

Special Communication

The Paradox of Disease Prevention Celebrated in Principle, Resisted in Practice

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Prevention of disease is often difficult to put into practice. Among the obstacles: the success of prevention is invisible, lacks drama, often requires persistent behavior change, and may be long delayed; statistical lives have little emotional effect, and benefits often do not accrue to the payer; avoidable harm is accepted as normal, preventive advice may be inconsistent, and bias against errors of commission may deter action; prevention is expected to produce a net financial return, whereas treatment is expected only to be worth its cost; and commercial interests as well as personal, religious, or cultural beliefs may conflict with disease prevention. Six strategies can help overcome these obstacles: (1) Pay for preventive services. (2) Make prevention financially rewarding for individuals and families. (3) Involve employers to promote health in the workplace and provide incentives to employees to maintain healthy practices. (4) Reengineer products and systems to make prevention simpler, lower in cost, and less dependent on individual action. (5) Use policy to reinforce choices that favor prevention. (6) Use multiple media channels to educate, elicit health-promoting behavior, and strengthen healthy habits. Prevention of disease will succeed over time insofar as it can be embedded in a culture of health.

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Why is prevention such a difficult sell? This puzzling question surfaces daily in clinical practice and public health, and it intrudes on policy makers wanting to make scientifically sound, evidence-based policy decisions. Because prevention is so deeply embedded in US culture, the relative neglect of preventive medicine seems paradoxical. Proverbs such as “a stitch in time saves nine” and “an ounce of prevention is worth a pound of cure” are repeated by grandparents and grandchildren alike. Culturally, prevention is valued. Yet despite familiar aphorisms and frequent lip service, prevention of disease is, in the words of Shakespeare’s Hamlet, “a custom more honour’d in the breach than the observance.”¹

Prevention did much to advance human longevity to the level seen today. Fossil records suggest that early modern humans living 25 000 to 40 000 years ago survived on average to their mid-twenties.² In the millennia leading up to the beginning of the 20th century, average life expectancy increased by another 25 years, a rate of not more than 1 year per thousand years. Then, in the space of just 100 years, life expectancy in the most developed countries increased another 25 years. Only in the 20th century did accelerating economic growth, improved sanitation practices, and recognition of infectious diseases allow development of better nutrition and living conditions and eventually widespread use of vaccines and antimicrobials. The great infectious diseases that flourished in the slum conditions of newly industrialized nations were no longer as threatening. By 2010, noncommunicable diseases accounted for two-thirds of deaths in the world.³ This epidemiologic transition raises the stakes for prevention of chronic disease.

The needed preventive approaches differ in several key ways from the traditional curative approach most commonly empha-

sized in practice (Table). When a patient seeks medical care because of symptoms, the physician’s goal is to make a diagnosis, understand the pathology driving the disease, and identify the optimal treatment for that patient. For the care and cure of the individual patient, it is not particularly relevant how many others in the community may experience a similar ailment.

Prevention reverses the usual order of clinical thinking: it often starts at the population level and then translates information back to the individual. Rather than dwell on the pathology of disease, preventive medicine focuses on risk. In curative care, the goal is usually to restore patients to their earlier, normal state of health. In prevention, as in dealing with hypertension or elevated cholesterol levels in a community, the goal is to shift the entire population-wide distribution to a healthier level, thus changing the norm. In curative care, the principal professional responsibility is to the individual patient, whereas in preventive care, focus is often at the population level and entails a responsibility to the entire community. In curative care, solutions involve prescribing medication, performing operations, or delivering other clinical therapies; in prevention, there is a much wider array of possibilities, from changing behavior choices to altering social conditions, in addition to clinical interventions such as immunizations. Ensuring the health of a population is more difficult than delivering health care to an individual.

Obstacles to Prevention

At least a dozen reasons explain why prevention is so regularly resisted, regardless of how good it is in principle or celebrated in cultural lore (Box 1).

