

PUBLIC COMMUNICATION, RISK PERCEPTION, AND THE VIABILITY OF PREVENTIVE VACCINATION AGAINST COMMUNICABLE DISEASES

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ABSTRACT

Because of the nature of preventive vaccination programs, the viability of these public health interventions is particularly susceptible to public perceptions. This is because vaccination relies on a concept of 'herd immunity', achievement of which requires rational public behavior that can only be obtained through full and accurate communication about risks and benefits. This paper describes how irrational behavior that threatens the effectiveness of vaccination programs – both in crisis and non-crisis situations – can be tied to public perceptions created by media portrayals of health risks. I concentrate on childhood vaccination as an exemplar of 'non-crisis' preventive vaccination, and on the recent flu vaccine shortage as a 'crisis' situation. The paper concludes with an examination of the steps necessary to resolve these threats through better public communication.

The shortage of flu vaccine caused by contamination at the manufacturing plant of vaccine maker Chiron has necessitated social policies that restrict access to vaccine, targeting distribution to 'high-risk' groups such as infants, pregnant women, the elderly, and the immuno-compromised. Despite attempts at public education about these restrictions, problems have arisen concerning compliance with distribution standards: while many high-risk people have had difficulty gaining access to flu vaccine, the vaccine has been available to many who are not eligible for access under CDC guidelines. For example, bioethicist Art Caplan describes not only a litany of access violations, but his own personal experience of offers of access to flu vaccine in an editorial published

at the MSNBC website.¹ Lack of compliance with vaccine distribution policy, I argue below, reflects a fundamental failure of public communication that permeates our public health system. This fundamental flaw must be addressed if we hope to have the compliance with public health policies necessary to maintain the level of control over infectious disease epidemics achieved during the 20th century.

No policy for vaccine distribution is likely to succeed until public fears that motivate counter-productive behaviors are addressed. Caplan's editorial describes criminal acts of burglary to obtain flu vaccine, as well as price gauging by wholesalers offering vaccine that normally costs about \$10/dose for as much as \$88. Such behaviors are not resolvable through public policy alone: indeed, burglary and price gauging are already prohibited in public policy. Resolution of these behaviors must involve addressing the fears that motivate non-compliance. The behaviors described are, in most cases, irrational behaviors resulting from misperceived risks and benefits related to the flu vaccine. Although there are certainly benefits to flu vaccination for the majority of the population, for most individuals (who do not fall into 'high risk' groups), the most significant benefits of vaccination are related to protection of others. It is for this reason that CDC efforts to increase flu vaccination normally emphasize hospital and nursing home workers, and those who come into contact with 'high-risk' individuals. Although these individuals also benefit by avoiding a bout of the flu, the more significant benefit is the immunity that keeps them from spreading the flu to 'high-risk' patients that they are in contact with. In short, the direct benefits of flu vaccination for individuals not in 'high risk' groups fails to connect to the self-interest-based demand reflected in motivations that underlie the types of criminal burglary and price gauging that have occurred.

Previous flu vaccine shortages have also been tied to 'irrational' demand created by events highly visible in the media. In the fall of 2001, anthrax was mailed to political and media figures in the immediate wake of the September 11 tragedies, creating bioterror fears throughout the country. Because early symptoms of anthrax (as well as a number of other bioterror agents) mimic the flu, demand for flu vaccine skyrocketed, creating shortages in some areas. This occurred despite the fact that the flu vaccine provided no protection against anthrax, but only served to help in diagnosing the potential cause of flu-like symptoms. In each of the above

¹ <http://www.bioethics.net/articles.php?viewCat=2&articleId=70>.

cases, the problems in question were 'created' by lack of effective public communication, resulting in a (mis)perception of risks that led to behavior which not only failed to optimize public health goals, but was actually counter-productive. Because of the nature of preventive vaccination programs, the viability of these public health interventions is particularly susceptible to public perceptions. Both the success of vaccination in non-crisis situations (especially childhood vaccination, as I discuss below), as well as the effective use of vaccination in crisis situations (such as the flu vaccine shortage described above) require rational public behavior that can only be achieved through full and accurate communication about risks and benefits. Below, I describe how irrational behavior that threatens the effectiveness of vaccination programs can be tied to public perceptions created by media portrayals of health risks; and the steps necessary to resolve these threats through better public communication.

