities. This suggested that the mass media at large had picked up the message of heart disease prevention; **[SLIDE 19]** 2) the trend was affecting all socioeconomic groups over time, but that while the lowest group benefited from this trend, the difference relative to higher SES groups was significantly lower; **[SLIDE 20]** 3) an analysis looking at community type revealed that the secular trend was evident in all three communities, but residents of the suburb, a relatively more media rich community, were more likely to report exposure to a greater number and diversity of sources. This difference, however, appeared to decline over time. It suggested that media

systems in each of the towns were becoming similar in size and complexity;

4) Not shown in these data is a related finding that lower education groups living in the more media rich community benefited somewhat more from this trend than their counterparts in less media-rich communities; and 5) while there were no differences across socioeconomic groups in citing television as a source of heart health information, lower SES groups were significantly less likely to cite print media, and consequently demonstrated less diversity in use of media and also other sources.

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This graph perhaps demonstrates more clearly the secular trend that confronted the Minnesota Heart Health Program and other community studies. The study asked a series of exposure questions answerable in either the intervention or reference communities. The blue line represents the reference community change over time – upward. The yellow line with 95% confidence limits represents the MHHP’s efforts to accelerate exposure at a rate faster than the secular trend. It was able to achieve this at a significant level for 3 of the 5 years of intervention.

[SLIDE 22]

To examine whether in fact the secular trend we saw was at least partly a function of mass media at large, we examined news reporting about

heart disease and prevention in the nation's major daily newspapers and television network news broadcasts. Here are the results of that study. From about 1982 to 1988, there was a major increase in news stories about heart disease. This coincided with the major intervention periods of the three community trials. Ironically, much of this coverage reported the results of heart health research itself. As the scientific community was effective in raising the importance of heart health research including community trials on the scientific agenda, so too did it succeed in raising its importance on the media agenda.

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We also examined news coverage in the local press of the Minnesota Heart Health Program's six communities. We used a constructed week sample, that is, random selection by time, for a content analysis of heart health coverage during three years of the campaign – early, middle, and late – in the intervention and reference communities. As the graph indicates, news coverage increased overall across all communities. However, the organized campaign in the intervention communities apparently had the effect of sensitizing reporters and editors to publishing more news about heart health by the close of the study than was true in the intervention

communities. This is indicative that such organized efforts can, in fact, influence the media agenda of important issues.

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A campaign study also showing secular change was the Rapid Early Action for Coronary Treatment (REACT) Study, a randomized community trial seeking to reduce patient delay in pursuing care for heart attack symptoms. The study involved ten matched pairs of communities across five US regions.

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One community of each pair was randomly selected to receive an 18-month multiple strategy campaign consisting of mobilizing community leaders, use of media, and professional and high-risk patient education.

[SLIDE 26]

Spontaneous recall of heart attack-related messages was the same in intervention and reference communities at the beginning of the study, but showed a significant increase over time in the intervention communities. However, an upward trend is visible in the reference communities as well. While the campaign did not affect differences in delay time, the study's primary outcome, **[SLIDE 27]** it did increase utilization of Emergency

Medical Services in intervention communities by 20 percent relative to reference communities.

Thus one overall lesson we learned from these studies that informs our views about public health campaigns: **[SLIDE 28]** change is ongoing in populations and communities, although it is not necessarily continuous, constant, or equally distributed across groups. In many if not most health campaign situations, we should not expect change in intervention communities measured against stability in reference communities. Rather we are seeking to accelerate change at a rate faster than the secular trend. This is a repeated finding in much campaign research and has implications for design and evaluation.

[SLIDE 29]

My colleague Professor David Murray of the University of Memphis has addressed these in his recent book on analysis of group and community trials. Researchers, he points out, should seek to reduce baseline differences and improve power through regression adjustment using covariates; better matching of communities in the design to reduce baseline differences; **[SLIDE 30]** increasing the numbers of observations and/or randomized units to boost degrees of freedom, and choosing matched or unmatched analyses to optimize power (Murray, 1998).