Table. Approaches to Curative and Preventive Medicine

Curative	Preventive
Identify pathology	Identify risk
Restore health (return to the norm)	Reduce risk (shift in the norm)
Promote individual service ethic	Responsibility is to the population
Clinical intervention predominates	Behavioral and social interventions are prominent, accompanied by clinical intervention

Success Is Invisible

This first obstacle is fundamental and intrinsic to prevention. There is no way to document or otherwise prove that an individual's personal preventive efforts improved his or her health. One can only assume that a lifelong effort to maintain a healthy diet, exercise regularly, or avoid smoking contributed to preventing a myocardial infarction. On the other hand, it is possible the individual could have been among the hypertensive, sedentary smokers who do not experience a myocardial infarction. As another example, consider the human papillomavirus (HPV) vaccine: if a researcher were to ask women if the vaccine helped them avoid cancer, are they going to know? Statisticians and scientists can count outcomes that occur, such as the number of cases of cancer, the number of myocardial infarctions, and the number of deaths. But when prevention succeeds, it creates an absence of events: indeed, when it works, prevention succeeds quietly, and it succeeds invisibly.

Invisibility leads to problems. Because of invisible success, some individuals might no longer see the need for immunizations. Certain diseases, like pertussis or measles, may seem distant and remote, and claims of immunization risks may seem more threatening, even when no reliable evidence supports these claims. When enough people stop getting vaccinated, as happened in the United Kingdom⁴ and Japan,⁵ outbreaks occur. Antivaccine movements endanger communities and especially children.⁶⁻⁹ Deaths from recent pertussis outbreaks in California¹⁰ were avoidable, yet they occurred. When vaccination rates decline, disease may reappear, and when vaccines are used, their success remains invisible.

Lack of Drama

There are television shows about emergency departments, but will there ever be a show about prevention? Think about the plot line: nothing happens. Certain types of curative interventions are, by contrast, dramatic and exciting. When a surgeon gives a child a chance at life because of a successful liver transplant, the child, the family, and the medical team are thrilled. However, does anyone think about the other child who became the liver donor when she died in a car crash because her parent did not put her in the car seat properly? Tragedy that could have been prevented is not considered. Visible drama in the foreground demands immediate attention; lack of drama does not. If prevention is to be successful, satisfaction needs to be derived from the absence of drama.

Statistical Lives

Statistical lives have little emotional effect. Statistics can estimate the number of lives saved by prevention, even though the actual individuals cannot be identified. Some years ago, a little girl known as "Baby Jessica" got stuck in a well in Texas. News coverage began

Box 1. Reasons Prevention Is Difficult

- Success is invisible.
- A lack of drama makes prevention less interesting.
- Statistical lives have little emotional effect.
- There is usually a long delay before rewards appear.
- Benefits often do not accrue to the payer.
- Advice is inconsistent or changes.
- Persistent behavior change may be required.
- Bias against errors of commission may deter action.
- Avoidable harm is accepted as normal.
- Prevention is expected to produce a net financial return, whereas treatment is expected only to be worth its cost.
- Commercial interests may conflict with disease prevention.
- Advice might conflict with personal, religious, or cultural beliefs.

within minutes; cameras were focused on that well, and reporters constantly updated an attentive public. When the fire department succeeded at freeing the girl after 2 days, everyone was relieved, and front-page headlines followed. In the United States, there are many children whose lives are just as confined by poverty and family circumstances as that little girl stuck in the well. Why is there not continuous coverage of these impoverished and disadvantaged children? Personal stories touch others emotionally; everyone connects to them and eagerly awaits the ending. It is difficult to become emotionally connected to a statistic. When it comes to health, every statistic is a number with a tear attached, but emotionally, it is just a number.