RISK PERCEPTION AND IRRATIONAL BEHAVIOUR

Although particularly salient for vaccination programs, the problem of misperceived risk is not unique to vaccination. George Gray and David Ropeik describe fear-induced behavior following the September 11 terror attacks as resulting in actions that actually increased risk for many individuals, rather than lowering it (e.g. purchasing guns, driving instead of flying, etc.).² Barry Glassner argues that irrational fear is a pervasive feature of contemporary American culture.³ In many cases, the fears motivating irrational behavior are the result of media coverage that heightens a sense of risk. As G. Ray Funkhouser and Eugene Shaw describe, there is considerable evidence that media present distorted views of the world that increase 'false expectations' and 'undesirable behaviors'.⁴ Trends toward sensationalization in 'established' news sources, combined with inherent issues of unreliability in many 'new' news sources (like the internet), can exacerbate this problem.⁵

For example, one study of media communication during this anthrax scare found that coverage included alarmist crawls/

² G.M. Gray & D.P. Ropeik. Dealing With the Dangers of Fear: The Role of Risk Communication. *Health Affairs* 2002; 21(6): 106–116.

³ B. Glassner. 1999. *The Culture of Fear*. NY. Basic Books.

⁴ G.R. Funkhouser & E. Shaw. 2000. How Synthetic Experience Shapes Social Reality. In *Media Power in Politics*. Doris Graber, ed. Washington, DC. CQ Press.

⁵ L. Downie & R. Kaiser. 2002. *The News About the News*. NY. Alfred A. Knopf.

taglines by Cable TV, and the use of large, sensational headlines such as 'Baby falls ill as scare widens across U.S.' by print media.⁶ Although actual anthrax cases were limited to clusters in Boca Raton, Florida, New York City, and Washington DC (though spores were found in distant locations such as Indianapolis and Kansas City,⁷ a fact not overlooked by the media), the threat was perceived to be much greater. According to an Institute of Medicine report, 'The widespread reporting of the anthrax contamination in the weeks after September 11 served to expand those events from several localized incidents into a potential generalized threat.'⁸ The result was striking: according to an article published in the *Journal of the American Medical Association*,⁹ more than 30,000 people are estimated to have received antibiotics related to the anthrax scare. Beyond supply issues, over-use of Cipro has threatened the effectiveness of this drug for a number of conditions. In his testimony before the US House of Representatives Subcommittee on National Security, Institute of Medicine President Kenneth Shine stated: 'In the case of anthrax, less than 20 cases resulted in thousands of people taking antibiotics that were not indicated. Perhaps 20 percent of these individuals experienced some side effects from these drugs. These antibiotics changed the bacteriological environment and may have rendered some organisms resistant to the antibiotics employed.'¹⁰ In short, media portrayals of a threat can, as stated by the Institute of Medicine report, 'inadvertently change the basic dimensions' of a threat.

This type of influence can be seen clearly in public behaviors following the announced flu vaccine shortage. In most years, the problem faced by the public health community is one of convincing the public to accept vaccination, rather than restricting access to flu vaccine. Ironically, the shortage of flu vaccine has seemingly

⁶ Kristen A. Swain. Finding Fact Before the Frenzy: Bioterrorism Communication Facts and Fiction. Presentation at the American Medical Writers Association National Convention, Miami, FL, Sept. 2003.

⁷ H.C. Lane & A. Fauci. 2002. Bioterrorism on the Home Front. In *Bioterrorism: Guidelines for Medical and Public Health Management*. Donald Henderson, T. Inglesby & T. O'Toole, eds. American Medical Association Press.