But it also has important implications for campaign design and implementation. Higher SES audiences are going to be exposed to public health campaign messages repeatedly through a wide diversity of media, group and interpersonal sources. But the web of exposure for lower SES groups is thinner and less diverse and as a result the “risk” of campaign exposure is less. **[SLIDE 31]** Exposure and knowledge gaps are less likely, for example, where there is attention to increasing the salience of issues – that is, where audiences perceive an issue as directly relevant to their concerns and interests. Community conflict or news of dramatic events often have this effect and may provide occasions for “piggybacking” health issues. We have seen some examples of this in the recent anthrax scare. With media and public attention riveted on anthrax, some public health spokespersons have taken the opportunity to urge the majority of the public to be more concerned about getting their flu shots than worrying excessively about access to Ciproflaxin.

Strategic lessons also emphasize the value of targeting and tailoring of media channel and content strategies to the specific interests and needs of lower SES groups and different cultures. Some channels have more influence than others depending on the group. For example, despite the widespread use of television to encourage breast cancer screening – and

everyone watches television – low-income women have been less likely to seek screening based on current recommendations. However, studies making use of social influence through peers, volunteers and important community institutions such as churches, combined with tailored media have often overcome exposure barriers and achieved significant behavior change (Slater, et al, 1998).

I mentioned that Minnesota Heart Health Program research suggested that media systems in our reference communities were changing during the study period. This was evident in findings showing an increasing quantity, but especially diversity of reported sources of heart disease prevention information. The key change we discovered in all of our communities was the growth of television and the increasing penetration of national newspapers. At the beginning of the study in 1980, each town possessed a media system that was relatively non-complex by today's standards, but measurably larger in channels in the cities and suburbs compared to the small towns – a distinction in “media rich” and “media poor.” By the end of the 1980s, the media systems of even the smallest communities looked very much like those of the largest. The biggest changes were in the addition by each community of franchised multi-channel cable systems, the availability locally printed national newspapers such as USA Today, The New York

Times, Washington Post, and Wall Street Journal, and “booster” transmitters permitting reception of signals from Minneapolis-St. Paul TV stations which had been too far away to receive.

[SLIDE 32]

What these communities were experiencing was part of a national trend, an explosion of media infrastructure that is still going on. This graph shows some of the growth in cable television, VCR technology, and satellite technology reflected as growth in the number of US households adopting. In 1980, cable TV systems linked about 25 percent of US households mainly with small 12-channel systems that re-broadcast local channels. That was the same year CNN went on the air. By 1988, more than half of US households were linked by cable TV. These were systems usually carrying 40-60 channels of content much of it increasingly national and specialized. By the year 2000, 75 percent of US households were linked to by cable, or satellite systems. A similar diffusion pattern can be seen in the adoption of VCRs that has permitted audiences to time-shift their television viewing.

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These changes alone have had profound impact on the media system, but have really taken off with the emergence of the Internet in the 1980s. This was based originally on a US Defense Department scientific

communication network called ARPANET, which had been functioning since 1969. In the early 1990s, new graphically oriented protocols for the dissemination of information over the Internet appeared as the first browsers. The World Wide Web was born. Growth in the use of the Internet has been astonishingly fast in the 1990s. Early adopters tended to be younger, white males and professionals, a profile that dominated through about 1996. Beginning in 1997, the “commodification” of the Internet through the World Wide Web spurred rapid increase in users and reduced some of the early sociodemographic differences. Women became users, the White middle class signed on, and the median age of users increased. By 2001, regular US users were approaching 130 million.

Those of you who recall the early days of television may remember public discussions about the medium’s potential as an educator, a potential widely touted especially as the price of mass-produced receivers dropped. It was heralded as the great leveler of information. As of 2001, television reaches 98-99 percent of American homes with some three-quarters reporting multiple receiver ownership.

The Internet, too, as a herald of the digital information age has posed the same promise especially in the areas of health and medicine which thus far are among the top content choices of web surfers. Some early studies

have suggested that providing people with the technology to access the web can benefit those who might not otherwise have been exposed. Some of these have been funded by the NIH (NCI, 2001).

[SLIDE 34]

And recent studies have shown what most of us have suspected: that the rate of adoption of new technologies has been increasing. For example, it required 46 years – well over a generation from its commercial availability – for electricity to reach 30 percent of American households. For the telephone, 38 years. Television more than halved this time to adoption. The Internet required but 7 years to reach 30 percent of American homes.