Long Delay Before Rewards Appear

A study of delayed gratification examined how long 4-year-olds could sit before eating a marshmallow placed in front of them.¹¹ The young children were told that if they did not eat the marshmallow until the investigator returned, they would get 2 marshmallows instead of just the 1 on the table. Some of the 4-year-olds just could not resist, while others managed to wait until the experimenter returned later.¹² The investigators found that the children who were able to delay gratification were, as adolescents, more reliable and much better performers on aptitude tests. Prevention is a bit like waiting to obtain that second marshmallow. However, people typically want what they want right away. For example, a 2-panel cartoon begins with the physician counseling a patient, "Everything seems okay: you just need to stop smoking, lose 20 to 30 lbs, cut down on your drinking, get 30 to 60 minutes of exercise daily, and try to reduce the stress in your life." In the second panel, the patient, staring plaintively at the physician, asks, "Can't you operate?" Prevention is often about doing things every day, and the reward is not only statistical and invisible, but also delayed. There is an analytic question of what a delayed payoff is worth relative to an immediate payoff (ie, considering discounted present value and uncertainty about the future), but even without such calculations, most people prefer tangible rewards in the here and now.

Benefits Often Do Not Accrue to the Payer for Prevention

Whoever pays for preventive care is often not the party that reaps the rewards from an eventual reduction in the burden of disease. An insurance company concerned with profit may not reimburse for

preventive counseling, supportive care, and patient encouragement if the payoff occurs many years in the future. From a commercial standpoint, supporting prevention is not a very smart proposition. Or suppose the board of a hospital were presented with an opportunity to launch a program that helps manage diabetes in the community. In this hypothetical situation, the hospital might hire a group of health care workers led by nursing teams who would work in the community to educate and motivate patients with diabetes. The patients do self-assessments at home, and the nurses monitor patients electronically (ie, via internet sites or e-mail) and receive feedback on a daily basis. Any time a patient's blood glucose levels start to get out of control, a nurse goes directly to the house to help ensure adherence with the therapeutic regimen. As a result, it is predicted that hospitalization could be reduced by half and patients will feel better. The average cost might be only \$1500 per patient per year, paid by the hospital, which would also experience a reduction in patient bed-days from the 50% decline in hospitalizations for patients with diabetes. This means the hospital bears the added costs of the home-based program while losing inpatient revenue. The board and the hospital leadership would have to ask whether they were prepared to make this investment. Someone on the board is bound to suggest it is probably an intrusion on patients' rights to send nurses into their homes and, besides, home care is not really the hospital's mission.

Incentives for prevention are often misaligned in a system designed to treat disease after it occurs. A key policy goal in health reform is to better align financial incentives with superior care, often including prevention. Too often still, the benefits of prevention do not accrue to the payer. Until incentives are aligned with health and not just diagnosis and treatment, true health care reform will be delayed.

Changing or Inconsistent Preventive Advice

A debate over mammography guidelines arose during the health reform discussion in Washington. After examining data showing the frequency with which mammography leads to false-positive findings, needless additional examinations, and biopsies, the US Preventive Services Task Force recommended that before age 50 years, women and their physicians should decide on an individual risk basis whether to obtain a mammogram, rather than recommend routine screening for all women aged 40 to 50 years.¹³ In other words, younger women with family history or other reasons should continue to undergo periodic mammography, whereas others should not. Some heard this refined advice to mean, "We don't care about women in their 40s anymore." Recent evidence suggests there has been no change in reliance on mammography following the panel's recommendations.¹⁴ Nevertheless, the panel's guidance highlights the point that prevention, although overall the most successful strategy in health, is not always the right or smart thing to do. In preventive screening, the value to the patient depends on the risk of disease, the frequency and consequences of error, and the ability to detect correctly and act accordingly.

To the public, the new guidance on mammography seemed like another example of shifting and inconsistent advice. Science progresses by reexamining, refining, and discarding previously held beliefs. Action must be based on what is currently thought to be true, yet this creates a weaker preventive message because there is no guarantee the advice will not change in the future. There is substan-

tial confidence in some recommendations: it is unlikely that cigarettes are ever going to be redeemed as a healthy habit. With other risk factors, such as nutritional counseling, more evidence over time may produce new insights. Given the twin epidemics of obesity and type 2 diabetes, consistent and specific recommendations about nutrition are particularly desirable.