⁸ Institute of Medicine. 2002. *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*. Washington, DC. National Academies Press: 275.

⁹ Lane & Fauci, *op. cit.* note 7, p.7.

¹⁰ K. Shine. Testimony before the House Committee on National Security, Veteran Affairs, and International Relations, Committee on Government Reform. Cited in Institute of Medicine 2003. *The Future of the Public's Health in the 21st Century*. Washington DC. National Academies Press: 324.

increased demand, despite the lack of serious risks for many who are now seeking access to the flu vaccine. All of the above examples demonstrate the need for better public communication about health risks – communication that reflects reasoned assessments of risks and potential courses of action. This is true not only for visible ‘crisis situations’ (such as the anthrax scare or the flu vaccine shortage), but also for more ‘mundane’ public health programs like childhood vaccination. In this context, fear motivates refusal of vaccination rather than demand, but the basic problem remains the same: irrational behavior (in non-compliance with vaccination policy) motivated by misperception of risks.

Since its inception, the program of mandatory childhood vaccination for children entering the U.S. public school system has been remarkably successful – widely recognized as one of (if not *the*) most successful public health programs in history.¹¹ The program has resulted in the eradication of smallpox, the elimination of polio, and a radical reduction in the number of cases of diphtheria, measles, pertussis (whooping cough), rubella, mumps, and a number of other serious diseases. For example, diphtheria has dropped from a peak of 206,939 cases in 1921 to only 4 cases in 1990, and similar drops in cases have occurred for measles, mumps, pertussis, and rubella.¹² The success of the childhood vaccination program, however, faces threats from an increasingly visible anti-vaccination movement, and from visible (though extremely rare) cases of adverse reactions to vaccination. The DTP vaccine results in adverse events such as convulsions or shock for 1 in 1,750; acute encephalopathy for 0–10.5 in 1,000,000; and the MMR vaccine results in encephalitis or severe allergic reaction for 1 in 1,000,000.¹³ These risks are extremely low when compared to the adverse consequences from contracting vaccine-preventable disease (for pertussis, encephalitis for 1 in 20; death for 1 in 200; for measles, encephalitis for 1 in 2,000; death for 1

¹¹ Centers for Disease Control and Prevention, Achievements in Public Health, 1900–1999, Control of Infectious Diseases, 48 *MMWR* 1999; 621; Centers for Disease Control and Prevention, Ten Great Public Health Achievements – United States, 1900–1999, 48 *MMWR* 1999; 241; Centers for Disease Control and Prevention, Impact of Vaccines Universally Recommended for Children – United States, 1990–1999, 48 *MMWR* 1999; 243.

¹² W.A. Orenstein & A.R. Hinman. The immunization system in the United States – the role of school immunization laws. *Vaccine* 1999; 17 (supp 3) October 29.

¹³ Centers for Disease Control and Prevention. Six Common Misconceptions about Vaccination. Available at: <http://www.cdc.gov/nip/publications/6mishome.htm>

in 3,000); however, the success of the vaccination program has made the chances of actually contracting a vaccine-preventable disease very small. In one study of the incidence of measles and pertussis in exempted children from 1987–1998, it was found that although the incidence of measles and pertussis in exempted children was 22 times greater than in vaccinated children, the annual incidence of measles was only 32.2 per 100,000, and of pertussis 80 per 100,000.¹⁴ It is only if one is unlucky enough to contract the disease, then, that one assumes the risks associated with that disease.