The potential of Web applications in public health are promising indeed. **[SLIDE 35]** This 24/7 medium is a platform for convergence of media formats; it is interactive and highly graphic. It offers the potential for instantly tailored communication and interaction – even multilingual and multicultural communication – that we are only beginning to explore now. E-health initiatives will likely become the next buzzword in health care and sites designed to help communities plan for their population health just as they now plan for other aspects of community life like housing. It is no accident, for example, that physicians, surgeons and health care providers

currently rank among the top 10 professions reserving domain names for health initiatives.

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But as with any new medium, there are sobering realities to be contemplated as well. Some experts have discussed the “digital divide” in access to, and use of this technology. A recent study of US households by UCLA found, for example, that despite impressive growth in the 1990s, fewer than a third of those with less than high school education access the Internet. This compares with more than 86 percent of those with a college or advanced degree. Those in lower SES circumstances are, as we know, often at greater health risks.

Some have also pointed out that as digital technology becomes more affordable along the lines of VCR technology, this difference will diminish over time. The testable assumption here is that market forces will ultimately triumph. There is, however, another way to look at the “digital divide,” suggested by my colleague Viswanath recently. This may be even more important for its potential impact on global health. North America, Europe and many of the countries of the Pacific Rim are highly developed nations with the production and market capacity to perhaps reduce internal social disparities in access to, and use, of the technology. **[SLIDE 37]** But as the

following graph and maps show, the greater “digital divide” is global and systemic. This graph displays the top 15 nations of Internet users. Brazil, China and Russia as developing nations are the exceptions on the list. These nations alone currently account for 82 percent of Internet users worldwide.

[SLIDE 38]

Similarly, in this map we see national disparities in Internet connections and bandwidth with Central and South America and Africa at substantial disadvantage. **[SLIDE 39]** The same is shown here in this display of global telecommunications traffic with the least developed nations at a substantial disadvantage thus far.

The promise of digital technology in public health is impressive for the reasons I have already cited. But the primary peril, it seems to me, is this global and systemic disparity in infrastructure, access and use. The issue runs headlong into global politics and the realities of developing nations. Will global market forces bring about information and health infrastructure sufficient to encompass the developing world? As political scientists have asked recently, does building a strong economy come first and give rise later to health and information infrastructure? Or does investment in health and information infrastructure give rise to productive people and a strong economy? Whichever is the case, there is one insight we can extrapolate

from the work of Abraham Maslow and his venerable hierarchy of needs: people focused on day-to-day physical and economic survival are not focused on prevention. That is undoubtedly true in developed nations as well.

Finally, I want to say a few words about the events of September 11 and their implications for public health. Some good, perhaps, may yet come out of this horrific tragedy. **[SLIDE 40]** There is no question that to judge from media coverage, public health is on the media's collective mind. These data reflect an analysis of global English-language newspapers and television transcripts combining the search term "public health" with "scare," "threat", or "crisis." The magenta bars reflect news coverage from July 31 through November 6. The blue line is taken from the same period one year earlier to provide a secular trend reference. (Fuller details of this analysis are provided in your handout).

[SLIDE 41]

It is no surprise that the appearance of the first anthrax case has dramatically focused media attention. But more importantly, the media have been communicating stories concerned about public health infrastructure, preparedness and readiness. It is instructive that this media discussion actually began before the first anthrax case appeared and its accelerated

discussion of public health scares. **[SLIDE 42]** It is also instructive that the media along within this coverage have discovered the importance of public health and communication.

As this discussion has been continuing largely in relation to bioterrorism, the Milbank Memorial Fund published in September an important report on Health Policies for the 21st Century: Challenges and Recommendations for the US Department of Health and Human Services (2001). The media unfortunately, ignored it. Like the Institute of Medicine project on Assuring the Public's Health in the 21st Century, the report recommends reassessing, expanding and refocusing the public health infrastructure. Among designated areas for key actions were “making a sustained investment in public health infrastructure,” increasing access to health information and further moving the overall focus toward population health building on the strengths of the biomedical model (Boufford & Lee, 2001).

Though the report itself received little coverage, it would appear that we might have reached a “teachable moment” with the media, the public and, of course, ourselves as health researchers. The convergence of such a tragedy, media coverage of the need for public health infrastructure, public opinion change, and careful policy analysis may lead us to rediscover

collectively that public health is an indispensable common good. But “teachable moments” such as this one provide windows that seldom stay open long.

Thank you very much for your attention.

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