Persistent Behavior Change May Be Required

Persistent behavior change is difficult yet often necessary to realize the benefits of prevention. It does not really help to control blood pressure only occasionally, when patients remember to take medication. The "daily" part of daily exercise is the challenge. The difficult part of healthy behavior is adhering to those healthy decisions day after day after day.

Bias Against Errors of Commission

Many people feel differently about adverse consequences due to action compared with consequences that follow from natural causes, even if they could have prevented them. Consider the following hypothetical scenario: a worldwide avian flu-like disease is moving steadily toward your country. Everywhere this outbreak has struck, 30% of the population has died. It is a horrific disease.

However, a new vaccine provides perfect protection against this strain of avian flu but also has a 10% mortality from adverse effects; 1 in 10 recipients will die from the vaccine. Should this vaccine be deployed in the face of an inevitable spread of the pandemic?

Some people would say yes, despite the dangerous adverse effects, and others would say no, but at least all could agree it was a debatable proposition. Now, imagine if the risk numbers were reversed: the flu carries a 10% mortality and the vaccine carries a 30% mortality. Under these circumstances, no one would recommend such a vaccine.

But why was this a relatively difficult decision when the disease was going to kill 30% and the vaccine was going to kill 10%, but trivially easy when the vaccine kills 30% and the disease, 10%? One reason is that most people do not feel the same about a death from natural causes as a death caused by their own action.

Some people have become disciplined to say, "I want to feel the same about it; I should feel the same about it; I should feel that adverse consequences of commission and omission are equivalent because in either case you are equally dead." When it comes to prevention, most people regret errors of commission more than errors of omission. Benjamin Franklin, who lost his 4-year-old son to smallpox in 1763, cautioned against weighing them unequally: "I long regretted bitterly, and still regret that I had not given it [the smallpox] to him by inoculation. This I mention for the sake of parents who omit that operation on the supposition that they should never forgive themselves if a child died under it; my example showing that the regret may be the same either way, and therefore that the safer should be chosen."¹⁵

Acceptance of Avoidable Harm as Normal

Too often, many people accept avoidable harm as normal. Nightly newscasts commonly report another murder and another deadly automobile collision. These unfortunate events happen. Most used to think it was normal to smoke, but today smoking is generally socially unacceptable. Thinking things are normal when they are avoid-

Box 2. Strategies to Overcome Obstacles to Prevention

- Pay for prevention.
- Make prevention cheaper than free.
- Involve employers.
- Reengineer to reduce need for individual action.
- Use policy to make the right choices easier.
- Use multiple channels to educate, reframe, and elicit positive change.

able is a psychological obstacle to implementing strategies of prevention. Safer cars and safer highways can be built; indeed, Sweden has adopted a goal it calls Vision Zero to eliminate highway fatalities, and some US jurisdictions are on the same path.¹⁶ And surely the right norm for the number of murders is zero.

Double Standard in Evaluation of Prevention as Compared With Treatment

When a new treatment for a particular disease is introduced, the main question is whether and how well it works. People want to know whether the chance of survival is better with or without a new treatment, and perhaps at what cost. That is the typical thinking when trying to evaluate a therapy. For prevention, the question is asked from a different perspective: a preventive intervention not only should be efficacious and cost-effective, but also should produce net savings in resources. The dollars saved to society from use of a vaccine should exceed the cost of the vaccine: in prevention, not only is value for the money obtained, the intention is to save money. Preventive interventions are supposed to produce net savings, whereas therapeutic interventions are only asked to produce better value, and that is a substantial difference. A double standard exists in judging the merit of preventives compared with therapeutic interventions.