Several popular books and anti-vaccination advocacy groups have touted this balance as a reason to forego vaccination, offering parents advice on how to successfully apply for exemption to vaccination on behalf of their children.¹⁵ Media reports of a possible link between the MMR vaccine and autism (a link investigated and rejected in the medical literature and by the IOM¹⁶) further motivates non-compliance, as the low level of perceived risk for contracting vaccine-preventable diseases makes vaccine safety issues more weighty for parents. Importantly, however, the perceived balance of risks for individuals may not coincide with the balance of risks considered on a population-wide level: that is, the level at which it is rational for an individual to accept the risks of vaccination may not correspond to the level at which community-wide considerations make vaccination rational.¹⁷ The dangers of refusing vaccination are often hidden by statistical risks calculated on the basis of circumstances that would not hold true if non-compliance were widespread.

No vaccine is 100% effective. The success of vaccination programs relies on a concept known as ‘herd immunity,’ wherein protection is achieved through attaining a high enough level of immunity to a disease so as to make exposure to the organism that causes the disease extremely unlikely. If a critical mass of people is immune, then, those who are not immune are protected

¹⁴ D.R. Feikin, et al. Individual and community risks of measles and pertussis associated with personal exemptions to immunizations. *JAMA* 2000; 284(3145).

¹⁵ H.L. Coulter & B.L. Fisher. 1987. *A Shot in the Dark*. Avery Press; J. Murphy. 1993. *What Every parent Should Know About Childhood Immunization*. Boston. Earth Healing Products.

¹⁶ Institute of Medicine. *Immunization Safety Review: Measles-Mumps-Rubella Vaccine and Autism*. April 23 2001. Available at: <http://www.iom.edu/report.asp?id=4715>

¹⁷ P. Fine & J. Clarkson. Individual versus Public Priorities in the Determination of Optimal Vaccination Policies. *American Journal of Epidemiology* 1986; 124 (6).

through 'herd immunity'. It is for this reason that vaccination does not require 100% compliance to be effective – a feature central to the success of most vaccination programs, and a feature that skews the level of risk for contracting vaccine-preventable disease where herd immunity exists. The actual level of vaccination necessary to maintain herd immunity is different for each potential disease (depending on the rate of effectiveness for the vaccine in question), but generally ranges from 83%–94%.¹⁸ So long as this level of vaccination is attained, those who refuse to be vaccinated are nonetheless protected through the unlikelihood that they will ever be exposed to the disease. The problem arises from this phenomenon: individuals who seek exemption from mandatory childhood vaccination will be protected from contracting vaccine-preventable diseases through herd immunity, gaining this protection as a result of the widespread vaccination of others, while assuming no (real or perceived) risk of adverse reactions to the vaccines themselves. If exemptions to vaccination should be great enough to threaten herd immunity, however, significant harms through exposure to vaccine-preventable disease could result not only for those exempted, but for those who are excluded from vaccination for medical reasons, and for those who are vaccinated yet remain susceptible to the disease (since, again, vaccination is not 100% effective).

This sets up a classic 'free-rider' problem.¹⁹ In his classic work *The Logic of Collective Action*, Mancur Olson states: 'In a large, latent group there will be no tendency for the group to organize to achieve its goals through the voluntary, rational action of the members of the group, even if there is perfect consensus.'²⁰ The reason for this is that the action of any one individual will have a nearly imperceptible effect on the achievement of a collective goal, motivating free-riding behavior that seeks to garner the collective good at no cost to the individual in question. This will be true so long as an individual cannot be excluded from the collective good (as excludors cannot be excluded from the protection provided when herd immunity is achieved), no matter how agreed upon the desirability of the collective good. However, widespread noncompliance with behavior necessary to achieve

¹⁸ <http://www.bt.cdc.gov/agent/smallpox/overview/intro-to-smallpox.pdf>

¹⁹ See T. May & R. Silverman. Free-Riding, Fairness, and the Rights of Minority Groups in Exemption from Mandatory Childhood Vaccination. *Human Vaccines* 2005; 1(1): 12–15.

²⁰ M. Olson. 1971. *The Logic of Collective Action*. Cambridge, Mass. Harvard University Press: 59–60.

the collective good can result in loss of the good entirely – even for those who comply – a phenomenon often described as a ‘tragedy of the commons.’ This phenomenon may well be playing out at an early stage: a growing number of parents are seeking exemption to childhood vaccination on behalf of their children. In Colorado, for example, the number of children receiving exemptions on philosophical or religious grounds increased by 59% from 1987 to 1998.²¹ Similar increases in exemption rates have occurred in several other states,²² most notably in Utah, where exemptions to mandatory vaccination rose high enough to threaten herd immunity and result in a measles outbreak where half of those contracting measles had been vaccinated but had not achieved immunity (not surprising, since the rate of exemption was roughly equal to the rate of vaccine ineffectiveness).²³

PUBLIC HEALTH AND PUBLIC COMMUNICATION

Traditionally, the type of free-rider collective action problem posed by childhood vaccination has been viewed as resolvable only through enforced compliance, because ‘under the logic of collective action, voluntary cooperation cannot be assured.’²⁴ Given the harms that could result from lack of compliance, this approach would be justified if vaccination rates fell below certain levels. Enforced compliance, however, poses special problems that are particularly worrisome in a society that values both individual freedoms as well as respect for the rights of minority groups (as many exemptors refuse vaccination on religious grounds).²⁵ For this reason, it is desirable that vaccination programs remain voluntary in all but the most dire circumstances.

Because childhood vaccination does in fact provide benefits for most who are vaccinated even in the absence of herd immunity (most routine vaccination effectiveness rates – rates at which immunity is achieved – are high), and because exemptions seem tied to misperception of the balance of statistical risks skewed by the protection afforded through herd immunity (a balance that is significantly altered should herd immunity be lost), it should

²¹ Feikin et al., *op. cit.* note 14.

²² R. Silverman & T. May. Private Choice Versus Public Health: Religion, Morality and Childhood Vaccination Law. *Margins* 2001; 1(2).

²³ T. May. Vaccines as Community-Oriented Therapy. *Expert Review of Vaccines* 2003; 2(3).

²⁴ R. Hardin. 1982. *Collective Action*. Johns Hopkins University Press. Especially chapter 4: Types of Collective Action Problems. Quote taken from p. 52.

²⁵ May & Silverman. *op. cit.* note 19.

be possible to address the problems created by increasing exemptions through targeted education of the public. For this to occur, however, it is essential that strategies be developed for clear, accurate, and non-sensationalized communication between health officials and the public, and that the information conveyed be placed in appropriate context. In order to attain this type of clear, non-sensationalized coverage, efforts must be undertaken on the part of both the media and the health community to work toward responsible communication of information to the public. This, in turn, requires an understanding of the complex nature of conventions of scientific language, newsworthiness, and the characteristics of journalistic reporting that facilitate both miscommunication and sensationalism.

It is common to hear news stories justified by the idea that 'the public has a need to know', yet this basic justification ignores the fact that neither scientists nor journalists regard their role as one of educating the public in a straightforward sense.²⁶ Scientists are normally focused on discrete facts about a specific phenomenon, rather than the broader social relevance of this information. According to Dorothy Nelkin, the dependence of science reporters on the scientific community for information has, therefore, produced a representation of science that ignores the social and political context of scientific information.²⁷ In addition, differing expectations about the role of caveats and qualifications, for example, result in miscommunication about the nature of information conveyed. Most writers who study the phenomenon of sensationalism in media coverage of scientific information agree that such sensationalization is in part facilitated by the failure of both scientists and reporters to appreciate each other's conventions of professional communication,²⁸ resulting in each profession blaming the other for the misleading nature of sensationalized stories.²⁹

Not all sensationalism, however, is due to simple misunderstanding. What is 'newsworthy' is often quite different than what is 'something the public should be educated about', and a focus

²⁶ J. Gregory & S. Miller. 1998. *Science in Public: Communication, Culture and Credibility*. NY. Plenum Press: 109.