Commercial Conflicts of Interest

This is an obvious obstacle to prevention. For instance, how can tobacco companies promote their products oblivious to the overwhelming body of evidence on the harmful effects of tobacco smoke? In 1994, 7 chief executive officers of Big Tobacco, one after another, affirmed under oath before the US House Energy and Commerce Committee that they did not believe nicotine was addictive.¹⁷ Is it possible that an executive of a tobacco company can truly believe that nicotine is not addictive? Human psychology is phenomenally adaptive so it is possible, but the rest of society should not have to be the victim of that perversion of thinking. Strong commercial interests can be distorting and problematic, even when those interests are promoting an effective preventive—as in the HPV vaccine controversy in the state of Texas.¹⁸ Commercial interests can work against prevention both directly and indirectly. However, they could be beneficial if incentives can be realigned so that both more profits and greater health occur through the same actions.

Conflicts With Personal, Religious, and Cultural Beliefs

Preventive strategies sometimes run counter to religious or deeply held personal beliefs. Some religious leaders teach that it is immoral to use condoms, even for the purpose of preventing the spread of a lethal sexually transmitted disease. Some believe in faith heal-

ing and abjure modern medicine. When preventive actions run contrary to a deeply held conviction, it is a much more difficult sell.

Strategies to Overcome Obstacles to Prevention

Despite these barriers, prevention is partially succeeding—invisibly—all around. The question is, how can that success be supported? How can prevention overcome the obstacles in its way? Following are 6 ways to overcome the barriers (Box 2).

Pay for Prevention

Incentives should be aligned so that clinicians are paid for the preventive care they provide. This has proven to be successful with immunizations in children, with very high vaccination rates. It now needs to be applied to other forms of care—nutritional counseling, physical therapy, and health counseling, to name a few—so that clinicians and health care organizations are rewarded for keeping their patients healthy.

Make Prevention Cheaper Than Free

Not only do incentives need to be realigned for the clinician, but they also need to be established for the individual. In the current culture that demands both better value and money savings from prevention, individuals and families will be most likely to take preventive measures if they are financially rewarded for doing so. This is not a novel idea: Mexico has had a program based on this model for many years. Now combined with the health policy called Seguro Popular, the Oportunidades program encourages low-income families to get regular checkups, receive vaccinations, and take other preventive measures by rewarding them with cash transfers if they do so.¹⁹ As an example, this model could be applied to the United States, expanding on financial incentives for insurance, bonuses for staying tobacco-free, and rewards for maintaining a healthy body weight. Indeed, this approach could be incorporated into accountable care organizations.

Involve Employers

Adults in the United States spend a large portion of their time and energy at work, leaving employers with one of the most significant opportunities to influence population health. Employers have often viewed health and fitness policies as a work benefit, traditionally including them only if they need to compete for employees. Instead, they could view prevention as an investment in their workforce—and a positive contributor to the company's success.

A study compared Johnson & Johnson, whose worksite health promotion program has been in place for more than 30 years, to other, similarly large companies on the basis of health care costs and employees' health risks. Not only were Johnson & Johnson employees found to be healthier, with meaningful reduction in rates of obesity, high blood pressure and cholesterol levels, tobacco use, and physical inactivity, but the health promotion program also generated cost savings, with lower rates of absenteeism and a reduction in high-cost interventions.²⁰ Companies like Safeway are showing that differential insurance premiums for employees based on tobacco usage, weight, blood pressure, and cholesterol levels can both promote individual health and help control employer costs of health care.²¹

Worksite programs that encourage employees to take better care of their health can do much to boost the health of the population. The field is wide open for employers to get more involved in prevention, and doing so will benefit both employees and the employers.

Reengineer to Reduce Need for Individual Action

Engineering, when harnessed to the needs of public health and prevention, can increase health and safety. Airbags in cars and antilock brakes have helped minimize avoidable risk. Taking it one step further, an intoxication screen to enable starting the car could reduce driving after consuming alcohol. On another front, engineering multiple-dose vaccines into single doses makes it more convenient to gain the vaccine's protection. There are many ways engineering can help prevention be less of a burden, and health care institutions would benefit from involving engineers in both curative and preventive medicine.

Use Policy to Make the Right Choices Easier

Policies that support prevention exist in many states and municipalities but are not consistent across the United States. Laws and regulations governing bike helmets, water fluoridation, and manufacturing requirements can do much to improve local health. Policies to reduce salt, eliminate trans fats in food products, and reduce sugar in the diet would lower population-wide risk of hypertension, cardiovascular disease, and diabetes. In preventive policy, New York City Mayor Michael Bloomberg's decision to ban smoking in public places, along with substantially increased taxes on cigarettes and a community-level intervention effort helping smokers to quit, has strikingly reduced smoking in the city, with adult smoking rates declining 11.2% in the first 5 years.²² Policy makers can do much to make prevention easier, and they should consider it part of their civic responsibility.

Use Multiple Media Channels to Educate, Reframe, and Elicit Positive Change

Making prevention easier, less expensive, and more convenient will help, and it is equally important that the medical community does a better job at explaining prevention to the population at large. In a recent JAMA Forum post, Josh Sharfstein, MD, illustrated with examples from his experience as health commissioner of Baltimore, principal deputy commissioner at the US Food and Drug Administration, and head of Maryland's Department of Health and Mental Hygiene how strategic communication and dialogue with constitu-

ents can pave the way for successful adoption of regulations to prevent disease.²³ Avoidable health risks need to be exposed as avoidable, and a culture that celebrates everyday healthy choices needs to be established. Prevention needs to be reframed: costs of commission and omission should be seen as equal, standards for measuring the value of prevention and treatment should be comparable, and statistics showing the success of prevention need to be humanized.

Traditional media, such as print, radio, and television, and newer, web-based and social media can be mobilized in this effort, along with the entertainment industry. Unconventional use of communication tools can yield positive returns. For example, the US Centers for Disease Control and Prevention recently made remarkably effective use of a graphic novella—a comic book—on the coming zombie invasion to inform the public about pandemic preparedness.²⁴

Deeply held beliefs can be made to work in favor of prevention as well as against it. Tony Schwarz, the late communication and advertising guru, argued that a product advertisement should never try to teach a listener or viewer something totally new. Rather, an ad should elicit something people already feel or believe but have not yet expressed.²⁵ Advertisers for commercial products succeed when they can align with a person's beliefs and desires and make use of the product part of a daily habit. Maybe those in the health and prevention field can similarly ask what is already in the mind of the public and how these beliefs and desires can be elicited to promote prevention. What are effective ways to reach out and expose something that people already care about and make it a healthy habit? Prevention needs to be connected to things people already value, to make prevention a daily reality.

Conclusion

The health care community cannot expect an overnight transformation; preventive messages must be repeated across many forms of media and entertainment to become solidified over time as cultural norms. Success will require a sustained effort from individuals and families in their daily lives; from physicians, nurses, pharmacists, and other health professionals; from cultural, entertainment, and sports celebrities; from employers and insurers; from political, civic, and business leaders; from public agencies at all levels; and from philanthropies. In the end, prevention is truly worth the investment to make a difficult sell just a little easier and to put everyone on the road to a healthier future.