²⁷ D. Nelkin. 1995. *Selling Science: How the Press Covers Science and Technology*. NY. W.H. Freeman.

²⁸ M. Shuchman & M. Wilkes. Medical Scientists and Health News Reporting: A Case of Miscommunication. *Annals of Internal Medicine* 1997; 126(12); J. Winsten. Science and the Media: The Boundaries of Truth. *Health Affairs* 1985; 4(1); Institute of Medicine, *op.cit.* note 10, chapter 7: Media.

²⁹ Winsten, *ibid.*

on the former is the leading concern of journalists. The result can be a story that is misleading. As Shuchman and Wilkes describe, 'The journalist overstates the scientific finding and, as a result, the public is misled about the implications of that finding. This sort of reporting has its roots in newsroom pressures to dramatize stories by sounding alarms or touting cures . . .'³⁰ Jane Gregory and Steve Miller observe: 'The shift toward . . . popularizations of science – and the sensationalism that may result – is, then, not a punishment inflicted on science stories by disdainful or malicious journalists. It arises because of the rhetorical conventions of popularization.'³¹ The need to make a story 'newsworthy' results in several recognized strategies of news reporting that give news stories characteristics of 'drama' and 'personalization' that tend to distort the information conveyed.³² These characteristics are widely recognized among media scholars. As W. Lance Bennett has observed, there is remarkable consensus on these characteristics of media stories, over a vast literature that has considerable empirical support.³³ Journalists interviewed in one study cited the competition for prominent display of their stories as a leading cause of overstating scientific claims. In the words of one reporter: 'A weak statement will go no place.'³⁴ The focus of stories, therefore, tends to reflect the conventions of 'newsworthiness' that are the primary concern of reporters.

What exactly are these conventions that lead to sensational stories? According to Gregory and Miller, several factors are relevant to the determination of whether a story is 'newsworthy.' First, the story must meet a 'threshold standard'. That is, the story must be perceived as 'big'. The headline 'Small Earthquake in Chile – Not Many Dead' is not newsworthy, but the headline 'Thousands escape Injury in South American Quake' is newsworthy, despite the fact that both headlines describe the same phenomenon. Second, there is a need for a clear relevance for current circumstances. Often, this is accomplished through 'personalization', emphasizing the immediate potential of the phenomenon to affect the lives of readers. Gregory and Miller offer the example that a small earthquake in Chile is not as interesting as even a

³⁰ Shuchman & Wilkes, *op. cit.* note 28, p. 976.

³¹ Gregory & Miller, *op. cit.* note 26, pp. 116–117.

³² W.L. Bennett. 1996. *News: The Politics of Illusion*. NY: Longman Publishers, chapter 2.

³³ *Ibid.* p. 47.

³⁴ Winsten, *op. cit.* note 28, pp. 8–9.

smaller earthquake close to home. Finally, there is a need for a clear 'good news or bad news' focus to a story. According to Gregory and Miller, bad news is often more newsworthy than good news, and of bad news, potential deadliness is the biggest (and most dramatic) danger to humans, so media emphasize deadliness. Thus, 'the mass media are interested in risk because danger is dramatic'.³⁵

It is precisely these types of conventions that are apparent in reporting about the flu vaccine shortage. To the extent that this shortage poses risks to *everyone* rather than only to select high-risk groups, the story becomes more 'newsworthy'. Thus, 'personalization' leads reporters to imply the risks are more widespread than they actually are. Likewise, the need to meet a 'threshold standard' provides an incentive for reporters to emphasize the most serious risks, and downplay the more mundane health risks that contracting the flu poses for the majority of the population. Likewise, the risks posed by childhood vaccination are more newsworthy than more mundane stories that confirm vaccine safety. This problem is exacerbated by the fact that most contemporary parents have never experienced an epidemic.³⁶ The last widespread epidemic to occur in the United States involved polio, which (because of the success of vaccination programs) has been virtually eliminated since vaccination against this disease was introduced in the mid-1950s. At the same time, there is an increasing hesitancy to seek medical intervention unless it is perceived as necessary, due to recent reports of widespread medical errors and mistakes.³⁷