ARTICLE INFORMATION

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REFERENCES

- Shakespeare W. *Hamlet*. Act 1, scene 4, lines 15-16.
- Trinkaus E. Late Pleistocene adult mortality patterns and modern human establishment. *Proc Natl Acad Sci U S A*. 2011. 108(4):1267-1271.
- Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380(9859):2095-2128.
- Church MA. Evidence of whooping-cough-vaccine efficacy from the 1978 whooping-cough epidemic in Hertfordshire. *Lancet*. 1979;2(8135):188-190.
- Sato H, Sato Y. Experience with diphtheria toxoid-tetanus toxoid-acellular pertussis vaccine in Japan. *Clin Infect Dis*. 1999;28(suppl 2):S124-S130.
- May T, Silverman RD. "Clustering of exemptions" as a collective action threat to herd immunity. *Vaccine*. 2003;21(11-12):1048-1051.
- Feikin DR, Lezotte DC, Hamman RF, Salmon DA, Chen RT, Hoffman RE. Individual and community risks of measles and pertussis associated with personal exemptions to immunization. *JAMA*. 2000;284(24):3145-3150.
- Gangarosa EJ, Galazka AM, Wolfe CR, et al. Impact of anti-vaccine movements on pertussis control: the untold story. *Lancet*. 1998;351(9099):356-361.
- Poland GA, Jacobson RM. Understanding those who do not understand: a brief review of the anti-vaccine movement. *Vaccine*. 2001;19(17-19):2440-2445.

10. Pertussis (whooping cough) in California and New York State. Public Health Agency of Canada; 2010.
11. Mischel W, Shoda Y, Rodriguez MI. Delay of gratification in children. *Science*. 1989;244(4907):933-938.
12. The power of delayed gratification: kids marshmallow experiment. LATorontoBlog YouTube video. <http://www.youtube.com/watch?v=OmWc1Y2dpmY>. Accessed June 6, 2013.
13. Screening for breast cancer. US Preventive Services Task Force. <http://www.uspreventiveservicestaskforce.org/uspstf/uspbsrca.htm>. Accessed June 6, 2013.
14. Pace LE, He Y, Keating NL. Trends in mammography screening rates after publication of the 2009 US Preventive Services Task Force recommendations [published online April 19, 2013]. *Cancer*. doi:10.1002/cncr.28105.
15. Franklin B. *The Autobiography of Benjamin Franklin*. Philadelphia, PA: Henry Altemus; 1895.
16. The Vision Zero approach to traffic safety. Vision Zero Initiative: Traffic Safety by Sweden. <http://www.visionzeroinitiative.com/en>. Accessed June 6, 2013.
17. Hearing of the House Energy and Commerce Committee: Subcommittee on Health and the Environment, Subject: nicotine and cigarettes: 1994. Tobacco Documents Online. <http://tobaccodocuments.org/lor/94668518-8672.html>. Accessed June 6, 2013.
18. Saul S, Pollack A. Furor on rush to require cervical cancer vaccine. *New York Times*. February 17, 2007. <http://www.nytimes.com/2007/02/17/health/17vaccine.html?pagewanted=all&r=0>. Accessed June 5, 2013.
19. Frenk J. Bridging the divide: global lessons from evidence-based health policy in Mexico. *Lancet*. 2006;368(9539):954-961.
20. Henke RM, Goetzel RZ, McHugh J, Isaac F. Recent experience in health promotion at Johnson & Johnson: lower health spending, strong return on investment. *Health Aff (Millwood)*. 2011;30(3):490-499.
21. Burd SA. How Safeway is cutting health-care costs: market-based solutions can reduce the national health-care bill by 40%. *Wall St Journal*. June 12, 2009. <http://online.wsj.com/article/SB124476804026308603.html>. Accessed June 6, 2013.
22. Li W, Kennedy J, Kelley D, Sun Y, Maduro G, Shen S. *Summary of Vital Statistics 2008*. City of New York: New York City Dept of Health and Mental Hygiene. <http://www.nyc.gov/html/doh/downloads/pdf/vs/2008sum.pdf>. Accessed June 6, 2013.
23. Sharfstein J. JAMA Forum: public health regulation as a public process. <http://newsatjama.jama.com/2013/05/22/jama-forum-public-health-regulation-as-a-public-process/>. Accessed June 6, 2013.
24. Zombie novella. Centers for Disease Control and Prevention Office of Public Health Preparedness and Response. http://www.cdc.gov/phpr/zombies_novella.htm. Accessed June 6, 2013.
25. Schwartz T. *Media, the Second God*. New York, NY: Random House; 1981.