One example of the experiences that have resulted in Americans' reluctance to accept vaccination is the Swine Flu Affair of 1976. That failed vaccination campaign resulted in more than 1,000 cases of Guillain-Barre syndrome (a paralytic disease) among those seeking protection against an outbreak that never materialized.³⁸ This history is perhaps one reason why it has been so difficult for the medical community to dissuade fears stemming from media reports about possible links between childhood

³⁵ Gregory & Miller, *op. cit.* note 26, pp. 112, 188–189.

³⁶ M.J. Rosenau. The Uses of Fear in Preventive Medicine. *Boston Medical and Surgical Journal* 1910; 162(10), March 10.

³⁷ L. Kohn, J. Corrigan & M. Donaldson, eds. 1999. *To Err Is Human: Building a Safer Health System*. Report of the Institute of Medicine. Washington, DC. National Academy Press.

³⁸ R. Neustadt & H. Fineberg. 1978. *The Swine Flu Affair: Decision-Making on a Slippery Slope*. Washington, DC. U.S. Department of Health Education and Welfare.

vaccination and autism. In short, the fact that contemporary parents have not experienced social conditions of widespread epidemic tends to weaken the perception of need for vaccination. At the same time, contemporary parents *have experienced* increasingly visible reports on medical errors and possible vaccine safety issues, resulting in a tendency to view vaccination with suspicion. These facts are particularly important because they influence public retention of health information: studies show that past experiences and the expectations created by past ('cumulative') communication are important components in the general public's processing and retention of information.³⁹ Thus, the public is more likely to retain a story about a possible link between vaccination and autism (which is a story that 'matches' expectations set by past experience, and both is 'personal' and meets the threshold standard for dangerous risk), than a story that discredits this (which meets none of these).

Overcoming these conventions will require conscientious effort on the part of both journalists and the medical/scientific/public health community. W. Lance Bennett identifies the need for journalists to downplay the 'personalized' and 'dramatic' characteristics of news reporting in favor of developing the historical, institutional, and social contexts of stories as his leading recommendation for better and more accurate media communication.⁴⁰ But responsibility also lies with the medical, scientific, and public health community to take steps to facilitate better reporting of the type Bennett advocates. Indeed, current public health communication strategies often exacerbate the problem by using 'shock tactics' and statistics that amplify risks as a means to gaining public attention.⁴¹ While use of such tactics may seem effective in the narrow context of gaining public attention, in a broader context this strategy can backfire and undermine both public understanding and trust.⁴² The negative consequences of overstating risk for political reasons is perhaps nowhere better illustrated than in the Swine Flu Affair,⁴³ where overemphasis

³⁹ L. Jeffres. 1997. *Mass Media Effects*. 2nd Edition. Prospect Heights, IL. Waveland Press.

⁴⁰ W. Lance Bennett. 1996. *News: The Politics of Illusion*. NY. Longman Publishers: 208.

⁴¹ N. Guttman & C. Salmon. Guilt, Fear and Knowledge Gaps: Ethical Issues in Public Health Communication Interventions. *Bioethics* 2004; 18(6): 531–532.

⁴² L. Goodman & M. Goodman. Prevention – How Misuse of a Concept Undercuts its Worth. *Hastings Center Report* 1986; 16(2): 26–38.

⁴³ A. Silverstein. 1981. *Pure Politics and Impure Science: The Swine Flu Affair*. Baltimore, MD. Johns Hopkins University Press.

of the risks of outbreak resulted in public mistrust that continues to this day.

Rather than adopting the tactics of sensationalization, the medical, scientific and public health community must make efforts to recognize the importance of 'packaging' information for intended audiences so as to maximize the likelihood of communicating the message intended. Here, 'packaging' information does not allude to 'spinning' or misrepresentation of the facts. Instead, it refers here to the presentation of facts in a manner that will be understood and retained by the greatest number of people. The structure and rhetoric of messages are essential in determining how the message is received and interpreted by the public.⁴⁴ In this context, public communication must account for the background schemas under which the public understands and processes information.

Packaging is particularly important for communication in matters of health policy because a significant gap may exist between communicator and audience. Studies have shown, for example, that political experts remember information that is both consistent *and* inconsistent with background schema (mental structures that organize information), while the general public remembers only information that is consistent with background schema unless particularly motivated to make sense of the message.⁴⁵ The result is that politically-oriented health policy experts may fail to recognize that an intended message might fail to resonate with an intended audience if it lacks an accompanying explanation that sufficiently relates the information to existing public perceptions. This type of 'mis-packaged' communication may be extensive: in the published proceedings of the Institute of Medicine's Mini-Symposium on 'Science and Risk Communication', Baruch Fischhoff describes the importance of recognizing cultural, economic, and experiential diversities that create communication differences: '... people of lower socioeconomic status tend to receive health information from a few local, community-based sources. Conversely, scientists tend to communicate in ways that provide greatest benefit to members of the highest socioeconomic

⁴⁴ N. Terkildsen, F. Schell & C. Ling. 2000. Interest Groups, The Media, and Public Debate Formation: An Analysis of Message Structure, Rhetoric and Source Cues. In *Media Power in Politics*. Doris Graber, ed. Washington, DC. CQ Press.

⁴⁵ Jeffres, *op. cit.* note 39.

groups.⁴⁶ The result is a gap in information dissemination, both in source and interpretation.

In the same vein, we must redouble efforts to streamline communication to the general public. As anyone who has ever played the children's game 'telephone' will know, the further away from the source a message gets, the more it will differ from its original intent. Streamlining communication requires that primary, 'authoritative sources' of information be made available early in the reporting process. This need was illustrated dramatically in the recent case of Terri Shiavo, where confusion over her condition was caused by reporting that conflated comatose, brain dead, and persistent vegetative state conditions. Subsequent publications in the *New England Journal of Medicine* helped alleviate the confusion in many circles, but occurred too late in the process to help clarify public opinion. Streamlining communication, however, can only occur if efforts are first taken to resolve the 'packaging' gap between communicator and audience just described. It is reasonable to assume, for example, that one reason people of lower socio-economic status receive health information from local sources is that the poorly 'packaged' information relayed by authoritative sources simply fails to resonate. If packaging concerns are not addressed, then, streamlining will be ineffective.

With all of these efforts made, there should be optimism for the prospect of more rational public behavior related to risks. For example, in the case of childhood vaccination, while vaccine safety will continue to be a concern among some segments of the population, the vast majority can be expected to comply with vaccination requirements once the true balance of risks is understood. Perhaps most importantly, developing a sound public health 'communication infrastructure' designed to accurately convey health information can go along way in mitigating crises created through fear (in cases like that of the flu vaccine shortage). In this regard, public behavior in the immediate wake of the September 11 2001 terror attacks offers reason for optimism. The public displayed remarkable altruism in behaviors that placed community needs above personal interests.⁴⁷ If public

⁴⁶ B. Fischhoff. The Challenges of Risk Communication. In the Institute of Medicine Report: Science and Risk Communication: A Mini-Symposium Sponsored by the Roundtable on Environmental Health Sciences, Research, and Medicine, 2001. Available in CD-ROM format: Public Health Preparedness: Recent IOM Reports. Institute of Medicine.

⁴⁷ S. Brill. 2003. *After: The Rebuilding and Defending of America in the September 12 Era*. NY. Simon & Schuster.

communication can succeed in relaying the serious social risks associated with non-compliance with vaccination policies (both 'mundane' and 'crisis-oriented'), it is not unreasonable to hope for similar respect for public duties.

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